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Cooperative Movement
and Prosperity
across Italian Regions

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Abstract

Our main objective is exploring the association between widespread prosperity and the presence of the cooperative movement at the regional level in Italy between 2010 and 2019. We summarize the widespread prosperity through an index originally proposed by Sen (1976) and we then perform a panel regression showing that there is a positive and significant association between such an index and the presence of the cooperative movement as captured by the relative size of cooperative employees. We also detect that the cooperative movement contributes to the regional prosperity more through its employment than in terms of the added value it generates. Moreover, the size of the cooperative presence significantly concurs to explain some large differentials among Italian regions.

JEL Codes: I31, J54

Keywords: social cohesion, regional well-being, income inequality, resilience

NON-TECHNICAL SUMMARY

Starting from the very fuzzy notion of "social cohesion", we recognize that the "well-being" dimension is needed to establish a multidimensional index of social cohesion. Such a dimension, in turn, may be split into a set of indicators, among which we concentrate on income distribution as summarized by an Index of Widespread Prosperity (IWP, obtained by a combination of average household's disposable income and a measure of their dispersion). Hence, we first analyze the regional patterns of this index and then we measure the impact of the regional cooperative magnitude on it. The benchmark is provided by all Italian regions in the period 2010-19.

In assessing well-being or the standard of living, a focus on income distribution is by now common practice. Even at the sub-national level, some measures of income inequality enter overall evaluations of economic inclusion (which in turn relates to well-being, social cohesion and standard of living) within communities. In the analysis of the Italian regions, the statistical evidence suggests that there is an increasingly negative correlation between average household disposable (real) income and the Gini value of its distribution. The IWP declines at the national level and in the vast majority of the regions.

In the econometric analysis uncovering the time frame 2010-19, we detect that, although cooperative employment and cooperative added-value are highly correlated, the latter is not significantly associated to regional prosperity. This is not surprising because a vast portion of cooperatives operates in labor-intensive sectors featured by relatively low added-value per worker. On the contrary, the size of the cooperative employment is highly and significantly associated to the IWP. Hence, we may cautiously claim that the Italian cooperative movement is entitled to be considered one of the relevant factors of regional prosperity, also potentially capable of reducing regional divides, at least in terms of employment and income disparities within territorial communities.

1. Introduction

The main objective of this paper is exploring the association between widespread prosperity[1] and the size of the cooperative movement appropriately summarized. The benchmark is provided by all Italian regions (*Nuts 2*) in the period 2010-19.

A measure of prosperity should capture an intuitive component of well-being, the one usually needed for a decent life in terms of freedom of choice in the access to resources. We are sympathizers of the *capability approach* (pioneered by Sen 1985 and 1986), where the individual well-being is defined as a function of the set of achievements (f*unctionings*), i.e., what one manages *to do or to be* in various life domains as well as the freedom one has in choosing among such achievements (*capabilities*). According to Sen (1985, p. 69), "the quality of life a person enjoys is not merely a matter of what he or she achieves, but also of what options the person has had the opportunity to choose from". Hence, well-being is a multidimensional phenomenon consisting of several functionings, but what ultimately matters in Sen's approach is the freedom of choosing among the many combinations of such subjective functionings. The well-known Human Development Index (HDI), firstly elaborated by the United Nations in 1990, is based on Sen's theory. It considers three key capabilities to human development: a long and healthy life, knowledge and a *decent standard of living*[2].

However, given the hard task to come up with selecting and measuring a group of capabilities, especially for sub-national layers of government, we follow here the so-called *equivalent income approach*, consisting in measuring well-being (also) in terms of an income metrics (Decancq *et al.* 2015). Of course, we are aware of several pitfalls of an income-based approach in trying to summarize attributes of a community which

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[1] According to the *Oxford Advanced Learner's Dictionary*, prosperity is "the state of being successful, especially in making money",

[2] Brandolini (2008) provides an insightful discussion of multivariate indexes of living standard and an application of the capability approach to four major European countries. For an interesting multidimensional approach to global well-being from a capability-based perspective in the last 150 years, see Prados de la Escosura (2021).

are doubtless multidimensional, but our ultimate goal is not about the perfection of an index of well-being, but the scrutiny of the relationship between a key component of well-being and our chosen main explanatory variable (the cooperative magnitude).

