

Local labour markets, technology, and Chinese imports' competition: Evidence from Italy during recession

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Abstract

In this article, we analyze whether the rising exposure to Chinese import competition lead to differences in local labour market outcomes in Italy. Our work draw upon the methodology developed by Autor et al. (2013, 2014, 2015) to estimate the impact of import competition on a wide array of labour market outcomes at the provincial level. We also investigate whether there exist spill-overs beyond manufacture to disentangle the general equilibrium effect of this phenomenon and to better understand to what extent non-trade sector has been affected by the rapid rise in the Chinese export during the Great Recession. The empirical analysis is based on the Italian Labour Force Survey data for the period 2009-2015 matched to the trade flows data from the ISTAT COEWEB archive including information on import and export at local and sectoral level. In order to recover a causal interpretation, we resort on an IV approach that corrects endogeneity by using the bilateral trade flow information collected by OECD. Our results indicate a larger heterogeneity in the effect of Chinese import competition that is partially captured by the traditional geographical differences in the Italian labour market. Notably, the estimates suggest that the final effect is related to the degree of complementarity or substitutability between internal production and Chinese import and how this relation affect the evolution of demand at industry level.

Introduction

The impact of international integration on labour market outcomes is an issue at the centre of the economic debate for decades. In the eighties and early nineties, the research on this subject primarily aimed to distinguish between the impact of technological progress and international trade as causes of the unfavourable trend in employment and wages of unskilled workers in the industrialized countries. Subsequently, the trend has been to see technological progress and international trade as two faces of the same phenomenon. Just think of the so-called *offshoring*, where the decentralization of manufacturing operations abroad reflects the combined effect of the

existence of differences in the costs of production factors between countries and the reduction in costs of disintegration of the production process resulting from the spread of information technology and declining barriers to international trade (Feenstra and Hanson, 1996 and 1999; Van Reenen, 2011).

Recently, thanks mainly to the contributions on the United States of Autor, Dorn and Hanson (2013; 2014), the analysis has been further developed to include, in addition to the estimate of the direct competition of imports on employment at the national level, the estimate of the effect on local labour markets. As argued in Acemoglu, Autor, Dorn, Hanson and Price (2016), the approach based on sectoral data at the national level can give an account of the direct impact of imports on employment in the sectors exposed to international competition. However, it does not include other possible direct and indirect effects that contribute to the overall impact of the increasing international integration in the labour market. In particular, using local labour markets as the unit of analysis, we can try to study both the presence of effects of employment reallocation between sectors exposed and not exposed to competition from imports, and the presence of Keynesian type's spillovers on aggregate demand.

The empirical work presented in this study aims to contribute to this line of research and represents a first exploration of the impact of import penetration on the local labour market in Italy, using data on Italian provinces. The analysis focuses on the recent years of recession and study the overall impact of import penetration, and the competitive pressure exerted by imports from China, Italy's main Emerging partner.

Local labour markets and imports: stylized facts

The empirical analysis presented in these pages is based on different data sources for the period between 2009 and 2014¹. Specifically, we used data on trade flows from the database Istat Coeweb at the province and industry level. In addition, we distinguish also by geographical origin of imports. A second source of information is the Labour Force Survey by Istat, which provides an insight into detailed quarterly Italian labour market. We extracted the number of employed and the youth employment rate in each province for the years 2009-2014. As control variables for the composition of the local labour markets we have used the information on the distribution by sex, level of education and industry of employment. Some variables were built at regional level, as Istat

