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The geographical structure of industrial specialization in Italy (1951 – 2011)

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abstract

This article seeks to provide a contribution to the literature on the evolution of manufacturing specialization by analyzing Italian regional production over the period 1951-2011. To this end, we start from the previous paper conducted by Cainelli and Stampini (2002; 2015) to create a dataset by making the most of seven different census data records on the Italian Industry released periodically by the National Statistics Institute (ISTAT) and compare data on the number of employees for 15 manufacturing sectors. Our analysis shows that regional specialization persists over time particularly in the Italian central area and in some regions of the North and South of Italy, while diversification and dispersion are observed in the rest of Italy.

JEL Classification: *N14, R11, O14*

Keywords: Manufacturing specialization; Italian regions, industrial diversification

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1. Introduction

Regional specialization is a topic which still arouses interest and receives an extensive amount of attention among economic historians and economists since Italian economic system is characterized by (i) structural change, (ii) economic diversity (Paci and Pagliaru, 1997; Ciccarelli and Proietti, 2013; Felice, 2018) and (iii) the presence of numerous specialized local production systems (Becattini et al. 1990, Schilirò, 2008; Cutrini, 2010; Lazzeretti, Boix and Capone, 2010). The existence of a specialized productive structure has been interpreted as a signal of localization economies, conversely, the presence of differentiated productive structures has been seen as a signal of urbanization economies. In the first hypothesis, knowledge spillovers and/or the diffusion of innovative activities occur between companies operating in the same productive sector, generating intra-industry externalities. In addition, the productive specialization can explain the concentration of an industry in a geographical area and therefore the growth of the local system (Cainelli and Leoncini, 1999). In the second hypothesis, these phenomena originate within a specific sector and spread to other industries of the same local system. In this case, the variety of the productive structure generates agglomerative processes and therefore stimulates its development through the exchange of ideas, information, and competences across the different sectors of the local system. (Cainelli et al., 2001).

Several studies have explored both the level of industrial concentration and diversification and have investigated the increase in industrial production, competitiveness and economic development (Zamagni, 1994; Cainelli et al., 2001; Cainelli and Stampini 2002; 2015; Giannetti Vasta, 2006; Ciccarelli and Proietti, 2013; Felice, 2018). In this context and using the biplots statistical technique, Ciccarelli and Proietti (2013) show that in the early 1870s, the difference between Northern and Southern Italy was not evident and the specialization towards "high-tech" manufacturing sectors of some industrial provinces such as Milan and Turin were marginal. However, still according to Ciccarelli and Proietti's paper, the geographical structure of industrial specialization changed significantly at the beginning of World War I, thus bringing out a North-South specialization gap.

In addition, to investigate the dual development of Italy, Felice (2018) distinguishes four phases in the history of regional inequality: (i) the liberal age characterized by slight divergence; (ii) the fascism age with strong divergence; (iii) the Golden Age (1951-1971) marked by general convergence, and finally (iv) the "two Italies" during the years 1971-2011. During the first two periods three macro-areas prevail -North-West; North-East and Center; South and Islands-; during the economic miracle they became two areas namely Center-North and South and Islands.

Through our paper we seek to contribute to this research stream in two ways. First, following the papers of Cainelli et al. (2001) and Cainelli and Stampini (2002; 2015), and overcoming the standardization issues of the information provided by the different Italian industry censuses carried out during the period 1951-2011 by the National Statistics Institute (ISTAT), we investigate the evolution of the pattern of specialization/diversification of Italian manufacturing at regional level. Second, by exploiting data on sectoral activities at the regional level, we intend to highlight which are the main sectors that have contributed to changes in specialization in Italian manufacturing over the period 1951-2011. The data show that the productive specialization is mainly located in the Center-Northeast of Italy, but this does not imply that local productive systems or localized growth processes cannot be found in the South.

The paper is structured as follows: the second section concerns (i) the standardization problems related to the use of different industrial censuses and (ii) the data used in our analysis. The third section describes the results of the analysis related to the processes of structural change and productive specialization; the last section concludes the paper. The Appendix contains the tables related to the number of manufacturing employment at regional and sector level.

2. The sources of data

To depict the evolution of the regional manufacturing employment in Italy during the period 1951-2011, we employ a dataset constructed exploiting information included in the Italian Industry Census released periodically by the National Statistics Institute (hereinafter ISTAT). In the construction of our database, particular attention is paid to the issues of comparability over time of the different ATECOs. To bridge these issues, we have based our work on previous studies carried out by Cainelli and Stampini (2002; 2015) on the regional distribution of manufacturing employment over the period 1911-1991. Differently from Cainelli and Stampini (2002; 2015), we focus on the period 1951-2011. To obtain standardized information on economic activities we also use the classification ATECO 1951 as a reference since ATECO 1951 is characterized by a higher level of aggregation. Then we have reconciled the ATECO 2002¹ and ATECO 2007² classifications with the ATECO 1951.

Our analysis is at regional level, the regions under consideration are 18, we aggregate the Aosta Valley to the Piedmont and the Molise to the Abruzzo. So, the data employed in this study gives information on the Italian manufacturing employment that covers 7 years, 15 sectors, and 18

¹ ATECO 2002 is the Italian version of the European classification NACE Rev.1.1. We employ ATECO 2002 to explore the regional manufacturing employees in 2001.

² We use ATECO 2007 to examine the distribution of manufacturing employment at regional level in 2011. ATECO 2007 is the Italian version of the European classification NACE Rev.2, this latter derives from the UN classification level (ISIC Rev.4).

regions. To measure the level of specialization we employ an index that allows us to have information on the changes of the economic structure of the Italian regions over time. Specifically, using this index, a region could be considered specialized in a specific industry when it shows high proportions of total employment at the national level in the same industry. The industrial specialization index is estimated by comparing the share, in terms of employees, of the sector in each geographic area with the same share of that sector quantified at the national level and can be defined in the following way:

$$Spec_i^k = \frac{l_{ik}/l_i}{l_k/l}$$

where l_{ik} is the number of employees in a sector k of a region i , l_i is the employment level in the region, l_k stands for the total of employees in the sector at national level and finally l identifies the total amount of employees at national level.

To observe the structural changes in the evolution of the Italian manufacturing sectors we investigate the evolution of manufacturing employment in Italy and split the data at territorial and sectoral level to test the differences. Finally, in order to describe the specialization for geographical area (northern, central and southern regions)³, we only focus on a few specific sectors.

