

# **China's competition and the export price strategies of developed countries – the case of Italy**

Giorgia Giovannetti<sup>a,b</sup> and Marco Sanfilippo<sup>b</sup>

<sup>a</sup>Department of Economics, University of Firenze ([giorgia.giovannetti@unifi.it](mailto:giorgia.giovannetti@unifi.it)), <sup>b</sup>European University Institute ([marco.sanfilippo@eui.eu](mailto:marco.sanfilippo@eui.eu))

## **Abstract**

This paper addresses the issue of the impact of China on Italian export prices. We estimate separately the pricing behavior of two major sub sectors of manufacturing, consumer goods and machinery, analyzing both the price and the market competition of Italy's main competitors (China and other OECD countries) in different destination markets. Results show that both channels have affected Italian price strategies over the period 2000-2008, but with some interesting differences. Price competition comes from both China and the rest of the OECD countries, especially in the group of consumer goods, with the former being still marginal in terms of magnitude compared to the latter. China's rising market shares affect price strategies putting a downward pressure in a number of sectors, mostly within the machinery and equipment group, but generally limited to those less relevant in terms of Italy's export specialization. Furthermore, competition from China is likely to be lower when there is a significant price differential between the exports of the two countries and when Italy's market shares increase jointly with the Chinese ones. This suggests that strategies of export upgrading and vertical differentiation can help tackling the competitive effect of the entry of lower income countries in the international markets.

**Keywords:** China, price competition, Italy

**JEL classification:** F-10; F-14

## **1. Introduction**

The international literature has devoted a great deal of attention to the exceptional economic growth experienced by China over the last three decades and its effects on other countries.

China's catching up through rapid growth resulted in a substantial increase in competition for a large number of countries and, more generally, in a structural change in global terms of trade. Overall, the magnitude of the impact of China via the trade channel is highly correlated to other countries' factor endowments and specialization and is expected to keep changing to the extent that the productive structure of China moves towards more sophisticated goods. This has raised questions on whether the quality of Chinese exports has moved towards more advanced standards, and the possible consequences of these changes on other countries. While some authors have stressed a recent relative upgrading of Chinese exports, therefore suggesting that even more advanced countries might increasingly be under the threat of Chinese competition (Rodrik, 2006; Schott, 2008), others have argued that China's specialization in labour intensive activities remains prevalent (Xu, 2007; Amiti and Freund, 2010).

Following WTO's accession, China's shares in the world's manufacturing sector have risen considerably, including in more advanced markets. How the main competitors have reacted to this threat is still a partially unexplored issue in the literature. While an established strand of the literature, based on the so-called "fallacy of composition" hypothesis, shows that prices of manufacturing goods from developing countries fell due to China's entry in the world markets, little is known on the competitive strategies of advanced competitors. Theoretically, as lower income countries specialize in low-technology sectors, developed countries react by upgrading the quality of their exports, slowly abandoning less sophisticated ones, in favour of more advanced products (Schott, 2008). Indeed, the existing evidence, mostly at the firm level, shows that China's competition has pushed producers in developed countries to reduce their margins in low-technology products, lowering their prices, while increasing the quality through vertical differentiation (Abraham and Van Hove, 2010; Bloom et al., 2011, Martin and Méjean, 2011).

The main objective of the paper is to help understanding whether in sectors with the highest competitive pressure from China, developed countries have undertaken a competition based on prices and reduced markups or if they have upgraded the quality content of their export for any given couple of markets (including low- middle- and high-income ones) and sectors. On the one hand, this could complement the findings by Bugamelli et al. (2010), who show that the competitive pressure by Chinese exports in the domestic market has contributed to a decrease in output prices of Italian firms, but adopting a macro framework and considering foreign rather than domestic prices. On the other hand, the paper can also support the view that the country has upgraded its exports, especially in traditional sectors, to protect its market shares from international competition (Lanza and Quintieri, 2007). To our knowledge, so far, there is no direct evidence that this has occurred as a consequence of increasing competition from lower income countries.

The paper is structured as follows: section 2 reviews the literature on China's competition and on developed countries' strategies to confront it. Section 3 introduces the theoretical model and the empirical strategy. Section 4 reports the results by main sectors and by destination markets. Section 5 concludes.

## 2. Literature review

The entry of China in the world market triggered a large literature on its likely effects. After the WTO accession in 2001, many studies focused on the possible consequences of the opening up of China in the international markets, for developing countries, particularly from Asia (Lall and Albadelejo, 2004; Feensta and Wei, 2010). More recent analyses, stimulated by the growing literature on China's export sophistication (Rodrick, 2006), have started to look at the competitive effect of China on developed countries as well, either by measuring the extent to which export similarity represents a threat to existing export structures (Schott, 2008; Fontagné et al., 2008) or which countries have reduced their market shares as a consequence of China's growth (Chepeta et al., 2010; Husted and Nishioka, 2010). Most of these studies argue that, despite an ongoing process of export upgrading, Chinese competition is still mainly due to cheaper cost of factors and relatively low quality of production, reflected in lower prices of exported products.

A paper by Fontagné et al. (2008) use data on the unit values from the BACI dataset to measure the relative price of exports at the 6-digit HS, finding that the relative prices of Chinese exports in 2004 were substantially lower compared to developed countries (around 30% of EU25, US and Japan's prices) and more competitive than those of other emerging economies (around 80% of Brazilian, Russian and India's prices). One of the main findings of unit-value based analysis is that most high tech products (e.g. consumer electronics) exported by China have, in general, declining prices and are exported in huge quantities (van Assche and Ganges, 2008). In line with these findings, Amiti and Freund (2008) adopt Gini indicators to measure whether the Chinese export structure has shown a pattern of diversification or specialization during two distinct periods (1992 and 2005), finding evidence that the shift in the export structure consisted of an increase in the quantity of existing varieties (the *intensive margin*).

A highly debated issue is that China's rise in the world economy has influenced the global terms of trade, lowering the prices in the manufacturing sector, in line with the so-called 'fallacy of composition' hypothesis (Faini, 1990). This hypothesis is based on the view that, as developing countries try to enter international markets they might face insufficient and/or highly elastic demand and start a 'race to the bottom' driving prices of exports downward (Mayer, 2003). This trend is supported by the findings of Kaplinsky and Santos-Paulino (2006). Using imports of EU (at the 8-digit HS from Eurostat) in order to test for recent trends in unit values, they show that prices of manufactures are likely to decrease more in those sectors in which China is a relevant exporter.

A first attempt to extend this analysis to other groups of countries is an empirical work by Fu et al. (2010), using data on the unit value of exports at a very disaggregated level for EU, US and Japan's imports, to show that over the last twenty years Chinese price and market competition has influenced not only the export prices of low- and middle-income in sectors at different levels of technology, but also the prices of high-income countries in low-technology sectors.

Most recently, a series of analyses based on firms' level data has tested specifically how developed countries have reacted to the Chinese competitive pressure. Bloom et al. (2011) use data on European firms over the period 1996-2007 and find that to face China's competition (measured through China's import shares in the host markets) EU firms have upgraded their production, with such upgrading measured by significant increases in key indicators such as TFP, adoption of information technology and their R&D performance. On the other hand, they also find that firms in sectors most affected by Chinese import competition have experienced reductions in export prices,

employment and profitability. Along similar lines, two works on Belgian firm's level data find that competition from China in the domestic (Mion and Zhu, 2011) and in foreign markets (Abraham and Van Hove, 2010) has contributed to an increase in skilled workers and differentiation by augmenting the number of varieties exported. Lastly, and most relevant for the rest of this paper, Martin and Méjean (2011) have measured the effect of competition from lower income countries to a sample of French firms over the period 1995-2005. They find that the increase of market shares of low-income countries has an impact on the quality of French exports, which they estimate to have increased by about 2 percentage points, the largest share of which is due to competition from China only.

Taking stock of these findings, in what follows we estimate the impact of China on the export prices of Italy using data on unit values of exports finely disaggregated by host markets and sectors. Within an international context where large economies export more at the extensive margin and at highest unit prices (Hummels and Klenow, 2005), Italy represents a case of interest, given its high persistence in specialization in traditional sectors (Di Maio and Tamagni, 2008). This has resulted in a rising similarity with the export structures of major emerging economies, one of the factors contributing to large losses of market shares over the last years (Chepeta et al., 2010), despite recent research did not find evidence of "adverse export elasticity" compared to other main manufacturing exporters (Feletthigh and Federico, 2010). Previous research, using firms' level data, shows that the prices of domestic firms have been affected by China's competition in the home market, reducing their margins in more traditional sectors (Bugamelli et al., 2010).

