Regional resilience and the role of cooperative firms

Regional Resilience and the Role of Cooperative Firms[§]

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Abstract

Purpose - We investigate the impact of cooperative firms on the patterns of regional economic resilience in Italy from 2008 to 2019.

Methodology - We use regional statistics to compute indices of resilience for both real GDP per capita and employment during both recovery and resistance periods. By means of a linear model, we investigate the relationships between indices of resilience and the cooperative presence, while controlling for a set of demographic, social and economic variables.

Findings - We show that during (and after) recessions such regional indices exhibit very different patterns, with notably poorer performance observed in Southern regions compared to the rest of the country. Furthermore, we illustrate that the size of the cooperative employment improves the overall resilience of regional employment, especially during recovery periods.

Originality/value - We are first in relating territorial resilience and the presence of a type of companies. We perform the analysis at the regional level regarding cooperative enterprises. Our new findings hint at some policies enhancing the strength and scope of the cooperative movement.

Keywords Regional economies, Macroeconomic shock, Employment, Cooperative movement

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1. Introduction

Resilience has become an extremely fashionable term in recent years, well far away from the original meaning of the word. A simple Google search for "resilience" on October 17th, 2022, at 9:30 am yields a staggering 694,000,000 results. According to Modica and Reggiani (2015), the earliest known use of this term, in the field of physics, traces back to the Merriam-Webster Dictionary in 1824. In the European Commission presentation of the *Recovery and Resilience Facility*, one reads that "The aim is to mitigate the economic and social impact of the coronavirus pandemic and make European economies and societies more sustainable, resilient and better prepared for the challenges and opportunities". As for academic research, a growing number of empirical studies have addressed several facets of economic resilience (see Martin and Sunley, 2015), especially after the recession driven by the 2008 financial crisis. Such a literature focuses on countries as well as sub-national territorial layers, given the vast heterogeneity within many national economies, e.g. the North-South dualism in Italy.

In this paper our focus lies on investigating the resilience of the Italian regional economic systems (NUTS II) between 2008 and 2019. Although relatively shorter compared to other studies, this time span uncovers the second major recession after WWII and precedes the major downturn in peacetime driven by the pandemic in 2020. In fact, the Italian economy experienced in 2009 a recessionary shock, begun in 2008, certified by a fall of about 5% in real GDP. An almost double (about 9%) decrease in real GDP happens in 2020. Hence, we build on a fairly consolidated methodology (e.g., Fingleton *et al.*, 2012) and update the findings of previous studies on the resilience of Italian regions since we have at our disposal data on a recession (2011-14) and a recovery period (2015-19) that were unavailable in earlier researches.

The key question that we tackle in our research is the following. Does the presence of the cooperative movement concur to explain why economic resilience varies so much across regional systems in Italy during and/or following recessionary episodes observed in our time frame? While we acknowledge that resilience is linked to very

many social and economic factors, we concentrate on the cooperative movement, meaning both cooperative firms and business groups controlled by cooperative firms (see Borzaga *et al.*, 2019, and Dow, 2018), summarized by the sizes of its added value and employment.

Why cooperatives can make the difference across areas? As established in the principles of the International Cooperative Alliance (ICA, 2017), the mission of cooperative firms (especially workers' cooperatives) consists also in protecting their work force and promoting the welfare of the communities they belong to. We aim at providing additional evidence supporting that they tend to behave consistently with such a mission. Cooperative firms are marked by a democratic governance, in Italy they hire significant portions of labour force in some regions and are responsible for conspicuous shares of added value and employment nationwide. According to Istat (2019), in 2015, including their subsidiaries, cooperative companies accounted for about 1,215,000 employees (7.4% of total employment in the Italian private sector) and 4.4% of the corresponding national added value. Borzaga *et al.* (2019) document that not only cooperative firms usually do not go off-shore, but they are rooted in very circumscribed areas: indeed, 99.6% of cooperative enterprises operate in a single region (84.7% for business groups controlled by cooperatives). By virtue of their commitment to democratic governance, local rootedness, and community welfare, cooperative firms possess unique characteristics that can contribute to explaining regional variations in economic resilience.

Why do we choose the regional breakdown? We know that many countries exhibit notably large economic disparities within their borders and such heterogeneity across territories is obviously concealed in cross-country analyses. Differences among regions within the same country may be larger than differences between countries. In 2013, for example, the regional employment rate in Italy ranged from 40% in Campania to 73% in the autonomous province of Bolzano (a subset of the Trentino-Alto Adige region). This interval is about as large as the one observed across all OECD countries at that

time (Veneri and Murtin, 2016). We may also notice that the distribution of cooperative firms around the world is drastically different across and within countries (ICA, 2017 and Euricse, 2020). Italy, which excels in the economic impact of the cooperative presence, is no exception. Hence, a region-based analysis of the impact of the Italian cooperative presence consistently follows. As far as we know, this is the first attempt to measure the relationship between economic resilience and the size of the cooperative movement at any administrative level. By controlling for the regional composition of employment and other socio-economic variables, we find that the cooperative employment is significantly and positively associated to the resilience of regional employment, especially during recovery times.

The rest of the paper is organized as follows. We discuss the mostly related literature in section 2. In section 3 we frame our work in the currently prevailing conceptual set-up utilized to investigate economic resilience. In section 4 we illustrate our statistical toolkit and data. Section 5 presents the approach we follow for the measurement of regional resilience. Section 6 shows an analysis of the regional resilience indices and comments the relationship between resilience and the cooperative presence. Section 7 concludes.

2. Related literature

The papers mostly related to our contribution may be organized in two main groups. The *first* includes a recent and rapidly growing academic literature dealing with regional resilience across European regions, especially in UK and Italy. Fingleton *et al.* (2012) are among the first to introduce *sensitivity* indexes (the ones that we reinterpret as regional elasticities above) to measure regional resilience in terms of *employment* across UK regions between 1979 and 2010. Employment is chosen as a key variable because it is claimed that usually it takes longer to recoup compared to output. They show that the reaction to shocks (resistance) is a good predictor of the

size of recovery. Moreover, they evaluate the role of the economic structure (as proxied by the industry mix or the migration flows, for instance) in relationship to *employment* resilience. Euroland and especially its eurozone subset are the geographic spaces considered by Fingleton *et al.* (2015) between 1980 and 2011. Testing resilience across regions, they show that the biggest impact of the financial crisis is experienced by isolated (Southern) territories, coinciding with those regions belonging to (low productivity) countries hit also by the sovereign debt crisis. Giannakis and Bruggeman (2017) investigate economic resilience across European regions between 2008 and 2013. They focus on employment changes and detect a substantial heterogeneity within countries, associated to a negative effect on resilience of the manufacturing sector. Regarding regional resilience in Italy, several studies adopt the methodology pioneered by Fingleton *et al.* (2012). Cellini and Torrisi (2014) select 6 major shocks that affected the Italian economy in the very long-time frame 1890-2008/9, but they use *GDP per capita* instead of employment as key variable to measure the regional resilience. One major finding is that shocks have lasting effects which differ across areas, "but there is limited heterogeneity in the ways in which different regions react and recover from common 'major' recessionary shocks" (p. 1791). Lagravinese (2015) considers three downturns occurred between 1970 and 2011 in Italy. He follows too the division of economic resilience in the pair resistance/recovery as measured by regional *employment* reactions. The study reveals that the composition of employment matters: regions accommodating comparatively large numbers of employees in service industries and public sector exhibit better resistance compared to regional economic systems featured by large shares of manufacturing and temporary workers. The importance of the resilience of the manufacturing sector on *employment* is also highlighted by Di Caro (2015) in the analysis of three recessions between 1977 and 2013. Cellini *et al.* (2017) consider 4 recessions in the Italian economy between 1975 and 2011. Interestingly, they compare the contrasting outcomes resulting from choosing employment or output when testing the regional resilience. They also notice that the slum observed in 2008-9 is the only one in their time span in which both

variables fall in all Italian regions. Faggian *et al.* (2017) divide the Italian territory into 686 Local Labor Systems and measure the resistance to (and recovery from) the financial crisis of 2008-9. They find significant variations in reactions across territories and, by means of a multinomial logit model, identify factors beyond the North-South dualism, such as industrial vocation and population size, that are relevant in explaining these variations.

