Do imports of intermediates promote exports?

Alessia Lo Turco and Daniela Maggioni*
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Abstract

Making use of a large panel dataset on Italian manufacturing firms, we provide evidence on the effect of imports on the firm export performance. We distinguish imports of intermediates according to their origin and we find that inputs sourced from low labour cost countries promote the firms' export activity. Imports from high-income countries do not significantly contribute to the export orientation of firms, especially when persistence in export is considered and the possible endogeneity of the import measures are accounted for via System GMM estimation of a linear probability model. Our evidence suggests that the impact of imports on the firms' entry in export markets works through the cost saving channel rather than the technology channel.

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*Università Politecnica delle Marche, Department of Economics; Ancona - Italy; Email:*a.loturco@univpm.it*; *d.maggioni@univpm.it*. The data used in this work are from the ISTAT Annual Report, 2006. All elaborations have been conducted at the ISTAT "Laboratorio per l'Analisi dei Dati ELEmentari" under the respect of the law on the statistic secret and the personal data protection. The results and the opinions expressed in this article are exclusive responsibility of the authors and, by no means, represent official statistics. We are grateful to Fabio Fiorillo and Stefano Staffolani for their useful suggestions.

1 Introduction and Literature Review

The increasing penetration of imports of intermediates from emerging and low income countries, especially toward European Union and USA, can be considered a noticeable feature of international relationships in the last decades. The fall of the iron curtain and the subsequent integration of low labour cost countries into the EU has meant the reshaping of the former members' production organization within and across their national boundaries. Also, the entry of China into the WTO and the growing international openness of developing countries have brought an unprecedented opportunity in terms of cheap imports and firm location choices for all of the industrial countries. While much evidence exists on the effect of international fragmentation of production, namely offshoring, on employment, skilled-low skilled wage gap and productivity[1], up to now less attention has been paid to the effect of offshoring practices on firm's export performance. The penetration of foreign markets has become an important strategy for a firm in the globalised world and the drivers behind the firms' export entry has drawn the attention of economists. The existing evidence shows that exporters are in general the best performers in a sector and self-select into the export market (Bernard, Jensen, Redding, and Schott, 2007; ISGEP, 2008; Wagner, 2007). The entry in foreign markets is by no means an easy activity and the evidence of sunk and fixed costs of exporting explains why only more productive firms succeed to sell their goods outside the national boundaries (Roberts and Tybout, 1995; Melitz, 2003). A growing and more recent strand of literature, however, is also pointing at two way traders and self-selection into the import market. The evidence is quite homogeneous: firms that both import and export are the best performers in a sector, compared to those that either export or import and to domestic firms (Vogel and Wagner, 2010; Altomonte and Bekes, 2009). For Italy too, Castellani, Serti, and Tomasi (2010) show that firms engaged in both import and export outperform both non-trading firms and firms involved in either importing or exporting only and that firms involved in importing but not in exporting outperform those engaged only on the export side. The premium of two-way traders however declines when they control for fixed effects. Through a transition matrix, they also document that importers are more likely to become exporters than domestic firms and the opposite is also true.

Another related part of the literature deals with the role of imports for productivity. Amiti and Konings (2007) find positive effects of input tariff reductions on firm productivity in Indonesia and these gains are found to be especially large for importers. Halpern, Koren, and Szeidl (2005) for Hungary and Kasahara and Rodrigue (2008), for Chile, confirm that import

[1]To cite only a few works the seminal papers for the U.S. economy are Feenstra and Hanson (1996), Feenstra and Hanson (1999), Amiti and Wei (2004), Amiti and Wei (2006). From these several contributions have focused on European countries too.

activity positively affects firm productivity. Paul and Yasar (2009) for the textile and apparel industries in Turkey show that plants outsourcing internationally (i.e. importers) perform better than those that only outsource domestically. For Ireland, Görg, Hanley, and Strobl (2008) and Forlani (2010) display different findings: while the first work supports a beneficial impact from international outsourcing of services inputs for exporters, Forlani (2010) shows in opposite that only material offshoring increases the firm efficiency. In opposite to the cited works, Vogel and Wagner (2010) find that no learning by importing can be detected for German manufacturing firms while self-selection into importing is at work. Few papers focus on the heterogeneous impact of imports according to the origin countries. Among these works, Lööf and Andersson (2010) prove that imports from highly knowledge intensive countries only are an important source of productivity in their sample of Swedish firms. In the same line, Jabbour (2010) finds an opposite result for a sample of French firms: both firm productivity and profitability measures are positively related with international outsourcing to developing countries only but the larger effect on the latter performance indicator confirms that outsourcing to developing countries is especially motivated by profit more than efficiency enhancing reasons.

Within this framework, the papers that link the firm import and export activities are a few. Sjöholm (2003) investigates whether foreign networks reduce the costs of exporting and finds that imports importantly affect the probability of becoming an exporter in Indonesian manufacturing sectors. Muûls and Pisu (2009), for the Belgian economy, show that firms that both import and export are larger and more productive than exporters and importers. They estimate a dynamic probit model for imports and exports and support the existence of sunk costs also for the import activity. Additionally, when the lagged import (export) status is included in the export (import) probability regression, the coefficient on the lagged dependent variable shrinks. The Authors interpret this finding as exporting and importing having common sunk costs: a firm which is already integrated into the international markets through one of these channels may activate the other more easily. It is worth to notice however that the lagged dependent variable coefficient only modestly decreases in magnitude (about 5% in both cases) when the other international activity status is taken into account and this points at other channels through which one activity can actually affect the other, out of the common sunk costs. Building on the Chilean evidence about the strict linkages existing between exports, imports and productivity, Kasahara and Lapham (2008) extend Melitz's model incorporating imported intermediates. In their theoretical framework imported inputs increase productivity due to increasing returns (a higher variety of imported intermediates increases total factor productivity) but, due to the high fixed cost of importing, only more productive firms can import from abroad. Thus, a firm's productivity determines its participation in international markets (i.e. importing inputs