### 3. Data, model and empirical analysis

#### 3.1 Model

The aim of the empirical analysis is that of determining Italy's export prices. Along the lines of Fu et al. (2010), we determine the prices of internationally traded goods taking into account both demand and supply factors. Let the demand function be:

$$d_t = a + by_t - cp_t + dX_t + \varepsilon_t^d \quad (1)$$

where  $d$  is the demand,  $y$  the income,  $p$  the price,  $X$  a vector of exogenous variables affecting demand, and  $\varepsilon^d$  is a random term.

The supply function is:

$$s_t = e + fp_t + gp_t^e + hZ_t + \varepsilon_t^s \quad (2)$$

where  $s$  is the supply,  $p$  the price,  $p^e$  the expected price and  $Z$  a vector of exogenous variables affecting supply. Again,  $\varepsilon^s$  is a random term taking into account for the unobservable factors having an impact on supply.

Expected prices are affected by lagged levels of domestic price as well as by prices of competitors.  $Z$  includes, among other variables, also exports from China and from other OECD countries. This allows us to take into account on the one hand the impact of larger volumes of trade

arising from China's entry in the world markets and on the other to control for the influence of Italy's main competitors from the OECD.

We assume that the elasticity of substitution among varieties of products traded internationally is positive, meaning that for each product imports are differentiated among countries of supply (Armington, 1969).

Equalizing demand and supply in equilibrium, the price is represented by a reduced-form single-equation model, which can be written as:

$$p_{i,j,x,t} = p_{i,j,x,t-k} + y_{j,t} + y_{pc_{j,t}} + d_{i,j} + llock_j + rer_{i,t} + rer_{i,t}^{ch} + q_{j,x,t} + p_{j,x,t}^{ch} + share_{j,x,t}^{ch} + p_{j,x,t}^{oeed} + share_{j,x,t}^{oeed} + \varepsilon_{i,j,x,t} \quad (3)$$

where the price ( $p$ ) of export is function of its lagged value (the lags varying according to the autocorrelation function), absolute and per capita levels of income ( $y$  and  $y_{pc}$ ), distance ( $d$ ) and geographical remoteness ( $llock$ ) of the importers, the real exchange rate ( $rer$ ) of the exporter and the corresponding volume of trade ( $q$ ) for any given couple of product/market/year. Three ad-hoc variables are included to take into account for the possible impact of China on the price function: (1) the real exchange rate of Chinese renmibi against the importers' currency ( $rer^{ch}$ ); (2) the corresponding price of China's export ( $p^{ch}$ ) and the market share of China for product  $x$  in market  $j$  at time  $t$  ( $share^{ch}$ ). Similarly, we introduce prices and market shares ( $p^{oeed}$  and  $share^{oeed}$ ) computed for the group including OECD countries net of Italy.

Literature on the determinants of prices shows consistent results across standard explanatory variables. So, for instance, prices tend to decrease with the size of the importer's market (Baldwin and Harrigan, 2011) and with an increase in the volume of exports (Ito, 2011), while they increase in markets with higher levels of per capita income (Schott, 2008; Bekkers et al., 2012<sup>1</sup>) and in more distant ones (Manova and Zhang, 2009).

With respect to the variables representing the China's competitive effect, their signs depend upon the likely impact on the exporter price strategy and are expected to vary according to different sectors and markets. Other things equal, a positive sign of Chinese price and/or a negative sign of the share of Chinese exports could represent a direct competitive pressure on Italian export prices. On the other hand, a depreciation of the Chinese exchange rate could generate a negative impact on Italy's export prices of close substitute products given that it might make exports more competitive and therefore increase China's market shares, as recently proven in a paper by Mattoo et al. (2012) on a sample including only developing countries. According to Bloom et al. (2011) rising market shares of lower income countries decrease the profitability to produce low-tech products, freeing-up resources which can be employed in more high-tech productions therefore reducing the opportunity cost of innovation. This is not likely to happen when competition is coming from other developed countries, given that it does not reduce the profitability of producing traditional goods relative to more advanced ones (Bloom et al., 2011).

---

<sup>1</sup> Bekkers et al. (2012) find also that there is an inverse relationship between unit values and income inequality, a result suggesting that prices of goods consumed by all income groups tend to reduce with higher inequality.

### **3.2 Data and Methodology**

Data on international prices are not easily available and they are often proxied by data on unit values. Unit values are computed as the ratio between the value and the quantity of goods traded and are more reliable the more disaggregated are the data. Analyses based on the unit values tend to assume a direct relation between the price of exports and the quality of products, although this relationship might be influenced by other relevant factors such as exchange rate movements, trade related policies and the vertical fragmentation of production (Schott, 2008).

Data on unit values used for this analysis come from the Trade Unit Value Database published by CEPII (Berthou and Emlinger, 2011) and cover the period 2000-08 for each product classified at the six digit level of the harmonized system (HS) for a large number of countries.

Data on the corresponding trade volumes come from BACI (Gaulier and Zignano, 2010) and information on geographic variables comes from CEPII (Mayer and Zignano, 2011). Data on other independent variables, including GDPs and exchange rates, are from the World Bank's World Development Indicators and Penn World Tables.

In order to compare products and markets under direct competition, our final database has been built by including the products at the six digit level HS contemporaneously exported by Italy and China to the same market.

As for the methodology, equation (3) presents several sources of misspecification related to the possible presence of autocorrelation, endogeneity and heteroskedasticity within panels. In order to overcome such problems a solution consists in adopting the Arellano-Bover/Blundell-Bond system GMM approach described in Roodman (2006). The system GMM approach allows for greater efficiency in the choice of instruments in a panel with large N and small T, increasing the overall performance of the estimator *vis-a-vis* alternative approaches including instrumental variables or the Arellano-Bond "difference GMM". As price strategies of international competitors are often intertwined, and it is therefore difficult to discern the direction of causality (Fu et al., 2010), we treat variables representing prices as endogenous using their lags as instruments. The other independent variables are considered strictly exogenous and used as standard instruments. As a standard test for the strict exogeneity of the instruments for a system GMM we report results of the Hansen J test for overidentifying restrictions (Wooldridge, 2002). Additionally, the Arellano-Bond test for autocorrelation to the residual is reported to detect second order autocorrelation (AR(2)) of the residuals. Finally, as suggested by Roodman (2006), we include time dummies in all the specifications so to avoid contemporaneous correlation among individuals across time, an assumption that is not taken into account in the autocorrelation test.

### **4. Empirical Analysis**

The large number of sectors and markets covered by the dataset allows us to conduct a very detailed analysis. More precisely, we run model (3) for the two most significant groups of the manufacturing sector according to the Standard International Trade Classification (SITC) revision 3, i.e. the one including machinery and transport equipment (SITC-7) and the miscellaneous manufacturing articles (SITC-8), which includes the consumer goods. In addition, we grouped markets according to their income levels following the World Bank classification, estimating our

model (i) for a group including middle income countries (the middle lower and the middle up income groups) and (ii) the group of high income countries belonging to the OECD.

