EMILIA-ROMAGNA IN THE TIME OF THE CRISIS: THE INDICATOR OF REGIONAL ECONOMIC ACTIVITY AND THE SPECIALISATION OF PRODUCTION AND TRADE

by

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Introduction

The financial crisis erupting in 2007 evolved shortly after the half of 2008 into a crisis of the real economy. The global contagion hit Italy not less than elsewhere and the country still struggles to recover.

Since March/April 2009 data for Italy show signs of resilience of the economic activity, while labor statistics continue to be discouraging. To get the full picture of the effects of recession and the country's potential for recovery, the causes and consequences of the crisis have to be assessed accounting for the peculiarity of the Italian economy, where the economic activity is deeply embedded in the local systems of production – traditionally known as industrial districts - and oriented towards a few sectors of specialisation.

In Italy the global financial shock displayed its major effects locally on the real economy and the nature of the changes occurred during - and in response to - the crisis largely depends on the structure of the specialisation and the competitiveness of the Italian regional economies. It is in this perspective that the "territorial dimension" – namely at regional level – becomes the key angle to interpret the economic scenario emerging in the aftermath of the crisis and grasp the opportunities that opened up.

The experience of this global economic crisis offers some elements for rethinking the role of social cohesion and partnership among all the stakeholders operating and interacting within the same socio-economic territory. The issue remains how to reconcile multi-stakeholders objectives and balance stability and growth?

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This paper is a joint-production of the authors. However Professor Cristina Brasili wrote section 2, Doctor Federica Benni wrote section 1, Barbara Barone wrote section 3. The introduction and the conclusions were a joint production of the authors.

This paper aims at providing some evidence of the short-term and long-term changes occurred in the regional economies following the economic downturn. Emilia-Romagna is taken as a case study. The analysis will focus on how this regional system has countered the most recent disruptive exogenous shock, by making better use of the local resources, know-hows and social and human capital and thus cushioning the negative effects on the labor market. The ultimate goal is to offer policy-makers a few considerations regarding the economic behavior of the regional economies, in order for them to design appropriate measures to accompany the evolution of the economic activity and relaunch growth.

Our analysis will combine the use of structural and coincident indicators to describe the economic system of Emilia-Romagna, its specialisation and its economic performance in the years of the crisis. We will thus investigate on the existence of discontinuities that changed the regional specialisation pattern.

In the first section we will present the economic performance of the region Emilia-Romagna through the use of the Indicator of the Regional Economic Activity – IREA (Brasili, Benni 2006), for whose computation we used the most recent available data, referring to the third quarter of 2010. The IREA is a timely indicator describing the evolution of the regional economic cycle and representing an alternative to the RGDP (Regional Gross Domestic Product) that is normally released with a two-year lag by ISTAT, the Italian National Institute of Statistics. We used the IREA to compare the economic performance of Emilia-Romagna with that of the rest of the Italian regions, being able to portray similarities and differences in terms of entry into the crisis and economic behavior during the crisis.

In the second section we will look at the structural specialisation of the economy of Emilia-Romagna. A first step is to describe the specialisation of the economic activity in a pre-crisis scenario by developing a set of indexes which capture the specialisation in one of the eight main economic sectors. For this exercise we used the data of the regional accounts (ISTAT). In a second stage, we will perform a conjunctural analysis of the first sectors of specialisation of the regional economy, in order to highlight the changes from the pre-crisis period.

In the third section we will focus on the trade specialisation of the manufacturing industry in Emilia-Romagna before and after the crisis.

To identify the trade specialisation pattern of the manufacturing industry, we will calculate an index at relative comparative advantages for the manufacturing sectors using the formula elaborated by Lafay (1992).

Our analysis will also target the nature of the regional trade specialisation, by looking at the technological content of the sectors of specialisation. Finally, we will compare the trade specialisation pattern of Emilia-Romagna with those of Toscana and Lombardia and discuss the changes occurred since 2000 with particular emphasis on the behavior of the indexes between 2007 and 2010.

Key words: indicator of economic activity, regional economic cycle, structural specialisation, trade specialisation, economic crisis.

JEL Classification: R1, R11, O18, E2, C51.

1. The Indicator of Regional Economic Activity (IREA)

The indicator of regional economic activity is a timely tool for policy makers to interpret the changes and understand the challenges experienced by the sub-national economies.

The economic performance of a country is commonly assessed using the Gross Domestic Product (GDP). This low-frequency variable is however not suitable for our analysis of the regional economic performance during the crisis. First, the GDP is produced annually and not much could be said regarding the exact moment in which a recession started. Second, the GDP at regional level is calculated and released by ISTAT with a considerable delay[2] with respect to its national equivalent. For these reasons we opted for the Indicator of Regional Economic Activity – IREA (Brasili, Benni 2005), which proxies the regional business cycle, using a set of timely and high-frequency variables that tend to move in concert with the GDP.

To develop the IREA a high number of territorial variables are necessary. In Italy we do not dispose of a variable to be used for developing the chronology of business cycles like the one produced by the National Bureau of Economic Research (NBER) for the U.S. Nevertheless, at territorial level we do have a sufficient number of high frequency (monthly

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[2] To date, the latest available data for the GRDP in Italy refer to 2008; 2009 data are still provisional.

and quarterly) variables that, when combined, could allow us to picture the economic performance of the regions.

We use a dataset encompassing 38 variables, whose data were available till September 2010. Thirty-four of these variables have territorial coverage[3] and other four refer instead to the national and international context[4] and control for common external shocks (Table 1.1). Raw data were then transformed into de-stagionalised, stationary and standardized variables with homogeneous frequency.

Table 1.1 Variables included in the IREA

		Employees in services	Labour market
Finished products unsold	Firm confidence	Employees in services	Labour market
Liquidity situation		Economic situation judgments	Consumer confidence
Domestic orders		Economic situation forecast	
Foreign orders		Unemployment forecasts	
Total orders		Judgments of family economic situation	
Production		Forecasts of family economic situation	
Liquidity trend		Family financial budget	
Economic trend		Possibility of saving	
Orders trend		Convenience to save	
Prices trend		Intention to buy durable good	
Production trend		Cars registrations	
Regional export	Import and export	Active firms	Firms demography
Regional import		Firms	
Macro area export		Stopped firms	
Employment rate	Labour market	German ind. production index	National and international variable
Unemployment rate		French ind. production index	
Activity rate		Real effective exchange rate	
Total employees		Italian ind. production index	
Employees in industry		Consumer price index	

To synthetize the information contained in this large set of variables we deployed the Dynamic Factor Models (DFM) methodology (Stock, Watson 1998), which made possible to extract few common factors from the dataset that capture the co-movement of the variables. These factors were then used to draw the regional business cycle. To identify the correct number of factors we referred to the methods proposed by Bai and Ng (2005).

To calculate the IRAE we followed two steps. In a first phase we estimated the factor model including the regional GDP growth rate for the available years[5] and the 38 variables of

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[3] Imports and exports (Istat data source); labour market data (Istat data source); survey on consumers' confidence (Isae data source); survey on firms confidence (Isae);Consumer prices (Istat data source); Business demography (Unioncamere data source); Car registrations (Unrae).

[4] German ind. production index; French ind. production index; Real effective exchange rate; Italian ind. production index.

[5] data were available for the period 1993-2008.

our dataset. Then we applied the EM algorithm[6] to interpolate the series of the GDP and convert the annual GDP growth rate to monthly frequency.

In a second phase we estimated the missing observations for 2009 and 2010 of the annual GDP growth rate with monthly frequency. Then we used the EM algorithm and projected the missing observations up to September 2010. With this two-stage process we obtained a series of the monthly trend growth rate of the GDP going from January 1993 to September 2010. To make the series less volatile we finally calculated the three-term centered moving average.

The advantage of this indicator of economic activity is that it could be updated till very recently. Given the variables we used for its calculation our IRAE has a lag of a few months. Therefore, while the official statistics are now able to portray the economic performance of the Italian regions only up to 2008, the IREA bridges this gap and presents the performance of the regional economic activity till September 2010.

In the next paragraph we present the results coming from the assessment of the business cycle of the Italian regions between June 2006 and December 2009. We want to give a snapshot of the peaks and troughs in the economic activity of the regions and visualize the moment in which they entered the recession, reached their minima and started recovering (Figure 1.1).

According to our series of IRAEs, the Italian regions behaved differently with respect to the crisis. The regional cycles do not follow the same patterns and it is not possible to identify one single moment in which all the Italian regions entered the recession. An encouraging sign is the fact that all the Italian Regions are now on the way to recovery, after having reached a minima in their economic activity in the first months of 2009. For some regions however, the IRAEs are still negative or tend to zero

Southern regions preformed relatively better during the crisis, but lag behind in recovery. During the months of the crisis, the IREAs of these regions were in fact displaying smaller negative values and earlier signs of resilience with respect to the rest of Italy. A lower export propensity and the relative minor importance of the manufacturing industry are probably the elements that protected these regions from even heavier impacts of the crisis.

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[6] The EM algorithm is used to replace missing observations and also to interpolate data with different frequency(Stock,Watson 2002).

The Northern and Central regions of Italy suffered more the impact of the crisis, however they have recovered faster, while Southern regions (with the exception of Sardegna, Calabria and Basilicata) still had negative IREAs in September 2010.

Figure 1.1. The crucial turning points in the regional economic cycle: the entry and exit from the crisis
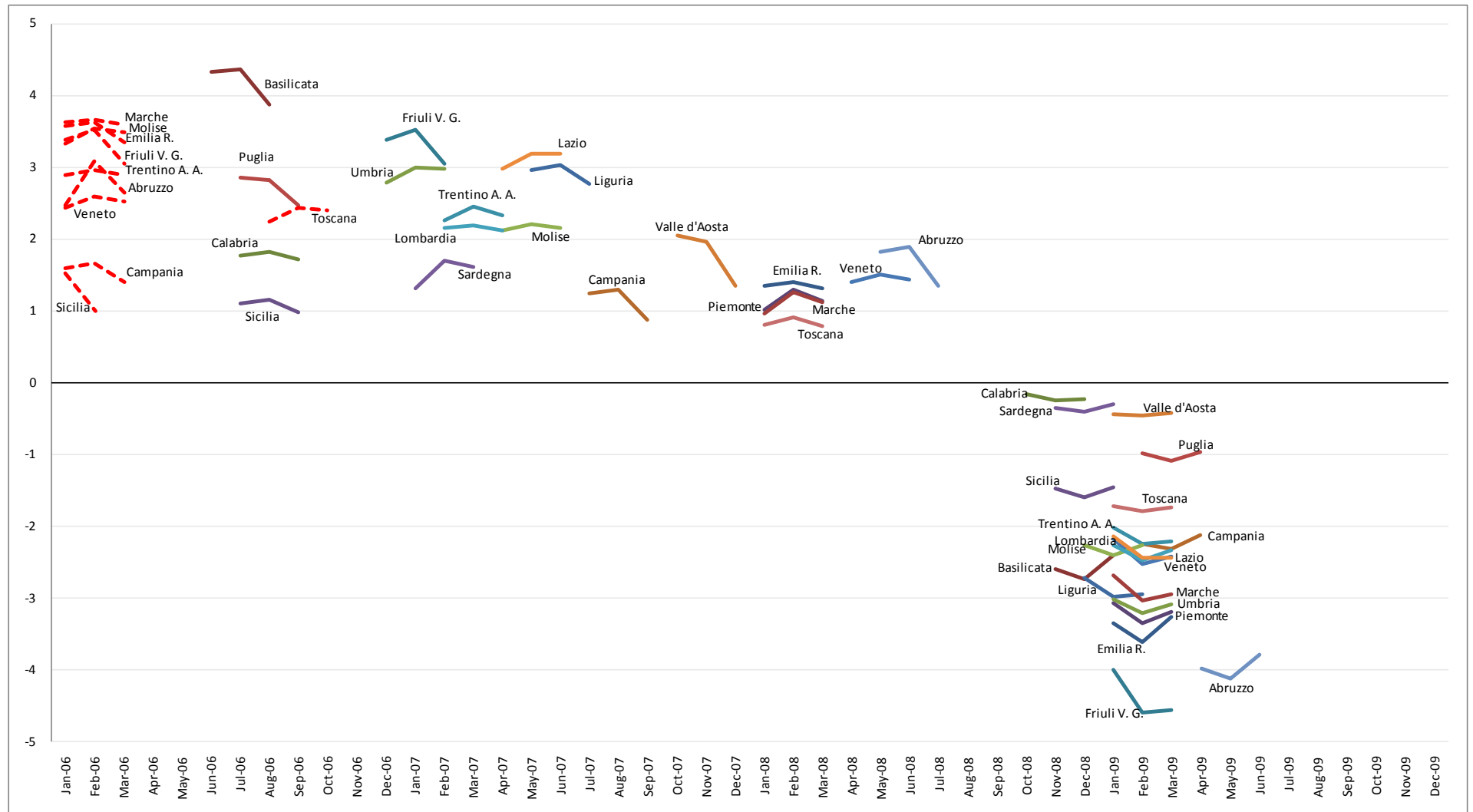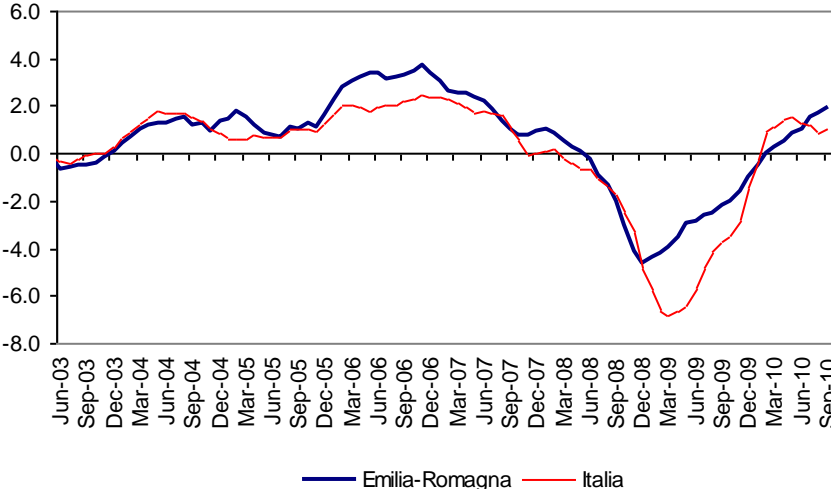

Source: RegiosS

1.1. The indicator of regional economic activity of Emilia-Romagna

Our indicator of regional economic activity – IRAE - shows that the economy of Emilia-Romagna experienced a steady upturn trend after March 2009, and eventually reached a value close to 2% in September 2010.