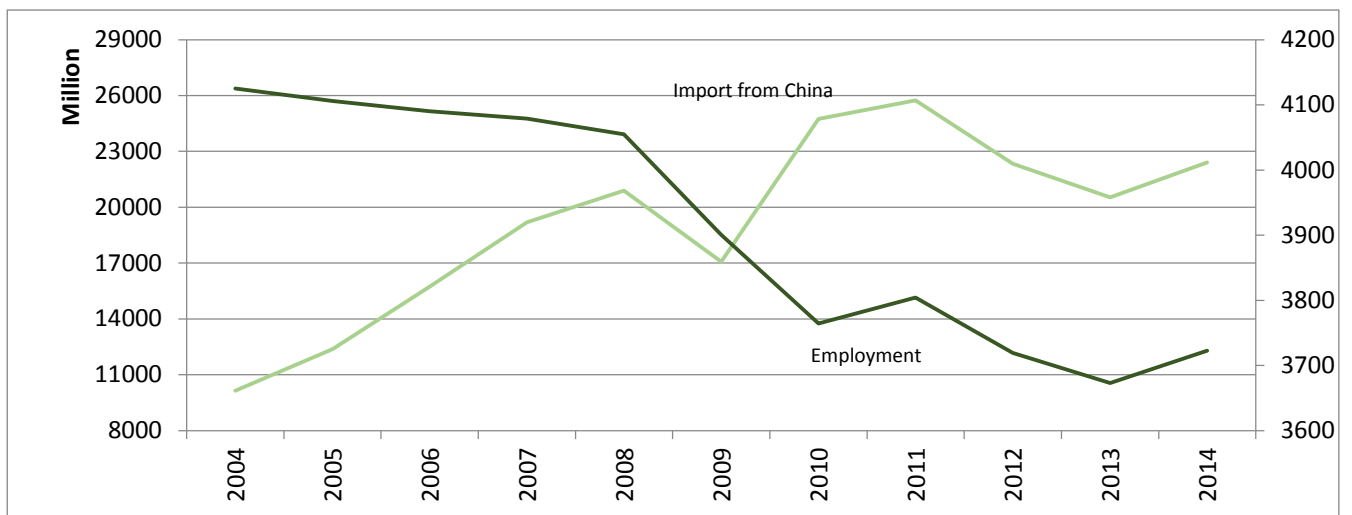
¹ We are updating the dataset to cover the period 2009-2015

(the Italian National Institute of Statistics) did not provide the data at the province level due to lack of representativeness of the Labour Force Survey at this detailed local level.

Using this integrated database allows us to conduct more detailed analysis on the impact of international trade at the local level and to study how the recession has affected employment trends locally through domestic and foreign demand's shocks. Before presenting the results of the empirical work, it may be interesting to show some general trends that emerge from analysis of employment data and flows of imports from China, the most important emerging trading partner on which we decided to focus our attention.

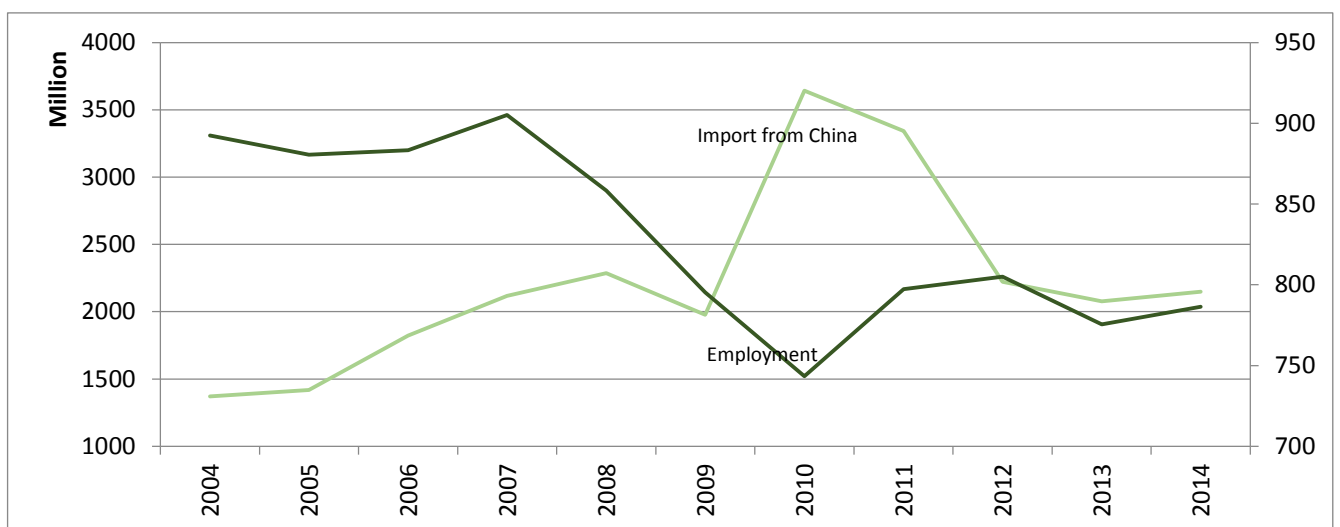
Graph 1a - Employment and import from China: North and Centre of Italy