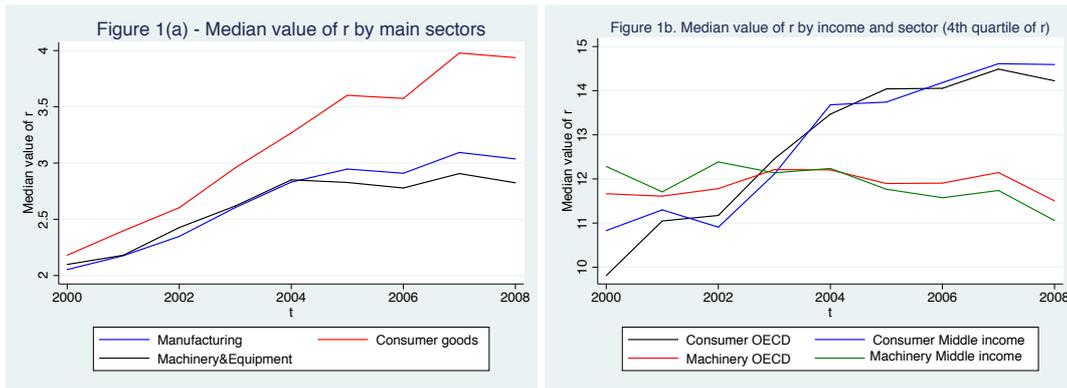
Before commenting the results, it is worth to further address whether the competitive effect on prices we look at has been equally affecting products at different levels of quality. As remarked in the previous paragraphs, despite a recent upgrading of Chinese manufacturing exports, there is some evidence that more advanced countries are still exporting more sophisticated goods and, furthermore, have often reacted to emerging countries' competition by upgrading their exports (see Schott, 2008; Abraham and Van Hove, 2011; Bloom et al., 2011). This seems true in the case of Italy, whereas there is cross-sectoral evidence of an overall increase in export prices despite an increase in the competitive pressure in the international markets, a strategy that underlines a restructuring process of the industrial sector towards more sophisticated productions (Lanza and Quintieri, 2007).

Given that a specific objective of this paper is to explore whether the competitive pressure on export prices is also affecting those goods for which the quality differential between products exported by China and Italy is larger, we consider two additional measures that could be interpreted as proxies for more differentiated products and for quality: the distribution of the relative unit value of the two countries and the relative market shares of Italy.

In order to measure the first indicator, we first compute the ratio between the unit values of Italian and Chinese exports for each product at the 6-digit level shipped to the same market at the same time. Figure 1(a) plots the median values of  $r$  for the manufacturing sector as a whole. The value of  $r$  has grown rapidly over the period 2000-05 to slow down in the following years stabilizing around a value of 3 (meaning that the median Italian price is 3 times larger than Chinese one). Figure 1(a) reports also the same value for the two divisions including consumer goods and machinery & equipment and shows that the gap is considerably higher for the former, which has basically doubled during the period under consideration, suggesting the existence of quality differential between products<sup>2</sup>. Based on this information, we generated four quartiles, each including 25% of the observations of  $r$  according to the income level of the host market (OECD and Middle), the sector (at the 2-digit level of the SITC classification, revision 3) and the year so to give a more homogenous structure to each group. Based on such distributions, we have then included as an additional regressor to our model an interaction term between the Chinese prices ( $lch_{uv}$ ) and a dummy equal to 1 if  $r$  belongs to the fourth quartile, i.e. the one with the largest gap between the two prices. As it is possible to see from figure 1(b), when considering the fourth quartile only, there is a widening of the price gap for the consumer goods in both OECD and middle-income markets, while in the sector including machinery and equipment the trend has remained stable over time.

---

<sup>2</sup> The lower values of  $r$  for the machinery group could reflect also the peculiarity of this sector, which is characterized by higher technology content, where the continuous upgrading and innovation in the production process contributes to an overall downward tendency of prices (Cossio et al., 2008).



Our second proxy of export upgrading takes into account the variation of the coefficient of Italian export shares. A joint increase in export prices and market shares for a given product in a specific market is a commonly adopted indicator of rising quality of exports (Vandenbussche et al., 2011). To account for such an effect, we generate a dummy with value 1 when the market share of Italy in country  $j$  and product  $x$  at time  $t$  has increased compared to  $t-1$ . We then interact this dummy for the coefficient of China market shares, with the underlying assumption that in those products where Italian market shares have kept rising the extent to which Chinese exports are putting a competitive pressure on export prices is lower<sup>3</sup>.

#### 4.1 Results for the group of consumer goods by income levels of importers

Table 1 below reports the results of the estimation of (3) for the group of OECD countries as importers. Tests' statistics show that in general the choice of instrument is valid and there is no second order autocorrelation in the residuals. Considering first signs and significance of the control variables used, table 1 shows that Italian export prices to other OECD countries are largely influenced by their lagged levels and that they tend to increase in larger markets. Contrary to our priors, the sign of the per capita income level is negative and significant for the products within the travel and the professional goods divisions, indicating that an increase of income does not translate in higher export prices, though it must be noticed that the group of OECD countries has less variability in the income compared to other groups. In line with our expectations, we find that prices increase with the remoteness of the importers, this being independent from the divisions within the group of consumer goods, but on the other hand they tend to decrease in more distant markets. The coefficient on the Italian real exchange rate reports a negative sign, but – with the exception of the group including professional and scientific goods – is not significant, this probably because most of the countries in this group are EU members that share the same currency with Italy. In line with existing evidence, we find a consistent negative relation between the quantity exported and the price.

<sup>3</sup> For both the dummies, we test their joint significance through standard F-test statistics. Results, reported in the output tables (where F-test1 refers to the coefficient of Chinese prices and its interaction and F-test2 to the coefficient of Chinese market shares and its interactions), show that the hypothesis of joint significance is accepted.

**Table 1.** Regressions results for the consumer goods (SITC-8) and selected divisions – OECD markets, 2000/08

	8	81	82	83	84	85	87	88	89
L.luv	0.403*** (0.0195)	0.240*** (0.0296)	0.274*** (0.0311)	0.297*** (0.0245)	0.138* (0.0762)	0.358*** (0.0347)	0.179*** (0.0246)	0.212*** (0.0284)	0.227*** (0.0167)
L2.luv	0.151*** (0.0144)				-0.204 (0.131)				
L3.luv	0.104*** (0.0181)				0.482*** (0.180)				
lgdp	-0.0158 (0.0139)	0.0399*** (0.0135)	0.0441*** (0.0110)	0.102*** (0.0189)	0.0555** (0.0276)	0.0430*** (0.0116)	0.139*** (0.0177)	0.0444** (0.0175)	0.0895*** (0.00984)
lgdp_pc	0.117*** (0.0136)	0.0531 (0.0420)	-0.00875 (0.0333)	-0.157*** (0.0512)	0.209*** (0.0553)	-0.000986 (0.0418)	-0.105** (0.0425)	0.0329 (0.0515)	-0.0136 (0.0232)
ldist	-0.0473*** (0.00698)	-0.0413 (0.0264)	0.0242 (0.0190)	0.0471 (0.0296)	-0.0238 (0.0420)	0.0161 (0.0239)	-0.0581** (0.0237)	-0.114*** (0.0323)	-0.0227* (0.0128)
landlocked	-0.0341 (0.0223)	0.00536 (0.0575)	0.104** (0.0417)	0.238*** (0.0552)	0.0505 (0.0531)	0.131*** (0.0412)	0.165*** (0.0451)	0.0240 (0.0646)	0.0820*** (0.0263)
er_it	-0.00752 (0.0120)	-0.0623 (0.0483)	0.0167 (0.0304)	-0.0429 (0.0465)	-0.0537 (0.0435)	-0.0579 (0.0362)	-0.136*** (0.0369)	-0.0229 (0.0530)	-0.0202 (0.0203)
er_china	-0.520 (0.509)	1.017 (1.490)	3.204*** (1.064)	-4.591*** (1.745)	0.721 (1.258)	-2.734* (1.527)	-0.0715 (1.286)	-5.357*** (1.938)	1.317* (0.769)
lq	-0.00747 (0.0138)	-0.0882*** (0.00948)	-0.0801*** (0.00789)	-0.0697*** (0.0115)	-0.0470*** (0.0125)	-0.0360*** (0.00640)	-0.131*** (0.00988)	-0.126*** (0.0139)	-0.119*** (0.00776)
lch_uv	0.174*** (0.0166)	0.208*** (0.0353)	0.215*** (0.0384)	0.411*** (0.0625)	0.245** (0.0968)	0.186*** (0.0398)	0.250*** (0.0235)	0.283*** (0.0332)	0.254*** (0.0191)
lch_uv_gap	0.0738*** (0.00251)	0.0814*** (0.00439)	0.0744*** (0.00373)	0.0929*** (0.00506)	0.0802** (0.0330)	0.0680*** (0.00459)	0.111*** (0.00331)	0.132*** (0.00492)	0.115*** (0.00246)
loecd_uv	0.291*** (0.0160)	0.156*** (0.0281)	0.0294 (0.0242)	0.201*** (0.0347)	0.300*** (0.0494)	0.326*** (0.0353)	0.101*** (0.0275)	0.252*** (0.0334)	0.239*** (0.0176)
share_ch	0.0964*** (0.0159)	0.0998*** (0.0304)	-0.0194 (0.0238)	-0.125*** (0.0433)	0.320 (0.340)	-0.0255 (0.0323)	-0.185*** (0.0343)	0.0917** (0.0416)	- (0.0187)
share_ch_gains	0.0167 (0.0107)	0.0412 (0.0275)	0.0562** (0.0231)	0.0336 (0.0283)	-0.705 (0.575)	0.0693*** (0.0243)	0.0858** (0.0381)	0.0624* (0.0375)	0.0361** (0.0149)
share_oecd	-0.0203*** (0.00779)	0.00682 (0.0210)	-0.0184 (0.0134)	-0.0287 (0.0239)	0.251 (0.450)	-0.0386* (0.0207)	0.000297 (0.0204)	0.0160 (0.0281)	-0.0126 (0.0107)
Constant	-1.677*** (0.332)	2.720*** (0.676)	3.216*** (0.518)	0.983 (0.716)	-2.907*** (1.019)	0.684 (0.661)	3.257*** (0.765)	2.859*** (0.839)	0.779** (0.377)
Observations	36,236	1,747	2,775	1,545	15,150	1,862	6,772	4,166	17,578
hansenp	0.0273	0.225	0.760	0.107	0.391	0.0416	0.373	0.286	0.123
ar2p	0.361	0.333	0.640	0.754	0.0353	0.402	0.210	0.455	0.116
F-test 1(p)	0.0000	0.0000	0.0000	0.0000	0.0405	0.0000	0.0000	0.0000	0.0000
F-test 2(p)	0.0000	0.0000	0.0512	0.0110	0.4678	0.0161	0.0000	0.0020	0.0018