The *second* group of contributions to be considered deepens the resilience of cooperative firms. Given the weight of Italian cooperative firms in the national economy, it is not surprising that their reaction to macroeconomic shocks has been carefully scrutinized, especially after the recession fuelled by the 2008 financial crisis. A fairly robust empirical evidence seems to support the view that cooperative firms are more resilient than conventional firms during downturns. This seems the case also elsewhere, as shown, for instance, by Musson and Rousselière (2019) with reference to a French experience. This view is confirmed, for example, by Carini and Carpita (2014) within the Italian cooperatives operating in the *industrial sector*. Moreover, Costa and Carini (2016) perform an interesting factor analysis of the Italian *social* cooperatives and detect a significant resilience especially in the Northern and Central regions of the country (see Tortia *et al*., 2022, for a thoughtful discussion of factors motivating workers in Italian social enterprises, the social cooperatives representing the main form of social enterprises). How resilience impacts cooperatives and their financial performance in different areas and across sectors is the focus of Fusco and Migliaccio (2018). They show, *inter alia*, that only the business sector matters regarding the strong impact of the crisis on cooperatives' profitability. In another paper (Fusco and Migliaccio, 2019), they consider a large sample of cooperatives in the decade 2004-2013 and show that the financial structure of the cooperatives surviving to the shock does not seem to have been affected by the crisis.

Overall, it may be claimed (and theorized, see Birchall, 2013) that cooperative firms, especially workers' cooperatives, enjoy comparative advantages in managing the

consequences of macroeconomic crises. In explaining the resilience of the cooperative model in response to the Covid pandemic, Billiet *et al.* (2021) emphasize the member centrality within cooperatives' governance and the embeddedness of cooperatives in their local environment. In particular, a non-negligible literature points out that a key advantage results from the observed strategy that Italian cooperatives distribute only a small portion of net revenues to members and tend to stabilize employment while sacrificing profits during downturns. "The cooperatives then through the attribution of profits to reserve, accumulate capital" (Carini and Carpita, 2014, p. 15) and this allows them to tackle difficult periods. This is especially true in worker cooperatives where a significant share of workers are also members of the cooperatives. This has been shown, for instance, by: Menzani and Zamagni (2009), Perotin (2012), Delbono and Reggiani (2013), Euricse (2013), Zamagni (2015), Navarra (2016), Amorato (2017, ch. 3), Istat (2019), OECD (2021) and Caselli *et al.* (2022).

3. The conceptual framework

The current use of the term *resilience* in economic debates - among scholars as well as among policy-makers - is much more recent with respect to its appearance in discussions nourished by other disciplines. The marked plurality in the very interpretation of what resilience may mean in the economic field has been masterfully scrutinized and fixed by Martin and Surley (2015). We agree with their approach. More precisely, we adopt a combination of what they label as the *ecological* definition plus the *engineering* one (see their taxonomy in Table 1, p. 4). According to the former, resilience is understood as "ability to absorb", while the latter stands for "bounce back" from shocks. In broader terms, we may refer to such attributes as *resistance* and *recovery*, respectively.

As we said, the main chosen variables will be *employment* and *GDP per capita*, but the novelty of our approach lies in our attempt to explain why these variables respond to

shocks so differently across Italian regions vis-à-vis the national patterns. We actually acknowledge that "regional economic resilience is produced by a complex interplay of compositional, collective and contextual processes…. its mix of industries and firms by age, size, *type, ownership* and so on…." and that "… these factors are also closely interrelated with *collective* factors including the relationships and connectivity among and between firms and local and regional labour markets …" (Martin and Surley, 2015, p. 25, first italics added). Consistently, we focus on the impact of particular entrepreneurial entities, the cooperative ones, whose members, often working-members, *own* the company and act *collectively* through the cooperative movement in an articulated and multilayer interplay with local labour markets, institutions and the economic environment altogether.

The related (empirical) literature mentioned above suggests that cooperatives, especially workers' cooperatives, tend to mitigate fluctuations in employment during macroeconomic cycles. Most importantly, they protect employment more than capitalistic companies during recessions. However, the prevailing theoretical literature – in the wake of the pioneering contribution by Ward (1958) – does not provide an adequate set-up to rationalize such empirical evidence and further research is needed to bridge theoretical modelling and empirical evidence. Ward considers the short-term labor choice of a Labor-Managed Firm (LMF), where all workers are also members, operating in perfectly competitive markets. The single LMF maximizes the revenue, net of non-labor cost, per member-worker. One may see Delbono *et al.* (2023) for an attempt of modelling the workers' cooperative objective function as a weighted average of profits and employment when competing against a capitalistic firm in a duopoly. The predictions stemming from such a model seem more consistent with the findings of a by now large empirical literature.

Our research focuses on two economic variables, GDP per capita and employment on both recession and recovery periods. Figure 1 visualizes the links to be tested through the two hypotheses listed below.

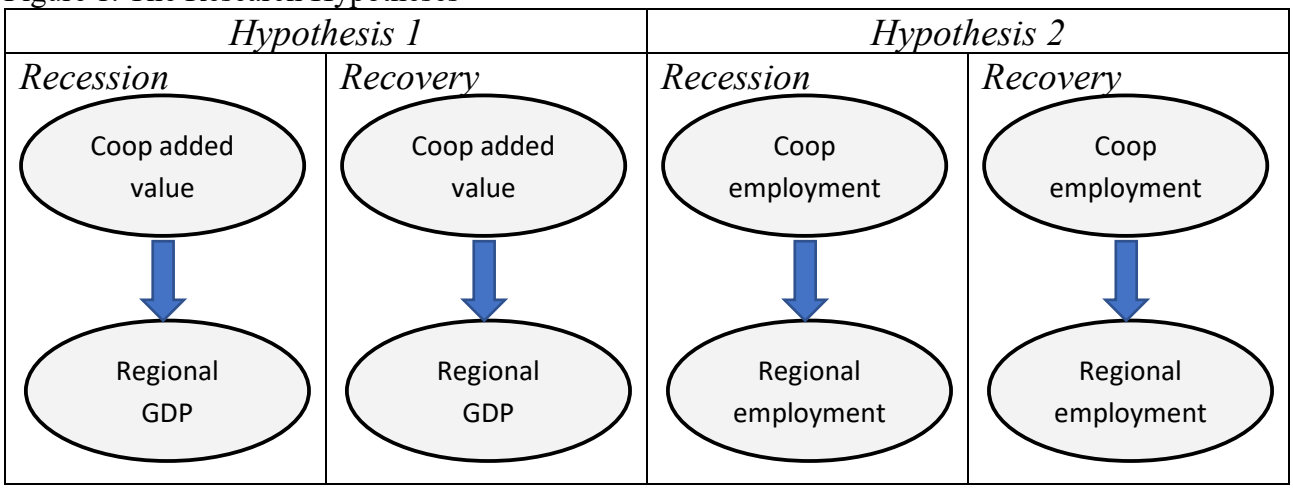
H1a. There is a positive association between the cooperative added value and the regional GDP during recessions.

H1b. There is a positive association between the cooperative added value and the regional GDP during recoveries.

H2a. There is a positive association between the cooperative employment and the regional employment during recessions.

H2b. There is a positive association between the cooperative employment and the regional employment during recoveries.

Figure 1. The Research Hypotheses



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The purpose of our study is to examine whether there is a positive relationship between cooperative added value and regional GDP during both recessionary and recovery periods (H1a and H1b). Additionally, we will explore whether there is a positive association between cooperative employment and regional employment during recessions and recoveries (H2a and H2b). By testing these hypotheses, we aim to shed light on the potential impact of cooperatives on regional economic systems during different phases of the economic cycle.

4. Data for regional resilience

When measuring resilience, a preliminary issue deals with the temporary scan of shocks; as we noticed, different criteria lead to different, hardly comparable, conclusions. Recessions are usually identified through falls in GDP. However, when investigating the resilience of employment, one may notice that GDP per capita and employment are not synchronized at the national level. Hence, we prefer to follow a route different from the prevailing one in the literature.

As for GDP, we select a variant of the strategy followed by Fingleton *et al.* (2012). The years of recessions are those featuring a negative rate of growth in the country's real GDP *per capita* and we too consolidate in a single shock the recessions occurring in consecutive years. We deflate nominal income through the Istat consumption price index. Fingleton *et al.* (2012) utilize GDP to identify recessions. Our choice is not immaterial to the identification of recessionary shocks: using GDP per capita (as Cellini and Torrisi, 2014, do) makes 2014 the last year of the recession started in 2012, whereas using GDP leads to consider such a recession ended in 2013. As for the identification of the recovery period, this consists in the overall time interval between the end of a recession and the start of another shock. This choice would be questionable in very long-run time series, as pointed out by Cellini *et al.* (2017), because it might entail recovery phases lasting decades. This issue cannot arise within our fairly short time frame. Given the above identification of recessionary shocks, in our time span we detect in Italy 2 recessions (2008-9, 2012-14) and two post-recession periods (2010-11, 2015-19).