3. Manufacturing specialization over time

Considering the evolution of the Italian manufacturing employment (Table 1), the period 1950-1970 was characterized by the *economic boom* and stronger employment growth (Felice, 2018). During these years and following the Perroux theory (1955) based on the growth pole concept, state-owned enterprises invested in manufacturing, services and telecommunications (Posner and Woolf, 1967; Bottiglieri, 1984). Finsider in the steel sector with the Italsider in Taranto, Alfasud in the mechanic sector localized in Pomigliano d'Arco (Cerrito, 2010) and Eni in the energy sector are considered positive examples of Italian government institution decision to address public financial resources in Southern Italy to develop this area and its local production system. A part of literature (Osti, 1993; Balconi, Orsenigo and Toninelli, 1995) considers that companies' success

³ We classify the 18 regions in the following way:

Northern Region: Piedmont and Aosta Valley, Lombardy, Liguria, Trentino-Alto Adige, Veneto, Friuli-Venezia Giulia and Emilia-Romagna;

Central Region: Tuscany, Umbria, Marche and Lazio;

Southern Region: Abruzzo and Molise, Apulia, Campania, Basilicata, Calabria, Sicily, and Sardinia.

in the local system is mainly due to entrepreneurial skills rather than to state funding and policy maker decisions

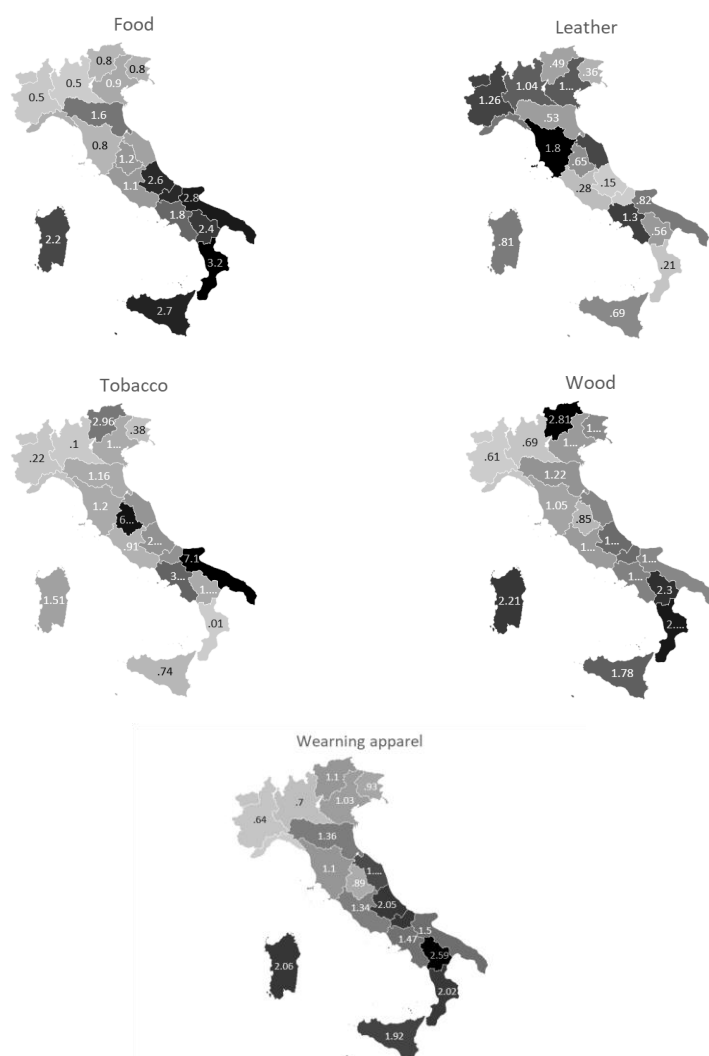
Table 1: Manufacturing employment in Italy

Sectors	1951	1961	1971	1981	1991	2001	2011
Food	360,058	396,947	370,426	431,872	396,584	361,255	332,054
Other	53,559	100,189	160,351	205,470	202,651	233,497	279,184
Paper	63,449	84,208	93,509	99,430	88,598	84,212	73,801
Chemicals	199,811	272,211	325,645	323,642	283,595	243,254	219,953
Cinema-photo	11,069	21,670	23,613	31,357	36,388	48,813	34,544
Editorial industry	74,499	110,212	139,448	182,706	191,311	169,959	130,249
Rubber	40,127	52,448	84,568	86,263	117,766	116,210	104,207
Wood	293,570	381,251	396,594	444,710	406,278	389,905	427,618
Machinery	896,891	1,377,449	1,921,169	2,436,283	2,215,950	2,205,871	1,775,720
Metallurgic ind.	145,071	182,433	245,648	252,439	178,283	163,470	143,719
Non-metallic	206,668	318,731	328,891	335,660	278,208	550,554	199,815
Leather	38,557	49,897	56,811	82,570	76,414	68,147	57,421
Tobacco	52,496	26,561	21,135	18,769	17,625	7,834	467
Textile	650,866	598,565	542,626	494,916	373,933	283,087	174,877
Wearing	411,547	513,390	588,499	675,197	639,386	479,416	408,617
Total	3,498,238	4,486,162	5,298,933	6,101,284	5,502,970	5,405,484	4,362,246