Standard errors in parenthesis

\*\*\* p&lt;0.01, \*\* p&lt;0.05, \* p&lt;0.1

Considering now in detail our variables of interest, we find that prices of main competitors, i.e. China and other OECD countries, tend to move in the same direction of Italian prices, with no relevant distinctions by division, suggesting thus that the prices of Italian exports in consumer goods and in richer markets tends to be responsive to that of its main competitors. On the other hand, however, when we look at the interaction term between the Chinese price and the dummy reporting the relative export price belonging to the fourth quartile of its distribution, the magnitude of the coefficient is constantly lower compared to the coefficient of the Chinese price. This is especially true in the cluster of products belonging to the divisions of travel goods, apparel and footwear and could be interpreted as a tendency for export price strategies of Italian firms to be less responsive to the price of Chinese exports for products that are likely to be more differentiated within the same group.

While we do not find evidence of market competition on Italian prices on the group as a whole (column I), it appears that China's rapid increase in some sub-sectors of consumer goods has put a downward pressure on Italian prices in some divisions, ranging from travel goods, which includes quality differentiated goods, to more sophisticated ones included in the professional and scientific apparatus division up to the highly heterogeneous group of products included in the miscellaneous manufacturing<sup>4</sup>. Interestingly, however, the sign and significance of the coefficient interacting Chinese shares with a dummy representing a gain in Italy's export shares is often positive, this being an overall indicator of quality upgrading of production which is a strategy that has been widely adopted by Italy, especially in the group of consumer goods. This is also true for two divisions that we found affected by China's competition (professional and miscellaneous goods), meaning that a portion of goods exported within such divisions (namely those which have experienced an increase in market shares) is not affected by such competitive pressure on prices.

Finally, the pattern of the coefficients of China's exchange rate is rather ambiguous. We find a strong evidence of a negative spillover effect of its depreciation on Italy's export prices in three divisions, including travel goods, footwear and photo, while a similar strategy produces an opposite effect on prices of goods in the furniture and in the miscellaneous manufacturing groups.

The results for the group of middle-income countries are reported in table 2. Contrary to what observed for the OECD markets, Italian prices in such an heterogeneous group of countries tend to grow with the per capita income. Once again, export prices increase with the size of the host economy and fall with the distance of the importer. The coefficient of the real exchange rate has mixed effects, differing by sub-sectors, but being mostly not significant.

---

<sup>4</sup> The distinction by technology content of each division is based on Lall's classification (Lall, 2000).

**Table 2.** Regressions results for the consumer goods (SITC-8) and selected divisions – Middle income markets, 2000/08

Middle	8	81	82	83	84	85	87	88	89
L.luv	0.232*** (0.0263)	0.189*** (0.0289)	0.147*** (0.0248)	0.176*** (0.0265)	0.188*** (0.0211)	0.241*** (0.0263)	0.171*** (0.0216)	0.197*** (0.0321)	0.181*** (0.0239)
L2.luv	0.0669*** (0.0113)				0.0587*** (0.0128)				
lgdp	0.00691 (0.0109)	-0.0269** (0.0127)	0.0301*** (0.00788)	0.0472*** (0.0140)	0.0182** (0.00825)	0.0361*** (0.00996)	0.104*** (0.0106)	0.0996*** (0.0192)	0.0525*** (0.0153)
lgdp_pc	-0.0152 (0.0305)	0.189*** (0.0304)	0.144*** (0.0213)	0.0697** (0.0307)	0.0742*** (0.0203)	-0.00377 (0.0246)	0.0398** (0.0197)	0.0642 (0.0397)	-0.0242 (0.0506)
ldist	0.0116 (0.0162)	0.00686 (0.0180)	-0.0336*** (0.0124)	0.00602 (0.0205)	-0.00875 (0.0144)	-0.0458*** (0.0145)	-0.0490*** (0.0116)	- 0.0733*** (0.0206)	0.0124 (0.0138)
landlocked	0.0229 (0.0267)	0.0435 (0.0402)	-0.0788*** (0.0287)	-0.0543 (0.0442)	-0.0185 (0.0304)	0.00751 (0.0344)	0.0350 (0.0298)	0.0744 (0.0594)	-0.0119 (0.0273)
er_it	0.0284 (0.0242)	-0.0243 (0.0382)	-0.0157 (0.0288)	0.0525 (0.0475)	-0.0376 (0.0402)	0.0378 (0.0373)	0.0336 (0.0334)	0.0842 (0.0671)	0.0534** (0.0255)
er_china	-2.318*** (0.622)	5.056*** (1.602)	0.785 (0.995)	-4.697** (1.975)	-3.293*** (0.855)	-0.660 (1.511)	1.666 (1.118)	-1.146 (2.020)	0.483 (1.011)
lq	-0.0569*** (0.0131)	-0.0884*** (0.00896)	-0.0845*** (0.00649)	-0.114*** (0.0117)	-0.0736*** (0.0107)	-0.0715*** (0.00718)	-0.139*** (0.00795)	-0.186*** (0.0166)	-0.101*** (0.0179)
lch_uv	0.490*** (0.0807)	0.262*** (0.0355)	0.278*** (0.0275)	0.369*** (0.0319)	0.306*** (0.0793)	0.307*** (0.0257)	0.218*** (0.0202)	0.248*** (0.0346)	0.474*** (0.0952)
lch_uv_gap	0.145*** (0.0364)	0.117*** (0.00465)	0.101*** (0.00331)	0.138*** (0.00612)	0.145*** (0.0303)	0.0978*** (0.00425)	0.118*** (0.00314)	0.136*** (0.00635)	0.143*** (0.0368)
loecd_uv	0.271*** (0.0333)	0.148*** (0.0234)	0.177*** (0.0203)	0.344*** (0.0386)	0.370*** (0.0390)	0.400*** (0.0283)	0.166*** (0.0227)	0.212*** (0.0320)	0.197*** (0.0288)
share_ch	0.121 (0.272)	0.0739** (0.0320)	-0.00560 (0.0229)	-0.0419 (0.0491)	-0.126 (0.223)	0.0239 (0.0264)	-0.150*** (0.0290)	-0.123*** (0.0423)	-0.194 (0.251)
share_ch_gain	-0.461 (0.354)	0.0148 (0.0293)	0.0114 (0.0240)	0.0711** (0.0324)	-0.164 (0.314)	0.0259 (0.0250)	0.0778** (0.0332)	0.157*** (0.0376)	-0.511 (0.324)
share_oecd	-0.247 (0.262)	0.0390* (0.0203)	0.0185 (0.0129)	-0.0458* (0.0251)	-0.509** (0.231)	-0.0293 (0.0191)	-0.0568*** (0.0185)	-0.0267 (0.0285)	-0.363 (0.266)
Constant	0.194 (0.297)	2.322*** (0.432)	2.144*** (0.266)	0.499 (0.475)	0.949*** (0.317)	0.379 (0.368)	2.037*** (0.352)	1.203** (0.501)	0.989** (0.398)
Observations	51,732	2,885	4,912	2,345	18,233	3,110	9,465	3,515	21,008
hansenp	0.169	0.107	0.198	0.112	0.252	0.928	0.620	0.421	0.0653
ar2p	0.547	0.922	0.403	0.951	0.893	0.115	0.170	0.113	0.673
F-test 1(p)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
F-test 2(p)	0.3811	0.0369	0.8929	0.0858	0.5443	0.2712	0.0000	0.0001	0.1302

Standard errors in parenthesis

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

Similarly to results reported in table 1, there is a significant price competition from both China and other OECD countries across all the divisions of consumer group. Also in this case, however, looking at the interaction term suggests a lower competitive pressure of Chinese prices on goods shipped at higher values from Italy, this difference being especially strong for traditional products of the so-called “made in Italy”.

