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Trade and Employment in Italy

P. L. Iapadre

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Abstract

TRADE AND EMPLOYMENT IN ITALY

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This paper addresses the relationship between trade, employment and wages in Italy from the perspective of the specific features of its international specialisation pattern. It focuses on several key questions: To what extent has international economic integration, including trade and international outsourcing, changed the structure of the Italian economy? To what extent has exposure to foreign competition helped Italian firms to restructure and upgrade their production, so as to increase the skill intensity of their activities? What are the effects of these processes on employment and wages?

The paper opens with a short review of the relevant literature and a description of recent developments in the trade specialisation pattern of the Italian economy, including its linkages with the structure of employment. This is followed by the main original contribution of the paper consisting of an econometric study structured around two parts. The first part presents an estimate of the employment effects of trade and off-shoring in the Italian manufacturing industry based on a panel of 15 sectors for the period from 1999 to 2008. The second part addresses the relationship between trade and wages using a rich micro-level panel of individual workers for the period from 1997 to 2003. In light of the results, the paper then considers the main policies adopted in Italy to facilitate the adjustment of employment and wages to external shocks, including short-term effects of trade liberalisation.

The Italian case appears to confirm that international economic integration, while generating important static and dynamic benefits, requires a flexible and efficient social security system, able to assist workers displaced by external competition or other kinds of structural change. In view of shortcomings in the existing system, a comprehensive social security reform, inspired by principles of universal access, medium-term financial equilibrium, and a proper design of individual incentives, may be necessary to better help workers displaced by international integration.

JEL classification: F16 (Trade and labour market interactions).

Keywords: Trade, employment, wages, inclusive growth.

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1. Many of the data used in this report have been kindly provided by the Italian national Institute of Foreign Trade (ICE). The author is grateful to Elena Mazzeo and Alessia Proietti for their help in selecting and preparing the data. The econometric study presented in this report is made of two sections. The first one, based on sector data for the 1999-2008 period, has been carried out specifically for this report with the cooperation of Mauro Costantini (University of Vienna). The second one, based on linked employer-employee data (LEED) for the 1997-2003 period, has been carried out with the cooperation of Alessia Matano (University of Rome "Sapienza"), building on her previous work in the context of a research agreement between "Sapienza" University and Istituto per lo sviluppo della formazione professionale dei lavoratori (ISFOL), which was partly used in an article by Matano and Naticchioni (2010). The author is grateful for the co-operation received.

Acknowledgements

The OECD-led **International Collaborative Initiative on Trade and Employment (ICITE)** has brought together ten international organisations in an effort to deepen our understanding of the linkages between trade and jobs and to develop policy-relevant conclusions. ICITE is mobilising resources world-wide in an extensive programme of research, dialogue and communications. Participating organisations include: ADB, AfDB, ECLAC, IADB, ILO, OAS, OECD, UNCTAD, World Bank and WTO. The OECD is publishing this series of Trade Policy Working Papers drawing on the ICITE research programme.

The ICITE project is being implemented under the auspices of a team at OECD. Douglas Lippoldt is the project manager and Secretary to ICITE. In relation to the ICITE working papers, Ania Jankowska and Monika Sztajerowska provided analytical, editorial and other substantive inputs, and Katjusha Boffa and Jacqueline Maher provided secretarial and administrative support. The OECD ICITE team is based in the Development Division, headed by Michael Plummer, and under the direction of Raed Safadi, OECD Deputy Director for Trade and Agriculture, and Ken Ash, OECD Director for Trade and Agriculture.

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This paper has been developed as an input to the ICITE project. The views expressed are those of the author(s) and do not necessarily reflect those of the OECD, OECD member country governments or partners of the ICITE initiative.

Table of contents

Tables

Figures

Executive Summary

This paper analyses the relationship between the increasing international integration of the Italian economy and its economic performance, with particular reference to employment and wages.

The starting point of the paper is a survey of the empirical literature on the role of trade for employment and wages in Italy, which refers mostly to the manufacturing industry in the 1990s. The evidence tends to underline the positive role played by net exports in sustaining labour demand, particularly in the traditional sectors in which the Italian industry is more specialised. A skill-upgrading process is visible in the structure of employment and wages, and most studies tend to explain the process more with technical progress than with international competition.

The paper continues by presenting recent trends of the Italian economy in the context of its main structural features. Before the global crisis, notwithstanding the sluggishness of production and the decline of export market shares, employment had continued to grow in Italy and the unemployment rate had significantly fallen. This was partly the result of regulatory reforms, which facilitated the absorption of a rising labour supply, including a growing fraction of immigrant workers. However, the Italian economy has remained fragile, due to its longstanding structural problems, and the impact of the crisis has been harsher than in other developed countries, making the current recovery slower and uncertain.

Although rising substantially in the last decades, the degree of international openness of the Italian economy is still lower than in other European countries of similar size. Its growth is curbed, among other factors, by the increasing weight of the services sector, which is structurally less open than the manufacturing industry.

Following a common pattern among developed countries, the GDP and employment shares of the manufacturing industry have declined in the last decades, in a context of rising international integration. Manufacturing trade balance has remained in surplus, sustaining the growth of employment, but its net labour content has become smaller over time.

Driven also by demographic factors, a strong trend of skill upgrading has affected the structure of employment, particularly in the manufacturing industry. The relative demand for unskilled labour has fallen in all sectors, increasing wage gaps between different occupations.

These changes might be partly interrelated with a recent evolution in the international specialisation pattern of the Italian manufacturing industry. Under the increasing competitive pressure exerted by developing countries, traditional

comparative advantages in low-technology consumption sectors have substantially weakened, and were replaced by a more intense specialisation in industrial machinery and other sectors producing intermediate and investment goods. Industries more exposed to competition from developing countries, both on the domestic and on export markets, have undergone the sharpest falls in employment.

This structural transformation is not only the unavoidable implication of changes in the 'international division of labour' between developing and developed countries, but also the result of market strategies carried out by Italian firms, and particularly by the most competitive medium-sized enterprises that are emerging from the selection process elicited by international competition. However, these changes have not been strong enough so far to overcome the structural problems limiting the growth of the Italian economy, and in particular the 'dynamic inefficiency' of its specialisation pattern, concentrated in products characterised by a lower income elasticity of demand. This calls into question the ability of the Italian economic system to generate sufficient product innovation, which in turn depends on the quality of its human- and knowledge capital. A related problem concerns the services sector, where an increase in openness and competition would be necessary to generate the high-skilled jobs that could sustain the growth prospects of the Italian economy.

In order to offer a more precise assessment of the employment and wage effects of international integration on the Italian manufacturing industry, the paper presents two econometric exercises. The first one confirms that, after controlling for the effects of output growth and technical progress on labour demand, trade specialisation has played a positive role in sustaining the growth of employment in the last decade, offsetting the negative impact of the competitive pressure from developing countries and of production off-shoring by Italian firms.

The second group of estimates, based on a large panel of data on workers characteristics, gives similar results for wages. After controlling for a set of individual worker characteristics (age, gender and occupation) as well as for firm size and labour productivity, we find again that the competitive pressure from developing countries exerts a negative impact on wage growth, which may, however, be more than offset by the export specialisation of the region in which workers are located. Nevertheless, both of these trade-related variables (competition from developing countries and export specialisation) tend to increase wage gaps between white-collar and blue-collar workers (who are likely to have lower skill levels than white collar workers).

The Italian case, therefore, seems to confirm that international economic integration, while generating important static and dynamic benefits, requires a flexible and efficient social security system, able to assist workers displaced by external competition as well as by any other kind of structural change.

The last section of the paper addresses the issue of labour policies in Italy from the perspective of their role in supporting trade adjustment. The current social security system looks unduly complex, iniquitous and ineffective. Most of the non-standard-contract workers, who have been impacted more severely by trade competition and by the global crisis, are not covered by any form of assistance. The large informal economy existing in Italy is not able to solve this problem. Rather, its presence and the interconnections between legal and illegal

activities threaten the financial sustainability of labour policies and obscure the growth and progress prospects of the Italian society.

Only a comprehensive reform of the social security system, inspired by principles of universal access, medium-term financial equilibrium, and a proper design of individual incentives, may help workers displaced by international integration, without jeopardising the substantial economic and social benefits associated with trade.

1. Introduction

The global economic crisis hit the Italian economy more severely than other developed countries, due to long-standing structural problems limiting its efficiency and growth. The fall of gross domestic product (GDP) has been greater than in the rest of the OECD, and its recovery appears slower, even in comparison with the other members of the euro area. The resulting employment loss was initially milder than in the OECD average, but only in terms of number of persons. Total hours worked recorded a sharp decline, reflecting the need of firms to reduce labour input in response to the collapse of demand. Even if the official unemployment rate is still below the OECD average, this is mostly the result of a very large proportion of discouraged workers in the labour force. The employment rate, which had risen substantially before the crisis, remains considerably lower than in other developed countries.

The growth of the Italian economy has been lagging behind the rest of the euro area in the last decade, as a result of a marked slowdown of productivity. The current account balance has gradually worsened, revealing problems of export performance more than a surge in imports. Italy's share of world exports has declined from 5% to 3% in the last two decades, responding only marginally to real exchange rate fluctuations. A substantial part of this fall is a reflection of the great success achieved by China and other emerging countries. However, Italian exports have been growing more slowly even in comparison to the average of the euro area, raising serious concerns about the competitiveness of exporting firms and their ability to adapt to the new features of international competition. Measured in terms of export propensity and import penetration, the international openness of the Italian economy has fallen drastically in the last few years, and is now the lowest in the European Union, well below openness levels of other countries of similar size, such as France and the United Kingdom.

Yet, exposure to international competition has played a positive role in the Italian economy, promoting a process of restructuring and firm selection. As a result, a large group of medium-sized enterprises, which seem able to successfully compete in foreign markets, has emerged as a dynamic force in the Italian economy. In comparison with their industry average, these firms are more productive, more innovative and employ relatively more skilled labour. In many cases, they have emerged from the population of small enterprises operating in local production systems (*distretti industriali* or industrial districts), which have characterised Italian economic development in the last decades.

At the onset of the global crisis, aggregate data on productivity and exports were starting to show the positive signs of this restructuring process. So far, the available evidence seems to suggest that the crisis has been particularly

unfortunate from this perspective, harming more severely the firms that were more dependent on foreign sales.

This confirms the importance of better understanding of the relationship between the particular features of Italy's international specialisation pattern and its growth and employment performance. It is often argued that the Italian economy is more exposed than other developed countries to the competition of low-wage exporters, due to its specialisation in traditional manufacturing sectors. It can be shown that this is only partly due to problems of price competitiveness, since many Italian firms have successfully upgraded their production to higher quality market segments, where non-price factors are more important. The main reason for the weak performance of Italian exports is the "dynamic inefficiency" of their specialisation pattern, i.e. their concentration in products characterised by a relatively slow growth of world demand. To a certain extent, this reflects the limited ability of Italian firms to invest in product innovation, which would be necessary to increase the income-elasticity of their exports. In turn, this innovation gap can be related to the fact that Italian firms tend to employ less skilled labour than their competitors in other developed countries.

This paper will address the relationship between trade, employment and wages in Italy from the perspective of the specific features of its international specialisation pattern. To what extent has international economic integration, including trade and international outsourcing, changed the structure of the Italian economy? To what extent has exposure to foreign competition helped Italian firms to restructure and upgrade their production, so as to increase the skill intensity of their activities? What are the effects of these processes on employment and wages?

Following a short review of the relevant literature, the paper will turn to comment on the main developments in trade, employment and wages in Italy over the last decade. Then, Section 3 will illustrate the trade specialisation pattern of the Italian economy and discuss its linkages with the structure of employment. The main original contribution of the paper consists of an econometric study structured around two parts. First, Section 4 will present an estimate of the employment effects of trade and off-shoring in the Italian manufacturing industry, based on a panel of 15 sectors for the period from 1999 to 2008. Second, Section 5 will address the relationship between trade and wages, using a rich micro-level panel of individual workers for the period from 1997 to 2003.

The main policies adopted in Italy to facilitate the adjustment of employment and wages to external shocks, including short-term effects of trade liberalisation, will be reviewed in Section 6, which will also consider the role of the informal economy and its relationship with trade exposure. The analysis will focus on how the Italian social security system has responded to the recent global economic crisis and what the prospects for its reform are. In particular, the analysis will consider means for improving its effectiveness in addressing trade-related adjustment problems. The final section will summarize the main insights and policy implications of the paper.

2. Trade, employment and wages in the Italian economy: An overview

Literature review

International economic integration, in all its aspects, exerts a growing influence on employment and wages, by changing the incentives faced by households and firms, the productive structure of the economy, and the macro-economic context. In the short run, trade liberalisation may improve real wages by reducing the price of imports and sustain employment by creating new export opportunities (Dee *et al.*, 2011). In the long run, the opening of international markets improves the allocation of resources and stimulates their accumulation. In particular, the selection effect elicited by trade liberalisation policies results in higher productivity, allowing for higher real wages and lower unemployment rates (Felbermayr *et al.*, 2009).