and/or exporting output) and, additionally, this participation decision (i.e. importing inputs) has an effect on its productivity. Trade liberalization in intermediates increases aggregate productivity because more productive firms start importing and achieve within-plant productivity gains which may allow them to start exporting[2]. They estimate their model on plant-level Chilean data and several counterfactual experiments suggest that there are substantial aggregate productivity and welfare gains due to trade. So, due to import and export complementarities, policies which inhibit the import of foreign intermediates can have a large adverse effect on the exports of final goods. The same linkage import-productivity-export is empirically investigated by Bas and Strauss-Khan (2010) on French data. The Authors analyse the impact of the number and diversification of imported inputs on the export scope, instead of on the export status, through the effect of imports on productivity. The Authors test for three different mechanisms - better complementarity of inputs, transfer of technology or decreased price index - by distinguishing the origin of imports (developing vs. developed countries) and constructing an exact price index (Broda and Weinstein, 2006). In a first step of their analysis they find that an increase in the number of varieties and diversification of imported inputs has a robust impact on the extensive and intensive margins of exports. Then they claim that this effect is due to the positive effect of the number of imported inputs on productivity which mainly runs through the technology and complementarity channel. Another channel through which imports may help the export activity is studied by Bas (2009) who, starting from Melitz and Ottaviano (2008), develops a trade model of heterogeneous firms to study how the access to high quality/cheaper foreign intermediate goods affects domestic firms' export performance: changes in the industry imported input intensity or in import barriers on intermediate goods reduce relative factor costs and enhance the competitiveness of domestic firms. A reduction in trade costs acts as a homogeneous increase of productivity for the firms in a sector. Firms in these sectors, then, experience a higher probability of becoming an exporter and a larger export share of the sales. Thus, this paper focuses on the cost saving effect of intermediate imports which operates through reduction in trade costs/increase in the intensity of foreign cheaper inputs at the sector level. The channel we mean to explore in this research is quite close to the one shown in Bas (2009). We have shown that in the previous literature the linkage between the import and export activity gets through the efficiency-enhancing role of imports. The increase in the variety of inputs available, the higher quality, and better technological content of imported inputs may increase the firm productivity and this productivity improvement may ease

[2]Additionally, in equilibrium, higher labour demand from new importers and exporters increases the real wage and, as a result, the least productive firms exit from the market, leading to a further increase of aggregated productvity.

the penetration in foreign markets. This hypothesis can be reasonable for the developing countries (as for example in Kasahara and Lapham (2008)) since most of their imports of intermediates originate from high income countries. On the other hand, for advanced countries distinguishing the origin of imports may be extremely important since the inputs originating from low labour cost country may be motivated more by cost saving reasons than by technological advances. If this is the case, firms willing to start exporting may compensate the fixed cost of exporting through an increase in the availability of cheaper foreign inputs. Once accounted for common sunk costs and productivity we may expect that an increased availability of cheaper imported input lowers average costs and delivers increased competitiveness to the firm: we expect that, *ceteris paribus*, an increase in the imported input intensity increases the probability to become an exporter. Thus, the breakdown of imports according to their origins allows us to investigate and capture the two different mechanisms that may be at work: the cost-saving channel that it is highly likely to prevail in the case of input flows from low-wage countries, and the technology channel that may characterise intermediates purchases from advanced economies. In our empirical strategy, we will estimate an empirical model for the probability of exporting where we include the intensity of imported inputs among the right hand side variables. The paper is structured as follows: section 2 presents the data and discusses some descriptive evidence on the import-export nexus; section 3 retrieves an estimable equation, while section 4 discusses the results; section 5 presents the main conclusions from the analysis.

2 Data

The main data source for this work is a balanced panel of Italian limited companies covering a 5-year period from 2000 to 2004. The data set has been used by the National Statistical Institute (Istat) for a descriptive analysis on offshoring practices by Italian firms published in the Istat Annual Report for 2006 and it has been obtained through the merge between customs and balance sheet data. Our sample represents about 40% of total manufacturing employment and output and reproduces their sectoral distribution. The data set provides detailed information for 40479 firms[3] on output and inputs, labour costs, tangible and intangible fixed assets, exports, control participation, offshoring (imports of intermediates). The firm activity sec-

[3]The original number of firms was slightly higher, however, as standard in the literature we cleaned the sample removing firms in NACE sectors 16 and 23 and firms with some anomalous (zero or negative) or missing values for the main variables (output, materials, value added or capital). We have also excluded firms which are considered as outliers for at least one year in the sample period, we consider as outliers those observations from the bottom and top 0.5 percent of the distribution of some main ratio (value added on labour and capital on labour).

tor is recorded at 3-digit NACE and allow us to define Traditional sectors according to the Pavitt's taxonomy [4] (Pavitt, 1984).

As in the literature (Feenstra and Hanson, 1996, 1999; OECD, 2007), researchers at Istat have defined imports of intermediates or offshoring the firm import flows of non-energy material intermediates from all sectors and the imports of finished goods from the firm's sector[5]. Also, imports have been split according to the development stage of partner countries, developed and non-developed economies.

2.1 Descriptive Evidence

The upper panel in Table 1 shows the share of exporters, importers and importers to Low and High income countries for the first and last year of our sample. These figures are shown for the total sample and for the two subsamples of Traditional and Non Traditional sectors. During our sample period both the share of exporters and importers is higher in Non Traditional sectors, but it has increased more in Traditional sectors. When importers are split according to the development level of their source country we can observe that this pattern mainly concerns importers from low income countries. This evidence confirms the growing presence of low labour cost countries in the international arena and raises questions about the impact of this increasing competitive pressure for the performance of firms in developed countries, in terms of threats but also opportunities. As far as importers from high income countries are concerned, their share over total manufacturing firms does not significantly change over the sample period. Finally, about 15% of the firms in the sample imports from both sources in 2000, and this share increases by about 2.5 percentage points by the end of our sample period with Traditional sectors experiencing once again a slighly higher growth. This growth proves the deeper and deeper involvement of Italian firms in international markets. Especially, it is worth to notice that most importers from developing countries (about 70%) are also buying intermediates by firms in advanced economies and this suggests the existence of a complementarity between the two international activities. The reasons behind these activities are likely to be different (cost-saving reasons versus technology purchases).

Turning to Panel B of Table 1, the share of exporters that import from low income countries increases much more than the corresponding share

[4]The following sectors are classified as Traditional: 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 171, 172, 173, 174, 175, 176, 177, 181, 182. 183, 191, 192, 193, 201, 202, 203, 204, 205, 212, 245, 256, 251, 286, 287, 361, 362, 364, 365, 366. The remaining ones are classified as non-Traditional.

[5]These latter flows are also part of the international fragmentation of production and it is important to take them into account: when firms decide to move some parts of their production process abroad they could decide to move the final stages too. Anyway, it is not possible to test the robustness of our results excluding these flows of goods.

Table 1: Importers and Exporters and Importing Exporters

PANEL A:						
		2000			**2004**	
	All	*Traditional*	*Non Traditional*	*All*	*Traditional*	*Non Traditional*
% *Exporters*	61.34	58.11	66.14	63.82	61.15	67.91
% *Importers*	37.32	34.14	42.01	38.89	35.82	43.59
% $Importers_{LI}$	20.88	17.41	26.02	24.99	21.61	30.13
% $Importers_{HI}$	31.44	29.87	33.76	31.50	30.30	33.33
% $Importers_{HILI}$	15.00	13.14	17.76	17.59	16.09	19.87
PANEL B:						
		2000			**2004**	
		Non Exporters	*Exporters*		*Non Exporters*	*Exporters*
% $Importers_{LI}$		3.47	31.55		3.75	36.71
% $Importers_{HI}$		6.68	46.74		6.29	45.51
$impshare_{LI}$		0.46	2.91		0.44	3.80
$impshare_{HI}$		1.45	7.32		1.35	6.88

of non exporters while the fraction of firms importing from high income countries slightly shrinks both for exporters and non exporters. Finally, the last two rows show that the average import intensity in intermediates is higher when imports originate from high income countries, but it only grows when imports are from low income countries and firms are classified as exporters. This descriptive analysis calls for a more rigorous investigation of the linkages between export and import activity. Especially it suggests to pay a particular attention on the role of import flows from developing countries that have noticeably grown in the last decades and may have changed the competitive and economic environment where firms operate.