The increasing market competition from China seems to significantly contribute to a reduction of Italy’s export prices in a similar small number of divisions, including professional apparatus and miscellaneous products, a result turning positive when the interaction terms with an increase in Italy’s export shares is taken into account.

#### ***4.2 Results for the group of machinery & equipment goods by income levels of importers***

The machinery and equipment sector has experienced an interesting performance over the last few decades. However, it has not yet received adequate attention, compared to more traditional consumer goods, despite its increasing role in Italy's specialization as well as its largest shares in terms of value added and employment in the country. A recent analysis based on aggregated data shows that, in this group, Italy specializes in high-quality products keeping its exported volumes high within the divisions including industrial machineries and electronics, while it specializes in lower quality products to keep the volumes high in the division including instrumental machineries (Cossio et al., 2008). Additional evidence from Ricotta et al. (2008) shows that in sub-sectors where Italy has higher comparative advantages it has recorded an outstanding performance in terms of quality of its export measured by their unit values at the 6-digit level of the HS classification. These divisions are machineries for specialized industries, industrial machinery and other transport equipment. On the other hand, Italy keeps some niche-markets but it is overall under specialized in other sectors such as office machines, telecommunications and electrical machines, all divisions where China's comparative advantage has rapidly increased over the last decade. Overall, however, generalization is difficult given that the machinery group is quite heterogeneous and includes either goods at different technological level and, above all, largely characterized by trade in parts and components.

Table 3 shows the results for the estimation of Italian prices for exports to OECD markets. Once again, most of the controls enter the regression with the expected sign. This is the case of the lagged values of prices and the size of the market – both leading to an increase in the unit values of export – or of the Italian real exchange rate, whose depreciation puts a downward pressure on export prices in all the divisions within the machinery group. Conversely, a not well defined trend emerges from the observation of the coefficients on per capita income and the lack of an access to the sea, while there is a systematic negative relation between prices and the distance, possibly reflecting a scale effect in more distant markets.

**Table 3.** Regressions results for the machinery goods (SITC-7) and selected divisions – OECD markets, 2000/08

	7	71	72	73	74	75	76	77	78	79
L.luv	0.279*** (0.0120)	0.335*** (0.0401)	0.167*** (0.0238)	0.158*** (0.0291)	0.305*** (0.0232)	0.221*** (0.0266)	0.205*** (0.0345)	0.248*** (0.0185)	0.350*** (0.0293)	0.297*** (0.0355)
L2.luv	0.0556*** (0.00935)				0.0632*** (0.0168)					
lgdp	0.0418*** (0.00579)	-0.00211 (0.0142)	0.0295*** (0.00969)	0.0847*** (0.0154)	0.0190*** (0.00729)	0.0190 (0.0173)	0.0350* (0.0206)	0.0851*** (0.0113)	0.0244** (0.0102)	0.0111 (0.0264)
lgdp_pc	-0.0211 (0.0129)	-0.0310 (0.0347)	-0.0823*** (0.0299)	-0.113*** (0.0428)	-0.0389** (0.0197)	0.0462 (0.0540)	0.0578 (0.0462)	-0.000884 (0.0273)	0.0309 (0.0324)	0.189** (0.0891)
ldist	-0.0624*** (0.00792)	-0.0650*** (0.0200)	-0.0569*** (0.0180)	-0.0609** (0.0242)	-0.0568*** (0.0118)	-0.0665** (0.0330)	0.0319 (0.0309)	-0.0594*** (0.0165)	-0.0129 (0.0159)	0.0706 (0.0431)
landlocked	0.0117 (0.0135)	-0.00834 (0.0377)	-0.0577* (0.0311)	0.0362 (0.0466)	0.0247 (0.0203)	-0.0140 (0.0555)	0.0651 (0.0462)	0.0245 (0.0278)	0.0844** (0.0407)	-0.193* (0.0993)
er_it	-0.0585*** (0.0110)	-0.0834** (0.0330)	-0.0625*** (0.0233)	-0.199*** (0.0406)	-0.0722*** (0.0164)	-0.0902* (0.0530)	0.0288 (0.0433)	-0.0382 (0.0233)	- (0.0290)	0.124 (0.0818)
er_china	0.930** (0.433)	4.392*** (1.453)	-0.503 (0.976)	-1.083 (1.652)	2.550*** (0.712)	6.556*** (2.514)	-3.997** (2.031)	-0.165 (0.792)	0.221 (1.182)	-1.621 (3.050)
lq	-0.0788*** (0.00580)	-0.0465*** (0.0105)	-0.0927*** (0.00768)	-0.0571*** (0.00839)	-0.0525*** (0.00592)	-0.0518*** (0.00898)	-0.0525*** (0.00949)	-0.125*** (0.00990)	- (0.00650)	- (0.0119)
lch_uv	0.225*** (0.0113)	0.217*** (0.0248)	0.218*** (0.0214)	0.225*** (0.0279)	0.190*** (0.0186)	0.390*** (0.0393)	0.423*** (0.0556)	0.218*** (0.0207)	0.198*** (0.0256)	0.261*** (0.0275)
lch_uv_gap	0.103*** (0.00149)	0.0969*** (0.00470)	0.104*** (0.00332)	0.128*** (0.00436)	0.0831*** (0.00266)	0.116*** (0.00440)	0.150*** (0.0225)	0.110*** (0.00233)	0.0882*** (0.00395)	0.122*** (0.00760)
loecd_uv	0.140*** (0.0109)	0.137*** (0.0253)	0.167*** (0.0211)	0.165*** (0.0253)	0.123*** (0.0159)	0.384*** (0.0424)	0.181*** (0.0464)	0.128*** (0.0201)	0.159*** (0.0280)	0.326*** (0.0508)
share_ch	-0.0378*** (0.0114)	-0.105*** (0.0392)	-0.0589** (0.0281)	-0.101** (0.0405)	-0.0143 (0.0200)	-0.0158 (0.0528)	0.350 (0.273)	-0.0608*** (0.0214)	0.00179 (0.0285)	-0.00623 (0.0908)
share_ch_gain	0.0401*** (0.0128)	0.0787** (0.0387)	0.0598* (0.0336)	0.0157 (0.0476)	0.0255 (0.0236)	-0.0853* (0.0512)	-0.749** (0.293)	0.0591*** (0.0191)	-0.0192 (0.0335)	0.165* (0.0929)
share_oecd	0.00257 (0.00742)	0.00138 (0.0216)	0.00822 (0.0172)	0.0363 (0.0257)	0.0148 (0.0128)	-0.0431 (0.0328)	0.0837 (0.189)	-0.00307 (0.0124)	0.0231 (0.0162)	- (0.0344)
Constant	2.771*** (0.289)	3.541*** (0.676)	5.372*** (0.673)	4.272*** (0.777)	3.383*** (0.517)	-1.196 (0.943)	0.819 (0.936)	2.655*** (0.516)	2.213*** (0.527)	-1.383 (1.064)
Observations	42,756	3,402	8,336	3,956	11,083	2,070	4,012	15,566	4,194	775
sarganp	0	5.79e-08	1.09e-08	0.00660	0	0.0142	4.67e-05	8.79e-10	6.58e-05	3.35e-05
hansenp	0.0757	0.247	0.138	0.572	0.121	0.577	0.125	0.251	0.620	0.768
ar2p	0.375	0.643	0.160	0.403	0.412	0.613	0.188	0.453	0.718	0.149
F-test 1(p)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
F-test 2(p)	0.0001	0.0254	0.0878	0.0185	0.5525	0.0955	0.0303	0.0021	0.8143	0.0977