As for employment, we will refer to *descent* and *ascent*, depending on whether the national employment falls or rises, respectively. We will neglect a mild isolated change preceded and followed by changes of the opposite sign. Doing so, we will ignore the tiny increase occurred in 2011 (+ 0.27%, corresponding to less than 67,000 employees) and identify a 6-years long descent (2008-13) and an equally long ascent (2014-19).

The dataset to be used for GDP per-capita and employment is entirely retrieved from Istat regional accounts. The Istat regional accounts allow us to disaggregate the information about the overall employment to isolate employment in the manufacturing sector and in the public sector. We shall employ yearly data because of the need to harmonize this dataset with the one that we will use on cooperative firms.

Figure 2. Employment and GDP per capita (2007 = 100), gray bands indicate recessions

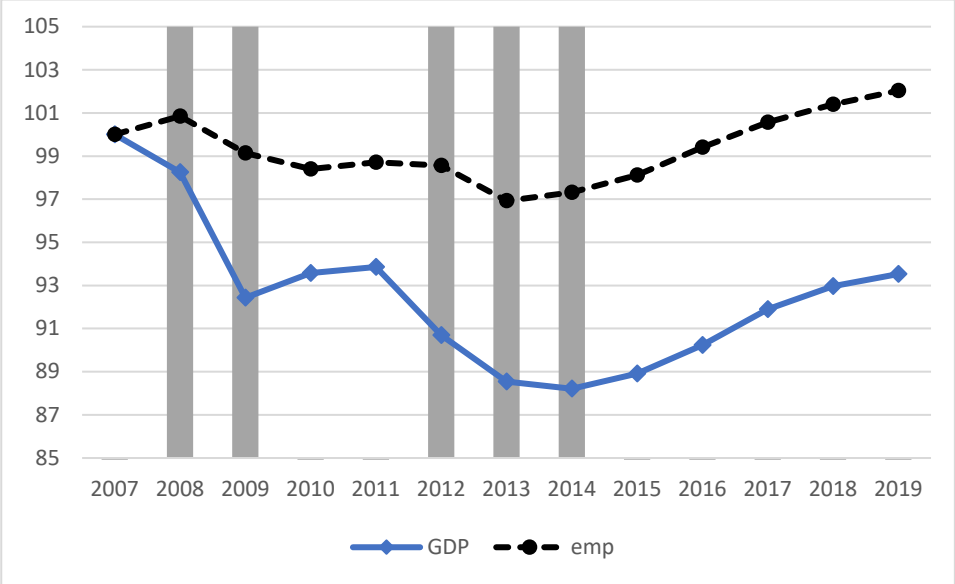

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Figure 2 above shows the behaviour of GDP and employment in our time period. Notice that, at the national level, while employment mildly goes up, GDP per capita falls. The two macroeconomic variables exhibit a positive correlation of 0.66.

The analysis of regional GDP (Table 1A, A mnemonics for Appendix) suggests that GDP per capita falls in all regions, except Trentino-Alto Adige; one observes also large differentials across regions in levels as well as in their variability and, focusing on variations, identifies those regions mostly hit by the recessions. Moreover, looking at means and standard deviations of regional employment (Table 2A) we may stress that employment recoups faster than GDP per capita, especially in a group of regions of the Centre-North of the country, with Lazio leading this group. When referring to macro-areas, we adopt the standard aggregation criterion, according to which, proceeding

from top to bottom in Table 1, Northern regions are the top 8, the Central section includes the following 4 and the bottom 8 regions are the Southern ones.

Some useful insights about the regional dynamics of GDP and employment are obtained from the correlations between the regional series 2008-19. For each region we compute the indices of Bravais-Person with respect to the other 19 regions and calculate their mean where we overcome the presence of negative values by focusing on absolute values (Table 3A). It turns out that the pair-wise correlation averages between the regional series of real GDP per capita are much higher than employment ones. Employment's pattern seems more heterogeneous than the GDP's one both across regions and for each region with respect to the national level.

Regarding the resilience of regional employment, as suggested in other related papers (e.g., Lagravinese, 2015, Martin *et al.*, 2016, Giannakis and Bruggeman, 2017)), we consider the composition of employment by focusing on shares of employees out of total employment, in the industrial and in the public sector (*Xi*, and *Xp*, respectively).

With the aim of capturing some relevant dimensions of the Italian regional economies, together with *Xi* and *Xp*, we also consider:

Xf, the female employment rate as measured by the ratio between employed women out of women in the interval 15-64;

Xe2, the percentage of high school graduates in the interval 25-64:

Xe3, the percentage of college graduates in the interval 25-64;

Xe, the percentage of population over 64 out of the population in the interval 15-64.

As for GDP and employment, also the data related to the last 4 variables are retrieved from Istat regional database.

Finally, in view of a better understanding of the economic forces driving the regional resilience, we focus on the size of the cooperative movement, as summarized by two variables:

(i) *Xc*, the ratio between the added value of cooperative firms and the regional GDP, and (ii) *Xg*, the ratio between the workforce employed in cooperatives and the overall regional employment.

The additional variables on the cooperatives are retrieved from the platform *Madh* (Market Access Data Hub) made by the Emilia-Romagna Union of Chambers of Commerce (*Unioncamere*) which includes, among the many information sets, the balance sheets of all Italian companies. For each registered company, the dataset draws information about local units from the Register of firms as recorded in the Chambers of Commerce, Inps, Minister of the Economic Development (MISE), Aida-Bureau van Dijk (containing balance sheets of companies and business groups), Istat and other sources. Unfortunately, this dataset is available (yearly) only between 2010 and 2019; this constraint shrinks the length of our time series as compared to other analyses of the resilience of Italian regions. Notice that since 2019 Istat revised the criteria to identify the active enterprises. Hence, data about that year are not fully comparable with the previous ones. We owe this remark to an anonymous referee.

The cooperative movement is clearly distributed unevenly across Italian regions (Table 4A, where the data regarding the period 2008-9 have been estimated using sample information provided by the three major cooperative associations) and it is mostly concentrated in the Centre-North, with Emilia-Romagna ranking first in terms of employment as well as added value. Moreover, the employment ratio is always superior to the added value to the GDP one.

The distribution of the cooperative movement across Italian regions is evidently uneven, as indicated in Table 4A. The data, which covers the period 2008-2019 (with estimates for the years 2008 and 2009 based on sample information provided by the three major cooperative associations), highlight that the cooperative movement is primarily concentrated in the Centre-North of Italy. Emilia-Romagna stands out as the region with the highest employment and added value attributed to cooperatives.

5. The measurement of regional resilience

To go on quantitatively, one then needs resilience indices obtained by the selected variables. In the wake pioneered by Fingleton *et al.* (2012) and Martin *et al.* (2016), *inter alia*, we shall concentrate on *relative* measures of both employment and GDP per capita to detect the resilience of Italian regional economies during downturns and in recovery periods. In our analysis, the term "relative" has a dual meaning. It refers firstly to “percentage” and secondly to a benchmark comparison, which, also in our analysis, will be the national performance of the chosen variable (say, X). Hence, the resulting index may be interpreted as a *Regional Elasticity* of *X*, i.e., $RE_{it} = (\%X_{it} / \%X_{Nt})$ if referred to region *i*, *N* standing for *National*. RE_{it} relates percentage variations in *X* occurred in period *t* in two different geographic entities (incidentally, the smaller one being a subset of the other one). We shall check the consequences of excluding region *i* from the denominator by computing the regional elasticity of region *i* with respect to the rest of the country (i.e., $\%X_{it} / \%X_{N\text{-}i,t}$), in short $RE_{\text{-}it}$.

To ease the interpretation of the regional elasticities across periods, we will mildly depart from the prevailing literature and refer to

$$RE_{it} = \%X_{it} / |\%X_{Nt}|$$

thus expressing in absolute value the denominator of regional elasticities. Clearly, positive (negative) values indicate an increase (decrease) of the relevant variable in the *i*-region, whereas greater (lower) values than |1| reveal that the intensity of the regional performance is larger (smaller) than the national one. As for the notation, we indicate with e_{it} (E_{it}) the regional elasticity of the employment of region *i* at time *t* (with respect to the national one) during descent (ascent). Similarly, we may denote by a_{it} (A_{it}) the regional elasticity of the real GDP per capita of region *i* at time *t* (with respect to the national one), during recessions (recoveries).