To shed further light on the correlation between the firm entry in foreign markets and the availability of cheaper and high-tech foreign inputs, we focus on a sample of export starters. We define export starters as those firms in our sample that start to export in t and have not exported in t-1, t-2 and t-3. According to our panel time span, the adoption of this definition of export starters leaves us with two waves of starters: the 2004 wave includes 1,026 firms and the 2005 one includes 973 firms, for a total of 1,999 export starters. Table 2 shows the difference in the import status (and shares) between export starters and never exporters one year and two years before the entry in foreign markets. The t-Tests reveal that in the pre-entry years export starters on average are more likely than never exporting firms to be importers and they also have a larger share of imports among their intermediate inputs.

The previous evidence proves that despite the larger weight of high income origins in the Italian firms' import activity, imports from low income countries gain importance in our sample period. As a consequence, we could expect an increase in the export activity to be associated with an intensification of imports from low income countries. Export starters also show

Table 2: Export Starters vs Never Exporters

	Starters	Never	t-test
$importer_{LI\ t-1}$	0.066	0.021	-13.252
$importer_{HI\ t-1}$	0.106	0.042	-13.541
$impshare_{LI\ t-1}$	0.007	0.002	-6.207
$impshare_{HI\ t-1}$	0.018	0.010	-5.151
$importer_{LI\ t-2}$	0.061	0.020	-11.835
$importer_{HI\ t-2}$	0.106	0.042	-13.236
$impshare_{LI\ t-2}$	0.007	0.002	-6.129
$impshare_{HI\ t-2}$	0.018	0.010	-5.041

significantly higher involvement in import activity than firms that never export. Following these hints, the next section means to develop an empirical model to test the role of imports in the firm export activity.

3 Empirical framework

The firm's technology can be described by a cost function in the price of labour, w, imported materials, p_m, domestic materials, p_d and output y

$$C(w, p_m, p_d, y) = \frac{y}{\phi} w^{\alpha} (p_m^{\gamma} p_d^{1-\gamma})^{1-\alpha} \ with\ 0 \leq \alpha,\ \gamma \leq 1 \tag{1}$$

where ϕ is the firm specific total factor productivity and $0 \leq \gamma \leq 1$ represents a firm specific technology parameter[6].

Assuming that firms face monopolistic competition in the output market and that the representative consumer's utility function is a C.E.S. over a continuum of varieties as in Melitz (2003), we can express the price for final output as a constant mark up over marginal cost

$$p_y = \frac{\sigma}{\sigma - 1} * \frac{w^{\alpha} (p_m^{\gamma} p_d^{1-\gamma})^{1-\alpha}}{\phi} \tag{3}$$

with σ expressing the elasticity of substitution across varieties. From the above equations follows that profits are

$$\Pi = \left[\frac{w^{\alpha} (p_m^{\gamma} p_d^{1-\gamma})^{1-\alpha}}{(\sigma - 1)\phi} \right] y \tag{4}$$

[6]We can assume that $\gamma \neq 0$ implies

$$\frac{y}{\phi} w^{\alpha} (p_m^{\gamma} p_d^{1-\gamma})^{1-\alpha} - \frac{y}{\phi} w^{\alpha} p_d^{(1-\alpha)} < f_m \tag{2}$$

With f_m representing a firm specific sunk cost of entrance into the import market. Just as for productivity, firms draw their f_m from a distribution and realise whether they can have access to the imported inputs or not.

Now, borrowing from Melitz (2003), in equilibrium we can express output of each variety in terms of its demand as

$$y = Y \left[\frac{p_y}{P}\right]^{-\sigma} \tag{5}$$

with Y representing the aggregate good made up of the varieties consumed and $P = [\int_\omega p(\omega)^{1-\sigma} d\omega]^{\frac{1}{1-\sigma}}$ representing the aggregate price.

Finally, plugging 5 into 4 we get the following expression

$$\Pi = \frac{YP}{\sigma} \left[\frac{(\sigma-1)}{\sigma} \frac{\phi P}{w^\alpha p_m^{\gamma(1-\alpha)}}\right]^{\sigma-1} \tag{6}$$

where p_d is taken as the numeraire. Now, entry in the export market requires an additional fixed entry cost, F_{exp}, then a firm will enter the foreign market if the expected profits are higher than this sunk entry cost. Ruling out uncertainty about future profits and defining r the interest rate

$$\frac{\Pi}{r} = \frac{\frac{YP}{\sigma}\left[\frac{(\sigma-1)}{\sigma} \frac{\phi P}{w^\alpha p_m^{\gamma(1-\alpha)}}\right]^{\sigma-1}}{r} > F_{exp} \tag{7}$$

We index sectors with j and define the fixed export cost as made up of a sector specific δ_j component and a sector-firm idiosyncratic shock, μ_{ijt}

$$F_{exp} = e^{\delta_j + \mu_{ijt}} \tag{8}$$

Substituting 8 into 7, taking the variables in logarithm and assuming μ_{ijt} is normally distributed, we get our empirical model to estimate via a probit model:

$$Pr(Exp_{ijt} = 1) = Pr(\beta_0 + \beta_1 ln\phi + \beta_2 lnp_{m\ it} + \beta_3 lnw\ it + \beta_4 lnr + \delta_j > \mu_{ijt}) \tag{9}$$

The main variables we include in our probit model are the logarithm of the firm total factor productivity, the logarithm the firm-level average wage and the share of imported materials over total intermediates which is used to proxy the relative price of imported intermediates. We also include the firm size, measured as the logarithm of the number of employees and a full set of two digit sector and time dummies as controls. Table 5 shows the descriptive statistics for the variables used in our model while Table 6 shows their pairwise correlations. In these Tables and in the following ones $impshare_{LI}$ and $impshare_{HI}$ stand for the share of imports coming respectively from Low and High income countries, TFP_{ind} is the total factor productivity index[7], l is the logarithm of labour and captures the firm size and w is the firm average wage.

[7]TFP has been computed using a multilateral index suggested by Good et al. (1997).

4 Results

We first present the results obtained on the sample of export starters and then we extend the estimation to the whole sample of manufacturing firms and we take into account persistence in the decision to export by means of the System GMM estimation on a linear probability model (LPM).