Standard errors in parenthesis

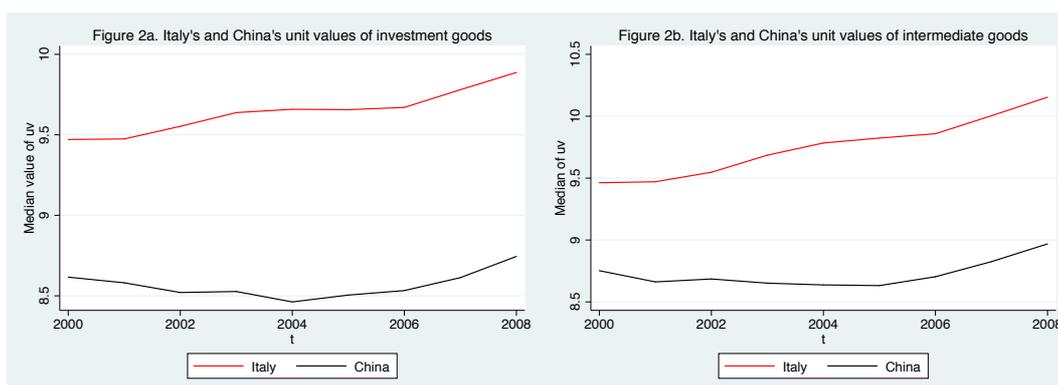
\*\*\* p&lt;0.01, \*\* p&lt;0.05, \* p&lt;0.1

Also in this case, we find that the unit prices of Chinese and OECD exports move in the same direction than Italian ones and show similar elasticities. In line with the findings for the consumer goods, the presence of large price differentials lowers the impact of Chinese export prices on Italian ones. Generally, Chinese exchange rate has a positive impact, meaning that in the group as a whole as well as in some divisions such as power, industrial and office machines there is no negative spillover from depreciation.

More interestingly, we find that the rapid increase in China's export shares in many of the division of the machinery and equipment group in the OECD markets has generated a competitive effect on Italy's export prices, a result in line with the findings by Abraham and Van Hove (2011) who find a strong competitive effect on market shares from China in a number of similar sectors for a sample including intra-OECD trade. This is notably the case of very specific sectors such as power machines, specialized machineries and metalworking as well as more heterogeneous ones as the electronics. At the same time, we find that market competition by other developed countries has

pushed Italian prices down only in the group including transport equipment. Very interesting cases are those of the office machines and the telecommunication divisions, where we find a negative and significant impact of China's market shares on the prices of Italian exports even in presence of an increase of the country's market shares. It must be remarked that the former is a very peculiar division, largely characterized by intermediate trade, which has recently been strongly affected by China's entry in the market. China's market shares in the OECD markets for the office machines division passed from 4.4% in 2000 to 34% in 2008. During the same period, Italian exports have remained at very low levels, dropping from 1% to 0.5% of the OECD markets. A similar trend in the market shares has been recorded in the telecommunication division, whereas the Chinese share in the OECD has risen from 6% in 2000 to 25% while the Italian has decreased from 1.4% to almost 1%. It is therefore likely that these are marginal divisions for Italy with no evidence of niche markets of differentiated products and very little space for upgrading strategies.

These results do not account for the large share of intra-industry trade and the role of intermediate goods. China's rising role within global production chains has been largely debated in the literature. Some have objected for instance that the growing importance of the country within this more sophisticated sector, now the largest in relative terms for Chinese exports, has been characterized by high shares of processing trade often generated by foreign invested firms, whose role in the country's more sophisticated sector exports is substantial (Koopman et al., 2008). In order to account for this debate, we further specify our model by classifying products according to the Broad Economic Categories (BEC), a classification which considers the main end use of the products distinguishing among consumption, investment, intermediary and primary goods. More specifically, we construct two main groups, the first including investment goods and the other intermediate ones, which in turn includes parts and accessories and processing goods. The main objective of this further analysis is to check whether the competition on prices and or quality is more relevant for one of the two groups. Descriptive information based on our data show that trends in the unit values for the two groups are rather different. The median unit value of China's investment goods (figure 2a) is considerably lower compared to Italy. If on the one side this could mean that Chinese investment goods are more competitive, implying a reduction in Italy's market shares and a competitive pressure on Italy's export prices, on the other it may also show that there is a quality differential. In this case, we expect a marginal effect of Chinese prices and market shares on Italy's price strategies. Price differences for intermediate goods for the two countries are instead closer (figure 2b), leaving any prediction more uncertain.



Results for the group of OECD markets disaggregated according to their end use are summarized in table 4. We notice in particular that there is a stronger price competition on the export prices of investment goods. If we relate this with figure 2a, it can be assumed that more competitive prices of Chinese goods put a strong pressure on Italy's price strategy across a number of divisions within the sector. As expected, such strong price competition becomes marginal for products with the largest price differential between the two countries.

Market competition from China hits Italy's price strategies in different divisions among the two groups of products. In the group including intermediate goods, divisions such as telecommunications, metalworking and road vehicles have seen China's growing competition posing a pressure on Italian prices to not lose market shares. Not surprisingly, these sectors are indicated by the analysis of Ricotta et al. (2008) as those where Italy is under specialized and China is rapidly catching-up, though its specialization is still in medium-quality products. As capital goods are concerned, the competitive pressure of China's rising market shares on Italy's prices has invested also specialized machineries belonging to divisions 71 and 72, where Italy holds a consolidate comparative advantage and is characterized by the high quality of its products.

**Table 4.** Regressions results for the machinery & equipment goods (SITC-7) and by end use– OECD markets

Investment	7	71	72	73	74	75	76	77	78	79
er_china	-1.523 (1.075)	5.602*** (1.523)	-1.512 (1.223)	-2.832 (2.155)	2.860*** (0.997)	7.419*** (2.797)	-5.194** (2.326)	-2.566 (1.714)	-2.164 (2.010)	3.212 (5.983)
lch_uv	0.547*** (0.0950)	0.192*** (0.0265)	0.254*** (0.0278)	0.264*** (0.0501)	0.250*** (0.0483)	0.319*** (0.0407)	0.435*** (0.0488)	0.195*** (0.0359)	0.0985*** (0.0310)	0.331*** (0.0666)
lch_uv_gap	0.178*** (0.0313)	0.0860*** (0.00477)	0.109*** (0.00418)	0.152*** (0.0260)	0.0958*** (0.0265)	0.116*** (0.00461)	0.126*** (0.00417)	0.106*** (0.00463)	0.114*** (0.00660)	0.187*** (0.0141)
loecd_uv	0.118*** (0.0244)	0.119*** (0.0231)	0.182*** (0.0236)	0.160*** (0.0343)	0.140*** (0.0250)	0.384*** (0.0390)	0.114** (0.0448)	0.181*** (0.0379)	0.380*** (0.0351)	0.0226 (0.0583)
share_ch	-0.168 (0.333)	-0.0901** (0.0399)	-0.0652* (0.0360)	-0.129 (0.356)	-0.323 (0.340)	-0.0594 (0.0560)	-0.123** (0.0498)	-0.0541 (0.0408)	-0.409*** (0.106)	0.0678 (0.185)
share_ch_gain	0.790 (0.499)	0.111*** (0.0382)	0.0677 (0.0426)	-0.470 (0.450)	0.285 (0.310)	-0.0813 (0.0536)	0.0547 (0.0406)	0.0121 (0.0427)	0.815*** (0.0930)	0.412** (0.168)
share_oecd	0.0660 (0.308)	0.0383 (0.0235)	0.00827 (0.0220)	0.322 (0.207)	0.119 (0.184)	-0.0349 (0.0361)	0.000636 (0.0294)	- 0.000754 (0.0258)	0.0982 (0.0614)	-0.0336 (0.0639)
Constant	1.845 (1.247)	4.490*** (0.712)	5.447*** (0.746)	4.943*** (0.879)	4.218*** (0.618)	-0.370 (1.034)	0.595 (0.840)	2.995*** (0.869)	3.345*** (0.707)	-1.403 (4.153)
Observations	27,710	2,299	5,520	3,337	8,704	1,571	2,317	3,386	466	110
hansenp	0.389	0.650	0.0938	0.116	0.0231	0.440	0.291	0.538	0.589	1.000
ar2p	0.746	0.437	0.585	0.329	0.552	0.263	0.121	0.776	0.900	0.276