However, the adaptation of economic systems to changes in international competition entails distributive effects, which may prove difficult to manage, particularly in the short run. One example is the simultaneous increase of skilled workers' wage premia and employment shares, which is well documented in developed countries. The underlying increase in the relative demand for skilled labour has often been explained as the combined result of international competition and technological change, even if some studies focus also on the role of labour market institutions and individual characteristics of workers. Recent surveys of this literature include Hoekman and Winters (2005), Chusseau *et al.* (2008), OECD *et al.* (2010).

The available empirical evidence on the role of trade for employment and wages in Italy refers mostly to the manufacturing industry. The evidence tends to underline the positive role played by net exports in sustaining labour demand, particularly in the traditional sectors in which the Italian industry is more specialised. A skill-upgrading process is visible in the structure of employment and wages, and most studies tend to explain the process more with technical progress than with international competition.

Using input-output tables, De Nardis and Malgarini (1996) confirm the dominant role of technical change in driving the evolution of productivity and employment, and show that net exports sustained Italian manufacturing employment in the period from 1982 to 1988. Similar results have been reached by De Nardis and Paternò (1997) for the period from 1980 to 1995, by comparing the labour content of net exports with the counterfactual assumptions of no trade and of an unchanged trade balance with respect to 1980. Econometric estimates carried out by Faini *et al.* (1999) for the period from 1951 to 1995 confirm that the role of trade for employment and wages, although less important than that of technical progress, has been positive, thanks to the Italian economy's specialisation in labour intensive sectors. On the other hand, Bella and Quintieri (2000) find a minor negative effect of import competition on employment in the period from 1975 to 1989.

The above studies address only the effect of trade on total employment, without distinguishing between skilled and unskilled labour. Quintieri and Rosati (1995) show that skill upgrading in the manufacturing industry was predominantly a within-industry process in the 1980s, interpreting this fact as evidence of the dominant role of technical progress, as opposed to trade, in raising

the relative demand of skilled labour. Somewhat different results have been obtained by Brenton and Pinna (2001), who confirm that in the 1980-90s technical progress was more important than trade in explaining skill upgrading in low-skill industries, but identify a substantial effect of import competition, and particularly of foreign outsourcing, in lowering the demand for unskilled labour in high-skill sectors. The relatively better performance of traditional sectors might be traced back to specific competitive advantages of Italian industrial districts, related to agglomeration economies. Helg and Tajoli (2005) confirm that in Italy, unlike in Germany, international outsourcing affected positively the relative demand for skilled labour over the 1990s.[2]

The increasing availability of micro-economic statistics, and particularly of linked-employee-employer data, allows for a better understanding of the functioning of the economic system and its structural changes. In particular, information about the number of workers hired and dismissed at firm level can be used to assess the process of job reallocation between less and more productive firms (Davis *et al.,* 1996). According to research based on a large business survey of the manufacturing industry conducted by the Bank of Italy, no significant changes have occurred in the size of this process since the recession of the early 1990s (Bugamelli *et al.*, 2010). The rates of job creation and destruction have remained quite stable, resulting in a steady increase in employment year after year. The restructuring process elicited by the introduction of the euro has occurred more at the intra-industry level than across different sectors. The share of blue-collar occupations in manufacturing employment has fallen as a result of vertical specialisation in high-skill stages of the production process. The process has been particularly intense in low-tech industries, which are more affected by the end of competitive devaluations. The reduction in the employment share of blue-collar workers has been accompanied by an increase in its variance across firms, confirming the intensity of intra-industry restructuring.

Other studies based on micro-data broadly confirm the main insights drawn from the empirical evidence at the industry level. In particular, skill-biased technical change is identified as the most important factor explaining the increase in relative employment of skilled workers in the manufacturing industry.[3] In a study on the mechanical industry, Manasse *et al.* (2004) show that within-firm changes are the most important factor behind the increase in the wage premium and employment share of skilled workers,[4] whereas trade has offset this trend by reducing the relative demand for skilled labour. Exposure to international competition has played an important role, as shown by the fact that skill upgrading has been more pronounced in exporting firms. However, in accordance with the structural features of the Italian economy, demand has shifted towards less skill-intensive exporting firms. Manasse and Stanca (2006) obtain similar

2. See also Lo Turco and Parteka (2009).

3. See also Casavola *et al.* (1996), Piva and Vivarelli (2002, 2004), and Bratti and Matteucci (2004). Piva *et al*. (2005) show that organizational change has been more important than technical progress in raising the relative demand for skilled labour.

4. Actually, the aggregate share of non-manual workers has remained virtually unchanged in the sample during the 1990s, but this is the result of an increase in the share of executives at the expense of clerks (Manasse et al. 2004).

results on a large panel of Italian manufacturing firms for the period from 1989 to 1995. Between-firm demand shifts, which may be traced back to trade, have exerted a small positive effect on the relative demand for unskilled labour, dwarfed by within-firm skill-upgrading in both employment and worked hours caused by technical progress.

Falzoni *et al.* (2007) use detailed micro-data for the period from 1991 to 1998 to conclude that import competition was detrimental for wages of both skilled and unskilled workers, whereas exports played a positive role only for the latter, confirming that the specific features of Italy's specialisation pattern are essential to understand the impact of trade on wage gaps. Similar results have been obtained for the period from 1991 to 2002 by Matano and Naticchioni (2010), who distinguish between trade with developed and developing countries and conclude that the largest impact on wage and employment has come from trade with developed countries. They find that exports increase the demand for unskilled labour and imports play the opposite role due to the complementarities between imports of capital-intensive goods from developed countries and high-skill labour. For the period from 1995 to 2003 Antonietti and Antonioli (2011) find support for the skill-upgrading effect of foreign production, showing that it is mostly due to a fall of unskilled labour employment in firms shifting production activities abroad.[5]

International openness, structural change, employment and wages in the Italian economy

The performance of the Italian economy before the global crisis was characterised by an apparent paradox (Codogno, 2008). Notwithstanding the stagnation of GDP, which grew at an average rate of 1.2% between 2000 and 2007, lower than in the rest of the euro area, employment continued to expand by about 1% per year. A larger labour supply, boosted by an increase in the activity rate and sizeable migration inflows, was absorbed relatively easily by the economic system. The unemployment rate, which had climbed to an historically high level of 11.3% in the second half of the 1990s, dropped steadily in the following years, reaching 6.1% in 2007.

Changes in industrial relations in the early 1990s led to a period of moderation in wage dynamics, which resulted in a rise in the profit share of value-added until 2001. This trend has reversed in the last decade. Wage growth has remained weak, but anyway higher than that of productivity. The resulting increase in labour cost has eroded the profitability of firms and their international competitiveness.

The sluggishness of productivity, as mentioned in the introduction, is commonly considered as the most important factor explaining the weak growth performance of the Italian economy in the last decades. The resulting structural fragility of the productive system exacerbated the impact of the global crisis, whose consequences were more severe than in other developed economies. Its

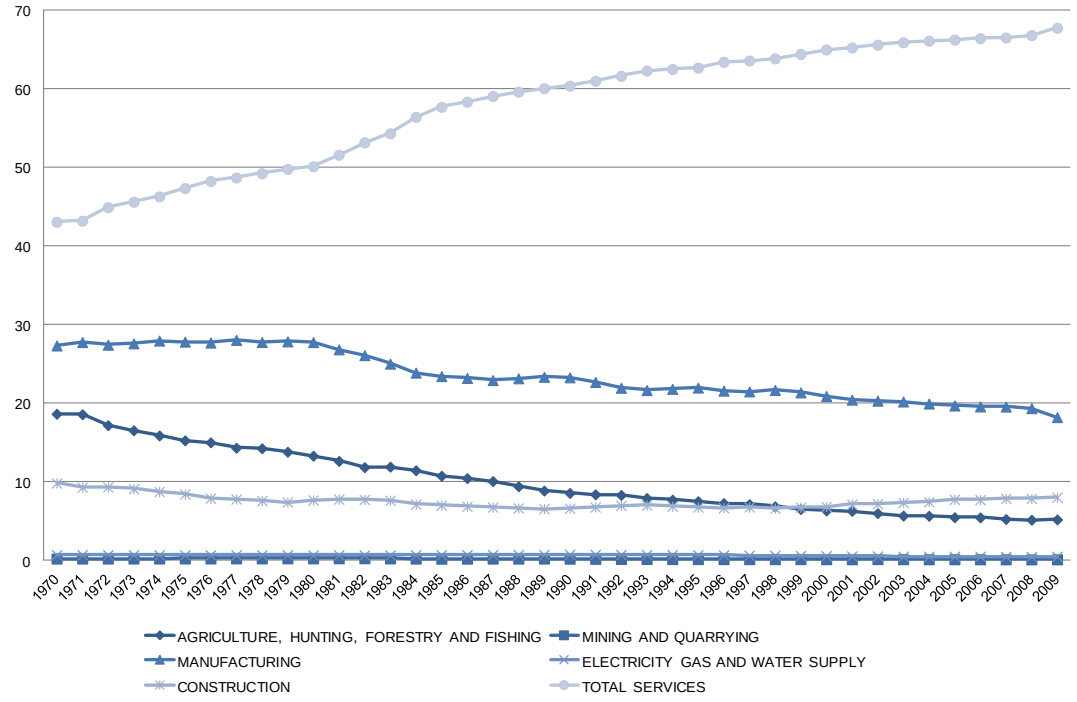
5. In a previous draft of their paper, Antonietti and Antonioli (2007) show that firms outsourcing their production abroad tend to be less skill intensive than non-outsourcing firms, confirming the idea that shifting production abroad could represent the defensive strategy adopted by more vulnerable firms.

consequences on employment have soon also become evident, even if the intense use of out-of-work wage supplementation schemes has curbed the growth of the official unemployment rate.

Following a common pattern among developed countries, the structure of the Italian economy has changed substantially over the last decades (Figure 1). Based on full-time equivalents, the share of services in total employment has risen from 43% to 68% between 1970 and 2009, at the expense of the manufacturing industry (from 27% to 18%), the primary sector (from 19% to 5%), and construction (from 10% to 8%). The process of tertiarisation was particularly rapid in the first half of the 1980s, but has continued almost unabatedly in the following decades and has been accelerated by the global crisis.

Figure 1. Employment by sector in Italy (full-time equivalents)

Percentage shares



Source: OECD-STAN data.

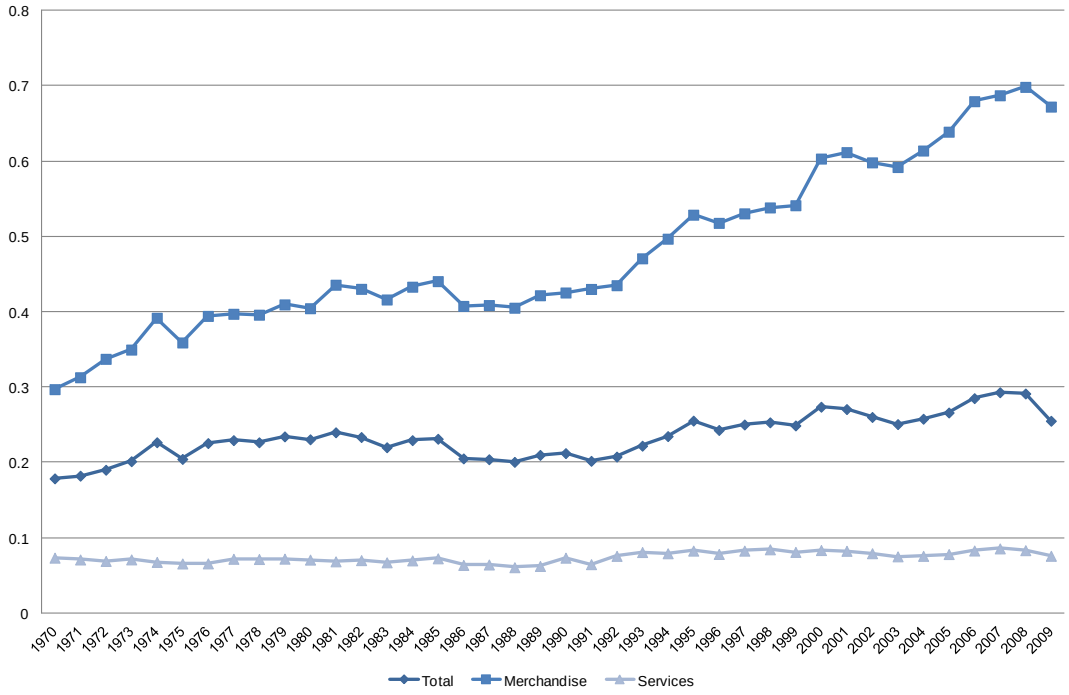
The services sector is structurally less open to international competition than the manufacturing industry, because many services are intrinsically non-tradable and restrictive market-access policies create additional barriers. So, other things being equal, the tertiarisation of the economy dampens its international integration. Figure 2 shows clearly that the openness degree of the tertiary sector in Italy, measured by the ratio between total trade (exports + imports) and the value of gross output at current prices[6], is much lower than in the rest of the economy and has remained quite stable in the last four decades. On the other

6. This way of measuring international openness overcomes the well-known upward distortion of the trade-to-GDP ratio, due to the fact that GDP is measured in terms of value-added, whereas exports and imports are recorded in terms of gross value, including the value of intermediate inputs.

hand, trade openness has increased substantially in the merchandise sector, particularly since the early 1990s. Overall, the trade-to-output ratio has risen by 11 percentage points between 1970 and 2008, but its increase would have been much larger, if the tertiarisation of the economy had not generated a negative composition effect of 8 percentage points.