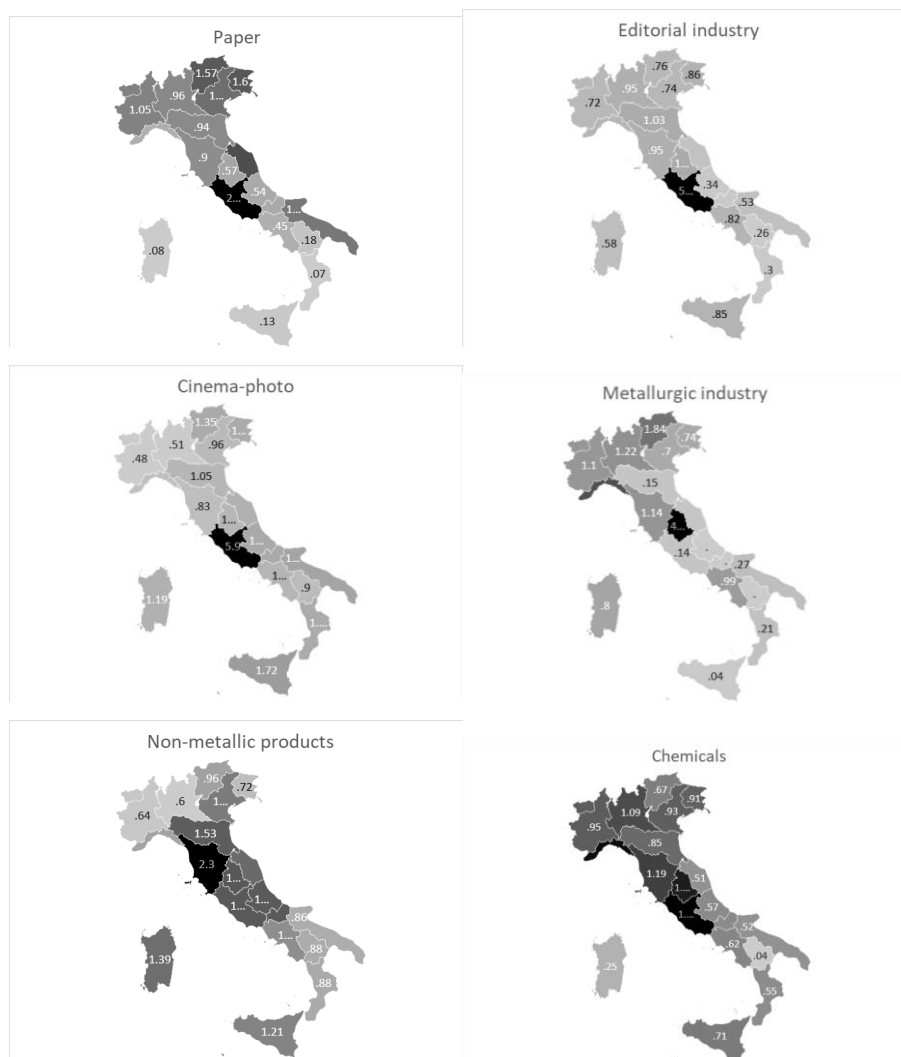
Source: Cainelli and Stampini, 2002 and our elaboration on ISTAT data 2001 and 2011

During the 1950s the presence of productive specialization and polarization in Southern Italy is the most relevant aspect when looking at the sectoral analysis (Brusco and Paba, 1997). Figures from 1 to 5 show the manufacturing specialization in this area: food in Calabria (3.1), Apulia (2.8), Sicily (2.7), Abruzzo (2.6) and Molise (2.6); leather in Campania (1.2); tobacco in Apulia (7.1)⁴; wearing apparel in Basilicata (2.5), Calabria (2.0) and Apulia (1.5), wood in Calabria (2.5) and Basilicata (2.2).

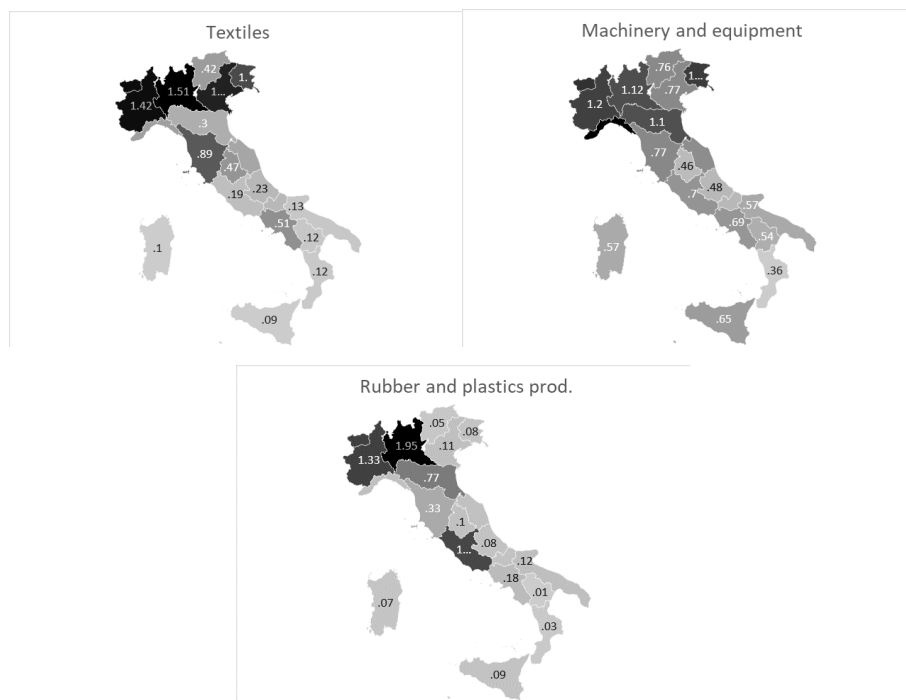
⁴ The tobacco specialization during the 1950s is a peculiar case since the State had the public monopoly of production from 1862 and the law established where to localize the industrial production (Ciccarelli and Proietti (2013).

Figures 1-5: Manufacturing specialization in the South of Italy during the 1950s

The regions of Central Italy, on the contrary, are specialized in the creative industry (Figures 6-8). In fact, the most polarized sectors in Lazio are paper, editorial industry, cinema-photo activities with a specialization index of 2.7, 5.2 and 5.9, respectively. In addition to being specialized in the creative industry, the central regions of Italy, in particular Lazio and Umbria are also specialized in the chemical sector, (Fig.11), Umbria region in tobacco and metallurgic industry too (Fig.3 and 9) and finally Toscana in leather and non-metallic products (Fig. 2 and 10).

Figures 6-11: Manufacturing specialization in the Centre of Italy during the 1950s

In Northern Italy, textiles, machinery and equipment, rubber, and plastic products (Figures 12-14) are the most polarized sectors together with leather, wood (especially Trentino has a specialization index of 2.8), paper and chemicals.

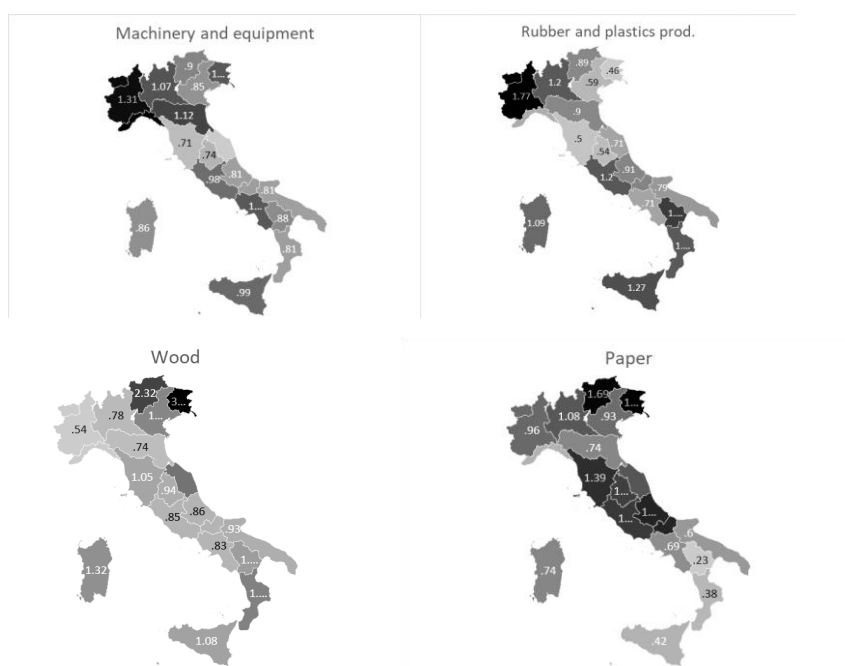
Figures 12-14: Manufacturing specialization in the North of Italy during the 1950s