Notice that during recessions, the sign of the country’s row in Table 5 is negative by definition of recessionary shock, while by the same token it is positive during

recoveries. A negative sign of the regional elasticities during recoveries (A1 and A2) in Table 5 indicates a countercyclical pattern of the corresponding region with respect to the national one. Counter-cyclical regions during recessions (see the signs of a1 and a2) have not been observed.

Table 5. Regional Elasticities, GDP per capita and Employment, 2008-19

	a_1	A_1	a_2	A_2	e_1	E_1
	2008/09	2010/11	2012/14	2015/19	2008/13	2014/19
Italy	-1,00	1,00	-1,00	1,00	-1,00	1,00
Piedmont	-1,54	2,53	-1,09	1,35	-0,64	0,43
Valle d'Aosta	-0,83	2,76	-1,38	0,46	-0,04	-0,07
Liguria	-0,93	-0,21	-0,76	0,85	-0,64	0,23
Lombardy	-0,85	2,22	-1,05	1,07	-0,76	1,61
Trentino-Alto Adige	-0,63	1,60	-0,14	0,86	0,96	1,72
Veneto	-1,21	1,69	-0,77	1,18	-0,49	1,63
Friuli-Venezia Giulia	-1,46	2,44	-0,93	1,16	-1,36	0,63
Emilia-Romagna	-1,31	1,75	-0,62	1,18	-0,17	1,17
Tuscany	-0,88	0,46	-0,59	0,85	-0,95	1,10
Umbria	-1,39	-0,16	-1,68	1,24	-1,19	0,75
Marche	-1,17	0,37	-0,80	0,70	-0,99	0,57
Lazio	-0,99	-0,45	-1,92	0,60	-0,32	1,39
Abruzzo	-0,88	3,31	-0,92	0,31	-0,36	-0,03
Molise	-1,03	-1,07	-2,22	1,17	-2,57	0,71
Campania	-0,87	-2,17	-0,98	0,83	-2,81	0,68
Apulia	-1,03	1,04	-0,74	1,05	-1,50	0,99
Basilicata	-1,18	0,37	-0,75	2,20	-2,80	1,53
Calabria	-0,63	-0,73	-1,34	0,48	-2,01	-0,51
Sicily	-0,79	-1,40	-1,31	0,48	-2,19	-0,11
Sardinia	-0,57	-0,11	-1,04	0,90	-1,49	0,81
Mean	-1,01	0,71	-1,05	0,95	-1,12	0,76
SD	0,27	1,49	0,47	0,41	0,97	0,63

Source: Author's own creation

Since the employment is not synchronized with GDP per capita, we obtain a different timing of recessions and descent-ascent. A negative (positive) regional RE_i means that employment in the *i*-th region is decreasing (increasing). Note that a positive RE_i during the descent phase (e_1) or a negative RE_i during the ascent phase (E_1) indicates that regional employment is moving in the opposite direction with respect to national employment.

Some remarks are in order. First of all, the regional employment (last two columns of Table 5), except for the years 2010-11, is always more heterogeneously reacting than regional GDP per capita, as it is apparent from the values of the SD, revealing also that, across periods, the range of the regional GDP' SD is smaller than the employment's one.

Moreover, Italian regions differ in their GDP resilience, but, for the first recession, such differences mainly concern the recovery period to the shock and not so much the resistance stage. During both recessions, all regions experience a fall in GDP (a_1 and a_2 are never positive) with a modest variability across regions (SD = 0.27 and 0.47, respectively), although a_1 ranges from -1.54 in Piedmont to - 0.57 in Sardinia, and a_2 from - 2.22 in Molise to - 0.14 in Trentino (Table 5). As for GDP per capita, Trentino is the most resilient territory.

As for employment, only Trentino exhibits a positive value of e_1, meaning that its employment level rises, while the Southern regions (especially Campania) perform significantly worse than the average.

In order to check the robustness of our results with respect to the regional size, in Table 6A we report the regional elasticities (Res) for GDP and employment, respectively, after excluding the region under scrutiny from the denominator. Most of the values vary mildly, although for the largest regions the gap is not negligible. For instance, the resilience of Campania's employment, during the first descent is approximately 2,8 times lower than the national one (Table 5), but it is 3,3 times lower than the rest of the country (Table 6A). On the other hand, the Lombardia's GDP during the first recovery is more than twice as resilient as the whole country, but it is almost 3.5 times as resilient compared with the rest of the country. We will come back to Table 6A when checking the robustness of our results (Section 6).

We now summarize in Table 7 our measures of resilience.

Table 7. Regional elasticities: resistance, recovery, total

Regions	Descent-Resistance		Ascent-Recovery		Total resilience	
	Employment	GDP	Employment	GDP	Employment	GDP
	e_1	$a_1 + a_2$	E_1	$A_1 + A_2$	$e_1 + E_1$	$A_1+A_2 + a_1 + a_2$
Piedmont	-0,64	-2,63	0,43	3,88	-0,21	1,25
Valle d'Aosta	-0,04	-2,21	-0,07	3,21	-0,11	1,00
Liguria	-0,64	-1,69	0,23	0,64	-0,41	-1,05
Lombardy	-0,76	-1,90	1,61	3,29	0,85	1,39
Trentino-Alto Adige	0,96	-0,78	1,72	2,46	2,68	1,69
Veneto	-0,49	-1,98	1,63	2,87	1,14	0,88
Friuli-Venezia Giulia	-1,36	-2,39	0,63	3,60	-0,73	1,21
Emilia-Romagna	-0,17	-1,94	1,17	2,93	1,00	0,99
Tuscany	-0,95	-1,47	1,10	1,31	0,15	-0,16
Umbria	-1,19	-3,07	0,75	1,08	-0,44	-1,99
Marche	-0,99	-1,97	0,57	1,08	-0,42	-0,89
Lazio	-0,32	-2,91	1,39	0,15	1,07	-2,75
Abruzzo	-0,36	-1,79	-0,03	3,63	-0,39	1,83
Molise	-2,57	-3,25	0,71	0,10	-1,86	-3,16
Campania	-2,81	-1,85	0,68	-1,35	-2,13	-3,20
Apulia	-1,50	-1,77	0,99	2,09	-0,52	0,32
Basilicata	-2,80	-1,93	1,53	2,57	-1,27	0,64
Calabria	-2,01	-1,97	-0,51	-0,25	-2,52	-2,22
Sicily	-2,19	-2,10	-0,11	-0,93	-2,31	-3,03
Sardinia	-1,49	-1,61	0,81	0,78	-0,68	-0,83

Source: Author's own creation

We obtain Resistance as the sum of a_1 and a_2 for GDP, while e_1, as we know, indicates the regional elasticity of employment during descent. Similarly, we calculate Recovery for GDP (A_1 and A_2), while E_1 measures the regional resilience of employment during ascent. Lastly, Total resilience results by adding the values of Resistance (Descent) and Recovery (Ascent) for GDP (Employment). This choice of measuring total resilience may be justified on the basis of the following arguments. Concerning employment, first of all, both the descent and ascent periods span an equal duration of 6 years. Moreover, the magnitudes of the national descent and ascent are very similar. As a consequence, the summation of e_1 and E_1 yields values of the employment total resilience unaffected by the mild variation in national employment along our time span. Similar arguments apply to GDP per capita, although A1 and A_2 refer to different length periods and in the second recovery the GDP uplifts much more than in the first one.

We now focus on total resilience.