Its economic cycle is similar to the Italian one. However, the national cycle experienced a lower "trough" in the first quarter of 2009 and a steeper upward trend that reached the its peak in March 2010. Since then, the indicator of economic activity of Italy had slight downward adjustments, while the IRAE of Emilia-Romagna was still increasing in the third quarter of 2010 (Figure 1.1.1).

Figure 1.1.1 The indicators of economic activity – Emilia-Romagna, Italy

Source: RegiosS

The variables we used for the calculation of the IRAE give mixed signals on the recovery (Table 1.1.1). Exports significantly increased in the third quarter 2010, scoring a positive variation of +20.7% with respect to the third quarter of the previous year. The trend of the domestic demand reinforces instead the pessimistic interpretations of the current situation. Car registrations registered a variation of -25.5% in October 2010 and a slightly better figure (-17%) in November 2010. The consumer price index returned to the 2008 level, recording a variation of +1.8% in November 2010[7].

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[7] All the variations were computed on the basis of a comparison with the same period of the previous year.

According to the Manufacturing and Mining Firms' Confidence Survey[8] produced by the Institute for Studies and Economic Analyses (ISAE), the manufacturing firms' assessments on the level of orders and production were negative in November 2010 (-19 for the level of orders and -16 for the level of production). On the other hand, the expectations towards on future trends remained positive: +8 for the orders and +9 for the production.

Labor Market data offer a worrisome picture. In the third quarter of 2010 the level of total employment fell by 0.4% with respect to the same quarter of the previous year. This mostly affected the industry sector - whose total employment recorded a -1%, cutting of 6,600 employees - and the service sector -which reduced its total employment by -0.5% with 6,300 jobs lost. In agriculture the scenario is different. The total employment increased in fact by +8.1% or, in absolute terms, by 5,800 workers. This increment just partly offset the employment loss of the other sectors.

A decline occurred in both the activity rate (-0.7%) and the employment rate (-0.6 %), while the unemployment rate unexpectedly had a light downward adjustment (-0.2) in the third quarter of 2010. This last result was mainly due to a downward "gender adjustment" in the labour market, where the male unemployment rate decreased by 1.1%, while the female equivalent climb up by 0.9%.

Table 1.1.1 Some of the variables used for the construction of the IRAE of Emilia-Romagna

Emilia-Romagna	Source	Update	Former data	Last data
Export	**Istat** - % change y/y *milion euro*	3rd quarter 2010	+19.3% *10,688.7*	+20.7% *10,985.7*
Cars registrations	**Unrae*** - % change y/y	November 2010	-25.5%	-17.1%
Production trend	**Isae** - balance	November 2010	13	9
Total orders	**Isae** - balance	November 2010	-17	-19
Unemployment rate	**Istat**- rate	3rd quarter 2010	5.8%	4.7%
Activity rate	**Istat** - rate	3rd quarter 2010	72.2%	71.4%

The business demography finally gives a few positive feedbacks. The number of active firms increased by +0.3% in the third quarter of 2010 compared to the same period of 2009. This reflects a general improvement of the business context, which managed to attract

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[8] ISAE conducts a Business Confidence Survey among the economic operators in the Italian manufacturing industry on a monthly basis. The purpose is to get their assessments on current trends and expectations regarding the production and orders. The indexes produced reflect the balance of positive and negative opinions given by entrepreneurs and managers. This survey is part of the European Commission Joint Harmonised Business and Consumer Survey (BCS) Programme. For further details refer to the ISAE website (www.isae.it).

more new enterprises (+ 8.3% of new registrations) and lowered the number of firms terminating of their economic activity (-5.3% of ceased firms).

2. The regional specialisation in Italy

2.1. The heterogeneous specialisation patterns across Italian regions

The Italian economy has a deeply fragmented economic structure and heterogeneous regional specialisation patterns. This is the picture we drew after pursuing an assessment of the regional specialisation in Italy through the use of six specialisation indexes[9].

Manufacturing industry resulted one of the main sectors of specialisation in the larger regional economies of North Italy, in Friuli Venezia Giulia, and in a few central regions (Toscana, Marche and Abruzzo). The rest of the central and southern regions are instead prevalently engaged in the primary sector (Figure 2.1.1). In the northern and central part of Italy, where the manufacturing industry is not the first sector of specialisation , tourism seems to be the alternative (Table 2.1.1). The South has a homogeneous specialisation pattern across the regions. Agriculture is the main economic activity, while little or no resources are devoted to tourism, a sector with high potential which turned to be a strength for some regions in the North and center of Italy. Sardegna is the only exception in the South, having tourism at least as second sector of specialisation.

Looking at the classification of the regions by intensity of specialisation, Lombardia stands in first place with a value of the synthetic index of specialisation equal to 22.13 (Table 2.1.1), Veneto occupies the second position with a 17.03 index value and Emilia-Romagna the third position with a 16.47 index value.

Emilia-Romagna has a structure of specialisation similar to the Marche Region. For both regions the manufacturing industry is the first sector of specialisation, followed by agriculture. We will see in the course of our analysis that the interdependency of these two sectors is a crucial element for Emilia-Romagna, which explains the key role played by the agri-food industry in the peaks-and-troughs of the regional economic cycle. The attention of policy makers should therefore be directed towards the linkages existing between the whole

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[9] The indexes we developed encompass variables - such as value-added, labor units, number of active firms, population- elaborated by the Regional Accounts and referring to the 2005-2006-2007 years. For further details on the methodology please see *Annex A*.

manufacturing industry, agriculture, the food processing sector and not least, the machinery sector.

Figure 2.1.1 Regional Specialisation in Italy by macro-economic sector – a pre-crisis scenario
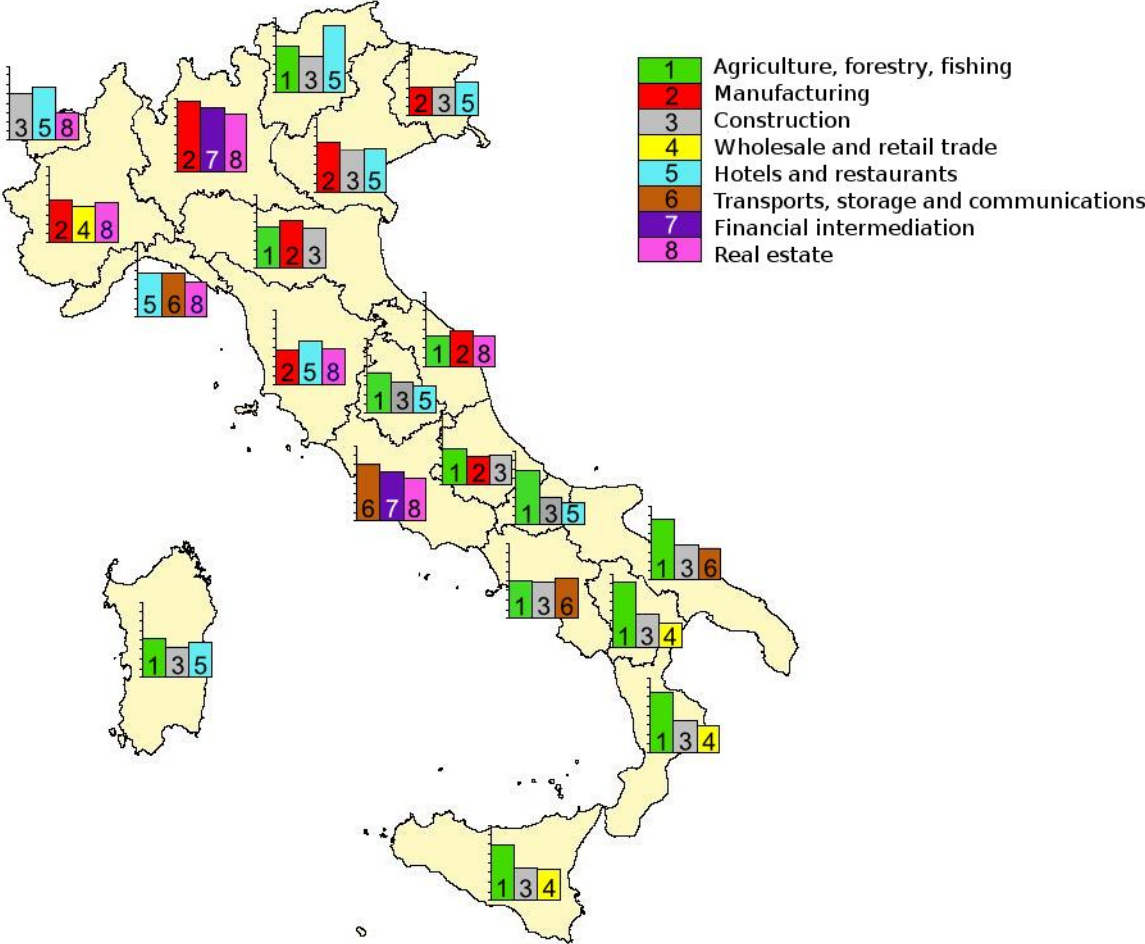
Source: our elaboration on ISTAT data and Movimprese. For details on the methodology for the construction of the specialisation indexes please refer to *Annex A.*

Table 2.1.1 Regional classification of the first three sectors of specialisation

		Sector 1: Agriculture, forestry, fishing	Sector 2: Manufacturing	Sector 3: Construction	Sector 4: Wholesale and retail trade	Sector 5: Hotels and restaurants	Sector 6: Transports, storage and communications	Sector 7: Financial intermediation	Sector 8: Real estate	Total:
NORTH WEST	PIEMONTE	1.54	2.22	1.87	1.91	1.63	1.85	1.90	2.11	15.03
	VALLE D'AOSTA	0.67	0.79	2.47	0.87	2.90	0.92	1.47	1.52	11.61
	LOMBARDIA	1.56	3.80	2.60	2.88	2.03	2.58	3.51	3.18	22.13
	LIGURIA	1.03	0.90	1.40	1.58	2.34	2.32	1.70	1.84	13.11
NORTH EAST	TRENTINO AA	2.52	1.07	1.96	1.31	3.56	1.13	1.30	1.40	14.24
	VENETO	2.03	2.69	2.28	2.01	2.34	1.82	1.88	2.02	17.08
	FRIULI VENEZIA GIULIA	1.48	1.56	1.57	1.39	1.85	1.35	1.55	1.43	12.18
	EMILIA ROMAGNA	2.28	2.58	2.17	1.79	1.94	1.71	1.99	2.02	16.47
CENTRE	TOSCANA	1.78	1.92	1.85	1.90	2.36	1.64	1.88	1.97	15.30
	UMBRIA	2.20	1.39	1.68	1.39	1.47	1.24	1.28	1.28	11.92
	MARCHE	1.65	1.92	1.59	1.48	1.46	1.19	1.46	1.61	12.37
	LAZIO	1.02	0.95	1.57	2.08	2.14	3.02	2.61	2.28	15.67
SOUTH AND ISLANDS	ABRUZZO	1.97	1.59	1.64	1.26	1.43	1.06	1.01	1.28	11.25
	MOLISE	2.92	0.99	1.52	1.01	1.20	1.13	1.11	1.02	10.91
	CAMPANIA	1.97	1.14	1.95	1.92	1.90	2.13	1.26	1.57	13.83
	PUGLIA	3.26	1.10	1.91	1.68	1.42	1.72	1.18	1.45	13.72
	BASILICATA	3.52	1.00	1.82	1.36	1.13	1.21	0.77	0.84	11.65
	CALABRIA	3.21	0.62	1.73	1.47	1.42	1.46	0.70	1.36	11.98
	SICILIA	2.94	0.88	1.72	1.69	1.35	1.60	1.31	1.48	12.98
	SARDEGNA	2.07	0.82	1.63	1.49	1.87	1.46	0.89	1.27	11.49

Legend:
1° SECTOR
2° SECTOR
3° SECTOR

Source: Our elaboration on Istat and Movimprese data

2.2 The pattern of specialisation in Emilia-Romagna

Our analysis aims at revealing the features of the model of specialisation of Emilia-Romagna in order to understand which have been its strenghts and weaknesses in this period of crisis. A pressing issue remains which could be the measures and tools at disposal of policy makers to restore structural and conjunctural stability while fostering regional development?

Emilia-Romagna has a relatively balanced structure of specialisation. When compared to the other regions of the Northeast (Figure 2.2.2), it is clear that the specialisation of Emilia-Romagna is well balanced among all the sectors considered (Figure 2.2.2). The first sector of specialisation is manufacturing, for which the specialisation index has a value equal to 2.6. The second and third sectors of specialisation are the primary sector (2.3) and the construction (2.2). The rest of the economic sectors exhibit moderately high values of the specialisation index, which ranges from 1.71 to 2.02 (Table 2.2.1).