4.1 Starters

Focusing on the sample of starters and never exporters let us to disregard the role of the previous firm export experience (that is, the lagged export status) on the probability to export at time t, and to detect sunk entry costs via the inclusion of sector dummies. We estimate a model as in equation 9 on the sample including starters for the entry year in the export market and never exporters for all the years they are in our dataset. Results are from pooled probit regressions. Table 3 shows the results on the population of export starters. Here the right hand side variables are alternatively included at time *(t-1)* and *(t-2)*, however the latter specification is pure preferred since it allows for a reduced influence of endogeneity and reverse causality problems on our results. The Table shows that an increase in the imported input intensity from cheap labour cost countries is associated to an increase in the probability to become an exporter. The same insight is confirmed when we include further firm and sector-level controls in Tables 7 and 8, where we focus on two-year lagged regressors. In Table 7 first we have substituted labour productivity for the TFP index and then we have controlled for the capital intensity of the firm in several way: first we have included the log of the real stocks of intangible and tangible capital, k_{int} and k_{tan}, and then we have included the log of their share over output, ky_{int} and ky_{tan}. In Table 8 we have controlled for some relevant sector-level variables: the export openness, Exp_Open, the import penetration from high and low income countries, Imp_Pen_{HI} and Imp_Pen_{LI}[8], and the output and input tariffs from high and low income countries, $OutputTariff_{HI}$, $OutputTariff_{LI}$, $InputTariff_{HI}$ and $InputTariff_{LI}$[9]. All these results confirm the evidence from the base specification of a possible positive role of imports from low income countries in the export status of manufacturing firms, regardless of the sector of activity. On the contrary there seems to be no role for imports from high income countries, especially when we also control for firm capital intensity and the internationalisation of their activity sector. It is worth to

[8]Export Openness and Import Penetration ratio are obtained making use of sectoral trade data from Istat (COE dataset) and the Italian firms economic accounts (Conti Economici delle Imprese, Istat) and are defined at 3-digit NACE level. For some 3-digit sectors trade indicators are missing.

[9]Output Tariff data are from WITS and concern 2-digit NACE sectors. Input Tariffs have been computed combining Output Tariffs and information from Input-Output Tables (ISTAT).

notice that the results are confirmed also when input tariffs are included in the specification, thus suggesting that cost saving from increased imported input intensity is not uniquely derived by trade liberalisation.

Table 3: Probit Model

	ALL SAMPLE		TRADITIONAL		NON TRADITIONAL	
$impshare_{LI\ t-1}$	1.529***		1.205***		2.067***	
	[0.33]		[0.405]		[0.583]	
$impshare_{LI\ t-2}$		1.681***		1.562***		1.796***
		[0.343]		[0.439]		[0.569]
$impshare_{HI\ t-1}$	0.292*		0.147		0.417*	
	[0.157]		[0.224]		[0.224]	
$impshare_{HI\ t-2}$		0.287*		0.209		0.355
		[0.154]		[0.22]		[0.219]
$TFP_{ind\ t-1}$	0.148***		0.267***		0.0792	
	[0.0438]		[0.0759]		[0.0541]	
$TFP_{ind\ t-2}$		0.190***		0.247***		0.163***
		[0.0425]		[0.0749]		[0.0525]
l_{t-1}	0.172***		0.197***		0.164***	
	[0.0172]		[0.0303]		[0.0211]	
l_{t-2}		0.175***		0.196***		0.175***
		[0.0173]		[0.0308]		[0.0211]
w_{t-1}	0.103*		-0.0137		0.168**	
	[0.0535]		[0.0904]		[0.0672]	
w_{t-2}		0.00779		-0.0154		0.0106
		[0.0516]		[0.0885]		[0.0646]
Const.	-2.874***	-1.927***	-1.740**	-1.724**	-3.938***	-2.395***
	[0.527]	[0.507]	[0.885]	[0.866]	[0.803]	[0.78]
Observations	22841	22838	7630	7594	15046	14988
pR2	0.0276	0.026	0.0305	0.0299	0.0292	0.0264
LL	-6584	-6590	-2236	-2216	-4283	-4285
	333.2	315.4	122.8	115.9	231.2	212.6

*** p<0.01, ** p<0.05, * p<0.1. The Dependent Variable is the probability to start exporting.
Pooled Probit Regressions. All regressions include a full set of sector and year dummies.
Robust standard errors are in brackets.

4.2 A dynamic model of the export determinants

In the previous section the role of sunk entry costs was assumed sector specific and time invariant and it was detected via the inclusion of sector dummies. However this may not be an appropriate way to identify export sunk costs, especially if the effect of imports on the probability to export works through the common sunk costs channel as in Muûls and Pisu (2009). Then, to control for the importance of sunk costs in the export activity and to ascertain that our import variables do not proxy for past international experience being fundamental to break into foreign markets we estimate a dynamic linear probability model on the overall sample: once accounted for past export experience, we might ascertain whether increased imported intermediate intensity still turns as a significant determinant of the export status. Additionally, the dynamic model also permits us to estimate the role of imports including all firms on the sample, not only export starters and

never exporters as in the previous regressions, but also continuous exporters ans switchers.

The inclusion of the lagged dependent variable poses a well known endogeneity issue due to its correlation with the latter and the individual specific effect. GMM estimators have usually been used to account for this endogeneity source (Arellano and Bond, 1991; Blundell and Bond, 1998; Bond, 2002) and as far as the linear probability model is concerned Bernard and Jensen (1998) adopt this empirical strategy on a panel of U.S.A. firms. The use of the GMM estimator also allows us to instrument our variables of interest, $impshare_{LI}$ and $impshare_{HI}$, and then to deliver causal effects from our estimates, under the validity and exogeneity of our instruments. Third and Fourth Lags of the variables have been used as instruments[10]. The Hansen tests confirm the validity of our instruments. The results show that the positive effect of imports from low labour cost countries on the export probability is confirmed in the base specification in Table 4 and also from the robustness checks in Table 9 and 10. These findings are confirmed for all sectors regardless of their technological level. Anyway, gains from imports seem to benefit firms in Non Traditional sectors more than the others.

5 Conclusions

With this paper we provide evidence on the role of the imported inputs in the manufacturing firms export activity. The estimation of a probit model on the export starters and of a dynamic linear probability model deliver some interesting insights on the internationalisation process of Italian manufacturing firms. Once controlled for productivity and common sunk costs between imports and exports, importing from low labour cost countries is a cost reducing strategy that enhances the competitiveness of manufacturing firms and allows them to enter or maintain their presence in foreign markets. Thus, the firm internationalisation strategies appear to be strictly linked each another. Additionally, the evidence shown in the paper also suggests that the deeper and deeper penetration of low-wage countries in the globalised world may represent not only a threat for firms in advanced countries, but may open them important opportunities to strengthen their competitive position even though competitiveness is enhanced by means of cost saving more than productivity improvements.

References

Altomonte, C., and G. Bekes (2009): "Trade Complexity and Productivity," IEHAS Discussion Papers 0914, Institute of Economics, Hungarian

[10]AR2 tests show a problem of autocorrelation and discard the validity of the second lag as instrument.