In sum, during the 1950s it seems that the polarization was working and it appears to be a certain level of convergence of the South of Italy towards those of the Center-North. However, despite during the 1970s the total Italian manufacturing employment increases, Apulia is specialized in the metallurgic industry and Campania in mechanical industry (Cerrito, 2010), during the 1970s, we witness the decade of the stagflation crisis (Felice, 2012), some social, political and industrial change in the Italian regions and areas. In addition, although the Italian industry in those years (from the 1970s to the 1980s) experienced radical changes and it has not been able to catch up with the emerging wave of innovations in the ICT and related sectors.

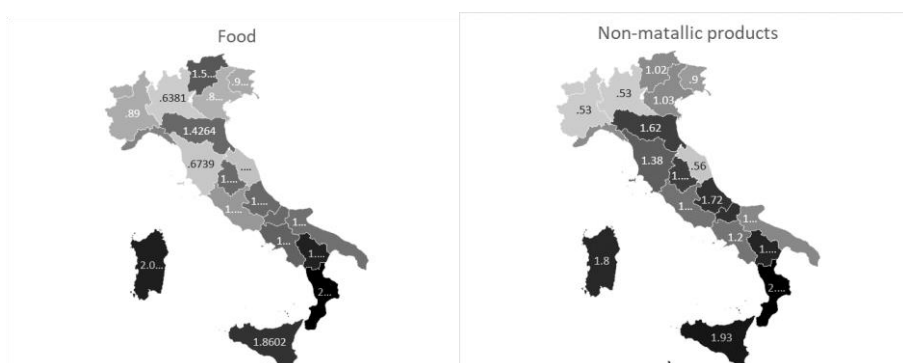
Also, during the “Silver and “Bronze” ages (Felice, 2018: 3), the total number of manufacturing employment persists considering the data at national level, different is the situation if we observe the industrial specialization at regional level. In the 1990s, the increase in the industrial privatization was driven by the idea that state ownership was a failure because of its negative impact on the state budget (Giannetti and Vasta, 2006) and during these years the number of employees decreased. In particular, the reduction in the textile sector is balanced by an increase in employment in the machinery sector: the textile sector decreases from 650,866 employees in 1951 to 373,933 in 1991, while machinery activity increases from 896,891 to 2,215,950 employees in the same period. Figure 15 shows how mechanical specialization is particularly high in Northwest Italy and the production gap is evident with the South, which remains specialized in traditional sectors (Figures 19 and 20). The only exception is the chemical industry, whose production is concentrated in Sicily and Sardinia (Figure 21). This change could also be due to

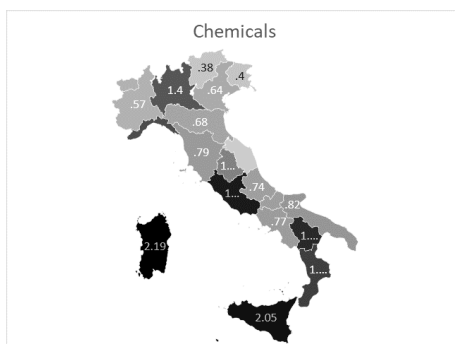
the use of the 1951 classification as our reference, which does not take into account the change in the composition of the macro-aggregates occurred in the 1991 classification. In other words, from 1951 to 1991 mechanical activities had significantly changed, incorporating sectors that were not considered in 1951 (Cainelli and Stampini, 2002). Also, the rubber and plastics products are concentrated in the North-West, while the North-East is specialized in wood and paper industry (Figures 15-18).

Figures 15-18: North-West and North-East specialization during the 1990s



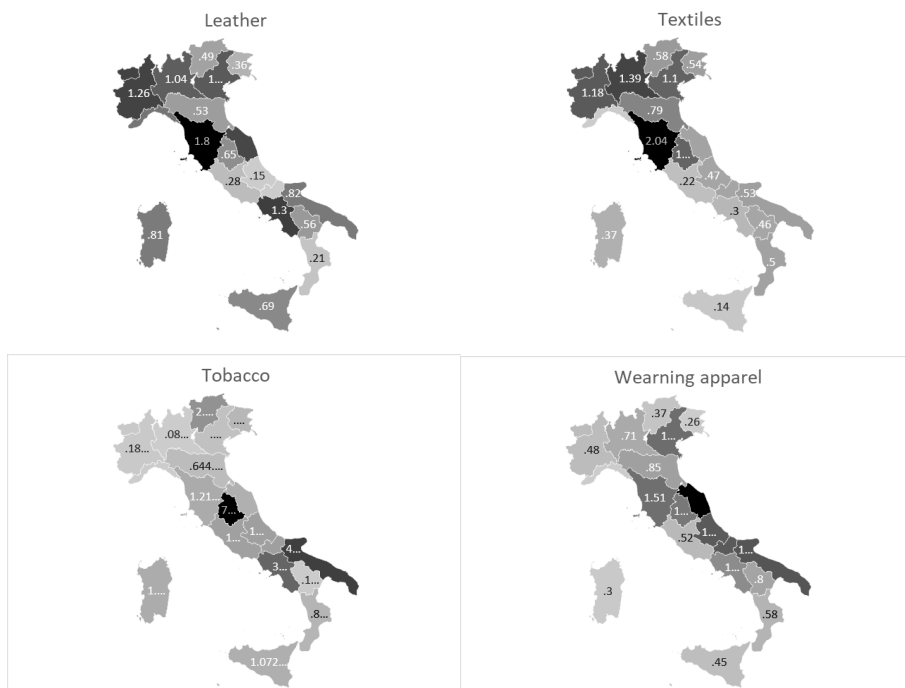
Figures 19-21: Manufacturing specialization in the South of Italy during the 1990s





In the Italian central regions, the level of industrial concentration at sectoral level is increasing (Figures 22-27). Specifically, in 1991 the activities of the leather and textile in Tuscany reach high levels of specialization equal to 3.7 the first and 2.0 the second, respectively. In addition, the tobacco production reaches in Umbria a level of specialization equal to 7.1 and the wearing apparel in Marche arrives to 3.0.