The manufacturing industry is to be seen as "a jewel in the crown" in the economy of Emilia Romagna - though, its "flaws" must be accounted. A part from being the first sector of specialisation, the manufacturing industry accounts also for 25% of the employment and the

value added of the region. There is then, a strong correspondence between the weight this sector has in terms of employment and economic contribution and the position it occupies inside the structural of specialisation of the region. No other sector and in no other region this correspondence occurs. As a matter of fact, in Emilia-Romagna the second sector in terms of value added is the "Real estate" (20%) (Table 2.2.2.) and in terms of employment is "Wholesale and retail trade", accounting for 14% of the total employment (Table 2.2.3). For this reason, the case of the manufacturing sector in Emilia Romagna is somehow unique when compared to the other regions and to the whole country. Along with that, the manufacturing sector is however highly vulnerable. The crisis hit indeed this sector more than any other, thus revealing its flaws. What have been usually interpreted as success factors of the manufacturing industry - the export-oriented model and the specialisation in instrumental goods (i.e. machineries) - turned out to be the weaknesses of the manufacturing sector in Emilia-Romagna and the causes of its great vulnerability to economic swings.

Table 2.2.1. Specialisation indexes by sector of economic activity (average value 2005-2006-2007)

EMILIA-ROMAGNA	Sector 1: Agriculture, forestry, fishing	Sector 2: Manufacturing	Sector 3: Construction	Sector 4: Wholesale and retail trade	Sector 5: Hotels and restaurants	Sector 6: Transports, storage and communications	Sector 7: Financial intermediation	Sector 8: Real estate
Indice 1	0.35	0.44	0.29	0.26	0.28	0.20	0.29	0.28
Indice 2	0.23	0.36	0.20	0.23	0.27	0.21	0.24	0.24
Indice 3	0.73	0.56	0.66	0.47	0.42	0.33	0.52	0.48
Indice 4	0.29	0.37	0.40	0.23	0.32	0.43	0.32	0.39
Indice 5	0.35	0.41	0.31	0.28	0.30	0.24	0.30	0.29
Indice 6	0.33	0.44	0.31	0.32	0.36	0.31	0.33	0.34
Totale	**2.28**	**2.58**	**2.17**	**1.79**	**1.94**	**1.71**	**1.99**	**2.02**

2°sector   1° sector   3° sector

Source: Our elaboration on Istat and Movimprese data

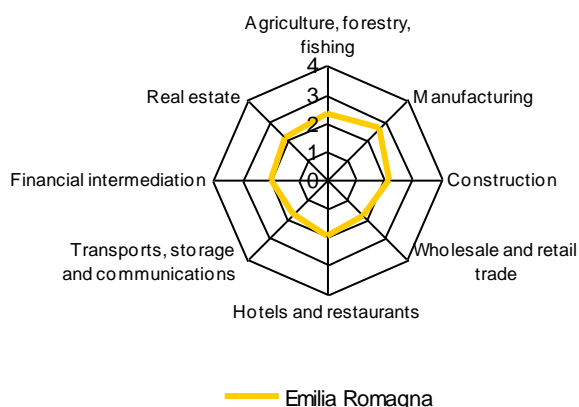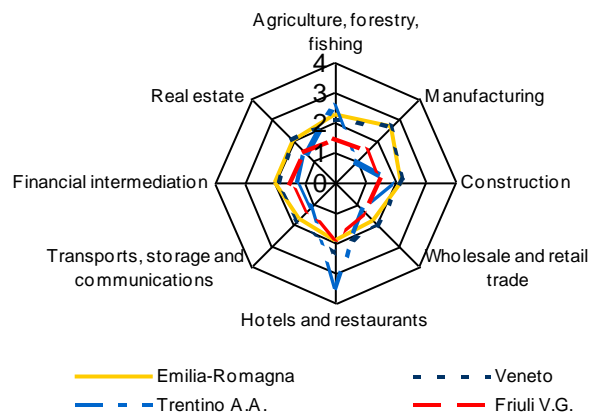**Figure 2.2.1 The pattern of Specialisation in Emilia-Romagna**

Figure 2.2.2 The pattern of Specialisation in Northeast Italy

Source: Our elaboration on Istat and Movimprese data

Source: Our elaboration on Istat and Movimprese data

Table 2.2.2 Value Added by sector (average value 2005-2006-2007). Emilia-Romagna

	1	2	3	4	5	6	7	8
Value added (milion euro)	2937.5	26696.0	5606.6	11541.4	3602.7	6657.2	5104.3	20592.2
Value added (% over total)	2.9	26.6	5.6	11.5	3.6	6.6	5.1	20.5

Source: Our elaboration on Istat data

Table 2.2.3 Full time equivalent units by sector (average value 2005-2006-2007). Emilia-Romagna

	1	2	3	4	5	6	7	8
Full time eq. units (thousands)	113.4	542.3	151.6	294.1	133.0	129.5	52.3	243.3
Full time eq. units (% over total)	5.3	25.4	7.1	13.8	6.2	6.1	2.5	11.4

Source: Our elaboration on Istat data

Manufacturing Industry in Emilia-Romagna

Since the third quarter of 2008 the manufacturing industry's turnover recorded negative changes both over the previous year and over the previous quarters. The two variables reached their minima respectively during the first quarter 2009 (–54%) and the second quarter 2009 (-18%). To register a positive value in the change over the previous quarter, the manufacturing industry waited till the first months of 2010, while an improvement over the previous year occurred just on the second quarter of 2010 (Figure 2.2.3).

All the manufacturing sectors experienced double digit turnover declines during the first and second quarters of 2009 with the exception of the agri-food industry that behaved "countercyclical" (-1.6% during the first quarter 2009 and by -2.8% during the second quarter).

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Also the manufacturing and mining firms' assessments on the current status and trends of the industry reflect the great downturn experienced by the sector in the first two quarters of 2009, which has been the most dramatic since January 1991. The entrepreneurs' opinion on the level of orders and production progressively deteriorated since January 2008 and reached the lowest point in spring 2009, remaining negative till the end of the year (Figura 2.2.4).

A similar picture comes out from the analysis of the entrepreneurs 'expectations on the orders and production trends. The balance of the opinions reached the minimum value between the end of 2008 and March 2009, while positive values appeared in autumn 2009 (Figure 2.2.5).

Figure 2.2.3 Manufacturing Industry Total Turnover
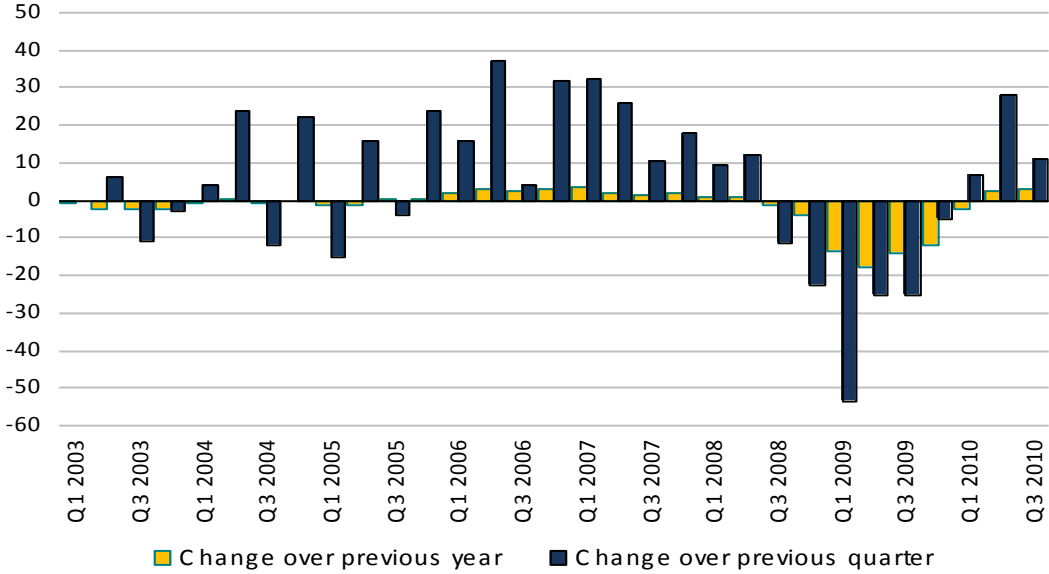
Source: Unioncamere Emilia-Romagna – Quarterly Survey on the Industrial Sector

It is possible to distinguish four phases that the trends in domestic, foreign and total orders went through since 2005. In Phase I - opened in January 2005 and ended during the summer 2007 – the variables were positive and increasing; the total orders were mainly driven by the foreign component, while domestic orders follow the same trend but at lower levels (Figure 2.2.6). In Phase II – in-between the summer 2007 and summer 2008 – the three variables started a slow declined; nothing changes in their relative position. In Phase III – starting in September 2008 and ending in March 2009 – the three components experienced a steep steady downturn. Phase IV - since in March 2009 – represents the beginning of the upturn, where total orders have been driven by the domestic component.

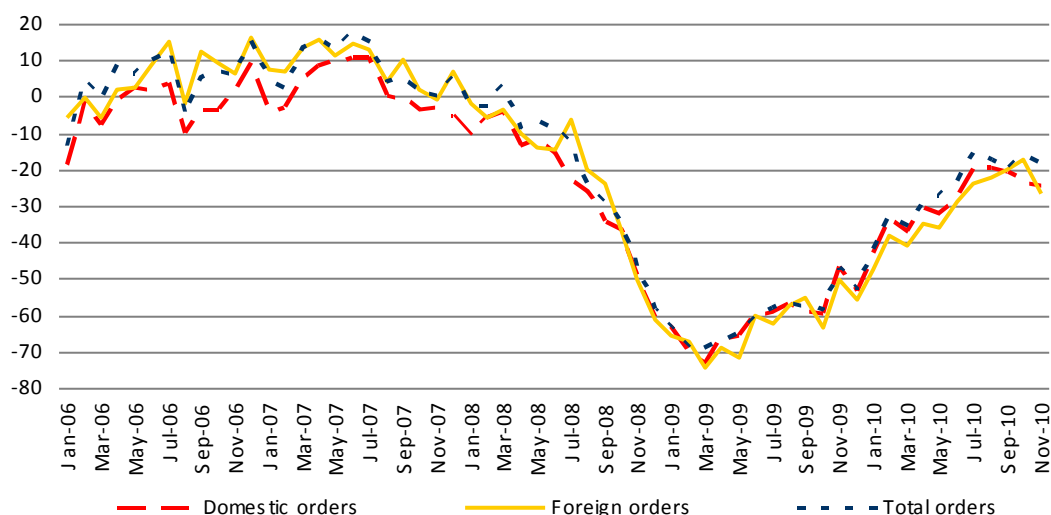**Figure 2.2.4 Levels of orders and production**
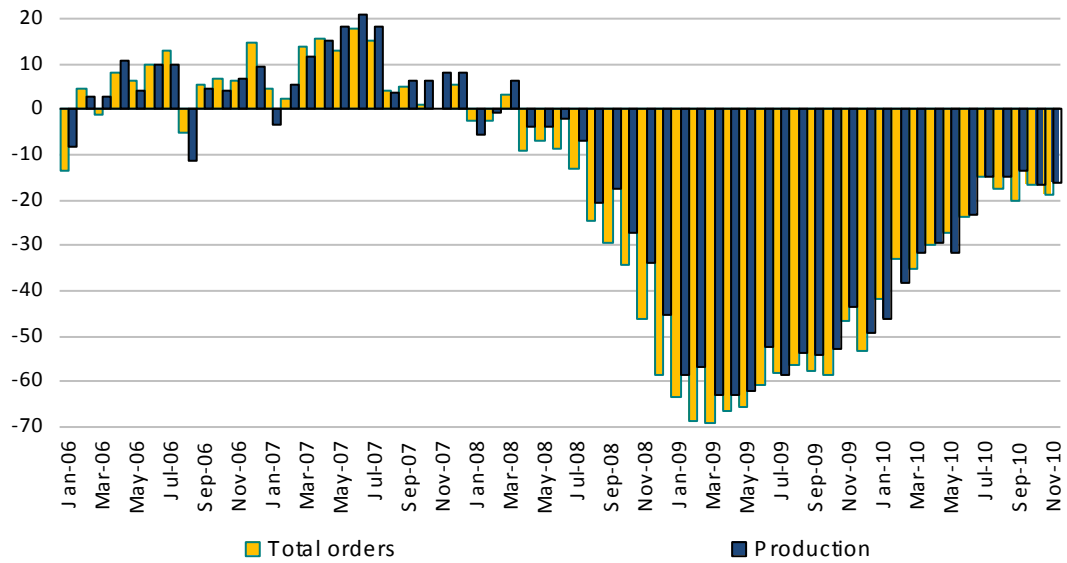
Source: ISAE Manufacturing and Mining Firms' Confidence Survey

2.2.5 Trends in orders and production
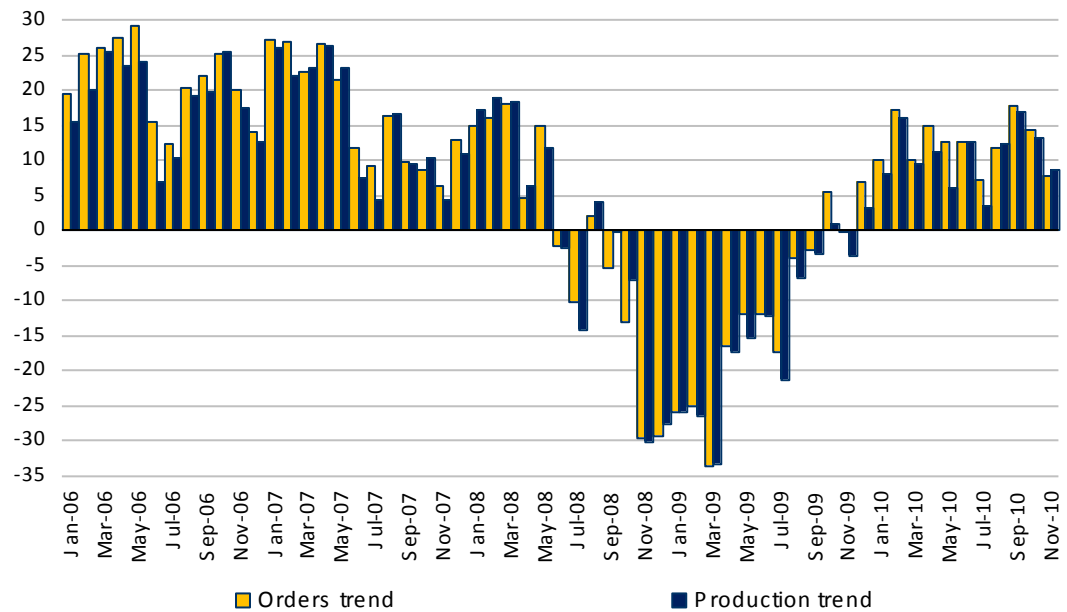
Source: ISAE Manufacturing and Mining Firms' Confidence Survey

2.2.6 Levels of domestic, foreign and total orders

Source: ISAE Manufacturing and Mining Firms' Confidence Survey

The Labor Market in Emilia-Romagna faces serious matters. The latest available quarterly data – third quarter 2010 - reveal the enduring decline of the employment rate (-0.7%) and the activity rate (-0.6 %), although at a slower pace than in previous quarters. The unemployment rate bettered, going down to 4.7% (Table 2.2.4).