Figure 2. Degree of international openness of the Italian economy by sector

Ratio between trade (exports + imports) and gross output at current prices

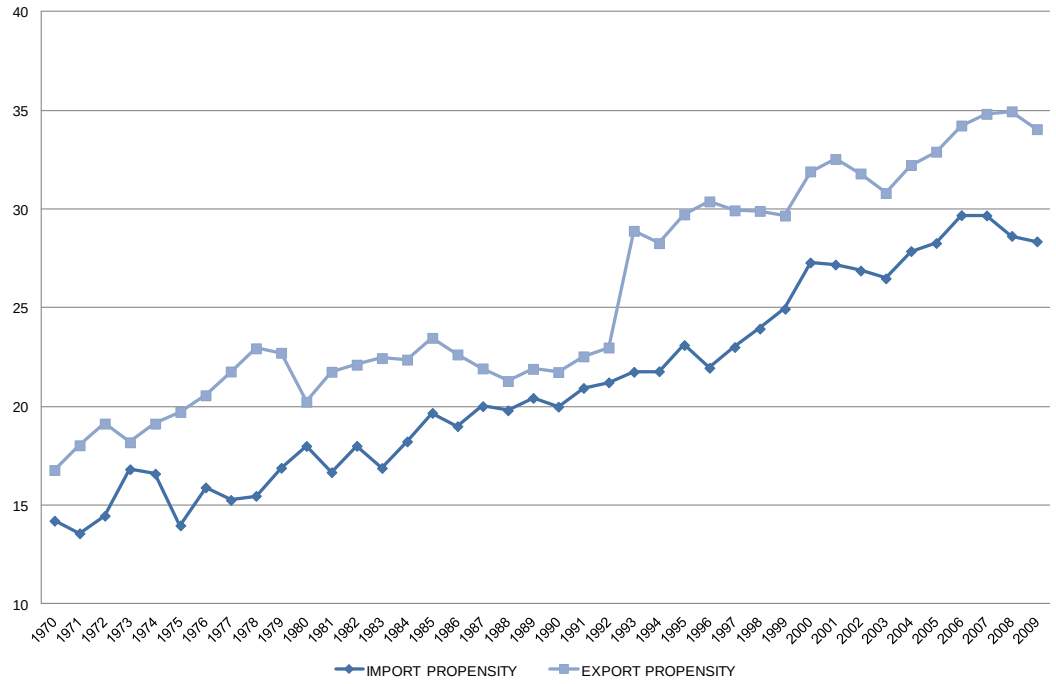


Source: Based on Istat and OECD-STAN data.

The relative downsizing of the manufacturing industry has sometimes been related to import competition. Actually, import propensity, measured with respect to the value of gross output, has risen from 15% to 30% in the period from 1970 to 2009, even if it has undergone a slight backlash in the last few years (Figure 3). On the other hand, export propensity has grown even more, from 17% to 35%, underlining the interdependence between the two trade flows, further intensified by international production fragmentation. So, assuming that the increase in import penetration has translated into job destruction in the manufacturing industry, the corresponding increase in export propensity should have offset this loss by creating new employment opportunities.

Figure 3. Degree of international openness of the Italian manufacturing industry

Ratio of exports and imports to gross output at current prices

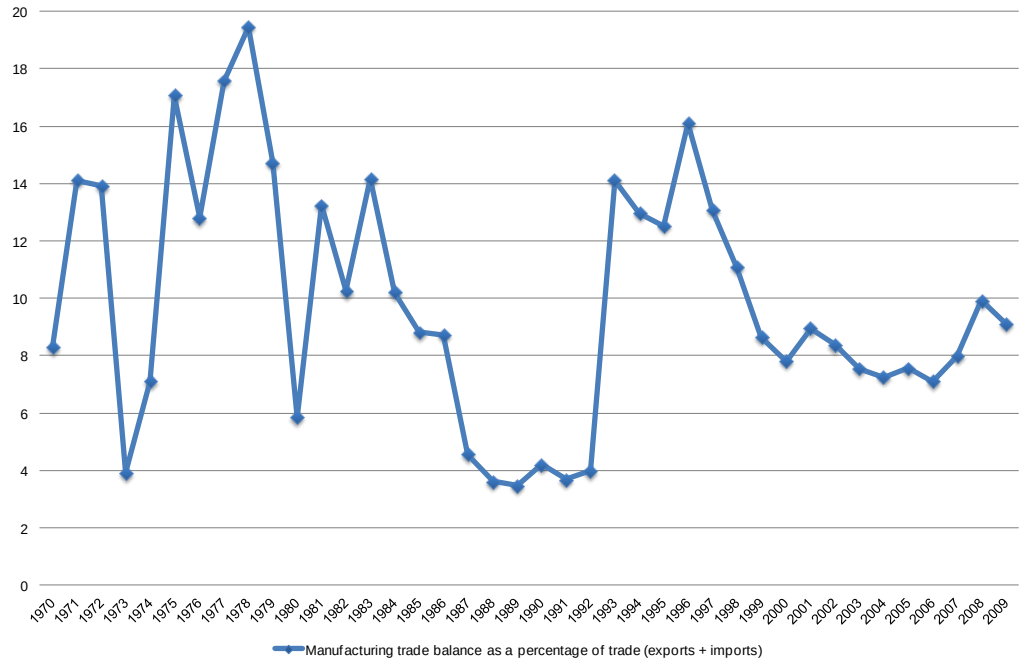


Source: Based on OECD-STAN data.

The trade balance in the manufacturing industry has always been positive, but a downward trend was clearly visible in the 1980s (Figure 4). The currency crisis of 1992, combined with restrictive fiscal policies aimed at reducing public debt, translated into a sharp fall in domestic demand and imports, with beneficial effects on the trade balance until 1996. In the following years the downward trend has emerged again, mostly reflecting the problems of Italian exports in keeping pace with the growth of world demand. The modest recovery achieved in 2007-08 has already been cancelled by the effects of the global crisis. Recently released data for 2010 show that the normalised trade balance of the manufacturing industry has fallen back to 7%.So, other things being equal, a simple computation of the labour content of trade on the above data would lead us to conclude that the net effect of trade on manufacturing employment in Italy has been positive, even if its size has tended to shrink in the last fifteen years.

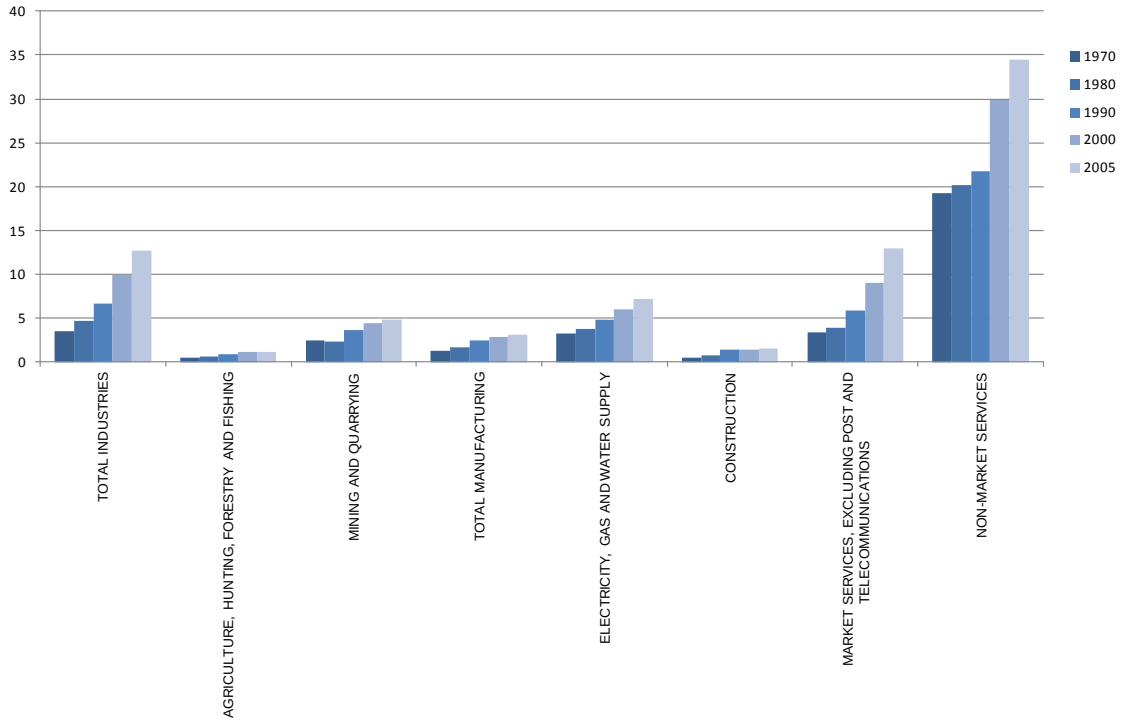
Turning to the structure of employment by occupation, a strong process of skill upgrading can be observed by looking at the share of hours worked by high-skilled persons engaged. These data are shown in Figure 5 for the main sectors of the Italian economy. It is clear that the process has accelerated since 1990 and has been particularly intense in the services sector, but is visible also in the manufacturing industry and in other sectors.

Figure 4. Normalised trade balance of the Italian manufacturing industry



Source: Based on OECD-STAN data.

Figure 5. Hours worked by high-skilled persons engaged as a percentage of total hours worked in Italy



Source: EU-KLEMS data base.

More recent data show, however, a partly different picture, revealing the impact of the global crisis on the occupational structure of employment (Table 1). The most qualified jobs, and particularly managers and technicians, have continued to expand their share of total employment until 2007, but have undergone a sharp contraction in the following three years. Nevertheless, the share of blue-collar occupations has continued to fall even during the crisis. The reshuffling of employment has favoured white-collar jobs and elementary occupations. Overall, these changes appear to be driven by sector-composition effects, confirming that the impact of the crisis has been more severe in the manufacturing industry, where the share of lower-skilled workers is larger.

Table 1. Employment by occupation - percentage shares

Occupation		2004	2005	2006	2007	2008	2009	2010
Managers, professionals and technicians		34.4	34.1	36.1	36.9	36.2	35.0	34.1
Managers, professionals and technicians	Legislators, senior officials and managers	4.7	4.6	5.0	4.9	4.7	4.3	4.0
	Professionals	10.1	9.9	9.7	10.0	10.4	10.3	10.0
	Technicians and associate professionals	19.6	19.6	21.4	21.9	21.1	20.4	20.1
White collar		27.0	27.1	26.3	26.2	26.8	27.5	28.1
White collar	Clerks	11.3	11.4	10.6	10.3	10.8	11.0	11.4
	Service workers and shop and market sales workers	15.7	15.7	15.7	15.9	16.1	16.5	16.7
Blue collar and craft and related trades workers		28.2	28.2	27.5	27.1	26.9	26.8	26.4
Blue collar and craft and related trades workers	Skilled agricultural and fishery workers, and craft and related trades workers	19.1	19.1	18.6	18.3	18.6	18.8	18.4
	Plant and machine operators and assemblers	9.1	9.2	8.9	8.8	8.3	8.0	7.9
Elementary occupations		9.2	9.4	9.0	8.8	9.1	9.7	10.3
Armed forces		1.2	1.1	1.1	1.1	1.0	1.1	1.1
Total		100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: Istat Labour Force Survey - Istat database.