Import in values (millions of euros), employment in thousands



Graph 1b - Employment and import from China: South of Italy

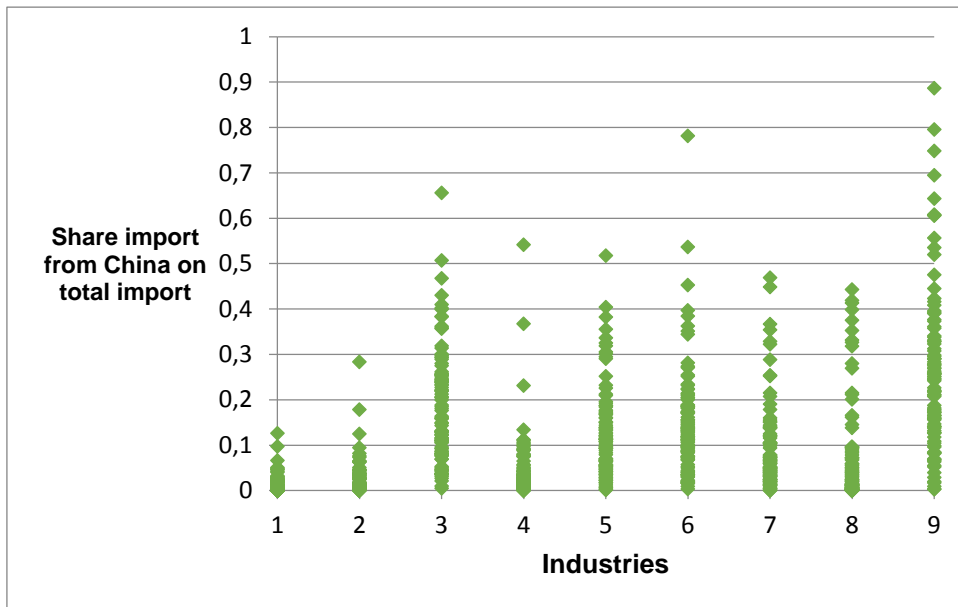
Import in values (millions of euros), employment in thousands



Source: our elaboration on Istat data

Graphs 1a and 1b show the evolution, from 2004 to 2014, of employment and imports from China, distinguishing between the area of northern and central Italy and of southern Italy. In both graphs emerge the effects of the crisis on employment and import flows. As for imports from China, the north and the centre of Italy show a growing trend that has no correspondence in the South.

Graph 2 - Import from China at industry level: share on total import by province. Year 2013



Source: our elaboration on Istat data

Legend:

- 1 Food products, Beverages and Tobacco
- 2 Chemical, Rubber, Plastics and Fuel Products
- 3 Textiles, Textile Products, Leather and Footwear
- 4 Wood, Pulp, Paper, Paper Products, Printing and Publishing
- 5 Rubber and Plastics Products - Other Non_Metallic Mineral Products
- 6 Electrical and Optical Equipment
- 7 Basic Metals - Fabricated Metal Products
- 8 Transport Equipment
- 9 Other manufacturing

Graph 2 allows us to highlight the heterogeneity across provinces and industries of the share of imports from China. In 2013, compared with a national share of imports from China by 6.5 per cent, the share of the various industries in different provinces is extremely diversified showing that the possible impact of competitive pressure from abroad on the local labour market can be very different.

Empirical strategy

In this section, we describe the empirical strategy to examine the direct and indirect impact of Chinese imports competition on the dynamics of employment and wages in the Italian local labor markets. Any fluctuations in the level of Chinese imports measured at sectoral and provincial level during our sample period potentially reflect our source of variation through which we would like to untangle the relationship between trade flows and labour market outcomes. Concretely, the analysis focuses entirely on the direct effect of domestic and foreign demand, generated by the recession. The idea is that those provinces with a greater dependence on external demand or a production oriented to Chinese imports will be more vulnerable to negative shocks on the demand side, linked to the recent recession. Therefore, we would expect to observe in the same provinces more adjustments in labor demand, compared to areas or local labor markets less exposed to international trade.