The economic crisis impacted with a delay on the labour market, which has been suffering for the whole 2009 and had slightly better results starting from the third quarter of 2010. During the last two years the economic system faced considerable difficulties in managing the mismatching of labour supply and demand that followed the crisis. As a result, the firms applied more frequently to the Italian Wage Guarantee Fund (CIG)[10] in order to temporarily reduce or suspend the activity of one or more of their employees without dismissing them. Between 2008 and 2010 the CIG data referring to the total number of hours authorized peaked up (Figure 2.2.8). Before 2008 the total hours authorized by the CIG didn't reach the 10 million, whereas this figure reached 60 million in 2009 (a +652% growth rate) and 119 million of hours in 2010.

The CIG encompasses two types of support: the "ordinary wage supplement and the "special wage supplement" [11]. The two measures target different situations and different type

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[10] The Wage Guarantee Fund (CIG) is a "social shock absorber" that was established in 1947 to protect workers' income in case of a temporary shrinkage of the labour demand. This system allows the employer to reduce temporarily the labour he uses, without dismissing the employee. The employee is paid 80% of the salary.

[11] The "Ordinary Wage supplement" covers the cases where a company reduces or suspends part of its activity due to temporary events not under the control of the employer – e.g. temporary market difficulties, seasonal weather conditions.

of enterprises. Since 2009 the number of hours granted by the ordinary CIG began to decline and a specular increase in the "special" CIG support occurred. The number of hours authorized by the special CIG exceeded the 38 million in 2010.

The total number of hours authorized by the CIG partly increased because of the introduction of a further type of social shock absorber since February 2009. The so-called "CIG in derogation"[12] (CIGD) was created in derogation of the conditions established for accessing the CIG (article 19 of Law 2/2009), in order to support during the crisis those firms and sectors previously excluded. In the first ten months of 2010, it is estimated that the CIGD reached 53,000 workers in Emilia-Romagna, corresponding to 7,871 enterprises for a total of 59 million of hours.

The major share of the CIG intervention went to the mechanical sector. During the summer 2009 this share peaked at 71% (Figure 2.2.9) and it was estimated that over 5 million hours were authorized in the first three quarters of 2010. The situation showed signs of improvement in autumn, when the hours authorized to the mechanical sectors went down to 4 million. The last available figure (December 2010), gives us however a worrisome prospect, since the number of hours authorized went up to 5.8 million.

Another shock absorber, operating at support of the labor market during the crisis, is the "Mobilità"[13]. During the first nine months of 2010, the number of people registered on the mobility lists increased by more than 21% compared to the previous year and this gives an idea of the number of workers laid off (SILER[14]).

The regional business demography is a key element to consider in order to measure the effects of the crisis. Entrepreneurship has always been a relevant phenomenon in Emilia-Romagna. Looking at its incidence over the total population residing in the region, we count 991 firms every 10.000 inhabitants. This result places Emilia-Romagna at the top of the Italian regions' list for entrepreneurial propensity.

The "Special Wage supplement" is used instead in case the company faces some restructuring, reorganization, change of activity or bankruptcy. This measure targets those enterprises with more than 15 employees. For further details: http://www.eurofound.europa.eu/pubdocs/2010/636/en/2/EF10636EN.pdf

[12] "The CIG in derogation" is a special measure established by agreement between the state and the regions in order to sustain the economy during the crisis. This measure is under the management of the Regions and is financed by public funds (coming from the regions and the state). The regional funds come from the European Social Fund (ESF), for whose utilization a certain number of criteria have to be met by the region.

[13] The CIG is deployed when the company wants to maintain the contractual relationship with the employee(s) and to reintegrate him/them into its workforce once the normal economic situation is restored. The "Mobilità" supports instead redundant workers and help them to find work elsewhere, providing tax breaks to companies willing to hire employees from the mobility lists.

[14] "Sistema informativo lavoro della Regione Emilia-Romagna".

By the end of 2010 the number of active firms in the region numbered 428.867, following a 0.2% increase over the previous year. The manufacturing sector scored a constantly negative net rate of firm creation since the third quarter of 2007. The indicator exhibited its lowest variation (around -1.2%) every first quarter of the last three years. The net rate of firm creation in the mechanical sector did not substantially differ from the one of the whole manufacturing and in fact it has been negative along the crisis and still recorded a -0.8% in the end of 2010. The death rate of manufacturing firms bettered just in the last quarter of 2009 (Figure 2.2.10), whereas the mechanical sector had an increasing death rate for the last six months of 2009, but an improvement of the situation during the whole 2010 (Figure 2.2.11).

Table 2.2.4 The Activity rate, the Employment rate and the Unemployment rate

	Activity rate	Unemployment rate	Employment rate	Difference over previous year		
				Activity rate	Employment rate	Unemployment rate
Q1 2008	72.7%	3.4%	70.1%	0.8	0.5	0.2
Q2 2008	72.8%	3.2%	70.4%	0.3	0.1	0.3
Q3 2008	72.6%	2.7%	70.6%	0.2	-0.1	0.4
Q4 2008	72.3%	3.4%	69.8%	-0.4	-0.7	0.4
Q1 2009	72.2%	4.1%	69.2%	-0.5	-0.9	0.7
Q2 2009	72.9%	4.4%	69.7%	0.1	-0.7	1.2
Q3 2009	72.1%	4.9%	68.5%	-0.5	-2.1	2.2
Q4 2009	70.9%	5.7%	66.8%	-1.4	-3.0	2.3
Q1 2010	71.1%	6.2%	66.6%	-1.1	-2.6	2.1
Q2 2010	72.2%	5.8%	67.9%	-0.7	-1.8	1.4
Q3 2010	71.4%	4.7%	67.9%	-0.7	-0.6	-0.2

Source: our elaboration on ISTAT data – Labour Force Survey

Figure 2.2.7 The Activity rate, the Employment rate and the Unemployment rate (differences over previous year)
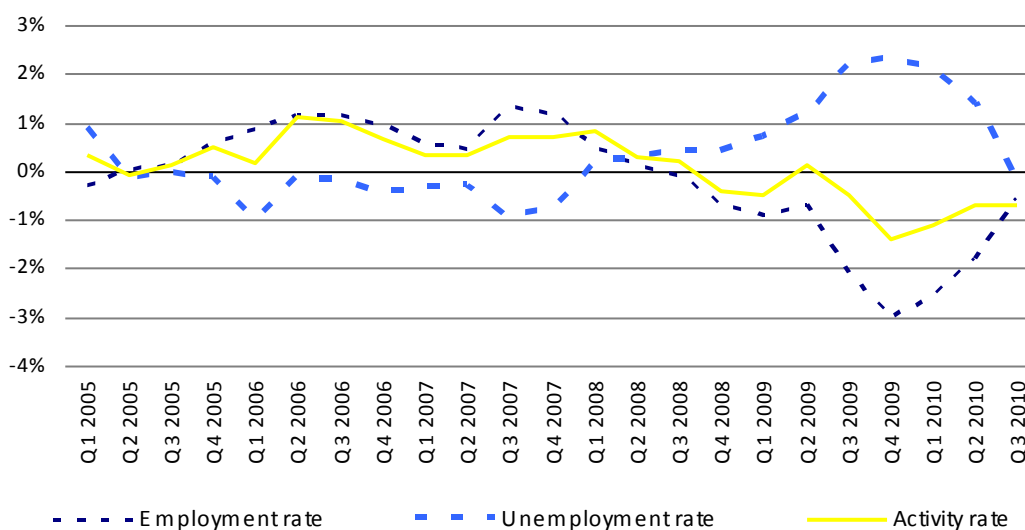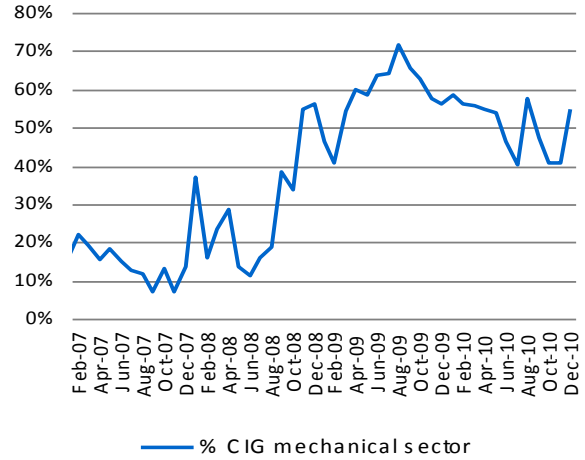

Source: our elaboration on ISTAT data – Labour Force Survey

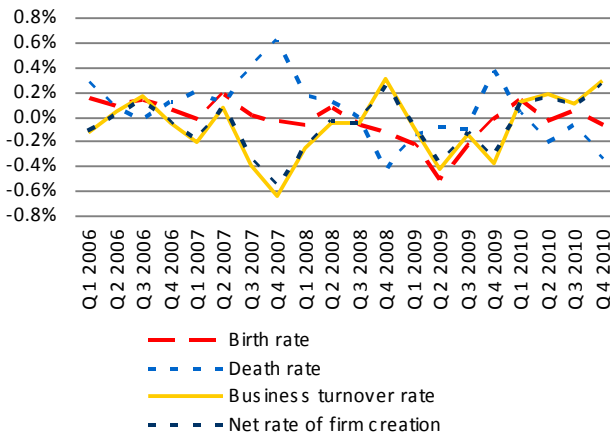**Figure 2.2.8 Number of hours authorized by CIG**
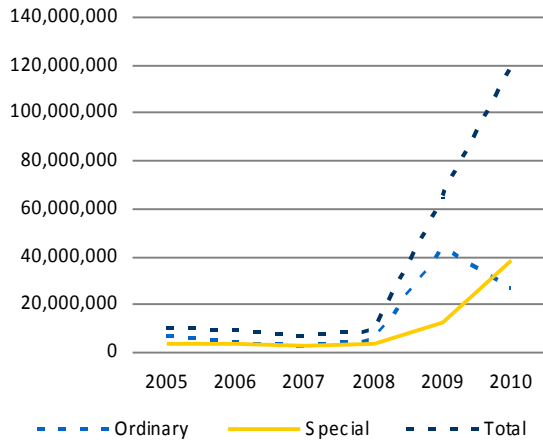
Source: Our elaboration on INPS data

**Figure 2.2.9 Share of CIG authorized hours granted to the Mechanical sector**

Source: Our elaboration on INPS data

Figure 2.2.10 Business demography Indicators for the Manufacturing sector (differences over previous year)

Source: Our elaboration on Infocamere – Movimprese data

Figure 2.2.11 Business demography Indicators for the Mechanical Sector (differences over previous year)
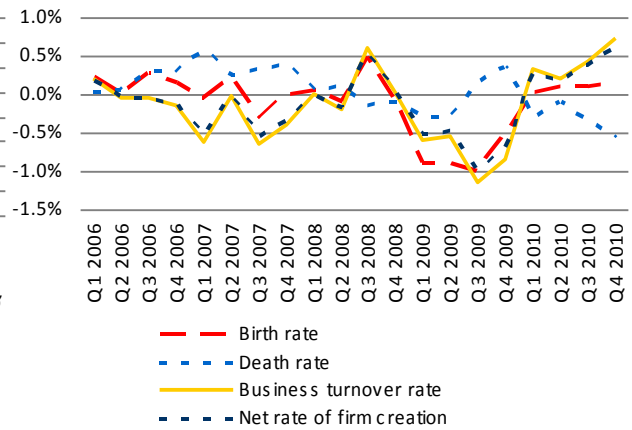
Source: Our elaboration on Infocamere – Movimprese data

|	
(Firm) Birth Rate =	Newly Registered Firms/ Active Firms
(Firm) Death Rate =	Deceased Firms/ Active Firms
Business Turnover Rate=	Birth rate – Death Rate
Net Rate Of Firm Creation =	[Newly Registered firms – Deceased Firms]/ Total number of firms registered

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The agricultural sector in Emilia-Romagna

After the good economic results obtained in 2007 and 2008, the Gross Marketable Production (GMP) in Emilia-Romagna dropped by 6.2% in 2009. This reduction was anyhow smaller than the fall experienced by the GMP at national level (-9%) (*Il sistema Agro-Alimentare dell'Emilia-Romagna* – Rapporto 2009). In 2009 the value of agricultural production had a reduction of roughly 250 million euros, thus reaching 3.7 billion euros, while the production quantity remained stable. For several agricultural products prices dropped.