Figures 22-27: Manufacturing specialization in the Centre of Italy during the 1990s





In sum, a change of direction in the specialization index can be observed from the 1990s particularly in the South and in the North of Italy, while the manufacturing specialization in the Central area is high and diversified.

During the 2000s, the Italian economy was affected by different shocks: the globalization, the introduction of the euro and the ICT diffusion (Di Giacinto et al., 2013). In addition, three crises must be considered: (i) the Twin Towers terroristic attack on September 11th, 2001; (ii) the financial crisis that exploded in 2008; (iii) and the European sovereign debt crisis in the years 2010-2011 (Accetturo et al., 2011). All these events have had a significant impact on the Italian production reduction, on the related growth of unemployment during the years 2001 and 2011 and on the change in the manufacturing specialization.

In this context and considering our results related to the year 2011, the traditional market appears stagnant specifically in the North and in the South of Italy, and the sectors of specialization are considerably reduced (Figures 28-30 for the North of Italy and Figures 31-33 for the South of Italy). Only few regions such as Friuli, Piedmont, Lombardy, Apulia, Calabria, Sicily and Sardinia remain specialized in traditional sectors. Differently, productive specialization persists in the regions of Central Italy (Figures 34-44). Specifically, in the Centre of Italy productive specialization is diversified throughout the manufacturing sector and is characterized by trends that are stable over time.

4. Final remarks

The aim of this study was to investigate the main sectors that have contributed to the changes in the specialization of Italian manufacturing by using ISTAT census data for the period 1951-2011. We have used a dataset by standardizing seven censuses and using ATECO 1951 as the reference classification because of the changes in the classification of economic activities during the time. Thus, we have obtained uniform information. Hence, we have studied the evolution of specialization in the Italian manufacturing activities for sectors and areas during the years 1951-2011.

The analysis shows that during the 50's the levels of specialization and polarization of the South of Italy reached those of the Center-North, the situation, in the contrary, changes after the 70's since this specialization of the South begins to dissolve. In addition, the context has changed again during the 1990s and the 2000s, when the Italian economy was affected by different shocks. This was reflected in a higher unemployment rate in 2001 and 2011 and in a reduction of production specialization in several sectors. These results are particularly evident in both the North and South of Italy where the sectors of specialization are considerably reduced.

At the same time, we find that the long-term evolution of the manufacturing specialization is mainly characterized by strong specialization in the traditional sectors with low and medium technology capacity, and high degree of industrial concentration specially in the Italian central area.

This means that in the central regions the process of the Italian productive specialization prevails, while the North and the South of Italy are affected by industrial diversification and dispersion. This change of direction could be explained as the result of the relocation of large companies, particularly in the Northwest, or as a form of productive decentralization.

Clearly, although the data we presented must be interpreted considering some limitations arising from the data source and standardization criteria, this paper attempts to provide an explanation of the evolution of manufacturing specialization at both territorial and sectoral level. Future research could consider the data provided in our study and develop further analyses.

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Appendix

Table A.1: Manufacturing employment in Piedmont and Aosta Valley

Sectors	1951	1961	1971	1981	1991	2001	2011
Food	31709	35860	35871	42172	40727	36430	34502
Tobacco	1927	890	534	392	379	7	46
Leather	7905	7784	4813	4053	3,320	1259	641
Textiles	150230	132309	95483	73654	50957	38831	22585
Wearing apparel	43124	48457	48127	44834	35346	21950	14300
Wood	29027	33844	27898	27882	25447	21728	53828
Paper	10899	14335	14307	13409	9780	8161	6134
Editorial industry	8824	13184	16305	19128	17574	17429	11514
Cinema-photo	878	1375	1542	2201	2456	3086	2237
Metallurgic industry	26008	41169	49041	46158	28875	25424	19197
Machinery and equipment	188486	285035	395201	415398	336127	290541	233080
Non-metallic products	21665	29569	23341	20100	16953	14832	13166
Chemicals	30853	32686	35596	25706	18578	18309	16942
Rubber and plastics products	8724	13939	25090	24951	24163	22444	17514
Other	8256	15861	28329	29293	24301	23355	23945
Total	568515	706297	801478	789331	634983	543786	469631

Source: Cainelli and Stampini (2015) from 1951 to 1991 and our elaboration on ISTAT data 2001 and 2011

Table A.2: Manufacturing employment in Lombardy

Sectors	1951	1961	1971	1981	1991	2001	2011
Food	55704	69674	75046	72326	65568	57301	55762
Tobacco	1659	1132	704	596	377	2	.
Leather	12879	15134	14268	15279	13053	6838	5624
Textiles	315220	262886	204173	173188	135096	101927	63741
Wearing apparel	92135	120193	132185	130945	118052	78010	73567
Wood	64934	87668	85125	90138	81855	69030	79882
Paper	19643	27965	29611	28546	24732	19173	17135
Editorial industry	22657	39843	52315	68050	65047	53841	39082
Cinema-photo	1824	4109	5197	8018	8875	10776	7897
Metallurgic industry	56718	76967	87307	78891	56834	54117	48151
Machinery and equipment	321616	496966	633244	716415	612018	573787	438777
Non-metallic products	39940	57071	50352	45908	38095	328222	26839
Chemicals	70288	110150	127317	118583	103138	91995	79636
Rubber and plastics products	25189	26297	33388	24795	36561	35665	33594
Other	23965	49144	65944	69873	66468	71041	82374
Total	1124371	1445199	1596176	1641551	1425769	1551725	1052061

Source: Cainelli and Stampini (2015) from 1951 to 1991 and our elaboration on ISTAT data 2001 and 2011