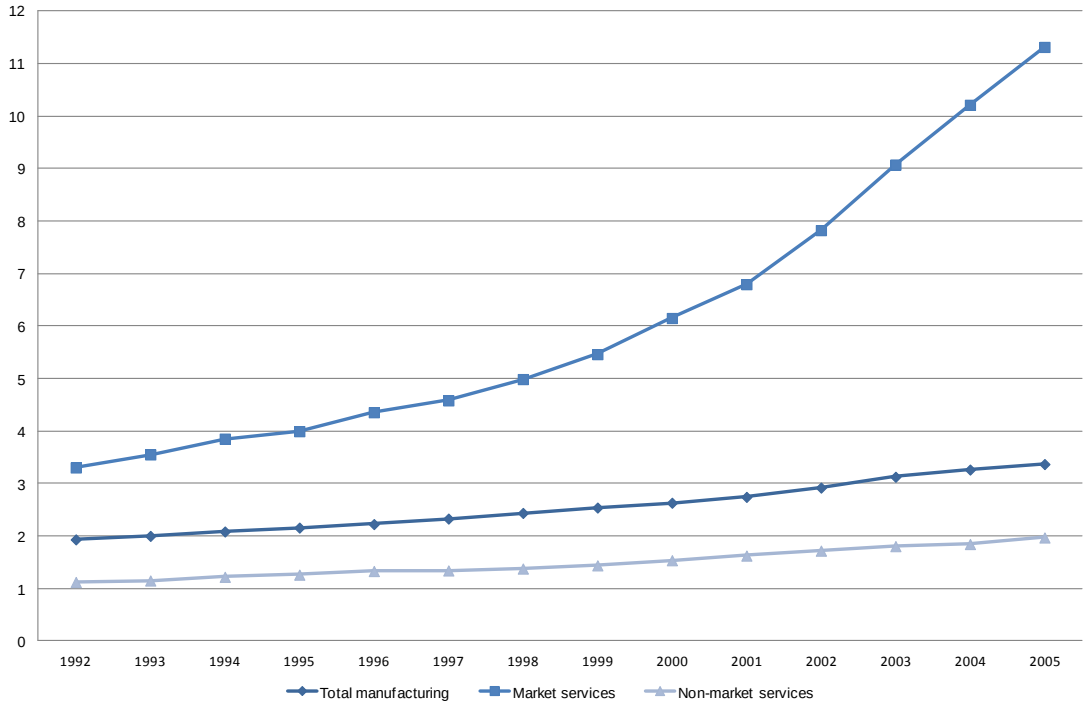
The process of skill upgrading is clearly visible in the manufacturing industry, where the ratio between non-manual and manual employees rose on average by 17% between 2000 and 2007. Recent data confirm this trend. Considering only employees in the private sector,[7] the number of manual workers rose by 2.5% between 2006 and 2010, against an average growth rate of 4.5% for total employment. The crisis impacted manual workers more severely, with an employment loss of 7% between 2008 and 2010, than non-manual workers, whose total number rose by 1.5% in the same period.

Evidence of skill-upgrading emerges also in the dynamics of relative wages. The ratio between labour compensation and employment may be used to indirectly estimate the wage premium of high- to low-skilled workers. Figure 6 shows this indicator for the three largest sectors of the economy (i.e. total manufacturing, market services and non-market services) and suggests that wage inequality has risen substantially in the last two decades.

7. These figures are based on INPS data on employees in the private sector, excluding agriculture and domestic workers.

Figure 6. Relative wages of high- to low-skilled workers in Italy

Relative ratios between labour compensation and employment shares



Source: Based on EU-KLEMS database.

This kind of data may be strongly affected by composition effects and does not allow for precise assessment of the dynamics of wages within each sector. More direct and recent data are available for the private sector, albeit only for a few years. Daily earnings of manual workers rose by 7% between 2006 and 2009, slightly less than the growth rate of earnings for the average of all occupations (8%).

Many different effects can explain the process of skill upgrading in employment and wages (Falzoni *et al.* 2007). Immigration tends to increase the wage premium of skilled workers because immigrants tend to be employed in low-skill occupations. The share of foreign workers over total employment, which had already grown from 2% to 4% over the 1990s, has continued to expand year after year, reaching 9% in 2010. Foreign workers' share of unskilled occupations was about 19% in 2010.

On the other hand, the increasing participation of women in the labour force may reduce wage gaps, because women have tended to be employed in low-wage jobs among skilled occupations and in high-wage jobs among blue-collar occupations. Actually women's share of total employment has continued to rise in the most recent years (from 39% to 40% between 2004 and 2010), but their share in manufacturing employment has fallen in the same period (from 29% to 27%), and the resulting effects on the wage gap are uncertain.

Another factor affecting the wage differential between skilled and unskilled workers is the age distribution of employees. Increasing shares of old workers result in higher wage premia for skilled workers. The ageing process of Italian

employees has continued in the last few years, with the employment share of workers between 15 and 34 years falling from 34% to 27% between 2004 and 2010.

3. International specialisation and employment in Italy

The Italian economy is often characterised as a latecomer in economic development, with an intermediate position between developed and developing countries in terms of factor endowments and pattern of comparative advantages. Its international specialisation is concentrated in traditional sectors, which tend to be relatively more unskilled-labour-intensive than those in which Italy's main trading partners are specialised. This has led some observers to argue that the distributive effects of trade, as predicted by the Stolper-Samuelson model, could have been favourable to unskilled workers in the case of Italy. However, this intermediate position was due to be challenged by recent developments in international economic integration. For instance trade liberalisation policies (the dismantling of the Multi-Fiber Agreement) affected traditional specialisation sectors of the Italian economy helping emerging countries to gain larger shares of world trade (Faini *et al.*, 1999).

In fact, recent changes in the Italian economy's trade specialisation pattern show clearly that its comparative advantage in traditional sectors producing consumer goods has weakened substantially, under the increasing competitive pressure of emerging countries. As a result, the Italian industry has further concentrated its specialisation in the mechanical industry and other "specialised-supplier" sectors, such as electrical machinery and apparatus. In the case of these sectors industrial districts of small- and medium-sized enterprises may still retain a significant lead and competition from emerging countries is less threatening than in traditional sectors.

Several indicators may be used for the analysis of trade specialisation patterns. In this paper, a net trade specialisation index (NTS) has been chosen, defined as follows:

$$NTS_{i,s} = \frac{\left(\frac{X_{i,s}}{X_{i,q}} - \frac{M_{i,s}}{M_{i,q}}\right)}{\left(\frac{X_{i,s}}{X_{i,q}} + \frac{M_{i,s}}{M_{i,q}}\right)}$$

$$-1 \leq NTS_{ik} \leq 1$$

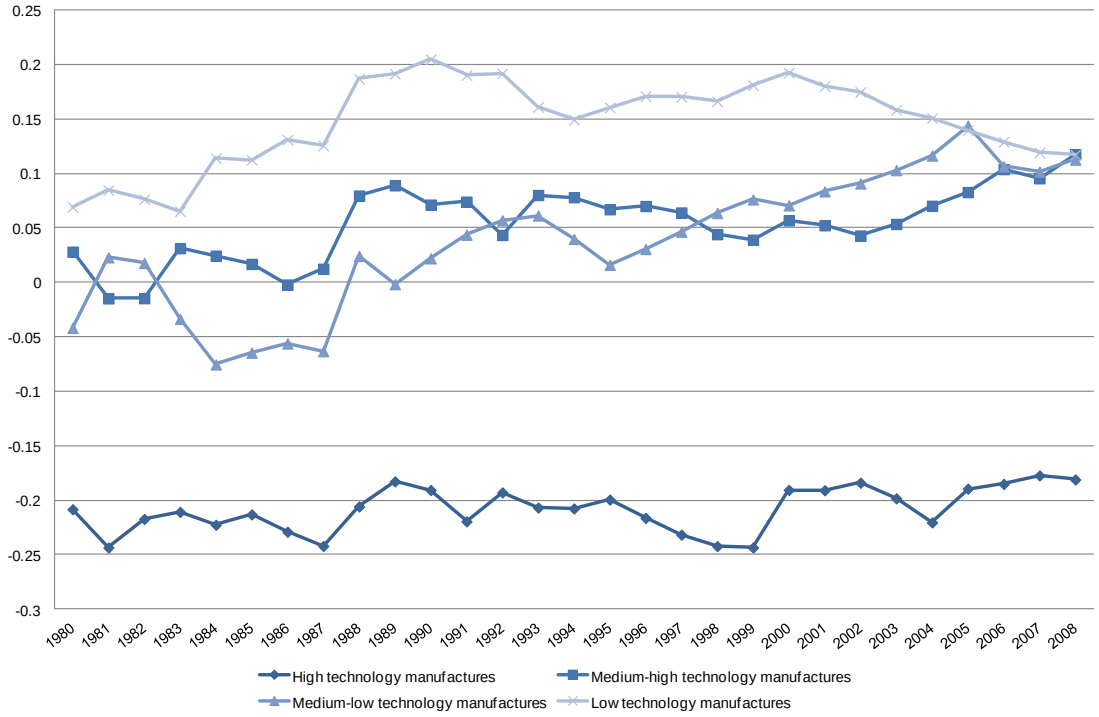
where X and M denote respectively exports and imports, i stands for the country, s for the sector and q for the sum of sectors.

This indicator, adapted from a measure of intra-industry trade specialisation proposed by Balassa and Bauwens (1988), has several advantages. First, unlike the well-known Balassa index of revealed comparative advantages (RCA), it is based on both exports and imports, giving a more comprehensive and theoretically well-founded measure of trade specialisation. Second, with respect to other net-trade indicators proposed in the literature (Lafay, 1992), it has a more

straightforward interpretation as a measure of intensity of inter-industry specialisation as it does not depend on other variables, such as the size of the sector or its degree of openness (Iapadre, 2001).

Figure 7 shows the trade specialisation pattern of the Italian manufacturing industry, classified in terms of technological intensity.[8] It is clear from the graph that the main qualitative features of Italy's specialisation pattern have remained unchanged since the early 1980s, and particularly the pronounced weakness in high-tech manufactures, which reflects the difficulty that large Italian firms face in gaining significant shares in international oligopolistic markets.

Figure 7. Net trade specialisation indices of the Italian manufacturing industry



Source: Based on OECD-STAN data.

However, the comparative advantages and disadvantages of the Italian industry have changed over time. In particular, in the last decade, its specialisation in low-tech manufactures has been substantially eroded by the competitive pressure of emerging countries, whereas the comparative advantage in medium-technology sectors has strengthened. In other words, even from this relatively aggregate classification, a process of upgrading is clearly visible in the pattern of specialisation of the Italian economy. A more detailed picture of this evolution is given by Table 2, which displays the NTS index for 24 manufacturing industries.

8 The four classes of technological intensity are those available in the OECD-STAN database. See: www.oecd.org/dataoecd/5/30/40729523.pdf

Table 2. Net trade specialisation indices of the Italian manufacturing industry

	1980-81	1990-91	2000-01	2007-08
MANUFACTURING NEC; RECYCLING	0.62	0.63	0.59	0.44
MACHINERY AND EQUIPMENT, NEC	0.34	0.43	0.41	0.44
OTHER NON-METALLIC MINERAL PRODUCTS	0.47	0.48	0.51	0.43
FABRICATED METAL PRODUCTS, except machinery and equipment	0.43	0.44	0.42	0.43
BUILDING AND REPAIRING OF SHIPS AND BOATS	0.30	0.04	0.44	0.37
COKE, REFINED PETROLEUM PRODUCTS AND NUCLEAR FUEL	-0.12	-0.21	-0.01	0.29
LEATHER, LEATHER PRODUCTS AND FOOTWEAR	0.69	0.62	0.38	0.29
AIRCRAFT AND SPACECRAFT	-0.17	0.03	-0.05	0.28
RUBBER AND PLASTICS PRODUCTS	0.25	0.25	0.25	0.26
TEXTILES	0.23	0.37	0.35	0.23
WEARING APPAREL, DRESSING AND DYING OF FUR	0.51	0.51	0.30	0.19
RAILROAD EQUIPMENT AND TRANSPORT EQUIPMENT NEC	0.50	0.26	0.16	0.17
ELECTRICAL MACHINERY AND APPARATUS, NEC	0.06	0.11	0.07	0.15
MEDICAL, PRECISION AND OPTICAL INSTRUMENTS	-0.33	-0.22	-0.16	-0.06
PULP, PAPER, PAPER PRODUCTS, PRINTING AND PUBLISHING	-0.26	-0.14	-0.15	-0.06
IRON AND STEEL	0.04	-0.04	-0.12	-0.08
FOOD PRODUCTS, BEVERAGES AND TOBACCO	-0.41	-0.31	-0.16	-0.10
PHARMACEUTICALS	-0.01	-0.25	0.00	-0.11
MOTOR VEHICLES, TRAILERS AND SEMI-TRAILERS	-0.19	-0.13	-0.19	-0.16
CHEMICALS EXCLUDING PHARMACEUTICALS	-0.32	-0.34	-0.29	-0.24
RADIO, TELEVISION AND COMMUNICATION EQUIPMENT	-0.37	-0.38	-0.25	-0.35
NON-FERROUS METALS	-0.73	-0.63	-0.58	-0.42
WOOD AND PRODUCTS OF WOOD AND CORK	-0.58	-0.49	-0.40	-0.44
OFFICE, ACCOUNTING AND COMPUTING MACHINERY	-0.15	-0.13	-0.47	-0.65

Until the early 1990s, the sectors in which the Italian economy revealed the most intense specialisation were still traditional industries producing consumption goods, such as apparel, footwear and furniture. In the last two decades most of these sectors have undergone a sharp reduction of their comparative advantage, which has lowered significantly their ranking in the table. On the other hand, the machinery and equipment industry has emerged as the most important sector of specialisation, reinforcing an already strong position, partly based on the production of investment goods for traditional consumption industries. Specialisation indices have also improved in several sectors producing intermediate goods. Signs of change can be seen even in high-tech production. The amplification of comparative disadvantage in "Office, accounting and computing machinery" has been offset by relatively better results in industries such as "Medical, precision and optical instruments" and "Aircraft and spacecraft".