Intermediate	7	71	72	73	74	75	76	77	78	79
er_china	0.490 (0.644)	0.227 (2.421)	0.960 (1.441)	-0.148 (1.856)	1.482 (0.995)	5.595* (3.391)	-0.340 (2.466)	0.776 (1.078)	0.0377 (1.423)	0.269 (2.226)
lch_uv	0.186*** (0.0165)	0.205*** (0.0314)	0.141*** (0.0255)	0.116*** (0.0245)	0.147*** (0.0249)	0.465*** (0.0271)	0.334*** (0.0408)	0.258*** (0.0239)	0.178*** (0.0306)	0.205*** (0.0133)
lch_uv_gap	0.0933*** (0.00234)	0.104*** (0.00684)	0.0799*** (0.00472)	0.0876*** (0.00528)	0.0657*** (0.00334)	0.114*** (0.00558)	0.109*** (0.00371)	0.111*** (0.00286)	0.0807*** (0.00460)	0.112*** (0.00444)
loecd_uv	0.133*** (0.0176)	0.279*** (0.0434)	0.111*** (0.0317)	0.0459** (0.0221)	0.0962*** (0.0213)	0.234*** (0.0498)	0.412*** (0.0387)	0.134*** (0.0237)	0.135*** (0.0249)	0.476*** (0.0231)
share_ch	-0.0262 (0.0187)	0.00317 (0.0673)	-0.0211 (0.0397)	-0.0992** (0.0504)	-0.00578 (0.0269)	0.215*** (0.0797)	-0.0992* (0.0539)	- 0.0638** (0.0295)	0.0474 (0.0302)	-0.150** (0.0610)
share_ch_gain	0.0223 (0.0218)	-0.0398 (0.0811)	0.0633 (0.0490)	-0.0300 (0.0707)	-0.0304 (0.0346)	-0.0894 (0.0852)	0.128** (0.0538)	0.0512 (0.0318)	-0.00544 (0.0446)	0.114 (0.0781)
share_oecd	-0.00657 (0.0113)	-0.0507 (0.0331)	-0.0221 (0.0239)	-0.0375 (0.0297)	0.00333 (0.0172)	0.0211 (0.0345)	-0.00704 (0.0278)	0.00111 (0.0172)	0.0100 (0.0181)	- (0.0363)
Constant	1.572*** (0.400)	3.308*** (1.026)	6.142*** (1.236)	3.977*** (0.636)	0.866 (0.535)	0.116 (0.917)	-1.023 (0.925)	1.154* (0.599)	1.752*** (0.550)	- (1.084)
Observations	17,236	1,042	2,562	619	4,278	499	549	8,775	2,530	342
hansenp	0.0878	0.348	0.232	0.0615	0.213	0.266	0.493	0.145	0.310	0.250
ar2p	0.751	0.880	0.178	0.982	0.437	0.392	0.375	0.688	0.802	0.910

Standard errors in parenthesis

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

Finally, we have estimated the same model also for the group of middle-income countries. Table 5 reports only results for the sub-groups of investment and intermediate goods. Comparison is again interesting and shows that the number of divisions where price strategies are affected by Chinese market competition are lower in the group of intermediate products, where competition is mostly based on prices. In the group of capital goods there is a larger impact of China's market shares, though in many of them the impact disappears when the share of Italy's exports has been rising.

**Table 5.** Regressions results for the machinery & equipment goods (SITC-7) and by end use– Middle income markets

Investment	7	71	72	73	74	75	76	77	78	79
er_china	-2.458**	2.045	-1.784	-0.150	-1.750	0.203	-4.197**	1.132	-5.058**	-6.292
	(1.033)	(1.693)	(1.118)	(1.746)	(1.758)	(3.266)	(2.141)	(1.733)	(2.281)	(5.870)
lch_uv	0.573***	0.176***	0.202***	0.287***	0.369***	0.279***	0.399***	0.300***	0.361***	0.352***
	(0.0932)	(0.0254)	(0.0214)	(0.0307)	(0.0981)	(0.0438)	(0.0307)	(0.0525)	(0.0388)	(0.103)
lch_uv_gap	0.190***	0.112***	0.129***	0.155***	0.156***	0.128***	0.156***	0.159***	0.132***	0.178***
	(0.0417)	(0.00492)	(0.00351)	(0.00432)	(0.0604)	(0.00526)	(0.00529)	(0.0349)	(0.00612)	(0.0180)
loecd_uv	0.168***	0.171***	0.271***	0.191***	0.178***	0.471***	0.215***	0.147***	0.484***	0.205***
	(0.0255)	(0.0319)	(0.0214)	(0.0271)	(0.0441)	(0.0445)	(0.0350)	(0.0383)	(0.0397)	(0.0616)
share_ch	-0.458	-0.0523	-	-0.199***	0.149	0.169***	-0.119**	-0.181	-	0.0622
	(0.370)	(0.0358)	(0.0262)	(0.0388)	(0.356)	(0.0564)	(0.0503)	(0.292)	(0.0488)	(0.0848)
share_ch_gain	1.155**	-0.0376	0.226***	0.147***	0.246	0.0765	0.127***	0.423	0.0643	-
	(0.560)	(0.0417)	(0.0329)	(0.0494)	(0.567)	(0.0559)	(0.0371)	(0.326)	(0.0619)	(0.191)
share_oecd	0.0927	-0.0177	-0.0245	-0.000120	0.00422	-0.0885**	0.0187	0.0647	-0.0120	0.394***
	(0.359)	(0.0230)	(0.0186)	(0.0280)	(0.361)	(0.0379)	(0.0281)	(0.217)	(0.0312)	(0.0828)
Constant	-0.131	3.023***	1.971***	0.996**	0.578	-1.539**	2.137***	1.067*	-0.200	1.993
	(0.700)	(0.520)	(0.323)	(0.398)	(1.167)	(0.614)	(0.522)	(0.549)	(0.486)	(2.671)
Observations	28,197	3,133	9,017	4,709	9,556	2,058	3,039	3,645	843	95
hansenp	0.562	0.450	0.0591	0.719	0.0418	0.468	0.404	0.297	0.326	1.000
ar2p	0.676	0.516	0.303	0.0275	0.186	0.486	0.350	0.0126	0.927	0.528