Table A.3: Manufacturing employment in Trentino Alto Adige

Sectors	1951	1961	1971	1981	1991	2001	2011
Food	3632	4693	5212	5494	8551	7754	8782
Tobacco	2023	1041	839	609	509	261	.
Leather	244	190	235	385	298	122	50
Textiles	3576	2560	3516	2933	2998	1830	988
Wearing apparel	5882	5259	5549	4045	3299	2065	2237
Wood	10712	11590	9671	13149	13081	12755	12190
Paper	1297	1170	1731	2126	2075	2359	1830
Editorial industry	732	1047	1545	2275	3342	3292	3209
Cinema-photo	195	335	315	341	472	574	539
Metallurgic industry	3478	5553	6079	5415	3324	2000	2174
Machinery and equipment	8913	13904	22319	29621	27697	31860	25082
Non-metallic products	2587	3113	3014	3333	3949	4300	3815
Chemicals	1753	1802	2366	2611	1504	2092	2582
Rubber and plastics products	26	133	584	623	1459	1222	942
Other	452	769	1760	3371	3770	4145	5194
Total	45502	53159	64735	76331	76328	76631	69614

Source: Cainelli and Stampini (2015) from 1951 to 1991 and our elaboration on ISTAT data 2001 and 2011

Table A.4: Manufacturing employment in Veneto

Sectors	1951	1961	1971	1981	1991	2001	2011
Food	25936	32776	31815	34848	40940	35538	30968
Tobacco	4774	3793	1581	885	1004	508	.
Leather	3163	6407	9930	14113	14001	16194	12874
Textiles	63394	51789	57138	54033	50358	33080	19367
Wearing apparel	32222	50067	77489	108603	120428	86213	72163
Wood	25722	40632	56294	72526	72245	74636	64860
Paper	6323	8684	9017	10301	10076	11725	11335
Editorial industry	4219	7502	11077	16000	17477	17171	14319
Cinema-photo	810	1419	1747	2076	2717	2598	2076
Metallurgic industry	7734	4	13540	13155	14441	15290	16683
Machinery and equipment	52364	98082	150571	219990	231772	277583	226238
Non-metallic products	20171	37519	37020	39354	35264	34664	27437
Chemicals	14257	19971	24149	25931	22236	21097	17825
Rubber and plastics products	346	1218	2530	6267	8475	8678	10672
Other	5546	8750	13785	24179	33737	46648	54257
Total	266981	377954	497683	642261	675171	681623	581074

Source: Cainelli and Stampini (2015) from 1951 to 1991 and our elaboration on ISTAT data 2001 and 2011

Table A.5: Manufacturing employment in Friuli Venezia Giulia

Sectors	1951	1961	1971	1981	1991	2001	2011
Food	7637	8835	9261	8011	9040	7559	6317
Tobacco	520	797	451	352	355	9	.
Leather	365	593	779	1444	1319	693	319
Textiles	17015	13020	12464	6984	5034	3577	1207
Wearing apparel	10060	10810	8111	6482	4181	2625	2919
Wood	10204	15032	22857	30380	32292	32697	25494
Paper	2670	3015	3265	3990	3815	3158	2484
Editorial industry	1685	1972	2301	2804	3478	3366	2531
Cinema-photo	389	538	590	738	1076	844	692
Metallurgic industry	2803	3837	5346	6324	5029	5537	5383
Machinery and equipment	29028	36824	54431	64808	58284	63050	55167
Non-metallic products	3924	6183	7429	7091	6231	6523	5579
Chemicals	4768	4898	4633	3949	2807	2636	2454
Rubber and plastics products	82	131	458	673	1343	2111	1639
Other	726	861	1947	2312	3148	6585	7946
Total	91876	107346	134323	146342	137432	140970	120131

Source: Cainelli and Stampini (2015) from 1951 to 1991 and our elaboration on ISTAT data 2001 and 2011

Table A.6: Manufacturing employment in Liguria

Sectors	1951	1961	1971	1981	1991	2001	2011
Food	14023	12222	10548	9374	9561	9098	8883
Tobacco	875	456	203	0	29	34	.
Leather	1490	1306	871	667	298	104	63
Textiles	11958	6311	4252	2549	749	544	435
Wearing apparel	10544	10775	8572	6169	3326	1944	1711
Wood	8957	9238	7928	6299	4389	3777	8984
Paper	1350	2159	1812	1433	733	834	576
Editorial industry	2653	3125	3208	3615	3685	2686	1967
Cinema-photo	388	654	613	813	913	874	771
Metallurgic industry	16657	20446	20064	15782	6710	4203	2648
Machinery and equipment	64094	65507	66293	75762	59290	46982	35635
Non-metallic products	8782	10234	8678	7100	5574	4050	3205
Chemicals	14633	16288	15704	12996	8392	5653	5204
Rubber and plastics products	212	581	814	806	1515	1803	1208
Other	1266	1752	3776	3858	3608	2968	4387
Total	157864	161054	153336	148223	108772	85554	75677

Source: Cainelli and Stampini (2015) from 1951 to 1991 and our elaboration on ISTAT data 2001 and 2011

Table A.7: Manufacturing employment in Emilia Romagna

Sectors	1951	1961	1971	1981	1991	2001	2011
Food	34755	52255	49472	94347	56494	48227	34972
Tobacco	3620	2239	1672	1529	1135	647	.
Leather	1215	3273	3764	6074	5246	3363	2204
Textiles	11666	24490	34771	39620	29339	18515	11081
Wearing apparel	33435	45791	48377	54798	54208	41451	37215
Wood	21421	34817	36020	36790	29874	28502	29824
Paper	3567	4988	5856	6319	6541	6475	5751
Editorial industry	4596	6942	10246	14281	16723	16412	12686
Cinema-photo	694	1312	1721	2327	2919	3384	2683
Metallurgic industry	1263	2014	4992	7832	7898	10511	9802
Machinery and equipment	59085	115285	174327	254609	247980	270582	232954
Non-metallic products	18832	33525	53840	62416	44988	48669	34709
Chemicals	10113	19347	19993	21102	19390	18860	20497
Rubber and plastics products	1848	3507	3767	4028	10581	10551	9280
Other	2506	5373	13906	18949	16264	20379	29309
Total	208616	355158	462724	625021	549580	546528	472967

Source: Cainelli and Stampini (2015) from 1951 to 1991 and our elaboration on ISTAT data 2001 and 2011

Table A.8: Manufacturing employment in Tuscany

Sectors	1951	1961	1971	1981	1991	2001	2011
Food	19498	21259	20170	20285	20703	19966	18665
Tobacco	4304	3452	2241	1334	1653	889	239
Leather	4754	8594	12622	21614	21926	24888	24903
Textiles	39749	62342	71430	83538	59034	48759	28891
Wearing apparel	31026	56201	81227	96412	74798	58383	74804
Wood	21043	34660	40860	40855	32933	29334	25563
Paper	3899	6406	8819	9451	9522	10604	10292
Editorial industry	4847	6425	7002	9089	10050	8854	6610
Cinema-photo	627	1015	1092	1456	1635	1671	1526
Metallurgic industry	11296	12102	16048	19181	10767	7944	6371
Machinery and equipment	47360	75180	99752	133248	121619	126143	101627
Non-metallic products	32629	46104	41537	37986	29663	22937	15487
Chemicals	16374	17287	18339	19791	17285	15596	14955
Rubber and plastics products	909	1808	2449	2466	4597	5018	4243
Other	1588	3442	8122	12260	10112	12112	14468
Total	239903	356277	431710	508966	426297	393098	348644