Most of these changes suggest the idea that the transformation of Italy's specialisation pattern is not only the passive result of the expansion of emerging countries, but is also partly driven by the process of international outsourcing carried out by many Italian firms in traditional sectors, which fosters exports of intermediate and investment goods within global production networks. However, this transformation raises concerns about the ability of medium-tech comparative advantage industries to absorb workers laid off by traditional labour-intensive sectors, nurturing the wide-spread fear that the process of tertiarisation observed in employment data might be more the result of a process of industrial decline, than a welfare-improving structural evolution of the Italian economy.

Considering data at industry level for the last decade, the idea that import competition has led to a fall in manufacturing employment does not find clear support. On aggregate, the number of full-time equivalent employees has remained virtually unchanged between 2000 and 2007 in the manufacturing industry (with a total increase of 25 000 units, 0.6% of its initial level), whereas the import penetration rate[9] has risen from 28.6% to 31.3% in the same period. However, the data differ markedly across industries. Figure 8 shows the lack of a clear correlation between the annual growth rate of manufacturing employment and the average level of import penetration for 16 industries in the period from 2000 to 2007.

However, industries shown in Figure 8 tend to cluster into two groups, characterised by different structural features. The first group is made of scale-intensive and science-based industries, in which import penetration is sustained by the relatively large role of multinational corporations. Employment trends in this group appear relatively more favourable than in the second cluster, which includes mostly traditional sectors producing consumption and intermediate goods. Within each group, a negative correlation between employment growth and import penetration appears clearer, and interacts with other factors affecting structural change in the manufacturing industry.[10]

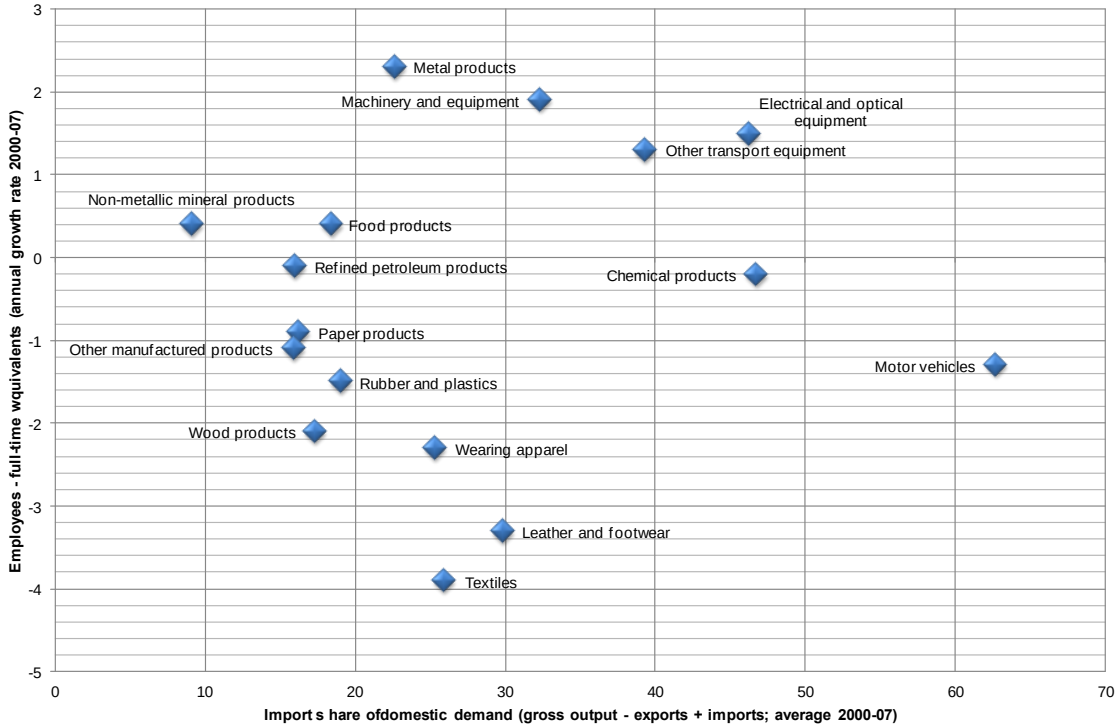
It has often been argued that the possible labour effects of trade stem mainly from the increasing penetration of developing countries' exports. From this standpoint, what matters is not only the domestic market, in which the share of imports from developing countries is still relatively low, but also foreign markets, where Italian firms compete directly or indirectly with manufactures produced in developing countries. Figure 9 shows clearly a negative correlation between employment growth in the Italian manufacturing industry and the average world export market share of developing countries.[11] In particular, textiles, clothing and leather are the three sectors in which employment has recorded the most severe losses, in the range between 2 and 4 percentage points per year.

9. The import penetration rate is measured as the ratio between imports and domestic demand at current prices. Domestic demand is computed as apparent consumption (gross output – imports + exports).

10. There are also signs of a positive correlation between international openness and the increase in the employment share of skilled workers. Considering large firms, sectors in which this skill upgrading process was more pronounced tend to coincide with sectors characterised by the highest degree of international openness (trade-to-production ratio), with a linear correlation coefficient of 0.47 in the 2000-07 period.

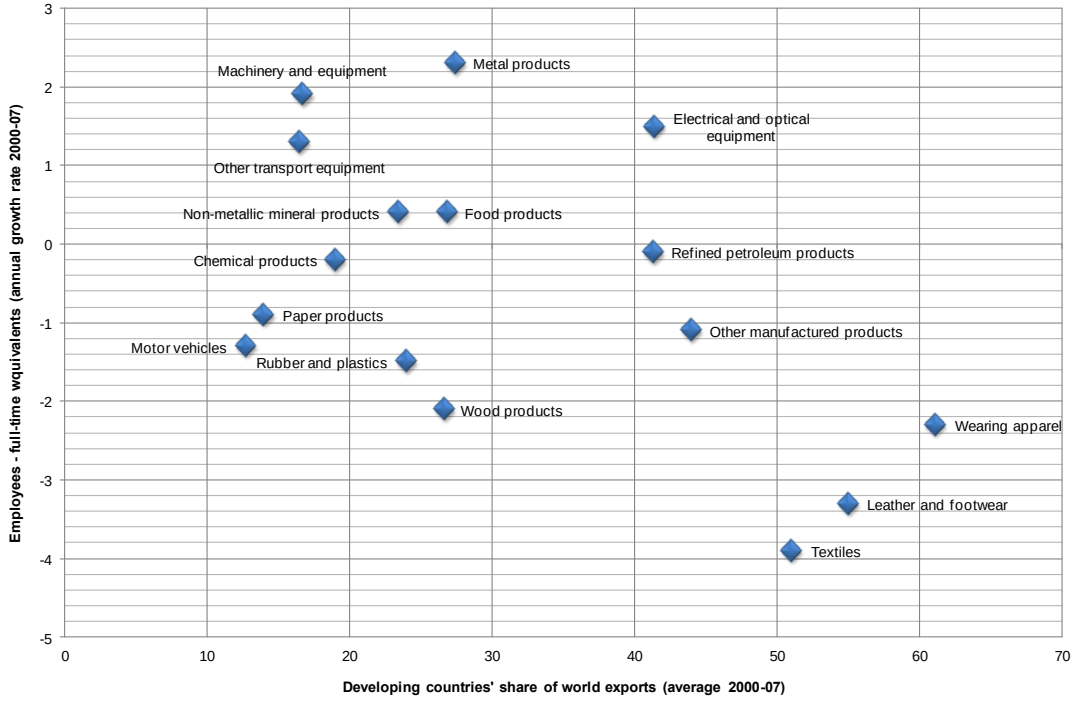
11. The linear correlation coefficient is - 0.52.

Figure 8. Import penetration and employment in the Italian manufacturing industry (2000-07)



Source: OECD-STAN database.

Figure 9. Export market share of developing countries and employment in the Italian manufacturing industry (2000-07)



Source: OECD-STAN database and Istat-ICE. *Commercio estero e attività internazionali delle imprese*, 2008 Yearbook.

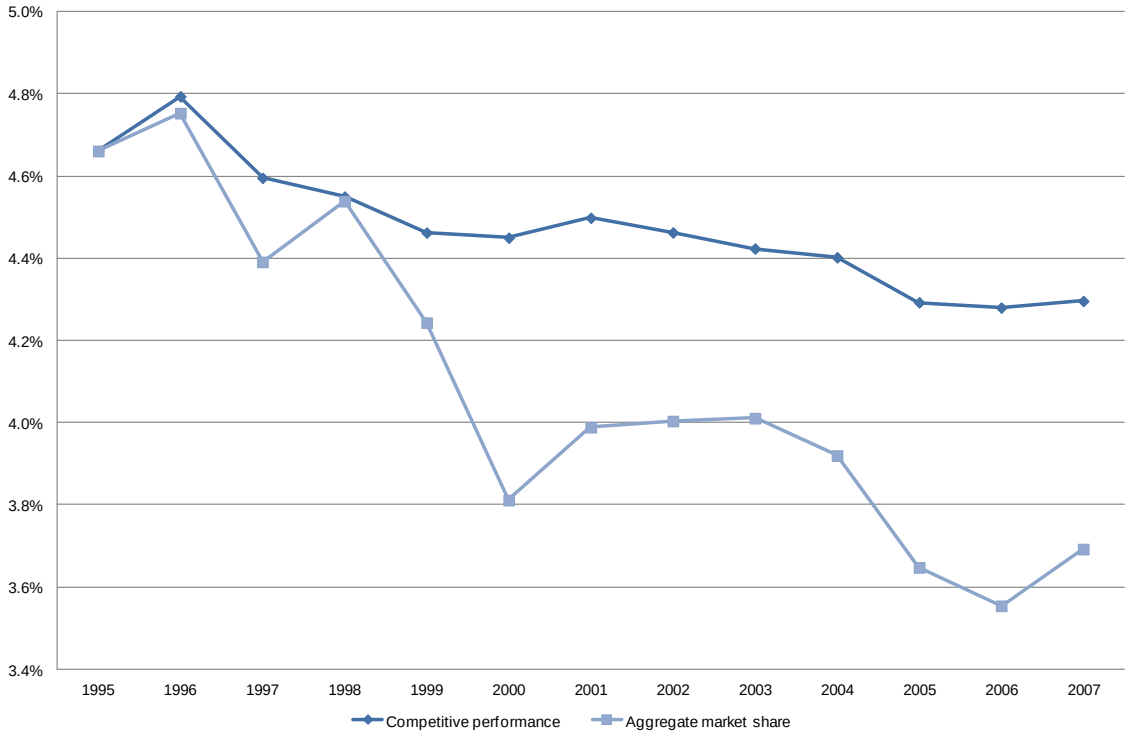
Of course, the fact that competition from emerging countries has created problems for traditional sectors in Italy should not be read as a sign of a harmful influence of trade on employment and wages at the economy-wide level. On the contrary, the downsizing of some industries might be seen as an adjustment of the economic system to the new features of international competition. As argued earlier, there are several reasons to believe that, to a certain extent, the lower specialisation in traditional sectors reflects the results of market strategies carried out by the most efficient Italian firms. First, many exporters have successfully tried to upgrade the quality of their production, targeting smaller but more remunerative market segments, where non-price competitiveness factors are more important. Second, a growing number of Italian firms has outsourced labour-intensive production tasks to foreign affiliates or independent partners in low-wage countries, concentrating domestic production in the most qualified segments of the value-chain and reinforcing their competitiveness. Third, what emerges from the selection process elicited by international competition in traditional sectors is the most efficient and innovative group of firms. Even if their aggregate market share has shrunk, their competitive position appears more robust for the future.

However, particularly in the aftermath of the global crisis, what really matters is the ability of the Italian economic system to generate new employment opportunities in sectors other than those affected more intensely by the rise of emerging countries. This challenge concerns primarily the services sector, which needs to become more open to international competition in order to better exploit its potential. But this particular issue is relevant also for the manufacturing industry.

As argued earlier in the Introduction, the main reason for the long-lasting decline in the world market share of Italian exports, even in comparison with the rest of the euro area, lies in the dynamic inefficiency of their specialisation pattern, i.e. their concentration in products characterised by a relatively slow growth of world demand (Memedovic and Iapadre, 2010). Figure 10 presents the results of a very detailed 'constant-market-share analysis' (CMS) exercise, aimed at measuring the composition effects generated by this problem. The difference between the actual aggregate market share (in red) and the competitive performance at the level of individual markets for each product (in blue) measures the dynamic efficiency of specialisation. Net of this problem, the competitive performance of Italian exports would have been better than that of France and Germany between 1995 and 2007.