Table 4: Dynamic LPM - SYS GMM estimates

	ALL SAMPLE		TRADITIONAL		NON TRADITIONAL	
exp_{t-1}	0.598***	0.590***	0.628***	0.615***	0.590***	0.586***
	[0.0379]	[0.0381]	[0.0583]	[0.0586]	[0.0531]	[0.0535]
$impshare_{LI\ t}$	0.241***		0.159***		0.379***	
	[0.0411]		[0.0494]		[0.0852]	
$impshare_{LI\ t-1}$		0.201***		0.148***		0.292***
		[0.0386]		[0.0434]		[0.0919]
$impshare_{HI\ t}$	-0.109		-0.18		-0.039	
	[0.087]		[0.124]		[0.109]	
$impshare_{HI\ t-1}$		-0.048		-0.085		-0.032
		[0.0536]		[0.0816]		[0.0686]
$TFP_{ind\ t}$	0.0442***		0.0480***		0.0373***	
	[0.00523]		[0.00915]		[0.00623]	
$TFP_{ind\ t-1}$		0.0440***		0.0511***		0.0348***
		[0.00545]		[0.00937]		[0.00665]
l_t	0.0528***		0.0482***		0.0524***	
	[0.00547]		[0.00778]		[0.0077]	
l_{t-1}		0.0508***		0.0444***		0.0519***
		[0.00520]		[0.00750]		[0.00738]
w_t	0.0202***		0.0133*		0.0270***	
	[0.00495]		[0.00739]		[0.00703]	
w_{t-1}		0.0204***		0.0151**		0.0282***
		[0.00438]		[0.00659]		[0.00615]
$Const.$	-0.101**	-0.0956**	-0.0337	-0.038	-0.154**	-0.047
	[0.0462]	[0.0410]	[0.0689]	[0.0625]	[0.0633]	[0.0585]
Observations	159770	159837	62327	62386	95397	95402
Number of id	40224	40236	16238	16251	24505	24505
Hansen	0.411	0.312	0.0776	0.0498	0.511	0.625
AR1	0	0.00	0	0.00	0	0.00
AR2	0	0.00	0	0.00		0.00

*** p<0.01, ** p<0.05, * p<0.1. All regressions include a full set of sector and year dummies. Robust standard errors are in brackets. GMM estimates are obtained using the 3^{rd} and 4^{th} lags of the dependent variable and regressors as instruments for the equation in differences and the 2^{nd} lag of the differenced variables for the equation in levels. The instrumented variables are the lagged dependent variable, $impshare_{LI}$ and $impshare_{HI}$. AR1 and AR2 show the P-value for the tests of the null hypothesis of no first and second order serial correlation in the differences of residuals. Hansen shows the P-value of the test of the validity of the over-identifying restrictions.

Academy of Sciences.

Amiti, M., and J. Konings (2007): "Trade Liberalization, Intermediate Inputs, and Productivity: Evidence from Indonesia," *American Economic Review*, 97(5), 1611–1638.

Amiti, M., and S.-J. Wei (2004): "Fear of Service Outsourcing: Is It Justified?," NBER Working Papers 10808, National Bureau of Economic Research, Inc.

——— (2006): "Service Offshoring and Productivity: Evidence from the United States," NBER Working Papers 11926, National Bureau of Economic Research, Inc.

Arellano, M., and S. Bond (1991): "Some tests of specification for panel data: Monte Carlo evidence and an application to employment equations," *Review of Economic Studies*, (58), 277–297.

Bas, M. (2009): "Trade, foreign inputs and firms' decisions: Theory and Evidence," CEPII Working Paper Series 35, CEPII.

Bas, M., and V. Strauss-Khan (2010): "Does importing more inputs raise exports? Firm level evidence from France," mimeo.

Bernard, A. B., J. B. Jensen, S. J. Redding, and P. K. Schott (2007): "Firms in International Trade," *Journal of Economic Perspectives*, 21(3), 105–130.

Bernard, B. A., and J. B. Jensen (1998): "Why some firms export.," *Journal of Econometrics*, (87), 115–143.

Blundell, R., and S. Bond (1998): "Initial conditions and moment restrictions in dynamic panel data models," *Journal of Econometrics*, (87), 115–143.

Bond, S. (2002): "Dynamic panel data models: a guide to microdata methods and practice," *CeMMAP Working Paper*, (09/02).

Castellani, D., F. Serti, and C. Tomasi (2010): "Firms in International Trade: Importers' and Exporters' Heterogeneity in Italian Manufacturing Industry," *The World Economy*, 33(3), 424–457.

Feenstra, R. C., and G. H. Hanson (1996): "Globalization, Outsourcing, and Wage Inequality," *American Economic Review, American Economic Association*, 86(2), 240–245.

——— (1999): "The Impact Of Outsourcing And High-Technology Capital On Wages: Estimates For The United States, 1979-1990," *The Quarterly Journal of Economics*, 114(3), 907–940.

Forlani, E. (2010): "Irish firms' productivity and imported inputs," Core discussion papers, Université catholique de Louvain, Center for Operations Research and Econometrics (CORE).

Görg, H., A. Hanley, and E. Strobl (2008): "Productivity effects of international outsourcing: evidence from plant-level data," *Canadian Journal of Economics*, 41(2), 670–688.

Halpern, L., M. Koren, and A. Szeidl (2005): "Imports and Productivity," CEPR Discussion Papers 5139, C.E.P.R. Discussion Papers.

ISGEP (2008): "Understanding Cross-Country Diffences in Exporter Premia: Comparable Evidence for 14 Countries," *Review of World Economics (Weltwirtschaftliches Archiv)*, 144(4), 596–635.

Jabbour, L. (2010): "Offshoring and Firm Performance: Evidence from French Manufacturing Industry," *The World Economy*, 33(3), 507–524.

Kasahara, H., and B. Lapham (2008): "Productivity and the Decision to Import and Export: Theory and Evidence," CESifo Working Paper Series 2240, CESifo Group Munich.

Kasahara, H., and J. Rodrigue (2008): "Does the use of imported intermediates increase productivity? Plant-level evidence," *Journal of Development Economics*, 87(1), 106–118.

Lööf, H., and M. Andersson (2010): "Imports, Productivity and Origin Markets: The Role of Knowledge-intensive Economies," *The World Economy*, 33(3), 458–481.

Melitz, M. J. (2003): "The Impact of Trade on Intra-Industry Reallocations and Aggregate Industry Productivity," *Econometrica*, 71(6), 1695–1725.

Melitz, M. J., and G. I. P. Ottaviano (2008): "Market Size, Trade, and Productivity," *Review of Economic Studies*, 75(1), 295–316.

Muûls, M., and M. Pisu (2009): "Imports and Exports at the Level of the Firm: Evidence from Belgium," *The World Economy*, 32(5), 692–734.

OECD (2007): "Offshoring and Employment: Trends and Impacts.," Discussion paper, OECD.