In this context the business profitability worsened. Because of the reduction in the value of the agricultural production of 6.5% over the previous year, farms had to cut off costs. As a matter of fact intermediate consumption decreased by 1.5%, thanks to the cost reduction in energetic products (-7.7%) and the lower cost increment in technical means of production.

The value added of Emilia Romagna (Figure 2.2.12) has an historical trend similar to the ones of the Northeast Italy and the whole Italy in general, however the indicator for Emilia-Romagna is always higher compared to the other two areas. From 1999 to 2001 the weight of the agricultural value added in the regional economy (share of agricultural value added over the regional value added) reached its peak, recording values ranging from 3.4% to 3.5%; it touched its minimum in 2007 (2.8%) and then began to grow again in 2009.

Figure 2.2.12 Trends of the agricultural value added over the total. Emilia-Romagna, North East and Italy
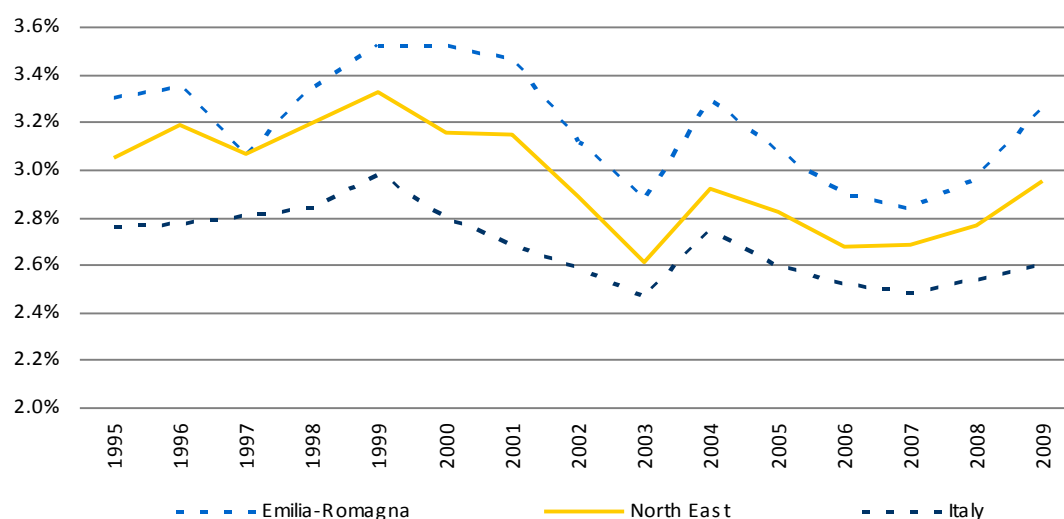
Source: our elaboration onISTAT data

The agricultural exports recorded positive quarterly growth rates (calculated over the previous year) ranging from 0% to 20% between 2005 and the last quarter of 2008 (Figura 2.2.13). During the third quarter of 2009 the value of this indicator touched -20% -the turning point - and exports start recovering after that, reaching +20% in the third quarter of 2010. The import growth rates followed the same pattern than exports, with the only difference that recessions and expansions were more intense in the case of imports.

Figure 2.2.13 Trade in agriculture (annual variation %)
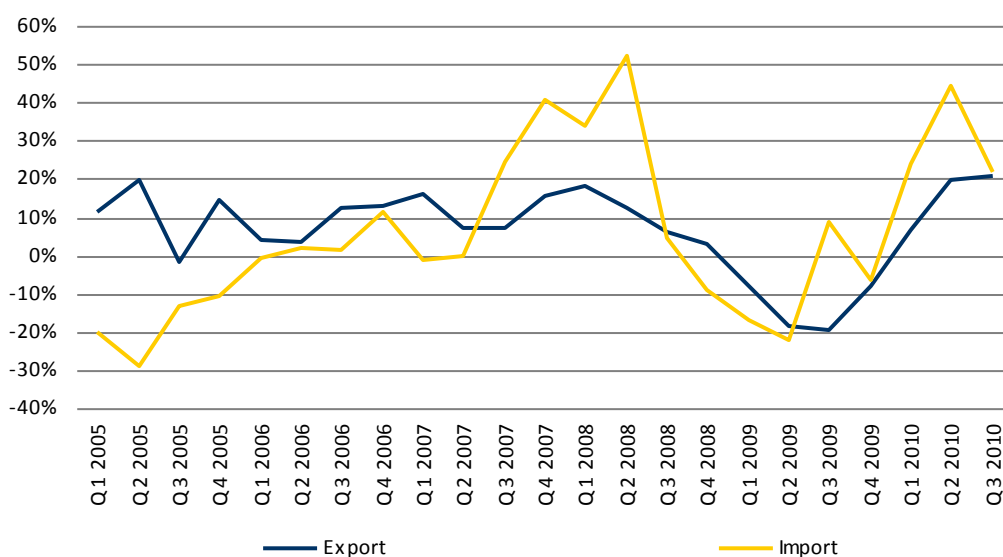
Source: our elaboration on ISTAT – COEWEB data

During the crisis the agricultural exports of Emilia-Romagna preformed slightly better than North East and Italy, although the figures were negative for the three areas considered (Table 2.2.5).

Table 2.2.5 Agricultural imports and exports during the crisis (million euros)

| Agricolture, forestry, fishing	2008		2009		% change y/y 2009/2008	
	Export	**Import**	**Export**	**Import**	**Export**	**Import**
Emilia-Romagna	830	1.173	717	1.045	-13.6%	-10.9%
North East	2.281	3.467	1.941	3.100	-14.9%	-11.8%
Italy	5.354	10.874	4.614	9.706	-13.8%	-10.8%

Fonte: nostre elaborazioni su dati ISTAT - COEWEB

The labor market of the agricultural sector experienced a constant reduction in employment across time and in all the Italian regions. Between 1999 and 2007, this reduction was of 35.9% in Emilia-Romagna. The negative trend worsened in 2004 when the reduction

in the number of self-employed was not even partially off-set by the increase in dependent employment. In the current time of the crisis, the situation in the agricultural labour market has been somehow reversed. Since the start of 2008 the agricultural employment increased in fact by 2.9% over the previous year and growth in self-employed started to outweigh the decrease in dependent employment.

These trends reversed once again in 2010. For the first three quarters of 2010 the agricultural workers numbered around 80 thousand, which is 1.9% less than in the previous year. Dependent employment increased (+7,2%), while self-employment declined (-6,2%). In 2009 women counted for 29.4% of the agricultural employment and this figure has been increasing then. The number of female agricultural workers increased by 19,3%, of which +15,1% in self-employment and +29,2% in dependent employment. Male workers increased instead by 5.6% in 2009. This figure is the result of a great expansion of the self-employment (15.2%), which was however substantially offset by the decrease in the dependent employment (-21,4%).

Figure 2.2.14 Dependent Employment and Self-employed in agriculture (thousand units)
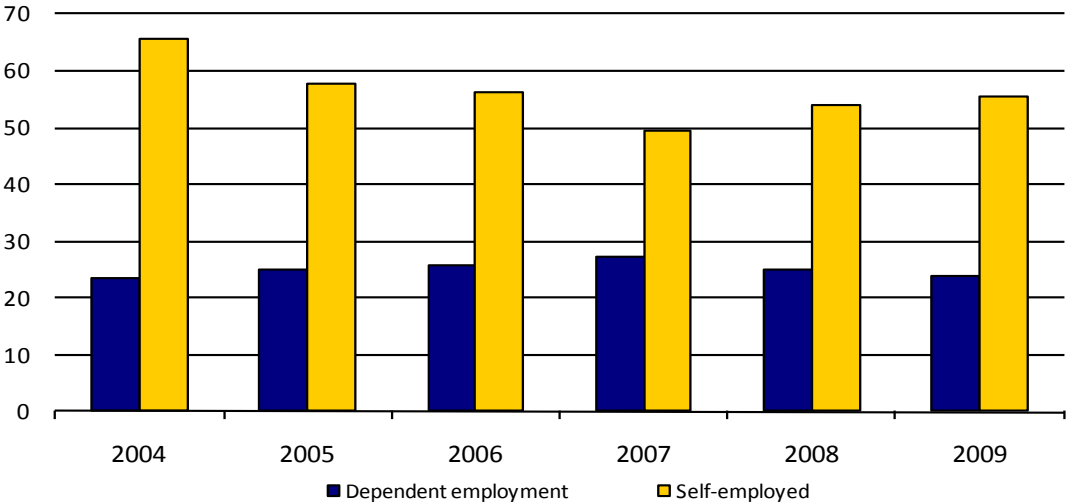
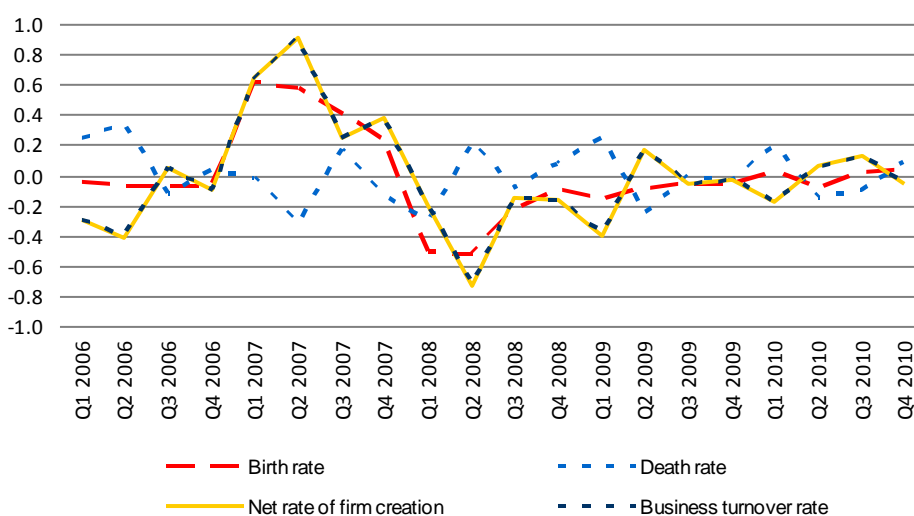Source: our elaboration on ISTAT data – Labor Force Survey

Figura 2.2.15 Dependent Employment and Self-employed in agriculture (Thousand of units)
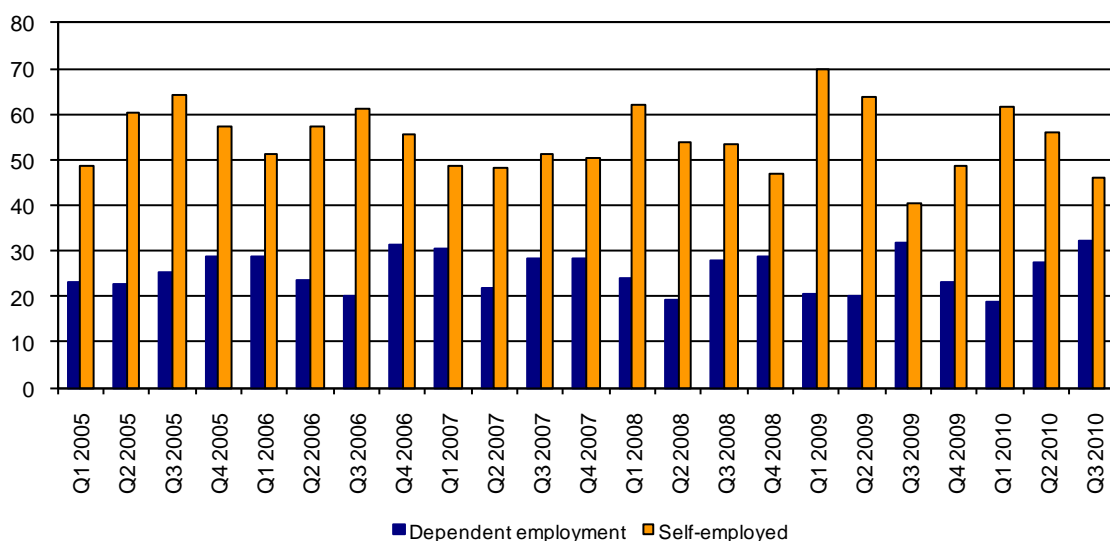
Source: our elaboration on ISTAT data – Labor Force Survey

The agricultural business demography indicators sketch a negative picture of the agricultural sector in Emilia-Romagna. The active firms have been long subject to negative trends due to the high fragmentation of the sector, the aging of the agricultural operators and the marginalization and depopulation of rural areas. At the end of 2010 there were 68.945 farms, which is 1.121 (-6%) less than in 2009. In less than ten years the number of farms reduced by 24% determing a deep restructuring of the regional system.