The correlation between the pattern of comparative advantage and the growth of world demand, which determines the dynamic efficiency of specialisation, may in turn be related to the income elasticity of exported products. In other words, the problems of Italian firms in export markets may be partly traced back to their inability to generate an adequate flow of product innovations, characterised by a high income-elasticity of demand. This calls into question, among other issues, the quality of human capital (Faini and Sapir, 2008), which entails the double challenge of raising the supply and the demand for high-skilled labour in the Italian economy.

Figure 10. Italy: CMS analysis of export performance (percentages at current prices)



Source: Drawn from Memedovic and Iapadre (2010) - based on BACI database.

4. Trade and employment in the Italian manufacturing industry: Econometric evidence

This section presents the results of an econometric exercise aimed at estimating the effects of trade on employment in Italy in a panel of 15 sectors of the manufacturing industry[12] for the period from 1999 to 2008. Employment is measured by the number of hours worked by employees, as available in the OECD-STAN database, so as to take into account not only the number of employees but also changes in their working hours.

The trade variables used as regressors are different from the openness indicators prevailing in the literature surveyed in Section 2. As mentioned in Section 3, we prefer a measure of the competitive pressure exerted by developing countries, given by their share of world exports in each sector.[13] This choice

12. The sector of refined petroleum products has been excluded, because its data show an anomalous degree of variability over time, due to the effects of the large swings in oil prices.

13. Export market shares are expressed at current prices. The necessary data has kindly been provided by the Italian National Institute of Foreign Trade (ICE) that maintains a data-base on world trade, combining UN COMTRADE with more up-to-date data provided by national statistical institutes through Global Trade Information Services (GTI). Tables on export market shares based on this data are regularly published in the ICE-Istat Yearbook on Foreign Trade and International Activities of Firms.

allows us to focus the specification on the most challenging aspect of recent changes in the international economic scenario. The increasing share of world exports coming from developing countries may be considered as a variable measuring synthetically the effects of trade liberalisation policies, as well as of other important factors of international integration, such as the growth of foreign direct investment (FDI) and other forms of international production fragmentation.

Following the widely spread belief that the Italian industry's specialisation pattern is particularly vulnerable to the competition from lower-wage countries, we expect that a higher world export share of developing countries would negatively affect employment in Italy, other things being equal. On the other hand, employment growth is positively affected by the strength of a country's comparative advantage. Namely, high levels of specialisation according to its comparative advantage reveal that Italy may overcome the problems created by higher labour costs with non-price competitiveness factors.

So, we include among the regressors the NTS index presented in Section 3, which measures revealed comparative advantages considering both exports and imports.[14] Of course, several other factors besides trade can affect employment. We have explicitly considered two of them.[15] The first is the growth rate of gross output at sector level, taking account of the impact of cyclical and sector variations in total demand (domestic and foreign) on employment.

The second factor is a measure of labour productivity, given by the ratio between value-added at constant prices and the number of employees (full-time equivalents). Its expected sign is negative, reflecting the combined effects of capital deepening, technical progress and business organisation improvements on the demand for labour.

So, our base econometric specification is as follows:

$$Log\ H_{s,t} = \alpha + \beta_1 * Log\ DCXS_{s,t} + \beta_2 * Log\ (NTS_{s,t} + 1) + \beta_3 * OG_{s,t} + \beta_4 * Log\ LP_{s,t} + \varepsilon_{s,t}$$

where H denotes hours worked by employees, $DCXS$ is the world export market share of developing countries, NTS the net trade specialisation index, as defined in Section 3,[16] OG is the growth rate of output, and LP denotes labour productivity, as defined above, with subscript s referring to 15 sectors of the Italian manufacturing industry and subscript t to years from 1999 to 2008.

14. As an alternative to the NTS index, we have also tried to include export propensity, measured as the ratio between exports and gross output at current prices, but the results have been statistically less significant.

15. Other important factors should be considered, including immigration and demographic trends affecting the growth of the labour force, as well as changes in institutions, regulations and industrial relations. However, most of these factors are hardly measurable, and even when some indicators are available, they do not cover all relevant aspects and are not differentiated by sector. In an unreported econometric exercise, we have also included time dummy variables in the estimated equation, in order to capture the effects induced by these processes. The results are, however, not statistically significant.

16. Since NTS ranges from – 1 to 1, it has been augmented by 1, so that its logarithm is defined over the entire range.

Moreover, following Ebenstein *et al.* (2009), we consider separately the possible negative employment impact of production off-shoring by Italian manufacturing firms. We understand that this impact may be partly captured by our measure of competitive pressure from developing countries. However, there are two reasons to believe that off-shoring should be included separately in the regression. First, for any given degree of competitive pressure, a higher level of employment off-shoring by Italian firms reveals a more cogent need to shift labour-intensive activities abroad. Second, horizontal FDI into other developed countries is mostly motivated by the market-access advantages of a direct presence in the host economy. Inasmuch as this kind of FDI replaces exports, it may exert a negative impact on employment in Italy, regardless of the competitive pressure from developing countries. Our measure of off-shoring is given by the number of employees in foreign affiliates of Italian manufacturing firms, by sector ($FAE_{s,t}$).[17]

Furthermore, a dynamic specification for the three variables related to international integration has been considered in order to control for possible delays in the transmission of their effects on employment. These variables have been lagged by one year (see also Ebenstein *et al.*, 2009).

The results of our estimates are shown in Tables 3 and 4. All the variables show the expected sign and are statistically significant. As already suggested by the negative correlation shown in Figure 9, the competitive pressure from developing countries exerts an adverse effect on manufacturing employment in Italy. The elasticity is, however, relatively low. Moreover, after controlling for the effect of employment off-shoring, which is also negative and significant, the size and the significance of the *DCXS* variable are reduced.

This result should not be taken as evidence of an overall negative effect of trade on employment in Italy. Rather, the opposite appears to be true.

The net trade specialisation index shows a strong positive effect. Sectors in which the Italian manufacturing industry reveals the most intense comparative advantages tend to have a better employment performance. As shown in Section 3, these sectors are no longer limited to traditional low-tech industries producing consumption goods, which have undergone a sharp reduction of trade specialisation and employment in the last decade. Instead, they increasingly tend to concentrate in the medium-high-tech grouping, and particularly in the production of machinery and equipment.

17. This data is drawn from the Reprint database, maintained by ICE, and is also included in the OECD database on *Measuring Globalisation – Activities of Multinationals*.

Table 3. Fixed effects estimations.
Dependent variable: Log of hours worked by employees

DC world export share	-0.080**	-0.044*
	[0.038]	[0.087]
L. Net trade specialisation index	0.666***	0.609***
	[0.114]	[0.118]
Foreign affiliate employees		-0.036***
		[0.012]
Output growth	0.284**	0.339**
	[0.117]	[0.107]
Labour productivity	-0.454***	-0.556***
	[0.110]	[0.106]
Constant	7.629***	8.221***
	[0.459]	[0.469]
Number of observations	150	150
R^2	0.43	0.45

Notes: ***, ** and * denote significance at 1%, 5% and 10%. Robust standard errors in parenthesis.

Table 4. Fixed effects estimations.
Dependent variable: Log of hours worked by employees

DC world export share	-0.056*	-0.033*
	[0.030]	[0.018]
L. Net trade specialisation index	0.600***	0.594***
	[0.118]	[0.120]
L. Foreign affiliate employees		-0.036***
		[0.012]
Output growth	0.428***	0.525***
	[0.117]	[0.117]
Labour productivity	-0.516***	-0.612***
	[0.112]	[0.119]
Constant	7.908***	8.459***
	[0.457]	[0.516]
Number of observations	135	135
R^2	0.42	0.46

Notes: ***, ** and * denote significance at 1%, 5% and 10%. Robust standard errors in parenthesis.

5. Trade and wages in Italy: A micro-level analysis

As mentioned in Section 2, recent trends in the structure of wages in Italy are difficult to detect and explain. Sector data give contrasting signals depending on the source used and on the aggregation level of the analysis. This suggests the possibility that composition effects hide the underlying trends of disaggregated data. More importantly, wage levels are strongly influenced by the individual characteristics of workers (gender, age, instruction, and so on), so that their distribution within each sector is characterised by a high degree of variability, and any analysis conducted on sector averages fails to capture the most important sources of their variance. This explains why a growing literature is trying to use linked employer-employee micro-data to better understand the dynamics of wages and factors affecting it, including trade. Following this approach, we present here the results of a micro-econometric analysis aimed at assessing the effects of trade competition on the growth and structure of wages in the Italian manufacturing industry.

Presentation of the data

In the following analysis we merge data from two different sources. The first is a micro database that contains individual level information on workers in Italy for the period 1997-2003, while the second one includes data defined at the sector level, similar to those used in Section 4 to study trends in employment. Data for workers are drawn from an administrative database provided by INPS. It is a panel[18] employer-employee dataset, which contains for each worker individual information such as age, gender, occupation, workplace, date of beginning and end of the current contract (if any), worker status (part-time or full-time), real gross yearly wage, and the number of weeks worked. As for the firms, there is the plant location, the number of employees and the sector.[19] The units of analysis are dependent workers in the manufacturing industry, both part-time (converted into full-time equivalents) and full-time. Here we consider males and females, aged between 15 and 64 and employed in blue-collar and white-collar occupations. The final sample includes 74 334 workers with 309 437 observations.

We use data at sector level to define control and interest variables that will be included in the econometric specification. Two of them are the same variables used in Section 4, namely developing countries' (DCs) shares of world exports, and labour productivity.[20] However, we use here a different indicator of trade specialisation, which may be computed for each of the 20 Italian regions, so that

18. The panel version was constructed considering only one observation per year for each worker. For those workers who have more than one observation per year we selected the longest contract in terms of weeks worked. We also eliminated the observations below (above) the 1st (99th) percentile of the wage distribution.

19. The sector classification is based on ATECO, the Italian version of the European nomenclature, NACE. We consider here 17 manufacturing sectors.

20. Labour productivity is defined here at sector level as the ratio between real value-added and the number of hours worked.

our analysis can take the territorial dimension of specialisation also into account.[21] In particular, we build an index of regional export specialisation ($RXS_{r,s}$) defined for every year as:

$$RXS_{r,s} = \frac{\left(\frac{X_{r,s}}{X_{r,q}} - \frac{X_{b,s}}{X_{b,q}}\right)}{\left(\frac{X_{r,s}}{X_{r,q}} + \frac{X_{b,s}}{X_{b,q}}\right)}$$

$$-1 \leq RXS_{r,s} \leq 1$$

where *r* stands for the region, *b* for all other regions (Italy except for region r), *s* for the sector and *q* for the sum of sectors. This index varies between – 1 and 1 and its range is not affected by the size of the region or of the sector considered.[22]

Econometric analysis

In order to assess the impact of trade competition on wages in the Italian manufacturing industry, we perform an individual-level random-effects estimate, where we regress each worker's wages on the DCs' share of world exports, our measure of export specialisation and a set of control variables. The econometric specification is as follows:

$$Log\ w_{i,t} = \alpha + \beta_1 * DGender_{i,t} + \beta_2 * Age_{i,t} + \beta_3 * AgeSq_{i,t} + \beta_4 * DBC_{i,t} + \beta_5 * Log\ Firmsize_{i,t} + \\ + \gamma_1 * Log\ DCXS_{s(i),t} + \gamma_2 * RXS_{r(i),s(i),t} + \gamma_3 * Log\ LP_{s(i),t} + \lambda_a + \delta_t + \varepsilon_{i,t}$$

where *i* refers to the individuals, *s* to sectors, *r* to regions, *a* to areas and *t* to time. The dependent variable in the regression is the (log) real gross weekly wage in euro.[23] The individual level control variables are $Age_{i,t}$, age squared ($AgeSq_{i,t}$), a female dummy ($DGender_{i,t}$) and a blue-collar dummy ($DBC_{i,t}$). $Log\ DCXS_{s(i),t}$ is the (log) developing countries' share of world exports, $RXS_{r(i),s(i),t}$ is the index of regional export specialisation, $Log\ LP_{s(i),t}$ is the (log) hourly labour productivity, while $Log\ Firmsize_{i,t}$ is the proxy for firm heterogeneity. Finally λ_a are dummies that control for area effects (five macro-areas in Italy: Northwest, Northeast, Centre, South and Islands), while δ_t are time dummies which control for the business cycle.

21. Unlike the NTS index used in Section 4, the RXS index does not consider imports in the measurement of revealed comparative advantages. This choice is made necessary by the fact that the regional distribution of imports is less significant than that of exports for the analysis of territorial specialisation. Trade intermediaries account for a large share of imports and their customers are often located outside the boundaries of their region.

22 Our *RXS* index is an adaptation of the symmetric revealed comparative advantage index proposed by Dalum, Laursen and Villumsen (1998) in order to overcome the limitations of the traditional Balassa index.