Paul, C. J. M., and M. Yasar (2009): "Outsourcing, productivity, and input composition at the plant level," *Canadian Journal of Economics*, 42(2), 422–439.

Roberts, M. J., and J. R. Tybout (1995): "An empirical model of sunk costs and the decision to export," Policy Research Working Paper Series 1436, The World Bank.

Sjöholm, F. (2003): "Which Indonesian firms export? The importance of foreign networks," *Papers in Regional Science*, 82(3), 333–350.

Vogel, A., and J. Wagner (2010): "Higher productivity in importing German manufacturing firms: self-selection, learning from importing, or both?," *Review of World Economics (Weltwirtschaftliches Archiv)*, 145(4), 641–665.

Wagner, J. (2007): "Exports and Productivity: A Survey of the Evidence from Firm-level Data," *The World Economy*, 30(1), 60–82.

Table 5: Descriptive Statistics

Variable		Mean	Std. Dev.	Observations
exp	overall	0.63	0.48	N = 200964
	between		0.44	n = 40385
	within		0.21	T-bar = 4.9762
TFP_{ind}	overall	-0.06	0.42	N = 202246
	between		0.37	n = 40472
	within		0.20	T-bar = 4.99718
l	overall	2.89	1.06	N = 202395
	between		1.05	n = 40479
	within		0.17	T = 5
w	overall	10.04	0.38	N = 202387
	between		0.36	n = 40479
	within		0.13	T-bar = 4.9998
$impshare_{LI}$	overall	0.02	0.09	N = 201293
	between		0.09	n = 40406
	within		0.03	T-bar = 4.98176
$impshare_{HI}$	overall	0.05	0.13	N = 201293
	between		0.13	n = 40406
	within		0.05	T-bar = 4.98176

Table 6: Pairwise correlation coefficients

	TFP_{ind}	l	w	exp	$impshare_{LI}$	$impshare_{HI}$
TFP_{ind}	1					
l	0.31	1				
w	0.65	0.5	1			
exp	0.23	0.35	0.25	1		
$impshare_{LI}$	0.07	0.12	0.0022ns	0.16	1	
$impshare_{HI}$	0.2	0.27	0.23	0.21	0.07	1

All significant at 1%. ns=not significant

Appendix A

Table 7: Robustness Checks - Firm-level controls

	ALL SAMPLE					TRADITIONAL					NON TRADITIONAL				
$impshare_{LI\ t-2}$	1.551***	1.700***	1.522***	1.562***	1.677***	1.451***	1.613***	1.466***	1.078**	1.562***	1.618***	1.762***	1.516***	2.110***	1.748***
	[0.345]	[0.346]	[0.345]	[0.395]	[0.343]	[0.434]	[0.446]	[0.437]	[0.513]	[0.439]	[0.582]	[0.57]	[0.577]	[0.671]	[0.574]
$impshare_{HI\ t-2}$	0.199	0.283*	0.203	0.294*	0.286*	0.112	0.209	0.109	0.29	0.209	0.273	0.348	0.293	0.279	0.355
	[0.154]	[0.154]	[0.155]	[0.165]	[0.154]	[0.222]	[0.221]	[0.222]	[0.238]	[0.22]	[0.22]	[0.22]	[0.222]	[0.233]	[0.221]
$TFP_{ind\ t-2}$		0.175***	0.275***	0.194***	0.251***		0.232***	0.326***	0.261***	0.247***		0.148***	0.252***	0.164***	0.257***
		[0.0424]	[0.0422]	[0.0459]	[0.0459]		[0.0747]	[0.0754]	[0.0821]	[0.0832]		[0.0524]	[0.0517]	[0.0564]	[0.0558]
l_{t-2}	0.186***	0.154***	0.0826***	0.160***	0.172***	0.209***	0.175***	0.125***	0.184***	0.196***	0.185***	0.154***	0.0652***	0.159***	0.168***
	[0.0172]	[0.0178]	[0.02]	[0.0186]	[0.0173]	[0.031]	[0.0315]	[0.035]	[0.0337]	[0.0308]	[0.0209]	[0.0218]	[0.0247]	[0.0225]	[0.0211]
w_{t-2}	-0.140***	0.00453	-0.116**	0.0305	-0.0328	-0.169*	-0.0189	-0.154*	-0.0297	-0.0154	-0.140**	0.00778	-0.105	0.0479	-0.0471
	[0.0515]	[0.0513]	[0.0525]	[0.0552]	[0.0527]	[0.0928]	[0.0883]	[0.0927]	[0.0975]	[0.0923]	[0.0627]	[0.0642]	[0.065]	[0.0683]	[0.0655]
LP_{t-2}	0.339***					0.377***					0.324***				
	[0.039					[0.0703					[0.0475]				
$k_{int\ t-2}$		0.0204***					0.0207***					0.0202***			
		[0.00366]					[0.00605]					[0.00465]			
$k_{tan\ t-2}$			0.0980***					0.0813***					0.111***		
			[0.011]					[0.0199]					[0.0133]		
$ky_{int\ t-2}$				0.0126*					0.00297					0.0169*	
				[0.00714]					[0.0126]					[0.0087]	
$ky_{tan\ t-2}$					0.0366***					3.11E-05					0.0571***
					[0.0118]					[0.0212]					[0.0142]
$Const.$	-4.055***	-2.008***	-1.713***	-2.017***	-1.443***	-4.207***	-1.805**	-1.2	-1.506	-1.723*	-4.334***	-2.455***	-2.386***	-2.462***	-1.699**
	[0.364]	[0.505]	[0.499]	[0.544]	[0.525]	[0.643]	[0.863]	[0.858]	[0.953]	[0.919]	[0.638]	[0.778]	[0.774]	[0.822]	[0.793]
Obs.:	22872	22838	22838	19107	22838	7616	7594	7594	6183	7594	15000	14988	14988	12692	14988
pR2	0.0301	0.0286	0.0324	0.0241	0.0268	0.0341	0.0327	0.0342	0.0255	0.0299	0.0305	0.0289	0.0346	0.0268	0.0283
LL	-6568	-6573	-6547	-5721	-6585	-2211	-2210	-2207	-1891	-2216	-4268	-4274	-4249	-3745	-4277
	370.6	344	393.4	250.7	325.8	133.7	127.2	132.2	83.39	116.1	246.6	228.1	278	185.7	230.2

*** p<0.01, ** p<0.05, * p<0.1. The Dependent Variable is the probability to start exporting. Pooled Probit Regressions. All regressions include a full set of sector and year dummies.
Robust standard errors are in brackets.