Potentially, also the indirect effect of imports competition may lead to relevant labour market adjustment. In this direction, our empirical strategy seeks to additionally quantify to what extent trade-induced shocks affect local employment and wages' prospects in non-exposed industries, i.e. those non-tradable industries that are not directly affected by Chinese imports either through competition for the same products market or through other input – output linkages (e.g. Acemoglu et al., 2016; Malgouyres, 2014).

Overall, this local labour market perspective, as accurately developed both theoretically and empirically in the Autor et al. (2013, 2014) framework, reflects an alternative way to calculate the aggregate employment and wages impact of a supply shock, generated by the growth of Chinese imports in the international trade flows.

The equation to estimate our basic model is defined as follows:

$$Y_{jt} = \alpha + \beta X_{jt} + \gamma \text{tradeshock}_{jt} + \varepsilon_{jt}$$

where Y_{jt} are our dependent variables, that measure alternative labour market outcomes at local level; X_{jt} represents a set of control variables about the workforce composition in terms of gender, education and age. Arguably, tradeshock_{jt} reflects the information on imports measured at industry and provincial level.

The data on international trade were initially collected by manufacturing sectors at the province

level. Since the analysis is focused on the effects on the local labour demand, we have constructed measures of foreign trade value of imports and exports in each sector and province, weighted by the share of employment in the same sector at the province level over the country total.

As suggested in the work of Autor, Dorn and Hanson (2013), the index was defined as follows:

$$trade_{jt} = \sum trade_{sj} * \frac{occ_{sj}}{occ_s}$$

where $trade_{sj}$ are, respectively, imports and exports set at the province and industry level; occ_{sj} is the number of employees in the industry s for each local market j and finally occ_s is the number of employees in the industry at the country level.

Results

We report both the OLS and FE estimates, exploiting the longitudinal dimension of the database that follows the same province over six years.

Table 1 shows the results for the total number of employees at provincial level. The first column reports OLS estimates for Italy as a whole for two different specifications. In the first we use total imports, while in the second we control only for the Chinese imports. All models include controls for the local labor market composition, region and time fixed effects in order to check for the unobservable factors that vary over time and between regions. Qualitatively, all the coefficients for imports are statistically significant and indicate a positive relationship between the level of imports at the provincial level and the total number of employees.

Concretely, imports and exports seem to show a positive correlation with employment outcomes at the local level in the case of OLS estimates. Even if not shown in the tables 1, the coefficient about the share of female workers appears to be the only positive and statistically significant parameter among those concerning labour market composition, indicating that a greater presence of women in employment at the provincial level is associated with a higher number of occupied. Taking into account that the sample period represents a negative economic cycle, it is a relevant policy result for the Italian labour market, traditionally characterized by low levels of female participation.

In order to capture the presence of regional specificities, we estimate the same model, splitting by

macro-regions, respectively for the Centre-North and the South. The results in Table 1 highlight traditional geographical peculiarities that characterize the impact of international trade. Specifically, looking at the effect of total imports we can observe as the positive effect for Italy (0.315) is entirely due to the South coefficient (0.365), while in the Center-North area the effect is undoubtedly weaker (0.124), although statistically significant.

Table 1 - Employment at the local labour market and trade flows over period 2009 - 2014:

	Italy		Centre - North		South	
	OLS	FE	OLS	FE	OLS	FE
Total imports	0.315***	-0.015*	0.124*	-0.029*	0.365***	-0.010
	(0.045)	(0.008)	(0.063)	(0.016)	(0.071)	(0.009)
Export	0.127***	0.015*	0.428***	0.076***	0.017	-0.003
	(0.044)	(0.008)	(0.062)	(0.017)	(0.055)	(0.008)
R ²	0.71	0.31	0.79	0.29	0.67	0.52
N. obs.	632	632	382	382	250	250
Chinese imports	0.208***	0.001	0.008	-0.003	0.320***	0.000
	(0.025)	(0.003)	(0.031)	(0.004)	(0.028)	(0.004)
Export	0.234***	0.004	0.538***	0.061***	0.109***	-0.009
	(0.027)	(0.006)	(0.045)	(0.014)	(0.019)	(0.007)
R ²	0.74	0.30	0.79	0.21	0.77	0.51
N. obs	632	632	382	382	250	250

Note: Standard errors are reported in parenthesis. ***, **, * indicate that coefficients are statistically significant at 1, 5 and 10 per cent. All columns included region and time fixed effects, as well as the share of female workers, the local youth employment rate and the share of college workers at regional level.