Figure 2.2.16 Agriculture Business demography indicators (difference over previous year)


Source: our elaboration on Infocamere – Movimprese data

During the crisis all the indicators calculated (Figure 2.2.16) show zero differences with the pre-crisis figures. The crisis seems then to have sort of "freezed" the existing negative patterns which have affected the agricultural system since well before the crisis. Nevertheless, the most recent figures related to 2010, indicate a slow deterioration of the situation: the death rate difference with the previous period is positive, while the business turnover rate and the net rate of firm creation become slightly negative (Figura 2.2.16).

3. Trade trends and structural change in Emilia-Romagna during the crisis - a focus on the manufacturing industry

The most visible effect of the crisis has been the trade collapse. As we have seen in the previous section (Figure 2.2.6), the foreign orders were the first that started to decline between March and May 2007, with the steepest downturn around the third quarter of 2008. Trade data confirm this trend and between the third quarter of 2008 and the second quarter 2010 both import and export flows experienced a deep fall down (Figure 3.1).

Figure 3.1. Trade trends of the manufacturing industry in Emilia-Romagna
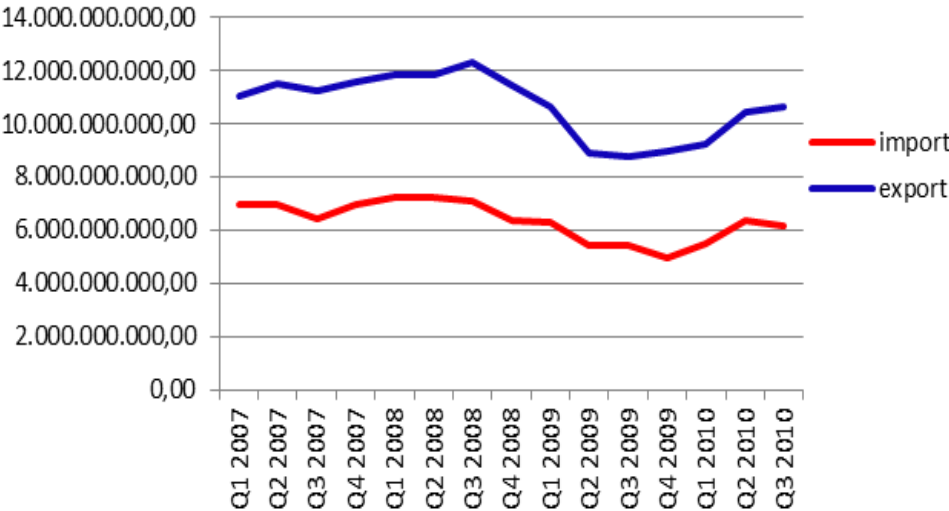
Source: our elaboration on ISTAT-COEWEB data

The recession hit the manufacturing industry more than any other. Within this industry, all sectors have been affected by the trade downfall. It is especially in the second year of the crisis that both imports and exports had their largest reduction, as supported by our calculations of trade annual growth rate by sector (Table 3.1).

From the analysis of trade data, it is not evident any relation between the extent of trade reduction in one sector and the sector's relevance inside the regional economy. In other words, the negative growth performance experienced by the manufacturing sectors during the crisis characterized all sectors of the industry, with no systematic difference across the sectors, depending on their economic relevance.

Table 3.1 Manufacturing Trade by sector - annual trade growth rate (2007-2009)

	Import		Export	
	2007/2008	2008/2009	2007/2008	2008/2009
Food products	5,1%	-6,8%	9,0%	-1,8%
Beverages	-14,7%	6,3%	3,3%	-6,1%
Textiles	-6,9%	-9,1%	-6,1%	-14,7%
Wearing apparel, dressing and dyeing of fur	9,2%	-4,3%	4,5%	-9,4%
Leather, leather products and footwear	-1,8%	-15,8%	6,5%	-19,7%
Wood and products of wood and cork	-10,7%	-29,4%	-7,8%	-28,1%
Paper and paper products	-7,1%	-15,50%	-2,8%	6,8%
Publishing, printing and reproduction of recorded media	97,6%	1,8%	8,2%	-40,4%
Coke, refined petroleum products and nuclear fuel	14,1%	0,00%	32,2%	-16,6%
Chemicals	3,1%	-25,4%	5,4%	-18,3%
Pharmaceuticals	3,9%	9,5%	1,8%	9,7%
Rubber and plastics products	3,6%	-14,7%	0,4%	-15,8%
Other non metallic mineral products	-5,5%	-26,5%	-4,2%	-19,3%
Basic metals	-6,3%	-53,8%	0,00%	-34,1%
Fabricated metal products	8,7%	-35,3%	1,6%	-21,2%
Office, accounting, computing and other electronic machinery; Medical, precision and optical machinery	10,0%	-12,7%	0,1%	-19,4%
Electrical machinery and apparatus, n.e.c.	1,1%	-19,5%	0,2%	-28,3%
Machinery and equipment, n.e.c	0,5%	-35,9%	3,8%	-30,7%
Motor vehicles, trailers and semitrailers	-10,4%	-33,4%	0,1%	-34,9%
Railroad equipment and transport equipment n.e.c	-11,4%	-14,9%	1,9%	-27,8%
Furniture	2,8%	-2,5%	-1,6%	-22,8%
Manufacturing n.e.c.	3,8%	-12,9%	-0,5%	-18,0%

Source: our elaboration on ISTAT-COEWEB data

In Emilia-Romagna there are some manufacturing sectors which are extremely relevant in terms of employment and share of manufacturing exports and it would be interesting to understand whether the crisis had a different impact on them.

Figure 3.2 Classification of manufacturing sectors by employment weight (2007)
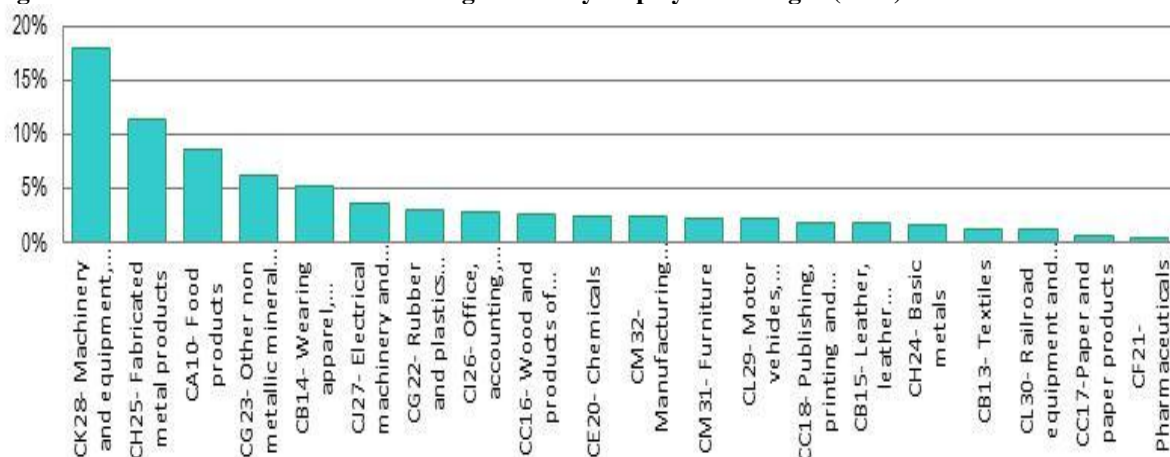
Source: our elaboration on Unioncamere Emilia-Romagna data

In terms of number of employees, the machinery sector, the sector of fabricated metal products and the food sector are the first three sectors (Figure 3.2). The machinery sector is also the first sector in terms of share of manufacturing exports, accounting for over 30 % of the total manufacturing exports of the region in 2007. Among the top exporting sectors of the region there are: "Motor vehicles, trailer and semitrailer" (10.1%), "Other non-metallic mineral products" (8.8%) and "Wearing apparel, dressing and dyeing of fur" (7.1%). The "Food products" and the "Fabricated metal products" are also very important and their share of the manufacturing regional export respectively was about 6% and 3.8% in 2007 (Table 3.2).

Table 3.2 Share of manufacturing export by sector before and during the crisis

|	2007	2009
CK28- Machinery and equipment, n.e.c	33	30,4
CL29- Motor vehicles, trailers and semitrailers	10,1	8,4
CG23- Other non-metallic mineral products	8,9	8,8
CB14- Wearing apparel, dressing and dyeing of fur	7,1	8,6
CA10- Food products	5,9	8
CJ27- Electrical machinery and apparatus, n.e.c.	5,3	4,9
CE20- Chemicals	5,1	5,6
CH24- Basic metals	4,7	3,9
CH25- Fabricated metal products	3,8	3,9
CG22- Rubber and plastics products	2,5	2,7
CM32- Manufacturing n.e.c.	2,3	2,4

Source: our elaboration on ISTAT-COEWEB data

The relative economic weight of these sectors changed during the crisis. The mechanical sector for instance lost relevance in favor of an expanded food sector (Table 3.2). This latter performed during the crisis better than other sectors also with respect to "job loss"[15] (almost 0%), thus confirming its countercyclical behavior. All the other sectors - except the pharmaceutical- recorded in fact negative employees growth rates, ranging from -10% to -2% (Figure 3.3).

Looking at the negative performances of the manufacturing sectors' trade flows and of employment data, it is still not sufficient to understand whether the crisis had an impact on the structure of specialisation of Emilia-Romagna, neither to infer its long-term and short-term effects. For this reason we decided to complement our analysis by studying the structure of the "relative comparative advantages" of the region and its evolution in the short and in the long run, through the use of the Lafay Index of specialisation.

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[15] calculated as growth rate of employees

Figure 3.3 Classification of manufacturing sectors by "job loss" (number of employees growth rate between 2009 and 2007)
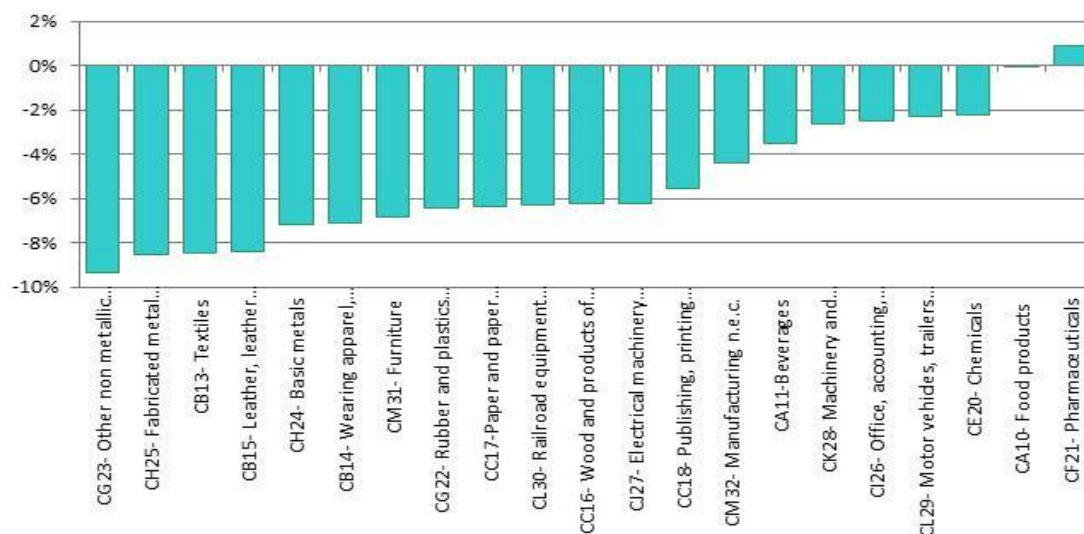
Source: our elaboration on Unioncamere Emilia-Romagna data

3.1 The relative comparative advantages of the manufacturing industry in Emilia-Romagna

The construction of the Lafay Index of specialisation stands on the economic arguments of the comparative advantage. According to the economic theory, a country will produce those goods it is able to produce at lower opportunity cost and will import the rest. A country will then specialize in certain sectors, whose exports embody its comparative advantage. As a consequence, it is customary to study the structure of comparative advantages by using the Balassa Index (1965), which captures the country's ability to export by comparing its exports to the ones of a larger economic area. With the increased fragmentation of the production at global level, the final products are however the result of an intensified international exchange of intermediate goods within the same industry. Therefore, single flow indicators such as the Balassa Index might not be the most appropriate measures and were recognized to have a considerable number of limitations (Iapadre 2001; Boffa, Bolatto, Zanetti 2009).

The Lafay index (1992) represents an alternative. It belongs to the category of bilateral trade intensity indicators, which accounts for the increased intra-industry trade when measuring the specialisation of a country. The key variable entering the LAFAY formula is the trade balance. The normalized net-exports of each sector is compared to the normalized

trade balance of the whole industry and then it is aggregated according to the weight of each sector over the total trade of the industry. This procedure makes possible to determine the contribution of each sector to the trade balance of the industry. If the contribution is positive, the Lafay Index will be positive, indicating a "relative comparative advantage" (or specialisation) in that sector; if negative, it will instead indicates de-specialisation (see Annex B).

To assess the nature of the specialisation and reveal the relationship between specialisation and technological content of the production we used the cumulative Lafay Index. This index was constructed by summing up the sectors' Lafay Indexes ordered by increasing technology intensity (see Annex B). This analysis aims at highlighting an economy's structural strengths and weaknesses in terms of technological intensity.

We calculated the Lafay Indexes for all the sectors of the manufacturing industry in Emilia-Romagna and compared the structure of specialisation given by the cumulative Lafay Index with that of Lombardia and Toscana.

We also wanted a dynamic outlook of the regional specialisation. That's why we proceeded to the same set of calculations for different years, ranging from 2000 to 2009. We thus obtained a snapshot of the evolution of the regional specialisation in the last ten years and along the crisis.