23 Wages have been deflated using the consumer price index for blue- and white-collar worker households (FOI). The base year is 2002. See: en.istat.it/prezzi/precon/

Table 5 shows the results. Column (1) refers to all workers. There is a statistically significant negative impact of the competitive pressure from developing countries on the wages of Italian workers. In particular, the estimated elasticity of wages with respect to *DCXS* is equal to -1.7%. At the same time, this negative effect may be offset by the export comparative advantages revealed by the worker's region. In other words, workers who are employed in areas of highly specialised economic activity tend to receive a higher remuneration. All our control variables have the expected sign. Wages show a concave curvature with respect to age. The female and blue-collar workers dummies negatively impact wages. The effect of labour productivity and firm size turns out to be positive and significant.

Table 5. Random effects estimations.
Dependent variable: Log of real weekly wage

	All workers (1)	Blue Collar (2)	White Collar (3)
LDC export share	-0.0173***	-0.0220***	-0.0106***
	[0.0015]	[0.0016]	[0.0035]
Specialisation index	0.0125***	0.0101***	0.0194***
	[0.0021]	[0.0022]	[0.0048]
Female dummy	-0.2201***	-0.1922***	-0.2641***
	[0.0024]	[0.0025]	[0.0054]
Age	0.0234***	0.0217***	0.0490***
	[0.0005]	[0.0005]	[0.0012]
Age Squared	-0.0002***	-0.0002***	-0.0003***
	[0.0000]	[0.0000]	[0.0000]
Blue collar dummy	-0.2955***		
	[0.0024]		
Firm size	0.0351***	0.0330***	0.0327***
	[0.0004]	[0.0004]	[0.0010]
Productivity	0.1696***	0.1757***	0.1246***
	[0.0042]	[0.0045]	[0.0087]
Constant	5.0889***	4.8093***	4.6949***
	[0.0181]	[0.0184]	[0.0381]
Area and time dummies	Yes	Yes	Yes
Number of observations	309 437	230 283	79 154
Number of individuals	74 334	56 758	19 622
R^2	0.51	0.36	0.42

Notes: ***, ** and * denote significance at 1%, 5% and 10% respectively. Robust standard errors in parenthesis

Our individual worker data also allow us to investigate the relationship between trade and wage inequality across different occupations. To this purpose we have obtained separate estimates for blue-collar and white-collar workers. Their results appear in columns (2) and (3) of Table 5. The negative wage impact resulting from the competitive pressure from developing countries turns out to be significantly higher for blue-collar- (with an estimated elasticity of -2.2%) than for white-collar workers (-1.1%), which suggests that trade competition increases the relative demand for skilled labour and widens the wage gap. Nonetheless, both categories of workers are harmed by the competition from developing countries.

On the other hand, the impact of regional export specialisation is confirmed to be positive and significant for both occupation categories. Even from this perspective, however, trade seems to contribute to widening of the wage gap. The estimated elasticity of wages with respect to regional specialisation is higher for white-collar (1.9%) than for blue-collar workers (1%).

To sum up, our initial analysis suggests that the increase of the DCs' share of world exports affects negatively wages in the Italian manufacturing industry and this impact is higher for blue-collar workers. However, it could be argued that these estimates do not consider two important issues. First, wage adjustments to changes in trade competition are not instantaneous. Second, as suggested in Ebenstein *et al.* (2009), within a given year, trade exposure and wages could be affected by simultaneous shocks, thus biasing previous estimates. In order to address these issues we perform the same estimates using lagged values for the variables of interest. In particular we regress the (log) real weekly wages on the 1-year lagged values of the (log) DCs' share of world exports, regional export specialisation index and hourly productivity variables. All the other variables remain the same. Table 6 shows the results of this estimation.

Table 6. Random effects estimations.
Dependent variable: Log of real weekly wage

	All workers (1)	Blue collar (2)	White collar (3)
LDC export share	-0.0200***	-0.0248***	-0.0144***
	[0.0016]	[0.0017]	[0.0036]
Specialisation index	0.0122***	0.0081***	0.0225***
	[0.0023]	[0.0023]	[0.0051]
Female dummy	-0.2221***	-0.1933***	-0.2650***
	[0.0025]	[0.0026]	[0.0054]
Age	0.0232***	0.0214***	0.0492***
	[0.0006]	[0.0057]	[0.0014]
Age squared	-0.0002***	-0.0002***	-0.0004***
	[0.0000]	[0.0000]	[0.0000]
Blue collar dummy	-0.3111***		
	[0.0025]		
Firm Size	0.0350***	0.0325***	0.0346***
	[0.0004]	[0.0004]	[0.0011]
L. productivity	0.1719***	0.1774***	0.1274***
	[0.0046]	[0.0048]	[0.0093]
Constant	5.0938***	4.8022***	4.6951***
	[0.0197]	[0.0200]	[0.0412]
Area and time dummies	Yes	Yes	Yes
Number of observations	263 146	195 625	67 521
Number of individuals	70 327	53 352	18 633
R^2	0.51	0.36	0.42

Notes: ***, ** and * denote significance at 1%, 5% and 10% respectively. Robust standard errors in parenthesis.

The wage effects of trade exposure appear even more clearly once taking into account a one-year adjustment lag. In fact, in comparison to our non-lagged estimates for all workers, the elasticity of wages with respect to DCs' shares of world exports increases in magnitude from -1.7% to -2%. Moreover, this increase concerns both blue-collar- and white-collar workers, even if the elasticity difference between the two categories remains the same (1.1%). As for the regional export specialisation index, results are similar between lagged and non-lagged estimates. However, its positive wage impact becomes higher in magnitude for white-collar workers (2.2%) and lower for blue-collar workers (0.8%), suggesting that the widening effect of trade on the wage gap is not simultaneous.

A further step in the analysis is to control for a possible interaction between the DCs' share of world export and the regional export specialisation variable. This is interesting since a positive interaction between the two variables would reinforce the conclusion that the negative impact on wages due to the competitive pressure from DCs can be reduced in those regions and sectors where the level of export specialisation is higher.

In order to perform such an analysis, we convert our *RXS* index into a categorical variable, to be interacted with the *DCXS* variable. Therefore, we split observations into two categories (low and high specialisation level) on the basis of the median of the (time average of) *RXS* in the database. Then, we repeat the regressions presented in Table 5, this time including the interaction term between DCs' share of world exports and a dummy indicating a high level of regional export specialisation. Results of this analysis are shown in Tables 7 and 8 for current and one-year lagged variables, respectively. As we can see, our two trade variables continue to be significant and with the expected sign. In addition, the coefficient of their interaction term is positive and significant. In particular, this interaction effect is equal to 0.8% (Column (1), Table 7) for all workers and, again, it is higher for white-collar (1.5%) than for blue-collar workers (0.5%). These results are also confirmed in Table 8, where interaction terms are again positive and significant, just slightly reduced in magnitude. So, our findings confirm the idea that in regions and sectors, where the level of export specialisation is higher, the negative impact of trade competition by DCs on wages is attenuated.

Table 7. Random effects estimations.
Dependent variable: Log of real weekly wage

	All workers (1)	Blue collar (2)	White collar (3)
LDC export share	-0.0209***	-0.0240***	-0.0192***
	[0.0018]	[0.0019]	[0.0041]
Specialisation index	0.0124***	0.0066*	0.0286***
	[0.0034]	[0.0035]	[0.0081]
DSpec*LDC export share	0.0075***	0.0046**	0.0154***
	[0.0020]	[0.0022]	[0.0047]
Female dummy	-0.2199***	-0.1919***	-0.2639***
	[0.0024]	[0.0025]	[0.0054]
Age	0.0234***	0.0217***	0.0491***
	[0.0005]	[0.0005]	[0.0012]
Age squared	-0.0002***	-0.0002***	-0.0004***
	[0.0000]	[0.0000]	[0.0000]
Blue collar dummy	-0.2955***		
	[0.0024]		
Firm size	0.0352***	0.0332***	0.0330***
	[0.0004]	[0.0004]	[0.0010]
Productivity	0.1694***	0.1753***	0.1252***
	[0.0043]	[0.0045]	[0.0087]
Constant	5.0793***	4.8060***	4.6636***
	[0.0182]	[0.0186]	[0.0386]
Area and time dummies	Yes	Yes	Yes
Number of observations	309 437	230 283	79 154
Number of individuals	74 334	56 758	19 622
R^2	0.51	0.36	0.42

Notes: ***, ** and * denote significance at 1%, 5% and 10% respectively. Robust standard errors in parenthesis

Table 8. Random effects estimations.
Dependent variable: Log of real weekly wage

	All workers (1)	Blue collar (2)	White collar (3)
L.LDC export share	-0.0229***	-0.0266***	-0.0211***
	[0.0019]	[0.0020]	[0.0042]
L.Specialisation index dummy	0.0124***	0.0077**	0.0250***
	[0.0036]	[0.0038]	[0.0087]
L.(DSpec*LDC export share)	0.0059***	0.0039*	0.0119**
	[0.0021]	[0.0023]	[0.0048]
Female dummy	-0.2220***	-0.1932***	-0.2649***
	[0.0025]	[0.0026]	[0.0054]
Age	0.0232***	0.0214***	0.0493***
	[0.0058]	[0.0006]	[0.0014]
Age^2	-0.0002***	-0.0002***	-0.0004***
	[0.0000]	[0.0000]	[0.0000]
Blue collar dummy	-0.3111***		
	[0.0025]		
Firm size	0.0352***	0.0327***	0.0348***
	[0.0004]	[0.0004]	[0.0011]
L.Productivity	0.1718***	0.1773***	0.1276***
	[0.0046]	[0.0048]	[0.0093]
Constant	5.0876***	4.7990***	4.6799***
	[0.0199]	[0.0202]	[0.0418]
Area and time dummies	Yes	Yes	Yes
Number of observations	263 146	195 625	67 521
Number of individuals	70 327	53 352	18 633
R^2	0.51	0.36	0.42

Notes: ***, ** and * denote significance at 1%, 5% and 10% respectively. Robust standard errors in parenthesis

6. Labour policies and international integration

Overall, the econometric evidence presented in the previous sections suggests, in line with theoretical predictions and previous findings reported elsewhere, a positive role of trade specialisation on employment and wages in the Italian manufacturing industry. Simultaneously, our results confirm that increasing competition from developing countries may exert negative pressure on both variables. Moreover, production off-shoring by Italian firms seems to reduce manufacturing employment at the sector level. Even if these negative outcomes were considered as short-term problems that need to be tackled in order to reap larger benefits stemming from international economic integration, their social costs cannot be neglected. In fact, these costs may be calling into question the ability of the Italian social security system to assist workers displaced by international competition and facilitate their search for a new job. This section will address the issue of labour policies in Italy from the perspective of their role in supporting trade adjustment. After an overview of the main limitations of the

Italian social security system, we will discuss the problems created by a sizable informal economy, and will conclude by presenting elements of social security system reform, required to increase its ability to assist workers displaced by international competition.

Labour policies and trade adjustment in Italy

The Italian system of social protection lacks a specific instrument for "trade displaced workers".[24] It is a complex set of differentiated provisions, which has grown without a consistent design, and has not been significantly improved by the labour policy reforms carried out in the last two decades. It includes several forms of income protection for workers who are in the process of losing or have lost their jobs. Among the most important are the ordinary and special wage supplements (*Cassa integrazione guadagni*), regular and reduced unemployment benefits, mobility allowances for dismissed workers, and job-security agreements providing for a reduction in the working hours and pay of a company's employees in order to prevent collective dismissals.[25]

In comparison with other EU countries, the Italian social protection system is weaker and somewhat peculiar. In 2005, public expenditure for unemployment subsidies and active labour policies amounted to 0.6% of GDP against an EU-15 average of 1.5%. More importantly, several qualitative features of Italian labour market policies impair their ability to address social problems created by trade competition (Sestito, 2008).

From this perspective, the most important problem is the weak linkage between benefits associated with social protection and measures aiming at promoting the search for a new job. Labour policy reforms in Europe have tended to strengthen the conditions required to remain entitled to public assistance, whereas in Italy the administration of unemployment support has been gradually separated from the management of active labour policies. As a result, the benefit system provides workers with little direct incentive to look actively for a new job.

A second problem is the wide differentiation in the treatment of various categories of workers. For instance, workers in industrial enterprises with more than 15 employees are entitled to the full benefits of a series of temporary measures (wages supplementation benefits, mobility allowances), which, however, may be easily cumulated over time. Others receive weak and short-lived support. There are also many so-called non-standard workers, formally not recorded as employees, who are not entitled to any form of assistance. As a result, the system is both iniquitous and inefficient because its relatively most generous benefits accrue where they are less needed, that is to workers who were already

24. Italian authorities have however made use of the recently established European Globalisation Adjustment Fund (EGF). Italian requests amounted to 12.5% of total requests between 2007 and June 2010 (European Commission, 2010). Financed requests amount to about EUR 35 million and are aimed at assisting about 6 000 textile workers in four Italian regions.