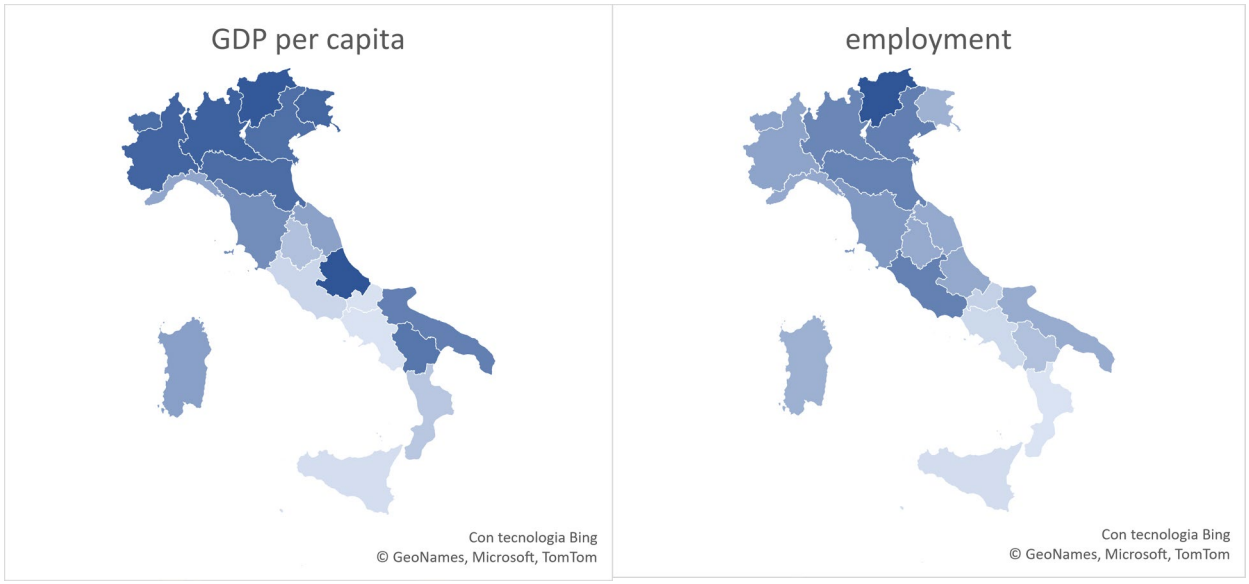
Employment. Lazio, Trentino-Aldo Adige and Emilia-Romagna present the best performance. As for Lazio, this outcome seems driven by its striking resistance: a value of - 0,32 means that its employment fell by less than one third compared to the national *fall*. This is not so surprising, given the high share of employees in the public sector. We will come back to the role of public sector employees in the next section.

GDP per capita. The top 3 regions are now Abruzzo, which ranks second in recovery (just behind Piedmont), Trentino-Alto Adige and Lombardy.

Southern regions display a significantly lower performance compared to the other 12 regions, especially in terms of employment. The well-documented territorial divide is confirmed once again (Bank of Italy, 2015, Di Caro 2018, *inter alia*).

In Figure 3 we visualize the total resilience indices reported in the last two columns of Table 7.

Figure 3. Total resilience (increases according to the color's intensity)



Source: Author's own creation

In Figures 4A and 5A we draw the maps for resistance and recovery resilience, respectively. As for the employment, the pictures do not significantly differ from the ones in Di Caro (2015, pp. 24-5), notwithstanding the different time scan of recessions. During both the resistance and recovery periods, the regions in the Centre-North, especially along the Adriatic belt, look more resilient than the Southern regions.

Notice that, differently from the finding in Fingleton *et al.* (2012) for a group of UK regions during and after earlier recessions, in our study the impact of the recessionary downturns on regional economies is not a good predictor of the size of the recovery. Indeed, we observe a low correlation between regional elasticities in resistance and in recovery of GDP as well employment, for both recessions and the descent occurred within our time frame (the full set of pair-wise Pearson's coefficients between a1, a2, e1, A1, A2, E1, and between all (variables in the) columns of Table 6 is available upon request).

Alongside measuring resilience across Italian regions, we also aim to the development of explanations of which factors contribute to its strengthening. To achieve this, we propose a two-step procedure. First, for employment, we distinguish among an ascent period, a descent period and the overall time period. Likewise, for GDP we distinguish between resistance periods, recovery periods and the overall time period. Second, for each of these cases, we compute the descriptive statistics. In Table 8 one finds the overall picture of the employment resilience (*RE emp*) and of the related explanatory variables. In order to investigate *RE emp*, we consider the average in the relevant periods of *Xi, Xp, Xc, Xf, Xe2, Xe3, Xel*.

Table 8. Descriptive statistics, employment resilience and explanatory variables, yearly data, 2008-2019

	RE emp	*Xi*	*Xp*	*Xc*	*Xf*	*Xe2*	*Xe3*	*Xel*
			Total					
Mean	-0,35	0,22	0,21	0,04	0,54	0,29	0,14	0,34
Median	-0,41	0,22	0,21	0,03	0,60	0,30	0,14	0,33
SD.	1,30	0,06	0,03	0,02	0,11	0,03	0,02	0,04
Min	-2,52	0,13	0,15	0,02	0,35	0,24	0,11	0,25
Max	2,68	0,32	0,27	0,12	0,66	0,35	0,19	0,45
			Descent					
Mean	-1,11	0,24	0,21	0,03	0,53	0,28	0,13	0,32
Median	-0,97	0,23	0,21	0,03	0,59	0,29	0,13	0,31
SD	0,99	0,06	0,04	0,02	0,11	0,03	0,02	0,04
Min	-2,08	0,14	0,15	0,02	0,33	0,23	0,10	0,24
Max	0,96	0,35	0,27	0,10	0,65	0,35	0,17	0,44
			Ascent					
Mean	0,76	0,21	0,21	0,04	0,56	0,30	0,15	0,35
Median	0,73	0,21	0,21	0,04	0,62	0,31	0,15	0,35
SD	0,64	0,06	0,03	0,02	0,11	0,03	0,02	0,04
Min	-0,51	0,11	0,15	0,02	0,38	0,24	0,11	0,27
Max	1,72	0,30	0,27	0,11	0,68	0,36	0,21	0,46

Source: Author's own creation

Similarly, Table 9 outlines the GDP resilience (*RE gdp*) together with the related variables (*Xg, Xf, Xe2, Xe3, Xel)*, as considered by the relevant time period averages.

Table 9. Descriptive statistics, GDP resilience and explanatory variables, yearly data, 2008-2019

	RE gdp	*Xg*	*Xf*	*Xe2*	*Xe3*	*Xel*
			Total			
Mean	-0,40	0,02	0,54	0,29	0,14	0,34
Median	0,08	0,01	0,60	0,30	0,14	0,33
SD.	1,77	0,01	0,11	0,03	0,02	0,04
Min	-3,20	0,01	0,35	0,24	0,11	0,25
Max	1,83	0,06	0,66	0,35	0,19	0,45
			Resistance			
Mean	-2,06	0,02	0,53	0,29	0,13	0,33
Median	-1,95	0,01	0,60	0,29	0,13	0,32
SD	0,57	0,01	0,11	0,03	0,02	0,04
Min	-3,25	0,01	0,35	0,23	0,10	0,24
Max	0,78	0,06	0,66	0,35	0,18	0,44
			Recovery			
Mean	1,66	0,02	0,55	0,30	0,15	0,35
Median	1,70	0,01	0,61	0,30	0,15	0,34
SD	1,61	0,01	0,11	0,03	0,02	0,04
Min	-1,34	0,01	0,36	0,24	0,11	0,26
Max	3,88	0,06	0,67	0,35	0,20	0,45

Source: Author's own creation

It is worth noting that the regional elasticities of employment exhibit a higher degree of heterogeneity compared to those of GDP across all time periods (as it emerged also in Tables 4A and 5). Looking at the first column of both Tables, one notices that the mean and the median share the same sign except in the case of total resilience in terms of GDP. The mean is negative and strongly affected by the pattern of some Southern regions, whereas the median is moderately positive.

6. Results

In the next step of our analysis we test the relationship between two dimensions of economic resilience (resistance and recovery) and the size of the cooperative movement, as summarized by the employment and the added value. To assess the presence of such a relationship we employ a simple linear model for regional resilience in its three senses of resistance, recovery and total, as reported in Table 7. To consider the well-known territorial dualism featuring the Italian regions, in addition to *Xi*, *Xp, Xf, Xe2, Xe3, Xel, Xc* and *Xg*, we include also a dummy *S* featuring the 8 Southern regions.

For each specification of our model, we formulate different alternatives, from the simplest ones (based on a unique explanatory variable), to the most complete ones including jointly all considered variables.

We now summarize the most interesting findings emerging from our analysis. The first one deals with the *total* resilience ($e_1 + E_1$) of regional employment (last but one column in Table 7). Hence, we are now considering the entire time span 2008-19.

The OLS cross-section estimate on the 20 regional data indicates a significant effect only for the cooperative employment *Xc* and the dummy *S*. Among the various specifications that we have considered, the ones which detect a significant relationship are the following:

Model 1: $(e_1+E_1)_i = \beta_0 + \beta_1 Xc_i + \beta_2 S_i + \varepsilon_i$

Model 2: $(e_1+E_1)_i = \beta_0 + \beta_1 Xf_i + \varepsilon_i$

The results are reported in the first two columns of Table 10, the robust standard errors (in brackets) are calculated by means of the Arellano HAC estimator because of the presence of heteroskedasticity.