3.2 A long-term overview of the evolution of regional specialisation in Emilia-Romagna, Toscana and Lombardia

Emilia-Romagna is characterized by a structure of the relative comparative advantages driven by the sectors in the central-right part of the distribution (Figure 3.4). The shape of the cumulative Lafay Index recalls in fact the typical model of medium-high technology-intensity specialisation identified by the literature (see Annex B). Proceeding left-to-right, the Lafay index becomes more and more negative till it touches the lowest point corresponding to the sector of "CH24- Basic metals"; then, it pickes at positive values thanks to the Lafay Index of the Machinery sector; ultimately decreases towards zero with some positive values for the "Railroads equipment" sector and the "Electrical machinery and apparatus".

The specialisation model of Emilia-Romagna is quite stable in a long-term perspective. There is evidence of some changes occurred in the more traditional sectors such

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as the "Wearing Appareal" and the "Leather" sectors, however there is a general tendency of the model towards the stability.

It is interesting to notice how the crisis managed to have an impact on the mechanical sector, which slightly declined.

**Figure 3.4 The structure of specialisation in the manufacturing industry of Emilia-Romagna**
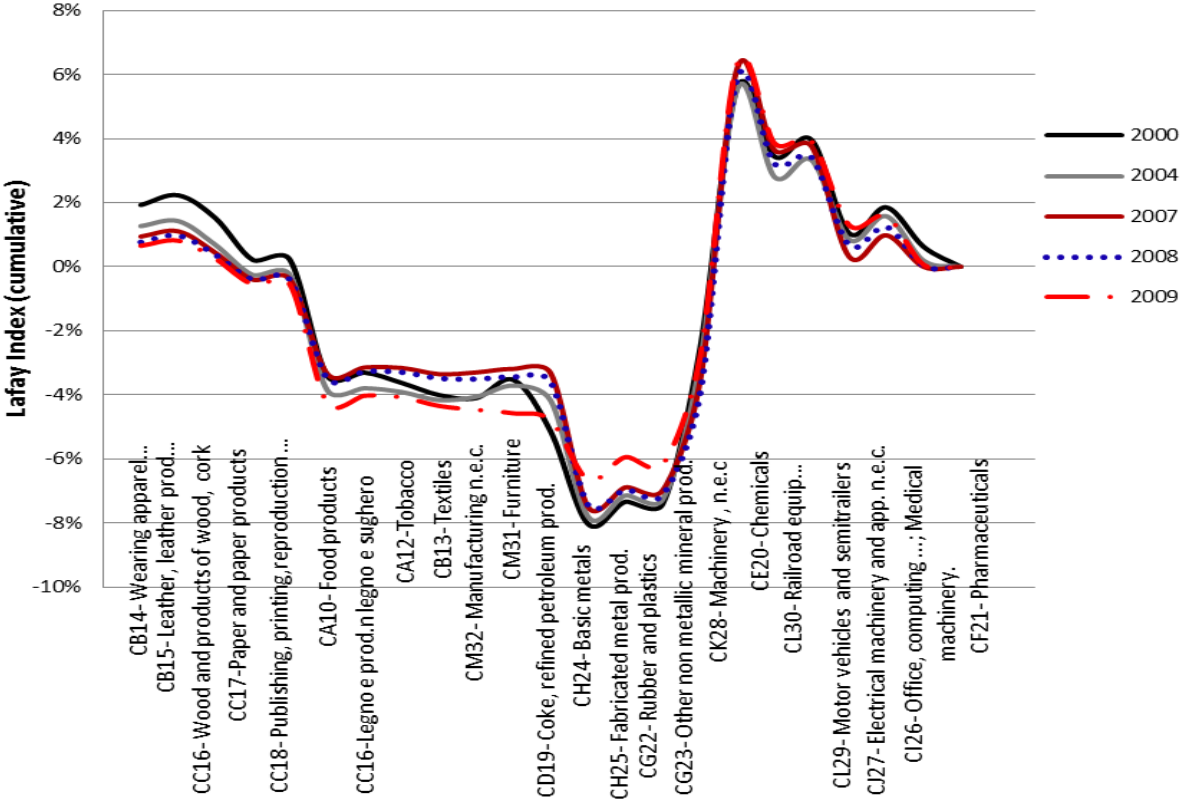
Source: our elaboration on ISTAT-COEWEB data

Toscana is characterized by a completely different specialisation model. Its shape indicates that here the manufacturing industry is specialized in a more traditional low-technology type of production dominated by a few sectors more or less referring to the Wearing apparel industry and its sub-components (i.e. leather and textiles). Also the "Manufacturing n.e.c." sector, which encompasses among others the production of jewelry, is highly important for Toscana (Figure 3.5).

The comparative advantages of this region have been progressively eroded since 2000. The area under the cumulative Lafay index has constantly reduced over time, supporting the well-known assumption that traditional sectors are the ones that generally suffer more from the low-cost competition and imitation.

Figure 3.5 The structure of specialisation in the manufacturing industry of Toscana
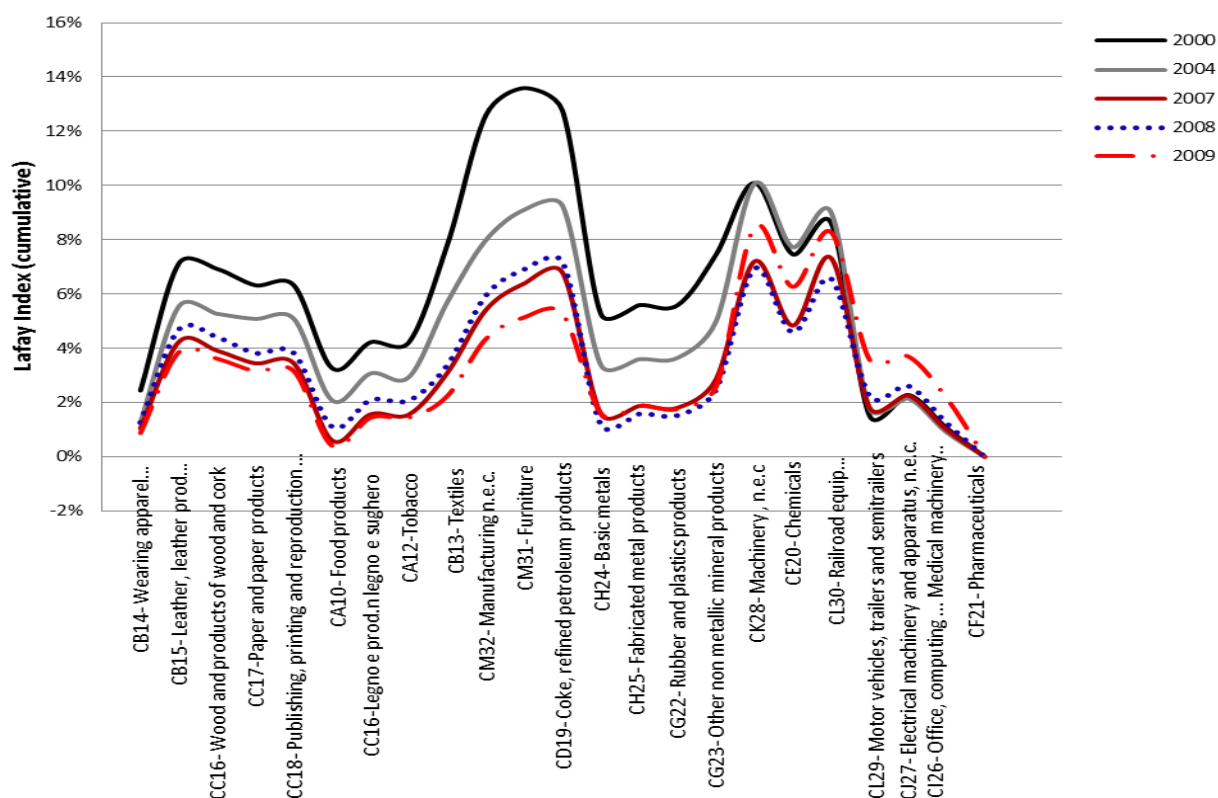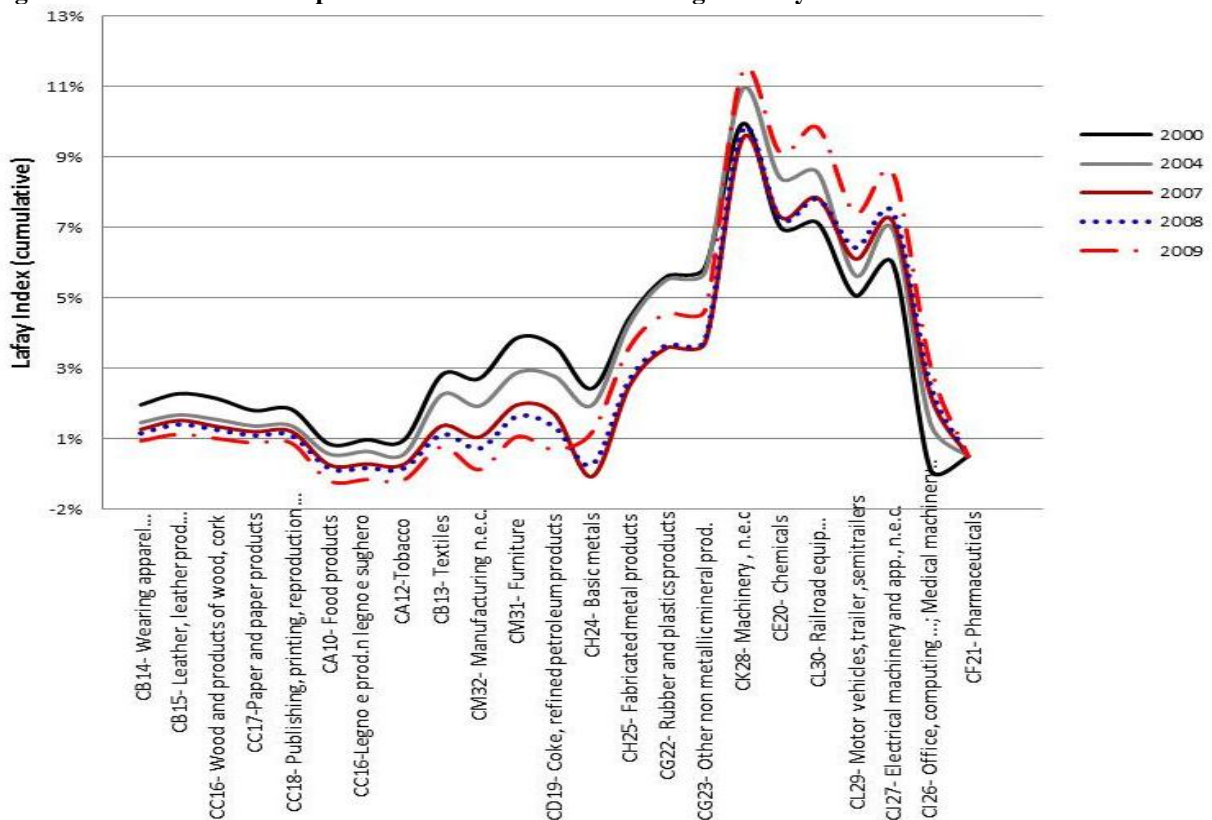

Source: our elaboration on ISTAT-COEWEB data

It is worth noting the behavior of the index in correspondence to the sectors with higher-technology content. Till 2004 these sectors maintained their comparative advantage, holding a considerable share of the exports of the region. Then they lost importance, but during the crisis they showed some resilience, performing somehow better than the rest of the manufacturing industry.

The specialisation model of Lombardia is shifted towards medium and medium-high-technology-intensity sectors and the pattern is quite stable across time (Figure 3.6). A process of de-specialisation occurred since 2000 in all the sectors at lower technology intensity. The most striking deterioration of the comparative advantages occurred in the Wearing Apparel and Textile sectors.

The crisis just confirmed this historical trend of deterioration of the comparative advantages for the low-tech production and the lower vulnerability of higher-technology-intensity production to shock in the short-term as well as in the long-term.