Nonetheless, the inclusion of region and time fixed effects, OLS estimates may be biased if there are unobservable components locally correlated with the performance of the local labour market. For this reason, taking advantage of the longitudinal nature of the database, we estimate the same model but exploiting a fixed effect approach that is able to capture the individual component (province), unobservable and time-invariant. Fixed effects estimates should be interpreted with some caution, as while providing a causal effect, are affected by the limited number of subjects followed over time.

Table 2 replicates the same models but now looking at the youth employment rate in each local

labour market. The idea is to examine to what extent the performance of young people are differently affected by imports competition with respect to the base model and if imports and exports act in different directions within this labour market segment. As before, the OLS estimates control for region and time fixed effects as well as for local labour market composition.

Table 2 - Youth employment rate at the local labour market and trade flows over the period 2009 - 2014

	Italy		Centre - North		South	
	OLS	FE	OLS	FE	OLS	FE
Total imports	-0.033***	-0.013	-0.066***	-0.064*	-0.007	0.008
	(0.012)	(0.022)	(0.017)	(0.034)	(0.017)	(0.032)
Exports	0.029***	-0.034	0.070***	-0.098***	0.006	-0.016
	(0.011)	(0.022)	(0.017)	(0.035)	(0.014)	(0.031)
R ²	0.86	0.41	0.57	0.55	0.65	0.30
N. obs.	632	632	382	382	250	250
Chinese imports	0.005	0.018**	0.008	-0.008	0.001	0.063***
	(0.005)	(0.008)	(0.007)	(0.009)	(0.008)	(0.015)
Exports	-0.002	-0.048***	-0.002	-0.134***	0.000	-0.026
	(0.005)	(0.017)	(0.008)	(0.028)	(0.006)	(0.023)
R ²	0.85	0.42	0.55	0.54	0.65	0.35
N. obs.	632	632	382	382	250	250

Note: Standard errors are reported in parenthesis. ***, **, * indicate that coefficients are statistically significant at 1, 5 and 10 per cent. All columns included region and time fixed effects, as well as the share of female workers and the share of college workers at regional level.

Column (1) of Table 2 provides a quantitatively and qualitatively different picture with respect to the previous results. In fact, the estimated coefficient for total imports seems to indicate a significant negative relation with the youth employment rate, the opposite of what we have found for the total employment. One possible interpretation relates the traditional weakness of this segment of the labour market, which has often suffered more than other periods of strong restructuring and crisis crossed by the Italian production system. When we look at the impact of Chinese import, the negative effect fade away and the estimated parameter is not statistically significant.

Columns (3) and (5) report the same coefficients respectively for the Centre – North and the South. For most cases, the estimates are not significant, with the exception of total imports in column (3). Conversely, albeit modest, it confirms the positive impact of exports, but it is not consistently significant among the various specifications and different geographical areas.

Looking at the FE models, we see that the estimated parameters are qualitatively and quantitatively similar to the OLS estimates for imports, while for exports the coefficients are negative and statistically significant.

Conclusion

In conclusion, the empirical analysis confirmed two relevant points recently been discussed in the literature on international trade. The first concerns the role of local labour markets and their ability to absorb external shocks in the process of reallocation of employment during a period of great recession, which has amplified the traditional geographical differences of the Italian production system. The second explicitly looks at the role of Chinese imports competition. Specifically, increased penetration of Chinese products can determine processes of employment recovery (or losses), depending on whether such imports are complementary or substitutes to local manufacturing output. A complementary point that will be included in the final draft of the paper also provide a check to quantify the indirect impact of Chinese imports competition on non-tradable service industries, in order to understand the mechanisms of employment reallocation at the local labour market.

Finally, in order to recover a causal interpretation of our analysis, we will resort on an IV approach, instrumenting actual imports from China to Italy by Chinese exports to a set of high-income countries whose economic cycle is weakly related to that of Italy, following the approach proposed by Dauth et al. (2014). The identifying assumption on which the validity of the instrument will be based on, is that Chinese exports flows to these other high-wage countries are independent from domestic shocks in Italy, so that the association between Italian imports from China and local labour market outcomes is only driven by supply-side variation in Chinese imports competition.

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