The value of the parameter for *Xc* suggests a positive impact of the cooperative employment on total resilience of regional employment. The value of the parameter for *S* captures the negative differential in total resilience of the employment in Southern regions.

Having considered the new variable *Xf*, *Xc* is not significant as it was before. Therefore, *Xf* is the only significant variable with regards to the employment resilience. This is no surprise since a large female participation to the labor market is typical of the resilience of a region. The importance of *Xf* does not shrink the one of *Xc*, since these two variables are heavily correlated especially with regards to rank correlation. Indeed, we find that regions with high values of one variable are also top ranked in the distribution of the other variable (e.g., Emilia Romagna). Similarly, the same pattern can be observed in the lowest values. Moreover, it is well known that cooperative firms, in the hiring process, do not discriminate between genders. Ultimately, we may claim that both *Xf* and *Xc* can be considered important drivers of employment resilience.

Table 10 – OLS cross-section estimates, Italian regional resilience, 2008-2019
Robust standard errors in brackets.

	Mod 1	*Mod 2*	*Mod 3*	*Mod 4*	*Mod 5*	*Mod 6*	*Mod 7*
Dep. Var.	(e_1+E_1)	(e_1+E_1)	e_1	e_1	e_1	E_1	E_1
Xp	-		-	-	-	-	-9,573
							(3,180)
Xf	-	0,091	-	-	0,072	-	-
		(0,018)			(0,012)		
Xc	12,619		20,423	4,751		12,123	-
	(5,641)		(8,507)	(3,516)		(6,674)	
S	-1,646	-	-	-1,342	-	-	-
	(0,424)			(0,341)			
R^2	0,53	0,58	0,15	0,52	0,64	0,14	0,25
RSS	14,95	13,42	16,00	8,95	6,74	6,76	5,90
Test F	12,64	26,52	5,767	8,25	37,67	3,300	9,065
p-value(F)	0,001	0,001	0,027	0,003	0,001	0,086	0,008

Source: Author's own creation

During the descent, as opposed to some empirical evidence - see Borzaga *et al.* (2021), OECD (2021) and Caselli *et al.* (2022), for instance - the model does not fully support an anti-cyclical role of the cooperative employment, possibly because of the severity of downturns and their widespread diffusion on the national territory. More precisely, by looking at *Xc* only, we test the following:

Model 3: $(e_1)_i = \beta_0 + \beta_1 Xc_i + \varepsilon_i$

and, from the results reported in Table 10 (third column), we find a positive effect; however, including the South dummy, that is by evaluating

Model 4: $(e_1)_i = \beta_0 + \beta_1 Xc_i + \beta_2 S_i + \varepsilon_i$

Xc stops being significant (Table 10, fourth column). As for total resilience, including *Xf in the descent periods as follows*

Model 5: $(e_1)_i = \beta_0 + \beta_1 Xf_i + \varepsilon_i$

brings to a significant result (see 5th column, Table 10), further strengthening the relevant role of female employment.

Another result worth commenting emerges from the model testing the regional resilience of employment during the ascent period 2014-19. In this case, we focus on specifications in which both *Xp* and *Xc* are singularly considered:

Model 6: $(E_1)_i = \beta_0 + \beta_1 Xp_i + \varepsilon_i$

Model 7: $(E_1)_i = \beta_0 + \beta_1 Xc_i + \varepsilon_i$

In the last two columns of Table 10 we report the OLS estimates. In both equations, *Xp* and *Xc* are significantly contributing to explain the employment resilience in ascent. As for the cooperative employment, the positive effect is confirmed, whereas the public sector employment operates counter-cyclically. This last effect can be interpreted as a weaker participation to recovery (ascent) for regions featured by a major presence of public employees. In either case, the dummy stops being significative, suggesting that recoveries have been about all regions without relevant territorial divides. It is worth noting that in the ascent *Xf* is not significant.

To check the robustness of the results collected in Table 10, we replicate our analysis using the values of regional elasticities obtained by eliminating the region under scrutiny from the denominator. In other words, we pick the dependent variables from Table 6A instead of Table 7. Our previous findings are basically confirmed as we still detect a positive and significant effect of cooperative employment and the rate of female employment on total resilience of regional employment as well as during the ascent. Unsurprisingly, the elimination of the "relevant" region from the national benchmark yields a minor role of the South dummy which stops being significant.

It is also worth stressing that the cooperative presence matters in terms of employment, but not in terms of the impact of its added value on GDP per capita. This evidence is assessed by testing the following three models:

Model 8: $(A_1+A_2+a_1+a_2)_i = \beta_0 + \beta_1 Xg_i + \varepsilon_i$

Model 9: $(a_1+a_2)_i = \beta_0 + \beta_1 Xg_i + \varepsilon_i$

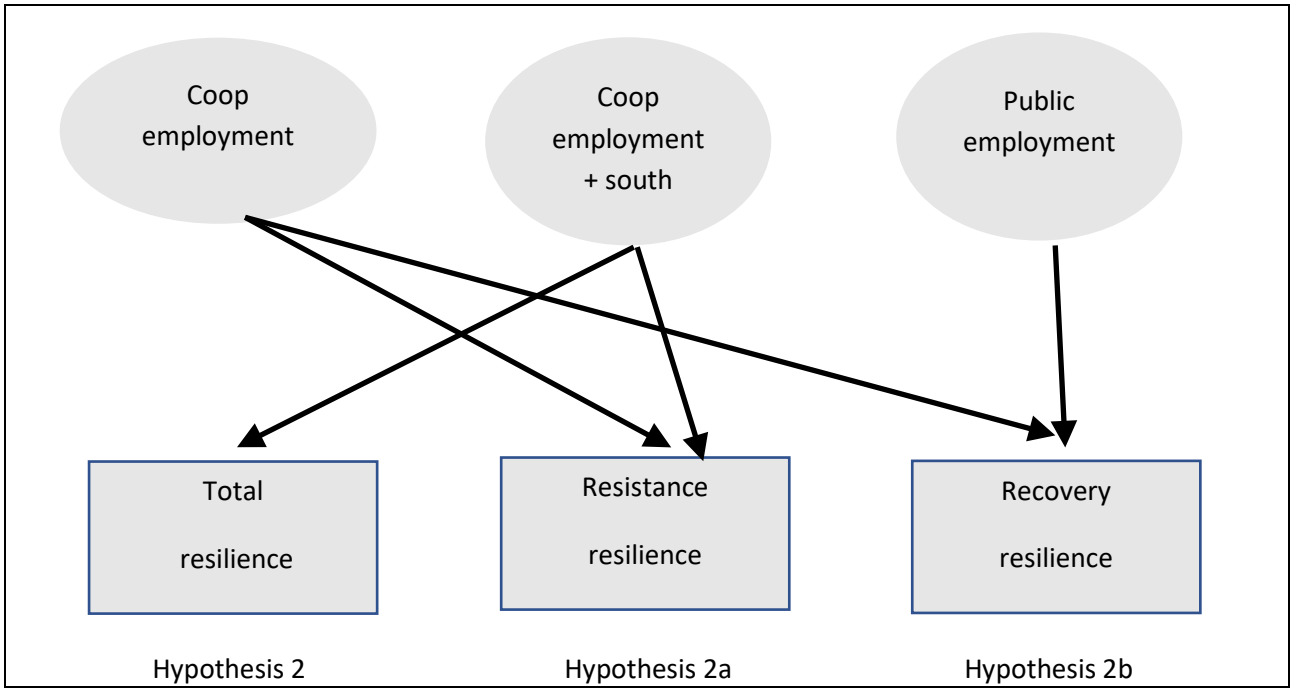
Model 10: $(A_1+A_2)_i = \beta_0 + \beta_1 Xg_i + \varepsilon_i$

The entire set of explanatory variables introduced in the analysis of GDP resilience, except *Xf*, is not significant. *Xf* represents an exception as it affects both total resilience and recovery resilience.