Figure 3.6 The structure of specialisation in the manufacturing industry of Lombardia
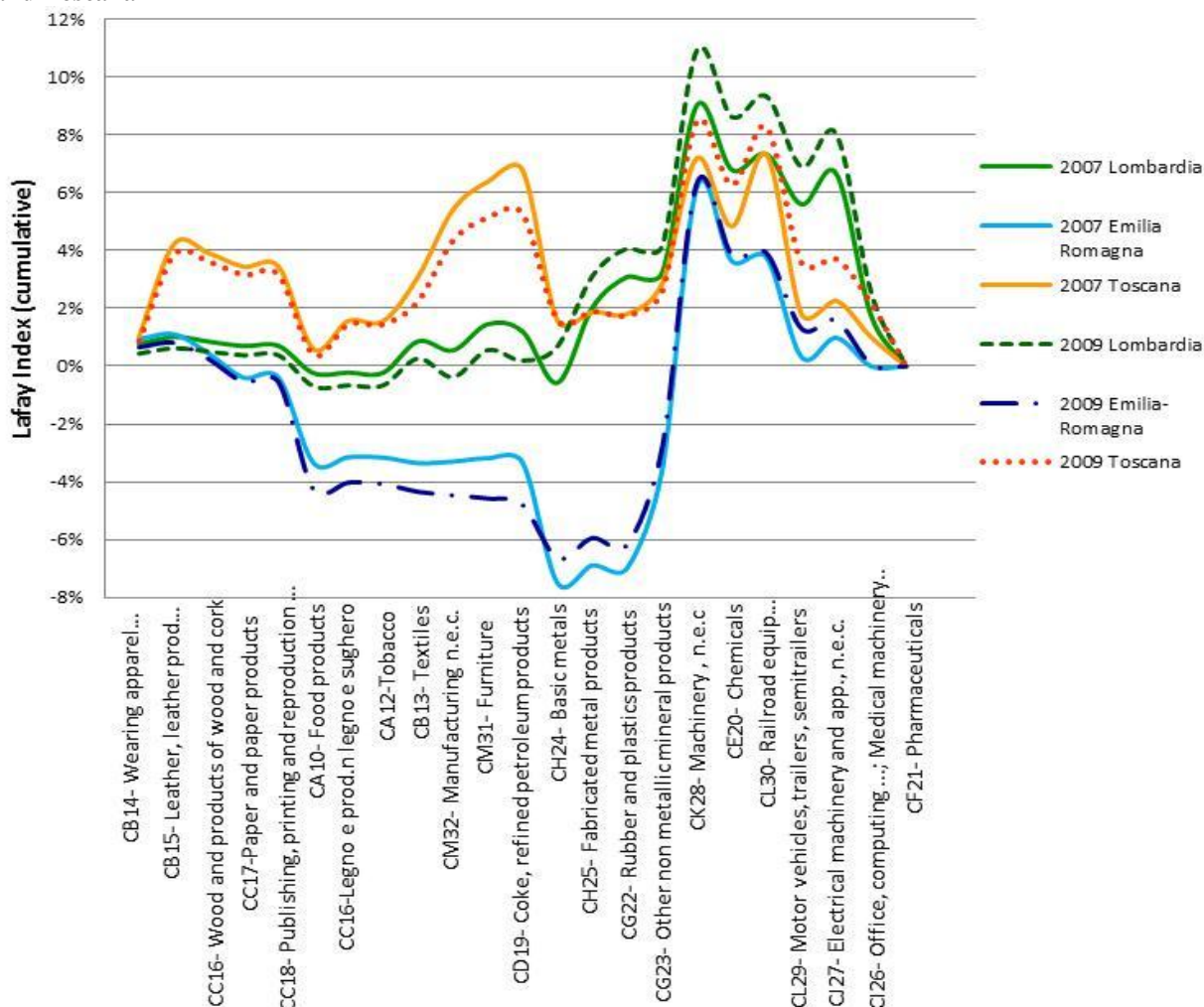

Source: our elaboration on ISTAT-COEWEB data

3.3 What about the Crisis?

The crisis had different impacts depending on the sector and on the region we look at (Figure 3.7). Emilia-Romagna preserved its structure of comparative advantages in the last ten years, however the crisis hit hard on its leading sector of specialisation. The restructuring occurred since 2000 mainly interested the low-technology intensity sectors, while the mechanical sector remained the leading specialisation of the regional economy. With the crisis being prevalently channeled through a fall in the foreign demand, the mechanical sector catalyzed the harder effects of the recession, diminishing for the first time its relative comparative advantage. The recent increase of machinery exports and the long-term stability characterizing its comparative advantages this sector offer positive elements to prospect no long-lasting effects of the crisis on the structure of specialization of Emilia-Romagna.

Figure 3.7 Changes in the regional specialisation in the time of the crisis. Emilia-Romagna, Lombardia and Toscana

Source: our elaboration on ISTAT-COEWEB data

Lombardia and Toscana experienced instead a further restructuring of the more traditional low-tech sectors, which is in line with the historical deterioration of their comparative advantages. In these two regions the crisis opened up some opportunities for reflecting on the role of the medium-high technology intensity sectors inside the regional economy. The latter showed lower vulnerability and higher degrees of resilience.

A common consideration to the three regions is that the crisis caused unprecedented changes in the pattern of regional comparative advantages. The novelty is not much in the extent of the change generated but more in the nature of the change, which rebalanced the roles and the potential of higher technology intensity sectors. Whether the changes occurred will be persistent it still a big unknown. Surely, future assessments of the trade specialisation will help clarifying this point.

4. Conclusions

The regional specialisation in the aftermath of the crisis: Structural change or conjunctural impasse?

The crisis had pervasive effects on the regional economic systems in Italy. The nature of the impact varied across the regions and economic sectors, depending on their structure of specialization and competitiveness.

Emilia Romagna is characterized by a balanced model of specialization which is centered on the manufacturing industry but benefits from a relevant degree of specialization also in the agricultural sector. The systemic interdependency between the primary and secondary sectors plays a great role for the stability of the system. Our analysis highlighted the severe effects of the crisis on the manufacturing industry and the simultaneous countercyclical behavior of the agricultural sector and the agri-food industry.

One of the strengths in Emilia-Romagna is the specialization in the medium-high technology intensity manufacturing sectors, that are less exposed to low-cost foreign competition and imitation. Contrary to other regions where low-tech production was prevalent, Emilia-Romagna was therefore able to maintain the structure of comparative advantages in the long run.

The stability of this specialization model was however disrupted by the crisis. The higher exposure to the foreign markets turned out to be a weakness in the time of the crisis, when the international economy experienced a deep fall in the demand. As a consequence the sectors more export-oriented experienced the hardest effects of the crisis, among those the mechanical sector, one of the leading specialization of the manufacturing industry in Emilia-Romagna.

The labor market in Emilia-Romagna has experienced the most negative and long-lasting effect of the crisis, despite the fact that pre-crisis regional labour market statistics were more favourable than in other regions. There are still no signs of recovery, although less negative trends characterize the indicators of regional employment in the third quarter of 2010.

Data regarding the access to the Wage Guarantee Funds are impressive but there is no evidence about whether this social shock absorber helped the productive system to overcome the recession or it ultimately led to the restructuring of the manufacturing sector. This

situation might have as result either the reintegration of the dismissed labour force or a permanent cleavage in the socio-economic network. To foster the recovery of employment and the revitalization of the regional economy, it is now the biggest challenge of the economic policy.

Specialisation Indexes in the Italian regions

A.1   Construction of 6 indexes calculated on 8 economic sectors

I1= Value Added Specialisation Index

I2= Full-Time Equivalent Units Specialisation Index

I3= Value Added / Full-Time Equivalent Units

I4= Number of Active Firms/ Resident Population

I5= Value Added Concentration Index

I6= Full-Time Equivalent Units Concentration Index

$$I_1 = \frac{VA_{\sec tor}^{region} / VA_{total}^{region}}{VA_{\sec tor}^{Italy} / VA_{total}^{Italy}}$$

$$I_2 = \frac{FTE_{\sec tor}^{region} / FTE_{total}^{region}}{FTE_{\sec tor}^{Italy} / FTE_{total}^{Italy}}$$

$$I_3 = \frac{(VA_{\sec tor}^{region} / FTE_{\sec tor}^{region}) / (FTE_{total}^{region} / FTE_{total}^{region})}{(VA_{\sec tor}^{Italia} / FTE_{\sec tor}^{Italy}) / (VA_{total}^{Italy} / FTE_{total}^{Italy})}$$

$$I_4 = \frac{(FRM_{\sec tor}^{region} / POP_{\sec tor}^{region}) / (FRM_{total}^{region} / POP_{total}^{region})}{(FRM_{settore}^{Italia} / POP_{settore}^{Italia}) / (FRM_{total}^{Italy} / POP_{total}^{Italy})}$$

$$I_5 = \frac{VA_{\sec tor}^{region}}{VA_{\sec tor}^{Italy}}$$

$$I_6 = \frac{FTE_{\sec tor}^{region}}{FTE_{\sec tor}^{Italy}}$$

VA: value added
FTE: full-time equivalent units
FRM: active firms
POP: resident population

   Data come from the Regional accounts (ISTAT). We constructed a pre-crisis scenario using the 2005-2006-2007 data. For every variable we took the average of the three annual

observations. For every Italian Region we calculated the 6 indexes referring to 8 economic sectors.

A.2   Standardization of the indexes

We used the Fischer and Schornberg's methodology (2007):

$$Is = \frac{I_{region}^{\sec tor} - I_{\min}^{total}}{I_{\max}^{total} - I_{\min}^{total}}$$

Through standardization it was possible to compare sectoral specialisation across Italian regions.

The Lafay Index (1992)

$$IS_i = \left[\frac{x_j^i - m_j^i}{x_j^i + m_j^i} - \frac{\Sigma_j x_j^i - \Sigma_j m_j^i}{\Sigma_j x_j^i + \Sigma_j m_j^i}\right] \times \left[\frac{x_j^i + m_j^i}{\Sigma_j x_j^i + \Sigma_j m_j^i}\right] \times 100$$

This index measures the intra-industry trade comparing the net trade balance of a particular product class "i" with the total net trade balance of the economy under assessment and multiplying it for the weight of the trade flows of product "i" over the total trade flows. The index varies between -1 and 1. When positive it indicates specialisation; whereas a negative value stands for de-specialisation.

The Cumulated Lafay Index

Various versions have been proposed to visualize the structure of the comparative advantages of a certain economic area. The most common analysis consider the relation existing between the intensity of the technological content of the production and the ability of a country to export such production – thus referring to the theory of Comparative Advantages.

A way to do that is through the cumulated Lafay index, which will determine in which sectors a country/region/province is specialized by cumulating the values of the index for each sector following a pre-established order. Should our interest be directed to the technology intensity, we will have to cumulate the index according to the classification of sectors by technology content.

Below it is reported the formula used for the calculation of the Lafay cumulated index and the table of reference (B2) for the classification of sectors by technological content.

$$IS^c{}_j = \sum_{k=1}^{j} \left[\frac{x_k^i - m_k^i}{x_k^i + m_k^i} - \frac{\Sigma_j x_k^i - \Sigma_j m_k^i}{\Sigma_j x_k^i + \Sigma_j m_k^i}\right] \times \left[\frac{x_k^i + m_k^i}{\Sigma_j x_k^i + \Sigma_j m_k^i}\right] \times 100$$

Table B2 Classification of manufacturing sectors by increasing technology intensity

Placement	Technology Intensity	Sectors
1	LT	CB14- Wearing apparel, dressing and dyeing of fur
2	LT	CB15- Leather, leather products and footwear
3	LT	CC16- Wood and products of wood and cork
4	LT	CC17-Paper and paper products
5	LT	CC18- Publishing, printing and reproduction of recorded media
6	LT	CA10- Food products
7	LT	CA11-Beverages
8	LT	CA12-Tobacco
9	LT	CB13- Textiles
10	LT	CM32- Manufacturing n.e.c.
11	LT	CM31- Furniture
12	MLT	CD19- Coke, refined petroleum products and nuclear fuel
13	MLT	CH24- Basic metals
14	MLT	CH25- Fabricated metal products
15	MLT	CG22- Rubber and plastics products
16	MLT	CG23- Other non-metallic mineral products
17	MHT	CK28- Machinery and equipment, n.e.c
18	MHT	CE20- Chemicals
19	MHT	CL30- Railroad equipment and transport equipment n.e.c
20	MHT	CL29- Motor vehicles, trailers and semitrailers
21	MHT	CJ27- Electrical machinery and apparatus, n.e.c.
22	HT	CI26- Office, accounting, computing and other electronic machinery; Medical, precision and optical machinery
23	HT	CF21- Pharmaceuticals

Source: F. Boffa, S. Bolatto, G. Zanetti (2009). Data on R&D spending and value added by sector coming from the OECD Science Technology and Industry Scoreboard 2007.

The possible outcomes of this type of assessment are reported in Figure B.1. Each of them represents a possible graph that will result from the representation in XY of the Lafay cumulated index.

Figure B.1 – The four reference models of trade specialisation and structure of comparative advantages

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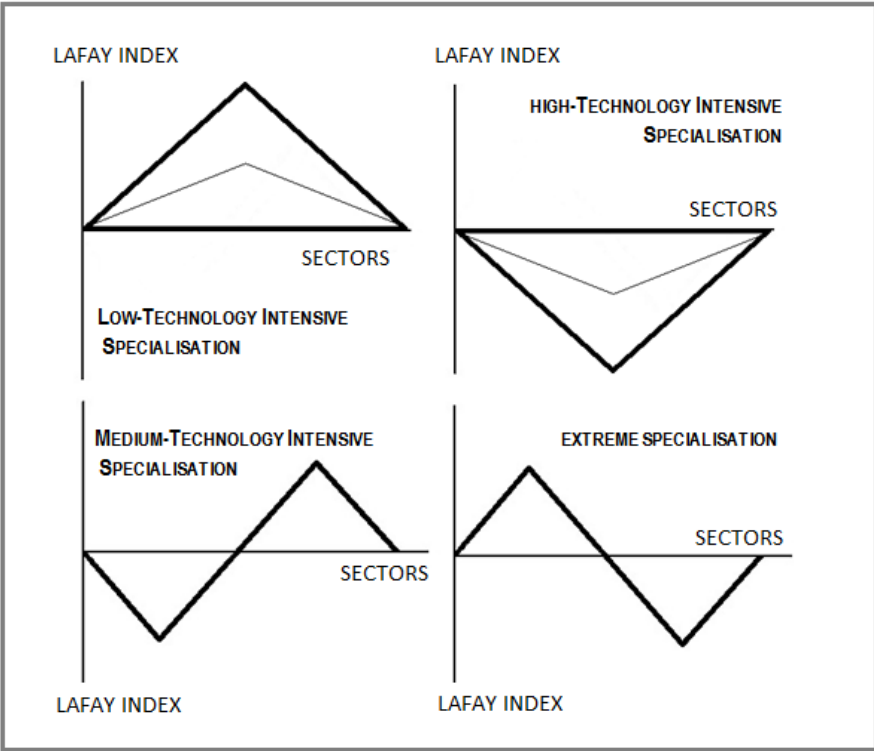
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