25. A detailed description of the system (in Italian) may be found at: *www.lavoro.gov.it/Lavoro/md/AreaLavoro/AmmortizzatoriSociali*. Some information in English is available at: *www.eurofound.europa.eu/eiro/studies/tn1004019s/it1004019q.htm*.

enjoying the advantages of open-ended contracts in large firms, and discourage the inter-sector mobility of workers.

A third structural flaw of Italian labour policies is the recurrent habit to augment existing measures with additional provisions, which are presented as temporary derogations for special circumstances, but *de facto* tend to become permanent. The reason is that policy makers find it easier to refinance these existing provisions than to tackle a comprehensive reform of the system. This is a convoluted way to offset the budgetary limitations of the system, which increases its distortions and further impairs the financial linkage between contributions and benefits.

Lastly, it has been observed that the Italian social security system, regardless of its size, does not play the expected cycle-stabilising role. This is due to the fact that most of its instruments are targeted at offsetting periodic shortfalls of labour demand, such as those related to seasonal variations in production, or give priority to long-term unemployment and industrial restructuring processes, more than to cyclical demand swings.

It might be argued that this problem is more relevant from a macro-economic perspective than for trade adjustment. Workers displaced by international competition tend to concentrate in a limited number of traditional manufacturing sectors, giving rise to long-term adjustment problems, which do not exhibit a cyclical pattern. However, trade represents also a powerful international transmission channel of cyclical instability, as shown clearly by the recent global crisis and the following recovery. So, a higher elasticity of social security expenditure with respect to the macro-economic cycle could be of help also to smooth the adjustment process in sectors more exposed to trade competition.

In fact the Italian system of wage supplements, notwithstanding its quantitative and qualitative limitations, has played a partial shock-cushioning role during the crisis. [26] The rise in the official unemployment rate (from 6.1% to 8.4% between 2007 and 2010) would have been much higher without this system, which has allowed many firms to reduce the labour input without firing workers. An indicator of labour underutilisation, including the work hours covered by wage supplementation payments as well as the number of discouraged workers, is estimated two percentage points higher than the official unemployment rate (Bank of Italy, 2011, p.32). Moreover, the use of non-standard job contracts, made easier by labour policy reforms of the last two decades, has become relatively more important. In 2010 fixed-term and part-time jobs rose respectively by 1.4% and 5%, whereas the total number of employees fell by 1%.

The problem is that, as already mentioned, the Italian social security system does not cover the entire labour force. Non-standard employees do not enjoy the same level of wage support as full-time workers with open-ended contracts, and are not entitled to the same unemployment benefits (Berton *et al.*, 2009). So, the burden of the adjustment to macro-economic shocks, such as the recent crisis, as

26. As a response to the crisis, the application of the wage supplementation scheme and mobility allowances was extended to enterprises previously excluded, such as industrial firms with fewer than 15 employees. However this extension was provided as a new temporary 'derogation' to existing rules and many non-standard employees continue to be excluded from the system.

well as to structural changes induced by trade competition falls predominantly on the shoulders of the weakest part of the labour force.

Informal employment and social protection

As argued in the previous section, in addition to the partial protection granted to standard workers by the Italian social security system, non-standard labour contracts, notwithstanding their limitations, may be considered a second-tier cushion against adverse employment and wage shocks. The large shadow economy growing beside and interacting with regular productive activities seems to offer a further adjustment mechanism, by providing displaced workers with employment and/or income maintenance opportunities. On the other hand, the very existence of an informal economy distorts the functioning of market competition and jeopardises the sustainability of the social security system. More importantly, even if conceptually clear (Castells and Porter, 1989), the border between informal and illegal activities is spongy in the real economy, and their interconnection is one of the most important factors impairing growth and societal progress.

The size of the informal economy in Italy is notoriously large, well above the average of developed countries. According to Schneider (2005) estimates, the GDP share of the shadow economy in Italy rose steadily until 1997-98 and declined only marginally in the following years, down to 26.2% in 2002-03, to be compared with an OECD average of 16.4%. More recent estimates (Schneider *et al.*, 2010) show that the size of the shadow economy has not changed significantly since 2001, fluctuating near 27% until 2007, to be compared with a weighted average of 13.4% for high-income OECD countries in 2005.

Official estimates of the informal economy, based on a different method, are regularly published by the Italian National Institute of Statistics (Istat). The most recent release (Istat, 2010) shows that the employment share of the informal economy has been gradually growing from 11% to almost 14% in the 1980-90s.[27] A sharp fall of this indicator was recorded between 2001 and 2003, as a result of new regulations facilitating the legalisation of unrecorded contracts with immigrant workers. In the following years the upward trend has resumed, up to a level of 12.2% in 2009. The number of informal jobs remained substantially constant between 2007 and 2009, whereas the number of full-time equivalent labour units fell by more than 750 thousand (3.4%), which shows the inability of the informal economy to absorb workers displaced by the crisis.

These estimates reveal the limited effectiveness of the policies pursued so far in reducing the incentives to perform economic activities outside the legal system. This applies to measures aimed at repressing illegal practices as well as to programmes targeted at reducing the cost of going formal. The latter may produce some important short-term results, as shown by the legalisation of immigrant jobs in 2002-03, but fails to address the structural roots of the problem.

Tax and social contribution burdens as well as restrictive regulations on business activities and the poor quality of public administration are widely

27. The sharp difference with respect to Schneider's estimates might be partly due to the fact that Istat method does not consider the grey area of informal agreements with officially recorded workers, for working hours and rewards going beyond contractual provisions.

considered the most important factors explaining the size of the shadow economy. Informal employment agreements may be deemed necessary by firms to reduce their labour costs and tax base, as well as to circumvent complex and costly regulations. So, the incentives feeding informal employment are the same that explain tax avoidance and evasion. To a certain extent, their strength might be abated through a reduction of the fiscal burden on firms. However, given the current situation of public finance in Italy, this would be difficult to engineer since it would require a politically difficult increase of tax pressure on financial rents. In addition, a simplification and liberalisation of rules on business activities might be of further help. Although each of these measures may be desirable, none are individually able to structurally reduce the weight of the informal and illegal economy, unless public authorities can better enforce existing rules and sanction their violation (Bovi, 2005). Even worse, the use of tax and social contribution amnesties, which has been so frequent in Italy, undermines the credibility of any measure designed to increase the cost of violating laws. On the other hand, a purely repressive strategy would also fail to achieve its targets Instead, a comprehensive reform of public administration, involving a significant cost reduction and improvement of the quality of services, is needed. From the perspective of trade adjustment policies, downsizing the relative size of the informal economy remains essential to generate the resources needed to finance the social security system as well as to preserve a well-functioning competition market and reinforce the incentives for welfare-improving structural change.

The Italian social security system and international integration: prospects for reform

In the previous section we argued that the Italian social security system is iniquitous and inefficient, and that reliance on the informal economy not only may not offset these limitations, but may exacerbate problems. Now we will present some general principles that could guide a reform process in order to allow the system to address the trade-related adjustment issues more effectively.

A necessary premise is that there is no compelling argument for an additional instrument specifically targeting trade adjustment. International integration is a multi-faceted process and its effects on employment and wages are channelled not only through trade, but also through FDI and other forms of international production fragmentation as well as through migration. Furthermore, the wave of skill-biased technical and organisational innovation contributing to the widespread fall in the relative demand for unskilled labour may also be traced back to the intensification of international competition. So, it could be very difficult to identify trade-displaced workers within the entire set of job losers. Moreover, an additional trade adjustment assistance instrument would add to the already high complexity and diversification of the social security system and could potentially work as a catalyst to reinforce political pressures against trade liberalisation (Sestito, 2008).

Even though introducing a new tool may not be optimal, it does not imply that the current system should not be reformed. On the contrary, the problems created by international competition in certain sectors and regions in Italy are serious, as shown in the previous sections of this paper. There is, therefore, a clear need for improved labour policies.

The first priority is clearly the removal of existing discriminations and the establishment of a universal system of unemployment subsidies, covering standard and non-standard contracts. This will require a reduction of the benefits currently granted to the most protected sectors of the labour force. If implemented, it would, however, ensure that the most vulnerable workers, who are often severely harmed by external competition, receive the assistance they deserve. Of course, a universal system will not prevent any sector from building its own *additional* benefit scheme, but this will have to be completed paid for by firms wishing to use it.

Another important criterion is financial sustainability, based on a medium-run contributions-payments equilibrium. It will have to be applied at the aggregate level, but also individually, so that the duration and the size of the benefits are proportional to past contributions and subject to precise conditionality criteria. Access to the benefits should be possible only after reaching a minimum threshold of working hours, which is necessary not only for the financial sustainability of the system, but also to generate incentives to work.

Moreover, continued receipt of the benefits should be made conditional on serious efforts to search for a new job, which requires measures and resources to strengthen the control activities of public employment offices. Indeed, this is one of the most important aspects of any reform design. Instead of competing with private firms in employment-matching services, the public administration should concentrate its resources in monitoring the system and ensuring that the most vulnerable sections of the labour force are not excluded from the necessary assistance. In this context, any specific issue related to trade displacement could be taken duly into account by the public administration, while avoiding further fragmenting the system with an additional subsidy scheme.

7. Summary and conclusions

This paper has attempted to analyse to what extent the increasing international integration of the Italian economy has affected its economic performance, with particular reference to employment and wages. The main insights that have been drawn from the descriptive and econometric evidence presented in the previous sections may be summarised as follows.

Before the global crisis, notwithstanding the sluggishness of production and the decline of export market shares, employment had continued to grow in Italy and the unemployment rate had significantly fallen. This was partly the result of regulatory reforms, which facilitated the absorption of a rising labour supply, including a growing fraction of immigrant workers. However, the Italian economy has remained fragile, due to its longstanding structural problems, and the impact of the crisis has been harsher than in other developed countries, making the current recovery slower and uncertain.

Although rising substantially in the last decades, the degree of international openness of the Italian economy is still lower than in other European countries of similar size. Its growth is curbed, among other factors, by the increasing weight of the services sector, which is structurally less open than the manufacturing industry.

Following a common pattern among developed countries, the GDP and employment shares of the manufacturing industry have declined in the last decades, in a context of rising international integration. Manufacturing trade balance has remained in surplus, sustaining the growth of employment, but its net labour content has become smaller over time.

Driven also by demographic factors, a strong trend of skill upgrading has affected the structure of employment. The relative demand for unskilled labour has fallen in all sectors, increasing wage gaps between different occupations.

These changes might be partly interrelated with a recent evolution in the international specialisation pattern of the Italian manufacturing industry. Under the increasing competitive pressure exerted by developing countries, traditional comparative advantages in low-technology consumption sectors have substantially weakened, and were replaced by a more intense specialisation in industrial machinery and other sectors producing intermediate and investment goods. Industries more exposed to competition from developing countries have undergone the sharpest falls in employment.

This structural transformation is not only the unavoidable implication of changes in the 'international division of labour' between developing and developed countries, but also the result of market strategies carried out by Italian firms, and particularly by the most competitive medium-sized enterprises that are emerging from the selection process elicited by international competition. However, these changes have not been strong enough so far to overcome the structural problems limiting the growth of the Italian economy, and in particular the 'dynamic inefficiency' of its specialisation pattern, concentrated in products characterised by a lower income elasticity of demand. This calls into question the ability of the Italian economic system to generate sufficient product innovation, which in turn depends on the quality of its human- and knowledge capital. A related problem concerns the services sector, where an increase in openness and competition would be necessary to generate the high-skilled jobs that could sustain the growth prospects of the Italian economy.

A more precise assessment of the employment and wage effects of international integration on the Italian manufacturing industry has been offered by our econometric exercises. The first one has confirmed that trade specialisation has played a positive role in sustaining the growth of employment in the last decade, offsetting the negative impact of the competitive pressure from developing countries and of production off-shoring by Italian firms.

The second group of estimates, based on a large panel of data on workers characteristics, gives similar results for wages. After controlling for a set of individual worker characteristics, firm size and labour productivity, we find again that the competitive pressure from developing countries exerts a negative impact on wage growth, which may, however, be more than offset by the export specialisation of the region in which workers are located. Nevertheless, both of these trade-related variables (competition from developing countries and export specialisation) tend to increase wage gaps between white-collar and blue-collar workers.

The Italian case, therefore, seems to confirm that international economic integration, while generating important static and dynamic benefits, requires a

flexible and efficient social security system, able to assist workers displaced by external competition as well as by any other kind of structural change.

The current system looks iniquitous and ineffective. Most of the non-standard-contract workers, who have been impacted more severely by trade competition and by the global crisis, are not covered by any form of assistance. The large informal economy existing in Italy is not able to solve this problem. Rather, its presence and the interconnections between legal and illegal activities threaten the financial sustainability of labour policies and obscure the growth and progress prospects of the Italian society.

Only a comprehensive reform of the social security system, inspired by principles of universal access, medium-term financial equilibrium, and a proper design of individual incentives, may help workers displaced by international integration, without jeopardising the substantial economic and social benefits associated with trade.

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