In models 8-10 we do not observe a significant role for the cooperative added value, since the parameter β_1 is never significantly different from zero. This not surprising, for a large portion of Italian cooperatives operate in labor-intensive sectors featured by a relatively low added-value per worker. In 2015, for instance, the average added value per worker was 45,605 euros in the overall Italian companies, whereas in the cooperative subset of them was only 24,851 euros (Borzaga, 2019, excluding financial and insurance activities). The massive presence of cooperative enterprises in labor-intensive sectors nation-wide actually emerges also from the gap between their weight in terms of added valued and the one in terms of employment (see Section 1). Therefore, this gap looks like a convincing explanation of the significantly positive impact of the cooperative employment on regional resilience of employment with respect to the non-significant impact of cooperative added value on the resilience of regional GDP per capita.

Figure 6 summarizes our main findings about the relationship between the cooperative presence and the regional resilience, supporting our initial Hypothesis 2 (according to which there is a positive association between the cooperative employment and the regional employment). This is confirmed even when we focus only to recessionary periods (H2a) and recovery periods (H2b).

Figure 6. Regional resilience and cooperative movement



Source: Author's own creation

7. Concluding remarks

In this paper we have investigated and compared two key dimensions of regional resilience (resistance and recovery) in terms of GDP per capita as well as employment for all Italian regions during the period 2008-19. In addition to enabling an update of similar studies on the resilience of Italian regions, our analysis provides new insights into explaining the large heterogeneity featuring the reactions of Italian regions during and after recessionary episodes. We have treated our regional elasticities as variables depending *also* on a substantial socio-economic phenomenon like the Italian cooperative movement and, in short, the novel evidence points to the cooperative employment as positively associated with the regional resilience when measured in terms of employment.

We believe that the deep explanation for the cooperative contribution to resilience lies in its democratic governance. This is especially true in the case of workers' cooperatives (including social cooperatives), i.e., enterprises controlled by their

working-members. Such cooperatives prioritize the protection of employees even at the cost of sacrificing profits. Hence, the cooperative model appears to be a socially meritorious organizational form that should be promoted through national as well as regional policies. The insightful report by OECD (2021) and Roelants *et al.* (2012) confirm the many interdependencies between cooperative organizations and local communities and some recent contributions (e.g., Costa *et al.* 2023) detect a positive relationship between the cooperative presence and regional prosperity in Italy.

Support for this notion can be found in the insightful report by the OECD (2021) and the research conducted by Roelants et al. (2012), which confirm the numerous interdependencies between cooperative organizations and local communities. Additionally, recent contributions such as the study conducted by Costa et al. (2023) have detected a positive relationship between the presence of cooperatives and regional prosperity in Italy.

We know that macroeconomic downturns damage both sides of public balance sheets. This is because, on the one hand, recessions shrink fiscal revenues and, on the other, welfare expenditures are uplifted to support households hit by the slumps. However, the presence of one type of firms, the cooperative one, which on average resist and survive the downturn longer than other business models, make it a remarkable antidote against the negative business cycles. The modest fiscal privilege currently enjoyed in Italy by predominantly mutual cooperatives (undistributed profits retained as reserves are not subject to taxation) might then be expanded and justified on the basis of an apparent countercyclical behavior during recessions.

In addition to the documented comparative advantages of cooperative firms, many empirical studies (e.g., Amorato, 2017, Borzaga *et al.*, 2019, OECD, 2021) have also identified some weaknesses associated with these firms as the uneasy access to banking and financial markets, especially for smaller companies (most of them also late in digitalization), and a productivity handicap with respect to profit-making competitors. Tailored-made policy instruments designed to mitigate such comparative handicaps of

cooperative firms might enhance welfare in the local communities. Needless to say, policies need to be place-based, to consider the large differences across regional economic systems and/or across sectors.

To conclude, we may cautiously endorse the OECD's viewpoint (2021) that cooperatives "in a post pandemic world could make a major contribution to steering the economy towards inclusiveness and sustainability". Given that both the ability to absorb (resistance) and to bounce-back (recovery) are desirable features of territorial systems, we argue that a large cooperative presence provides a comparative advantage in promoting prosperity and safeguarding it during and/or after downturns. These remarks implicitly hint at some policy implications for both national governments and international organizations involved in the implementation of SDGs. Promoting and sustaining cooperative business models aligns with these goals. This opportunity may apply to wealthy as well as less affluent territories as long as the diffusion of the cooperative presence drives the resilience of the relevant socio-economic systems. We may finally claim that a strong cooperative movement tends to represent a driver of goals such as the inclusive growth, as well as a potentially powerful instrument for implementing the EU Recovery and Resilience Program.

Appendix

Table 1A. Regional GDP per capita, descriptive statistics, yearly data, 2008-19

	Levels		% Variations	
	Mean	SD	Mean	SD
Italy	28.317	839	-0,53	2,26
Piedmont	29.917	1.044	-0,56	3,39
Valle d'Aosta	38.217	1.536	-0,65	2,91
Liguria	30.866	1.008	-0,58	2,37
Lombardy	37.653	1.163	-0,26	2,79
Trentino-Alto Adige	40.772	772	0,16	1,57
Veneto	31.634	873	-0,38	2,54
Friuli-Venezia Giulia	30.218	879	-0,54	3,07
Emilia-Romagna	34.403	1.040	-0,36	2,80
Tuscany	30.178	689	-0,38	1,85
Umbria	25.582	1.400	-1,18	3,09
Marche	26.676	784	-0,76	2,32
Lazio	34.143	2.011	-1,39	2,44
Abruzzo	24.575	546	-0,45	2,31
Molise	21.045	1.397	-1,39	2,92
Campania	18.355	713	-0,93	1,86
Apulia	18.142	393	-0,39	2,08
Basilicata	21.277	822	-0,01	3,75
Calabria	17.087	736	-0,94	1,73
Sicily	17.782	832	-1,12	1,78
Sardinia	20.706	631	-0,46	2,11

Source: Author's own creation

Table 2A. Regional employment, descriptive statistics (thousand), yearly data, 2008-19

	Levels		% Variations	
	Mean	SD	Mean	SD
Italy	22.731	354	0,17	0,99
Piedmont	1.816	25	-0,02	1,17
Valle d'Aosta	55	1	-0,22	0,86
Liguria	616	12	-0,28	1,26
Lombardy	4.281	101	0,48	0,91
Trentino-Alto Adige	476	13	0,88	0,52
Veneto	2.099	37	0,27	1,53
Friuli-Venezia Giulia	504	7	-0,12	0,98
Emilia-Romagna	1.946	39	0,46	1,19
Tuscany	1.558	23	0,39	0,78
Umbria	356	5	0,10	1,65
Marche	632	12	-0,15	1,60
Lazio	2.274	79	0,94	1,03
Abruzzo	492	10	0,03	2,06
Molise	106	4	-0,15	2,73
Campania	1.612	42	-0,29	2,02
Apulia	1.211	37	-0,24	2,43
Basilicata	187	4	-0,13	2,12
Calabria	546	22	-0,58	2,38
Sicily	1.390	51	-0,67	1,72
Sardinia	575	17	-0,18	2,62

Source: Author’s own creation

Table 3A. Average correlations among regional series, yearly data, 2008-2019

	Employment	GDP per capita
Italy	0,62	0,84
Piedmont	0,65	0,78
Valle d'Aosta	0,56	0,64
Liguria	0,59	0,80
Lombardy	0,45	0,81
Trentino-Alto Adige	0,43	0,35
Veneto	0,60	0,70
Friuli-Venezia Giulia	0,64	0,77
Emilia-Romagna	0,49	0,68
Tuscany	0,48	0,80
Umbria	0,55	0,78
Marche	0,55	0,82
Lazio	0,46	0,69
Abruzzo	0,55	0,68
Molise	0,65	0,71
Campania	0,48	0,77
Apulia	0,64	0,79
Basilicata	0,45	0,42
Calabria	0,61	0,70
Sicily	0,59	0,68
Sardinia	0,62	0,78

Source: Author’s own creation

Table 4A. Descriptive statistics, cooperative added value and employment, yearly data, 2008-2019