Source: Cainelli and Stampini (2015) from 1951 to 1991 and our elaboration on ISTAT data 2001 and 2011

Table A.9: Manufacturing employment in Umbria

Sectors	1951	1961	1971	1981	1991	2001	2011
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Food	5454	6475	8843	9650	8474	7340	7010
Tobacco	4409	657	695	432	1908	532	7
Leather	325	566	356	435	388	249	276
Textiles	3973	4662	6786	8907	6211	5879	4683
Wearing apparel	4726	4987	8094	15715	13551	9503	8073
Wood	3221	4317	5603	6692	5806	7119	6823
Paper	468	407	716	1805	1699	1687	1643
Editorial industry	1033	1744	1896	1835	2360	2682	2124
Cinema-photo	150	185	218	273	0	787	438
Metallurgic industry	7917	4211	7407	8685	5071	4213	4208
Machinery and equipment	5377	9393	14189	23354	24833	28421	23692
Non-metallic products	4182	5817	6593	8755	6840	6999	5246
Chemicals	3827	6143	5726	5856	4349	2191	1834
Rubber and plastics products	53	149	252	368	967	935	1222
Other	39	129	563	1809	1059	1483	2498
Total	45154	49842	67937	94571	83812	80020	69777

Source: Cainelli and Stampini (2015) from 1951 to 1991 and our elaboration on ISTAT data 2001 and 2011

Table A.10: Manufacturing employment in Marche

Sectors	1951	1961	1971	1981	1991	2001	2011
Food	6698	7352	8264	9934	10306	9665	8719
Tobacco	1809	973	652	757	677	312	56
Leather	846	1034	1699	4684	4224	2959	2277
Textiles	4166	4365	6575	7919	6683	4611	3810
Wearing apparel	13522	21371	39967	71267	69281	58460	43869
Wood	7195	12674	19785	27377	24874	27292	24141
Paper	1968	2088	2684	3433	3516	4068	3364
Editorial industry	682	955	1246	2131	3312	3873	3312
Cinema-photo	239	377	396	613	701	1040	898
Metallurgic industry	301	296	895	2081	1830	3318	2565
Machinery and equipment	11899	18546	29613	48115	52890	72105	58864
Non-metallic products	5240	8328	8404	7999	5683	5855	4807
Chemicals	1830	2348	2888	3529	3481	3712	4531
Rubber and plastics products	77	350	1735	2762	3016	3654	4032
Other	6173	6667	8503	11644	8921	11720	14300
Total	62645	87724	133306	204245	199395	212644	179545

Source: Cainelli and Stampini (2015) from 1951 to 1991 and our elaboration on ISTAT data 2001 and 2011

Table A.11: Manufacturing employment in Lazio

Sectors	1951	1961	1971	1981	1991	2001	2011
Food	15790	18256	19406	21082	20299	18733	16504

Tobacco	1826	1951	1520	1676	1365	690	22	
Leather	409	514	1152	1395	926	620	619	
Textiles	4629	5868	8538	7907	4062	2757	2347	
Wearing apparel	21052	21535	26155	20807	16141	9758	7860	
Wood	12846	17359	19065	19672	16756	12862	15531	
Paper	6716	6817	7397	7269	5629	4156	3074	
Editorial industry	14953	17291	20694	26153	25346	18414	13916	
Cinema-photo	2500	6271	5534	5955	5823	13765	6819	
Metallurgic industry	802	1294	2124	3623	4148	3479	2366	
Machinery and equipment	24047	45177	79384	118927	105367	93597	79363	
Non-metallic products	12310	17443	17742	19410	16493	14109	11770	
Chemicals	13151	16387	20972	25154	26840	24590	23438	
Rubber and plastics products	1942	2048	6102	7038	6884	5168	3577	
Other	890	1925	3731	6857	11277	8185	10280	
Total	13386	3	180136	239516	292925	267356	230883	197486

Source: Cainelli and Stampini (2015) from 1951 to 1991 and our elaboration on ISTAT data 2001 and 2011

Table A.12: Manufacturing employment in Abruzzo and Molise

Sectors	1951	1961	1971	1981	1991	2001	2011
Food	13851	10192	9762	12780	13726	12786	10847
Tobacco	1573	312	722	547	703	43	.
Leather	85	167	1307	3041	3871	2452	1444
Textiles	2202	2888	3210	4106	4287	5617	4642
Wearing apparel	12403	12191	13598	21217	27992	21987	13840
Wood	7126	7400	7231	8824	8515	9021	11100
Paper	501	1438	1255	2395	3165	3843	3030
Editorial industry	367	570	718	1415	2219	2629	2102
Cinema-photo	226	404	348	535	533	625	640
Metallurgic industry	8	297	771	2007	2243	2885	2837
Machinery and equipment	6348	8619	16284	38975	43984	55143	45233
Non-metallic products	4713	8077	11523	13179	11693	10546	8427
Chemicals	1668	1196	1821	3210	5145	4498	4109
Rubber and plastics products	49	208	278	1428	2626	3255	3311
Other	257	923	858	3092	3733	5512	6936
Total	51377	54882	69686	116751	134435	140842	118498

Source: Cainelli and Stampini (2015) from 1951 to 1991 and our elaboration on ISTAT data 2001 and 2011

Table A.13: Manufacturing employment in Campania

Sectors	1951	1961	1971	1981	1991	2001	2011
Food	32745	43113	27204	33035	27572	29547	26252
Tobacco	9559	4624	6179	5540	3012	1896	97

Leather	2489	2965	4132	7932	6319	6912	5387
Textiles	16403	10913	9381	8463	5208	3956	3328
Wearing apparel	30169	36729	33748	40474	33546	32230	24599
Wood	20753	21756	18152	19070	15910	12786	23980
Paper	1419	1850	2475	2921	2849	3964	3939
Editorial industry	3058	3740	4367	5841	7043	6267	5164
Cinema-photo	591	1035	1240	1967	2670	2670	2283
Metallurgic industry	7184	10398	13007	13765	6905	4758	3673
Machinery and equipment	30755	44098	78593	125214	109332	99205	79572
Non-metallic products	11488	18001	19330	18564	15696	13073	9346
Chemicals	6140	9729	12317	12844	10216	7361	6938
Rubber and plastics products	353	808	1479	2134	3925	5212	4815
Other	1084	3069	5544	10288	8048	6600	9752
Total	174190	212828	237148	308052	258251	236437	209125