Table 8: Robustness checks - Sector Level Controls

	ALL SAMPLE				TRADITIONAL				NON TRADITIONAL			
$impshare_{LI\ t-2}$	1.676***	1.653***	1.677***	1.677***	1.517***	1.529***	1.553***	1.554***	1.911***	1.831**	1.792***	1.792***
	[0.372]	[0.372]	[0.343]	[0.343]	[0.446]	[0.444]	[0.438]	[0.438]	[0.709]	[0.715]	[0.569]	[0.570]
$impshare_{HI\ t-2}$	0.25	0.243	0.285*	0.286*	0.132	0.102	0.205	0.205	0.363	0.383*	0.355	0.354
	[0.159]	[0.159]	[0.154]	[0.154]	[0.228]	[0.229]	[0.220]	[0.220]	[0.229]	[0.227]	[0.220]	[0.219]
$TFP_{ind\ t-2}$	0.194***	0.187***	0.192***	0.192***	0.224***	0.234***	0.254***	0.254***	0.178***	0.166***	0.163***	0.163***
	[0.0455	[0.0457	[0.043]	[0.043]	[0.0772	[0.0773	[0.075]	[0.075]	[0.0575	[0.058	[0.053]	[0.053]
l_{t-2}	0.163***	0.157***	0.175***	0.175***	0.180***	0.179***	0.197***	0.196***	0.164***	0.156***	0.174***	0.174***
	[0.0189]	[0.0188]	[0.017]	[0.017]	[0.0316]	[0.0316]	[0.031]	[0.031]	[0.0237]	[0.0237]	[0.021]	[0.021]
w_{t-2}	-0.0057	-0.00201	0.005	0.006	0.0324	0.0143	-0.023	-0.023	-0.0402	-0.0226	0.012	0.013
	[0.0551]	[0.0553]	[0.052]	[0.052]	[0.0908]	[0.091]	[0.089]	[0.089]	[0.0712]	[0.0717]	[0.065]	[0.065]
ICT	-0.018	0.166			0.333	0.596*			-0.172	0.0182		
	[0.133]	[0.132]			[0.381]	[0.349]			[0.174]	[0.176]		
$Exp.Open_{t-2}$	0.626***				0.706***				0.641***			
	[0.109				[0.232]				[0.141]			
$Imp.Pen_{HI\ t-2}$		-0.12				-0.0366				-0.379**		
		[0.144]				[0.341]				[0.186]		
$Imp.Pen_{LI\ t-2}$		1.594***				0.837				4.054***		
		[0.537]				[0.735]				[1.101]		
$OutputTariff_{LI\ t-2}$			0.000				0.002				0.023	
			[0.016]				[0.021]				[0.027]	
$OutputTariff_{HI\ t-2}$			-0.025				-0.033				-0.034	
			[0.028]				[0.036]				[0.072]	
$InputTariff_{LI\ t-2}$				0.007				0.018				0.042
				[0.029]				[0.039]				[0.045]
$InputTariff_{HI\ t-2}$				-0.058				-0.099				-0.001
				[0.055]				[0.080]				[0.140]
$Constant$	-1.678	-3.074***	-1.536**	-1.327**	-4.816	-6.568**	-1.195	-0.737	-0.613	-2.207	-2.356***	-2.496***
	[1.141]	[1.137]	[0.603]	[0.665]	[3.053]	[2.834]	[0.972]	[1.081]	[1.696]	[1.718]	[0.800]	[0.846]
Obs.:	18864	18741	22838	22838	7219	7219	7594	7594	11415	11292	14988	14988
pR2	0.0268	0.0243	0.026	0.026	0.031	0.0292	0.03	0.03	0.0263	0.0246	0.026	0.027
LL	-5539	-5505	-6589	-6589	-2090	-2094	-2216	-2215	-3371	-3329	-4285	-4285
chi2	276.3	247.2	317	317.3	115.6	108.8	117.3	118.7	167	155.5	213.3	213.5

*** p<0.01, ** p<0.05, * p<0.1. The Dependent Variable is the probability to start exporting.
Pooled Probit Regressions. All regressions include a full set of sector and year dummies. Robust standard errors are in brackets.

Table 9: Dynamic LPM - Robustness Checks - Firm-level Controls

	ALL SAMPLE					TRADITIONAL					NON TRADITIONAL				
exp_{t-1}	0.594***	0.596***	0.595***	0.581***	0.598***	0.625***	0.624***	0.625***	0.606***	0.626***	0.585***	0.589***	0.589***	0.578***	0.590***
	[0.0380]	[0.038]	[0.0382]	[0.0415]	[0.0379]	[0.0589]	[0.0588]	[0.0588]	[0.0642]	[0.0585]	[0.0530]	[0.0531]	[0.0533]	[0.0573]	[0.0531]
$impsh_{LI\ t}$	0.236***	0.239***	0.232***	0.247***	0.240***	0.151***	0.157***	0.148***	0.173***	0.158***	0.375***	0.379***	0.370***	0.356***	0.379***
	[0.0409]	[0.0409]	[0.0408]	[0.0429]	[0.0410]	[0.0489]	[0.0491]	[0.0488]	[0.0502]	[0.0491]	[0.0852]	[0.085]	[0.0847]	[0.0911]	[0.0852]
$impsh_{HI\ t}$	-0.112	-0.115	-0.107	-0.131	-0.109	-0.199	-0.185	-0.196	-0.253*	-0.166	-0.035	-0.0439	-0.0284	-0.017	-0.041
	[0.0871]	[0.0873]	[0.0867]	[0.0892]	[0.0870]	[0.127]	[0.125]	[0.127]	[0.135]	[0.123]	[0.108]	[0.109]	[0.107]	[0.109]	[0.109]
$TFP_{ind\ t}$		0.0427***	0.0525***	0.0536***	0.0541***		0.0466***	0.0565***	0.0500***	0.0504***		0.0358***	0.0447***	0.0366***	0.0338***
		[0.00514]	[0.00592]	[0.00585]	[0.00559]		[0.00899]	[0.0104]	[0.00841]	[0.00806]		[0.00611]	[0.007]	[0.00669]	[0.00606]
l_t	0.0531***	0.0484***	0.0364***	0.0211***	0.0252***	0.0492***	0.0443***	0.0330***	0.0165**	0.0246***	0.0524***	0.0478***	0.0366***	0.0517***	0.0530***
	[0.00547]	[0.00516]	[0.00409]	[0.00538]	[0.00525]	[0.00797]	[0.00733]	[0.00565]	[0.00836]	[0.00831]	[0.00760]	[0.00723]	[0.00588]	[0.00809]	[0.00779]
w_t	0.0056	0.0185***	0.00604	0.0443***	0.0352***	-0.005	0.0115	-0.00393	0.0480***	0.0298***	0.0160**	0.0254***	0.0158**	0.0263***	0.0288***
	[0.00441]	[0.00489]	[0.00448]	[0.00564]	[0.00477]	[0.00672]	[0.00729]	[0.00679]	[0.00984]	[0.00744]	[0.00621]	[0.00692]	[0.00631]	[0.00747]	[0.00724]
LP_t	0.0584***					0.0641***					0.0492***				
	[0.00632]					[0.0113]					[0.00739]				
$k_{int\ t}$		0.00357***					0.00330***					0.00353***			
		[0.000403]					[0.0006]					[0.000528]			
$k_{tan\ t}$			0.0147***					0.0146***					0.0134***		
			[0.00159]					[0.00262]					[0.00198]		
$ky_{int\ t}$				-0.00159***					-0.00477***					0.0003	
				[0.000559]					[0.00112]					[0.0007]	
$ky_{tan\ t}$					-0.00717***					-0.0143***					-0.00282*
					[0.00107]					[0.0024]					[0.0012]
$Const.$	-0.574***	-0.102**	-0.108**	-0.100**	-0.168***	-0.528***	-0.0318	-0.011	-0.0693	-0.179**	-0.566***	-0.152**	-0.176***	-0.134**	-0.179***
	[0.0733]	[0.0462]	[0.0464]	[0.0502]	[0.0499]	[0.116]	[0.0688]	[0.0681]	[0.0785]	[0.0787]	[0.0921]	[0.0631]	[0.0643]	[0.0668]	[0.0658]
Obs.:	159880	159770	159770	140471	159770	62396	62327	62327	54301	62327	95438	95397	95397	84289	95397
id:	40231	40224	40224	37703	40224	16244	16238	16238	15096	16238	24507	24505	24505	23041	24505
Hansen	0.474	0.317	0.4	0.244	0.415	0.0913	0.0765	0.0726	0.385	0.0869	0.527	0.437	0.473	0.229	0.515
AR1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
AR2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