	Coop. Added Value / GDP				Coop. Employment/Employment			
	Mean	SD	min	max	Mean	SD	min	Max
Piedmont	1,34	0,08	1,11	1,41	3,66	0,45	2,62	4,01
Valle d'Aosta	1,01	0,09	0,85	1,14	2,70	0,57	1,74	3,45
Liguria	1,23	0,06	1,06	1,30	3,20	0,60	2,17	3,71
Lombardy	1,08	0,08	0,94	1,17	3,60	0,76	2,25	4,18
Trentino-Alto Adige	2,32	0,30	1,74	2,59	4,84	0,54	3,66	5,33
Veneto	1,28	0,11	1,04	1,39	3,25	0,62	2,11	3,80
Friuli-Venezia Giulia	1,49	0,08	1,32	1,64	3,88	0,65	2,62	4,68
Emilia-Romagna	5,66	0,21	5,22	5,88	11,69	0,94	9,79	12,61
Tuscany	2,01	0,09	1,90	2,15	4,30	0,53	3,23	4,75
Umbria	3,31	0,36	2,69	4,18	5,67	0,71	4,46	6,72
Marche	1,35	0,11	1,07	1,48	2,92	0,59	1,58	3,40
Lazio	1,11	0,09	0,98	1,23	4,15	1,02	2,42	5,24
Abruzzo	0,79	0,06	0,68	0,89	2,24	0,60	1,10	2,74
Molise	0,93	0,18	0,66	1,44	2,81	0,58	1,76	3,57
Campania	0,86	0,07	0,76	0,96	2,77	0,81	1,39	4,07
Apulia	1,14	0,07	0,99	1,23	3,86	1,13	2,12	6,18
Basilicata	0,93	0,12	0,64	1,06	2,82	0,69	1,46	3,60
Calabria	0,55	0,04	0,46	0,58	2,05	0,31	1,46	2,34
Sicily	0,86	0,04	0,78	0,92	3,01	0,90	1,57	4,86
Sardinia	1,47	0,03	1,42	1,52	3,47	0,76	2,11	4,12

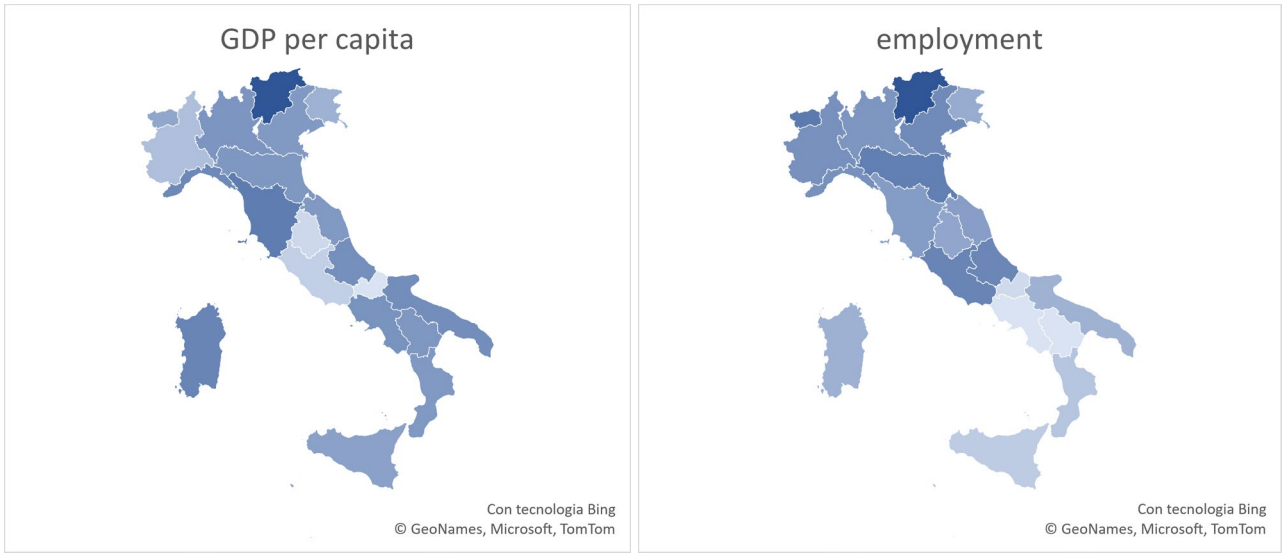
Source: Author’s own creation

Table 6A. RE.i, GDP per capita and employment, 2008-19

	a_1 2008/09	A_1 2010/11	a_2 2012/14	A_2 2015/19	e_1 2008/09	E_1 2010/11
Italy	-1,00	1,00	-1,00	1,00	-1,00	1,00
Piedmont	-1,61	2,88	-1,10	1,39	-0,63	0,41
Valle d'Aosta	-0,83	2,77	-1,39	0,45	-0,04	-0,07
Liguria	-0,93	-0,20	-0,75	0,84	-0,63	0,23
Lombardy	-0,82	3,46	-1,05	1,12	-0,72	1,87
Trentino-Alto Adige	-0,63	1,63	-0,14	0,86	0,92	1,75
Veneto	-1,24	1,81	-0,75	1,20	-0,46	1,73
Friuli-Venezia Giulia	-1,48	2,52	-0,93	1,17	-1,37	0,62
Emilia-Romagna	-1,35	1,90	-0,60	1,21	-0,16	1,19
Tuscany	-0,88	0,44	-0,57	0,84	-0,94	1,11
Umbria	-1,39	-0,16	-1,70	1,24	-1,20	0,75
Marche	-1,18	0,37	-0,79	0,70	-0,99	0,57
Lazio	-0,98	-0,38	-2,15	0,58	-0,29	1,45
Abruzzo	-0,87	3,47	-0,91	0,31	-0,35	-0,03
Molise	-1,03	-1,07	-2,23	1,17	-2,59	0,71
Campania	-0,86	-1,79	-0,98	0,82	-3,33	0,66
Apulia	-1,03	1,05	-0,73	1,05	-1,55	0,99
Basilicata	-1,18	0,37	-0,75	2,22	-2,85	1,54
Calabria	-0,62	-0,71	-1,34	0,48	-2,06	-0,49
Sicily	-0,78	-1,24	-1,33	0,47	-2,39	-0,11
Sardinia	-0,56	-0,11	-1,04	0,90	-1,51	0,81
Mean	-1,01	0,85	-1,06	0,95	-1,16	0,78
SD	0,29	1,57	0,50	0,42	1,04	0,66

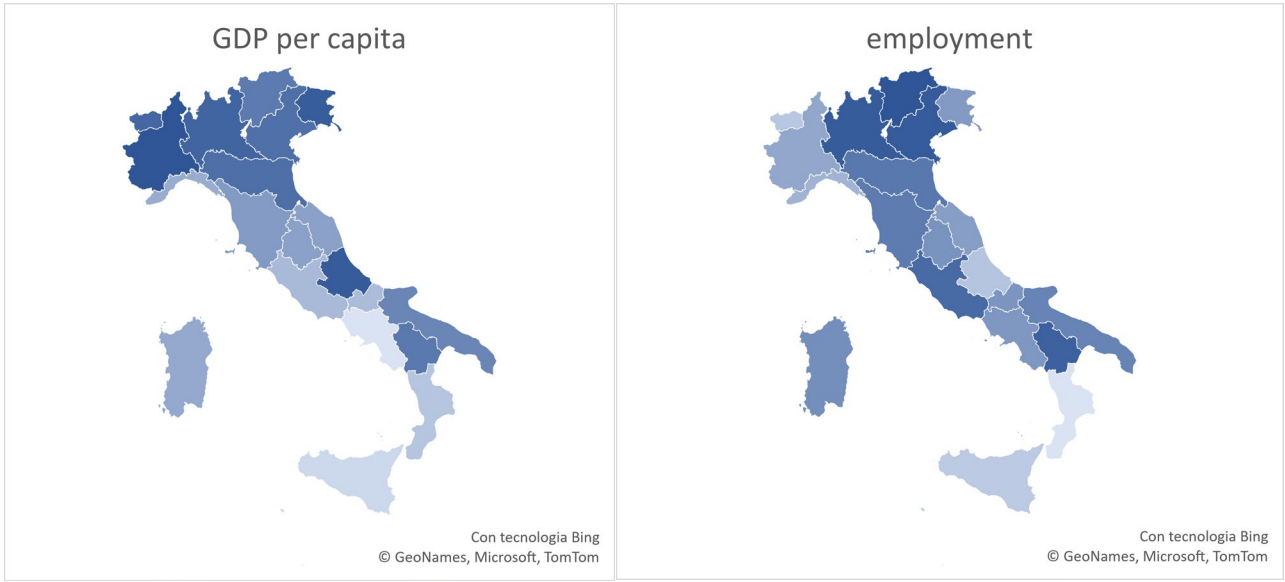
Source: Author's own creation

Figure 4A. Resistance (increases according to the color's intensity)



Source: Author's own creation

Figure 5A. Recovery (increases according to the color's intensity)



Source: Author's own creation

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