Source: Cainelli and Stampini (2015) from 1951 to 1991 and our elaboration on ISTAT data 2001 and 2011

Table A.14: Manufacturing employment in Apulia

Sectors	1951	1961	1971	1981	1991	2001	2011
Food	30648	26194	21143	21810	22152	20073	20630
Tobacco	11258	2818	2313	3199	3577	1418	.
Leather	958	566	325	552	508	851	509
Textiles	2544	5834	11546	10780	8180	7671	4956
Wearing apparel	18691	23385	25945	31432	48927	44057	24456
Wood	12007	14214	13522	16082	15552	21981	22548
Paper	2282	1539	2059	2230	2203	2146	1539
Editorial industry	1194	1794	2279	4047	4860	4541	3881
Cinema-photo	508	806	1011	1405	1755	2161	1674
Metallurgic industry	1180	2000	16049	25261	17238	14132	12863
Machinery and equipment	15475	20737	37614	69869	73652	65793	53918
Non-metallic products	5341	10679	12792	14336	12085	10643	9166
Chemicals	3115	2233	6529	7972	9572	5391	4031
Rubber and plastics products	151	392	2533	4031	3809	4046	3256
Other	305	519	1278	3121	2599	3135	5377
Total	105657	113710	156938	216127	226669	208039	168804

Source: Cainelli and Stampini (2015) from 1951 to 1991 and our elaboration on ISTAT data 2001 and 2011

Table A.15: Manufacturing employment in Basilicata

Sectors	1951	1961	1971	1981	1991	2001	2011
Food	3954	3108	2800	3228	3783	4056	3692
Tobacco	282	110	101	119	9	2	.
Leather	98	65	21	69	32	79	4

Textiles	365	722	822	936	826	650	589
Wearing apparel	4820	4090	2982	2403	2453	1941	623
Wood	3043	2296	1341	1724	2248	4779	5835
Paper	52	40	171	50	99	163	159
Editorial industry	86	120	168	300	527	616	483
Cinema-photo	45	99	118	183	277	344	222
Metallurgic industry	0	3	294	426	416	597	711
Machinery and equipment	2192	2323	4567	8462	9310	16625	14413
Non-metallic products	819	1159	1500	2394	2428	2557	1898
Chemicals	32	160	3230	4065	2461	955	435
Rubber and plastics products	2	28	50	227	781	980	704
Other	8	7	271	551	713	1147	901
Total	15798	14330	18436	25137	26363	35491	30669

Source: Cainelli and Stampini (2015) from 1951 to 1991 and our elaboration on ISTAT data 2001 and 2011

Table A.16: Manufacturing employment in Calabria

Sectors	1951	1961	1971	1981	1991	2001	2011
Food	17214	12327	8324	9389	7859	7330	7050
Tobacco	9	18	17	132	137	113	.
Leather	124	43	105	286	170	124	72
Textiles	1139	2543	2420	2266	1634	1534	490
Wearing apparel	12608	10154	5768	3550	3280	2612	1505
Wood	11345	8738	5104	5999	5391	4579	3436
Paper	67	325	220	339	294	279	167
Editorial industry	340	529	577	1047	1378	1622	1734
Cinema-photo	225	344	367	466	652	632	632
Metallurgic industry	451	651	678	1048	955	567	480
Machinery and equipment	4954	5565	8995	14961	15820	17931	14323
Non-metallic products	2770	5200	5251	6340	5161	4494	4049
Chemicals	1671	1718	2274	3571	4023	1409	1080
Rubber and plastics products	20	231	488	675	1231	1119	928
Other	50	286	132	488	395	523	1303
Total	52987	48672	40720	50557	48380	44868	37249

Source: Cainelli and Stampini (2015) from 1951 to 1991 and our elaboration on ISTAT data 2001 and 2011

Table A.17: Manufacturing employment in Sicily

Sectors	1951	1961	1971	1981	1991	2001	2011
Food	33464	25340	19680	17450	20772	20614	22557
Tobacco	1344	886	474	670	532	296	.
Leather	923	540	322	394	393	256	113
Textiles	2070	3702	4897	3954	1526	1215	765

Wearing apparel	27373	24828	18636	14497	8135	4921	3650
Wood	18076	18427	14211	15312	12354	10630	9043
Paper	279	806	1434	1802	1042	993	989
Editorial industry	2178	2773	2654	4017	5013	4407	4029
Cinema-photo	659	1121	1207	1738	2205	2254	1926
Metallurgic industry	202	494	824	1860	1559	1449	1500
Machinery and equipment	20251	29724	45636	67043	61866	54298	41405
Non-metallic products	8647	15629	14279	16532	15104	12759	10530
Chemicals	4879	9292	16024	18469	16339	11175	9952
Rubber and plastics products	119	482	2132	2687	4209	3162	2504
Other	425	522	1617	3275	3897	7012	4449
Total	120889	134566	144027	169700	154946	135441	113412

Source: Cainelli and Stampini (2015) from 1951 to 1991 and our elaboration on ISTAT data 2001 and 2011

Table A.18: Manufacturing employment in Sardinia

Sectors	1951	1961	1971	1981	1991	2001	2011
Food	7346	7016	7605	6657	10057	9238	9942
Tobacco	725	412	237	0	264	175	.
Leather	285	156	110	153	122	184	42
Textiles	567	1361	5224	3179	1751	2134	972
Wearing apparel	7755	6567	3969	1547	2442	1306	1226
Wood	5938	6589	5927	5939	6756	6397	4556
Paper	49	176	680	1611	828	424	360
Editorial industry	395	656	850	678	1877	1857	1586
Cinema-photo	121	271	357	252	709	728	591
Metallurgic industry	1069	697	1182	945	4040	3046	2107
Machinery and equipment	4647	6484	10156	11512	24109	22225	16377
Non-metallic products	2628	5080	6266	4863	6308	5322	4339
Chemicals	459	576	5767	8303	7839	5734	3510
Rubber and plastics products	25	138	439	304	1624	1187	766
Other	23	190	285	250	601	947	1508
Total	32032	36369	49054	46193	69327	60904	47882

Source: Cainelli and Stampini (2015) from 1951 to 1991 and our elaboration on ISTAT data 2001 and 2011