Intermediate	7	71	72	73	74	75	76	77	78	79
er_china	-4.587**	0.0347	1.453	2.030	1.100	-5.705	-6.632**	1.599*	0.405	-
	(2.030)	(2.111)	(1.471)	(2.729)	(1.468)	(3.964)	(3.249)	(0.896)	(1.245)	(7.137)
lq	0.0756	-	-0.177***	-	-	-0.103***	-	-0.150***	-	-
	(0.0591)	(0.0114)	(0.0106)	(0.0138)	(0.0190)	(0.0144)	(0.00975)	(0.00762)	(0.00652)	(0.0399)
lch_uv	0.557***	0.221***	0.203***	0.236***	0.289***	0.246***	0.383***	0.231***	0.243***	0.103
	(0.200)	(0.0357)	(0.0235)	(0.0331)	(0.0648)	(0.0526)	(0.0430)	(0.0188)	(0.0286)	(0.154)
lch_uv_gap	0.215***	0.113***	0.112***	0.104***	0.133***	0.130***	0.159***	0.113***	0.105***	0.0712**
	(0.0719)	(0.00589)	(0.00416)	(0.00615)	(0.0339)	(0.00740)	(0.00549)	(0.00267)	(0.00404)	(0.0312)
loecd_uv	0.195***	0.231***	0.0930***	0.239***	0.136***	0.290***	0.225***	0.121***	0.280***	0.309**
	(0.0588)	(0.0455)	(0.0270)	(0.0319)	(0.0250)	(0.0553)	(0.0426)	(0.0160)	(0.0312)	(0.152)
share_ch	0.0283	-0.0112	0.0172	0.0807	0.462	-0.0209	-0.146**	-0.116***	-	-0.151
	(0.562)	(0.0544)	(0.0409)	(0.0669)	(0.356)	(0.0651)	(0.0643)	(0.0207)	(0.0292)	(0.607)
share_ch_gain	0.512	-0.00784	-0.0446	-0.00454	-0.730	0.142*	0.0398	0.118***	0.0940***	0.267
	(0.936)	(0.0608)	(0.0518)	(0.0955)	(0.512)	(0.0799)	(0.0743)	(0.0233)	(0.0306)	(0.768)
share_oecd	-0.637	0.0382	0.00106	0.0381	0.0941	-0.100*	-0.0646	-0.0106	0.0122	0.767***
	(0.509)	(0.0323)	(0.0243)	(0.0391)	(0.310)	(0.0532)	(0.0428)	(0.0125)	(0.0158)	(0.181)
Constant	-2.339	0.629	3.141***	-0.634	0.933	1.463	1.863**	1.709***	0.998**	-0.895
	(1.580)	(0.682)	(0.459)	(0.723)	(0.691)	(0.985)	(0.753)	(0.253)	(0.391)	(4.570)
Observations	25,526	1,342	3,848	860	9,096	713	1,028	14,468	4,167	80
hansenp	0.865	0.477	0.0223	0.184	0.107	0.489	0.275	0.0611	0.0935	0.997
ar2p	0.360	0.0600	0.340	0.283	0.305	0.418	0.484	0.208	0.219	0.249

Standard errors in parenthesis

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

## 5. Conclusions

This paper analyzes the impact of Chinese competition on Italy's export price strategies for a number of sectors within the manufacturing over the period 2000-2008. More specifically, we test the direct impact through price competition and the indirect impact arising from an increase of China's market shares at a very detailed product and market level.

To account for the possible quality upgrading strategy of Italian exporters, we consider separately the cases where the difference in unit value of exports of the same products between Italy and China is large as well the cases where Italy's market shares have increased, despite competition from China.

Our results show that there is a direct influence of Chinese prices on Italian prices in all the main sectors of the manufacturing, while the indirect effect of China's rising market shares is affecting only some divisions, especially in the machinery and equipment sector. We also find that both direct and indirect competition from China is likely to decrease, if not vanish all together, when there is a significant price differential between the export of the two countries as well as when Italy's market shares increase. This shows that strategies of export upgrading and vertical differentiation in both traditional and capital intensive sectors are worth to be implemented to reduce the competitive effect of the entry of lower income countries in the international markets.

## References

- Abraham, F. and Van Hove, J. (2010) Can Belgian firms cope with the Chinese dragon and the Asian tigers? The export performance of multi-product firms on foreign markets, National Bank of Belgium Working Paper N. 204, October 2010
- Abraham, F. and Van Hove, J. (2011) Chinese competition in the OECD markets: impact on the export position and export strategy of OECD countries, *Journal of Economic Policy Reform*, 14(2): 151-170
- Amiti, M. and Freund, C. (2010), An Anatomy of China's Export Growth, in Feensta, R.C. and Wei, S.J. (Eds.) (2010) *China's Growing Role in World Trade*, National Bureau of Economic Research Conference Report
- Armington, P.S. (1969) A Theory of Demand for Products Distinguished by Place of Production, *International Monetary Fund Staff Papers*, 16, pp. 159-176
- Baldwin, R. and Harrigan, J. (2011) Zeros, Quality and Space: Trade Theory and Trade Evidence, *American Economic Journal: Microeconomics*, 3(2), pp. 60-88,
- Bekkers, E., Francois, J. and Manchin, M. (2012) Import Prices, Income, and Inequality, CEPR Discussion Papers N. 8911
- Berthou, A. and Emlinger, C. (2011) The Trade Unit Values Database, CEPII Working Paper n. 10/2011
- Bloom, N., Draca, M. and Reenen, J. (2011) Trade induced technical change? The impact of Chinese imports on innovation, IT and productivity, NBER Working Paper N. 16717
- Bugamelli, M. (2007) Prezzi delle esportazioni, qualità dei prodotti e caratteristiche di impresa: un'analisi su un campione di imprese italiane, Bank of Italy Working Paper Series N. 634
- Bugamelli M., Fabiani S., and Sette, E. (2010) The Pro-Competitive Effect of Imports from China: an Analysis of Firm-Level Price Data. Bank of Italy Working Paper Series N. 737
- Chepotea A, Fontagé L. and Zignago, S. (2010). EU export performance. CEPII Working Paper N.12
- Cossio, A., Nenna, M. and Ricchi, O. (2008) I settori della meccanica e dell'elettronica: analisi degli indicatori di prezzo-qualità, Fondazione Masi Working Paper N. 5
- Di Maio, M. and Tamagni, F. (2008) The Evolution of World Export Sophistication and the Italian Trade Anomaly, *Rivista di Politica Economica*, 98(1), pp. 135-174
- Feensta, R.C. and Wei, S.J. (Eds.) (2010) *China's Growing Role in World Trade*, National Bureau of Economic Research Conference Report
- Felettigh, A. and Federico, S. (2010) Measuring the Price Elasticity of Import Demand in the Destination Markets of Italian Exports, Banca d'Italia Temi di Discussione N. 776
- Fu, X., Kaplinsky, R. and Zhang, J. (2010) The Impact of China's Exports on Global Manufactures Prices, SLPTMD Working Paper Series N. 032, University of Oxford
- Faini, R. (1990) The Fallacy of Composition Argument: Does Demand Matter for LDC Manufactured Exports? CEPR Discussion Paper N. 499/December 1990
- Gaulier, F. and Zignago, S. (2010) BACI: International Trade Database at the Product-level The 1994-2007 Version. CEPII Working Paper N.23
- Hummels, D. and Klenow, P.J. (2005) The Variety and Quality of a Nation's Exports, *The American Economic Review*, 95(3), pp. 704-723
- Ianchovichina, E. and Martin, W. (2004) Impacts of China's Accession to the World Trade Organization, *The World Bank Economic Review*, 18 (1), pp. 3-27
- Ito, T. (2011) Revisiting the Determinants of Unit Prices, mimeo
- Koopman, R., Wang, Z. and Wei, S.J. (2008) How Much of Chinese Exports is Really Made in China? Assessing Domestic Value-Added when Processing Trade is Pervasive, NBER Working Paper 14109
- Lanza, A. and Quintieri, B. (Eds.) (2007) *Eppur si Muove. Come cambia l'export italiano*, Rubbettino: Rome
- Kaplinsky, R. and Santos-Paulino, A. (2006) A disaggregated analysis of EU imports: the implications for the study of patterns of trade and technology, *Cambridge Journal of Economics*, 30, pp. 587-611
- Manova, K. and Zhang, Z. (2009) Export Prices Across Firms and Destinations, NBER Working Paper Series N. 15342
- Mattoo, A., Mishra, P. and Subramanian, A. (2012) Spillover Effects of Exchange Rates: A Study of the Renminbi, IMF Working Paper N. 12/88
- Mayer, J. (2003) The Fallacy of Composition: a Review of the Literature, UNCTAD Discussion Paper N. 166, February 2003
- Mayer, T. and Zignago, S. (2011), Notes on CEPII's distances measures: The GeoDist database, CEPII Working Paper 2011-25.

- Ricotta, F., Mannarino, L., Pupo, V. and Succurro, M. (2008) Export quality in the machinery sector: Some evidence from main competitors, MPRA Paper No. 12677
- Rodrik, D. (2006), What is so Special About China's Exports?, Center for Economic Policy Research Discussion Paper N. 5484
- Roodman, D. (2006) An Introduction to "Difference" and "System" GMM in Stata, Center for Global Development Working Paper N. 103
- Schott, P.K. (2008), Chinese Exports, *Economic Policy*, January 2008, pp. 5-49
- Vandenbussche, H., Di Comite, F., Rovegno, L. and Viegelahan, C. (2011) Moving up the quality ladder? EU-China trade dynamics in clothing, IRES University of Louvain Discussion Paper N. 2011-47
- Xu, B. (2007), Measuring China's Export Sophistication, mimeo China Europe International Business School, October 2007