*** p<0.01, ** p<0.05, * p<0.1. All regressions include a full set of sector and year dummies. Robust standard errors are in brackets. GMM estimates are obtained using the 3^{rd} and 4^{th} lags of the dependent variable and regressors as instruments for the equation in differences and the 2^{nd} lag of the differenced variables for the equation in levels. The instrumented variables are the lagged dependent variable, $impshare_{LI}$ and $impshare_{HI}$. AR1 and AR2 show the P-value for the tests of the null hypothesis of no first and second order serial correlation in the differences of residuals.
Hansen shows the P-value of the test of the validity of the over-identifying restrictions.

Table 10: Dynamic LPM - Robustness Checks -Sector-level controls

	ALL SAMPLE				TRADITIONAL				NON TRADITIONAL			
exp_{t-1}	0.583***	0.582***	0.598***	0.598***	0.638***	0.638***	0.627***	0.626***	0.549***	0.550***	0.591***	0.590***
	[0.0405]	[0.0404]	[0.038]	[0.038]	[0.0597]	[0.0596]	[0.059]	[0.059]	[0.0574]	[0.0568]	[0.053]	[0.053]
$impshare_{LI\ t}$	0.203***	0.203***	0.242***	0.243***	0.133***	0.132***	0.161***	0.162***	0.310***	0.305***	0.378***	0.379***
	[0.0396]	[0.0398]	[0.041]	[0.041]	[0.0483]	[0.0482]	[0.049]	[0.049]	[0.0783]	[0.0781]	[0.085]	[0.085]
$impshare_{HI\ t}$	-0.103	-0.113	-0.11	-0.111	-0.109	-0.094	-0.183	-0.178	-0.063	-0.077	-0.034	-0.032
	[0.0889]	[0.0894]	[0.087]	[0.087]	[0.120]	[0.122]	[0.127]	[0.127]	[0.117]	[0.117]	[0.109]	[0.108]
$TFP_{ind\ t}$	0.0449***	0.0452***	0.044***	0.044***	0.0441***	0.0441***	0.048***	0.048***	0.0408***	0.0405***	0.037***	0.037***
	[0.00531]	[0.00532]	[0.005]	[0.005]	[0.00900]	[0.00902]	[0.009]	[0.009]	[0.00645]	[0.00640]	[0.006]	-0.006
l_t	0.0515***	0.0525***	0.053***	0.053***	0.0453***	0.0447***	0.048***	0.048***	0.0545***	0.0550***	0.052***	0.052***
	[0.00544]	[0.00551]	[0.005]	[0.005]	[0.00789]	[0.00786]	[0.008]	[0.008]	[0.00767]	[0.00768]	[0.008]	[0.008]
w_t	0.026***	0.027***	0.020***	0.020***	0.020**	0.020**	0.014*	0.014*	0.029***	0.033***	0.027***	0.027***
	[0.00562]	[0.00566]	[0.005]	[0.005]	[0.00827]	[0.00805]	[0.007]	[0.007]	[0.00782]	[0.00810]	[0.007]	[0.007]
ICT	-0.124*	-0.081			-0.267***	-0.238***			-0.014	0.037		
	[0.0709]	[0.0687]			[0.0856]	[0.0847]			[0.0891]	[0.0848]		
$Exp.Open_t$	0.185***				0.131***				0.165***			
	[0.0202]				[0.0261]				[0.0252]			
$Imp.Pen_{HI\ t}$		0.0189*				-0.041				-0.016		
		[0.00982]				[0.0352]				[0.0123]		
$Imp.Pen_{LI\ t}$		0.314***				0.176***				0.608***		
		[0.0452]				[0.0433]				[0.117]		
$OutputTariff_{LI\ t}$			-0.001				-0.003**				0.002	
			[0.001]				[0.001]				[0.002]	
$OutputTariff_{HI\ t}$			-0.001				0.000				-0.004	
			[0.001]				[0.001]				[0.003]	
$InputTariff_{LI\ t}$				-0.001				-0.004*				0.002
				[0.002]				[0.002]				[0.003]
$InputTariff_{HI\ t}$				-0.002*				-0.001				-0.002
				[0.001]				[0.001]				[0.005]
$Constant$	0.781	0.45	-0.088*	-0.082*	1.903***	1.710***	-0.002	-0.011	-0.095	-0.545	-0.150**	-0.156**
	[0.546]	[0.523]	[0.047]	[0.048]	[0.653]	[0.648]	[0.070]	[0.070]	[0.761]	[0.724]	[0.063]	[0.064]
Obs.:	143145	142068	159770	159770	60593	60593	62327	62327	80874	79797	95397	95397
id:	36510	36273	40224	40224	15864	15864	16238	16238	20979	20741	24505	24505
Hansen	0.283	0.396	0.431	0.444	0.0457	0.0574	0.064	0.074	0.465	0.442	0.506	0.544
AR1	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
AR2	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

*** p<0.01, ** p<0.05, * p<0.1. All regressions include a full set of sector and year dummies. Robust standard errors are in brackets. GMM estimates are obtained using the 3^{rd} and 4^{th} lags of the dependent variable and regressors as instruments for the equation in differences and the 2^{nd} lag of the differenced variables for the equation in levels. The instrumented variables are the lagged dependent variable, $impshare_{LI}$ and $impshare_{HI}$. AR1 and AR2 show the P-value for the tests of the null hypothesis of no first and second order serial correlation in the differences of residuals. Hansen shows the P-value of the test of the validity of the over-identifying restrictions.