As for the choice of a measure of such component of well-being, let y_{it} be the average household disposable (real) income of the *i-th* population in year *t* and G_{it} be the value of the Gini index of the corresponding distribution. Let's then define $Y_{it} = y_{it} (1 - G_{it})$: this can be interpreted as an Index of Widespread Prosperity (*IWP*), as it aims at catching an individually desirable attribute (high purchasing power as a proxy for prosperity), weighting positively the diffusion of close-to-the-average levels of such a power among households which belong to the relevant population. Y_{it} has been originally proposed in Sen (1976) in a seminal analysis of real national income: under some regularity conditions on social preferences, it may be (cardinally) interpreted as a social welfare function, in which G_{it} measures the proportional loss in social welfare to be imputed to inequality in the income distribution. Of course, any index hinging on Sen's (1976) one can accommodate other indicators of, say, well-being, and variables other than real income, as well as measures of inequality of such variables different from the Gini one[3].

To motivate the choice of a regional scale, one may notice that many countries exhibit notably large economic differences within their boundaries and such heterogeneity is obviously concealed in cross-country analyses[4]. Specifically, given the ultimate goal of our research, the distribution of cooperative firms around the world is drastically

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[3] See Decancq and Schokkaert (2016) for a step in that direction.

[4] Various studies by (and within) OECD have shown that differences among regions belonging to the same country may be larger than differences between countries. In 2013, for example, regional differences in the employment rate in Italy ranged from 40% in Campania to 73% in the autonomous province of Bolzano. This range is as large as the one observed across all OECD countries (Veneri and Murtin, 2016). Moreover, it is worthwhile noting that when looking at the inequality measures (e.g., Gini coefficients), regional inequality in income dimension may be relatively larger than in any other well-being dimension (as jobs, housing, education, health, access to services, civic engagement, environment, safety): Pinar (2019, p. 41, Table 3). In other words, income inequality matters not only *per se*, but also once it is embedded into richer indicators of economic conditions.

different across and within countries. Italy, which ranks top in international comparisons as for the economic impact of the cooperative presence, is no exception. Hence, a region-based breakdown of the Italian experience consistently follows.

The intuition driving the attempt of assessing the impact of the cooperative movement (also) on prosperity relies upon a sound background. Cooperative firms are featured by a democratic governance[5], they do not discriminate across workers and/or members (as for gender or ethnicity, for example). Moreover, the empirical evidence suggests that they pursue a combination of revenue net of non-labour costs and employment, distribute a small portion of net revenues to members and tend to be more resilient than profit-making firms during downturns by stabilizing employment while sacrificing net revenues[6]. This countercyclical behaviour, by sustaining labour incomes - whose differences are notoriously the main source of overall personal income inequality at least in OECD countries - ends then with contrasting unemployment and the resulting wage edges between employees and unemployed people. In addition, the pay-ratio within cooperative firms, consortia and organizations is usually lower than within other organizational forms and this contributes to shrink income differentials among employees.

Furthermore, given the well-known structural small dimension of the vast majority of Italian enterprises, a comparative advantage is reaped by those territories capable of *networking* their tiny production units. In carrying out such a task, the cooperative movement excels and the outcome of such a coordination likely enhances the overall

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[5] See, for instance, Zamagni and Zamagni (2011) for a thoughtful account of the *Italian* cooperative movement. To provide an order of magnitude of the economic presence of cooperative entities in the Italian economy, see Borzaga *et al.* (2019, p. 9-11). They elaborate figures retrieved from Istat datasets, according to which, in 2015, including subsidiaries, the cooperative companies account for about 1,215,000 employees (7.4% of total employment in the Italian private sector) and over 32 billion euros (4.4% of the corresponding added value).

[6] See, for instance, Perotin (2012), Kruse (2016), Navarra (2016) and Caselli *et al.* (2021) for the related empirical literature cited therein. In the cooperative companies, net revenues are mostly plough-back to increase indivisible reserves or increase capital and such a strategy clearly strengthens their financial sustainability. See Delbono and Reggiani (2013, p. 394) for some figures about the Italian experience before the financial crisis.

prosperity of the relevant territories (see Menzani and Zamagni, 2009 and Zamagni 2015).

These are the reasons why we did prefer the term *movement* instead of *firms* in the title of this paper: cooperative associations, indeed, continue to play a key role not only in representing cooperative companies (or groups[7]), but also in orienting them, promoting mergers and workers-buy-out and other related supporting initiatives. Hence, one is reasonably induced to detect whether and how, in addition to feed other dimensions of social cohesion and well-being, the cooperative presence is linked to (our measure of) widespread prosperity. Of course, as argued above, given the remarkable differences in the cooperative magnitude across territories, our investigation makes sense especially at the regional level. As far as we know, this is the first attempt of measuring such a link, whatever the choice of the administrative layer.

The rest of the paper is organized as follows. In section 2 we briefly frame our contribution within the vast literature on social cohesion and well-being and then provide in section 3 a short description of how real income and its distribution jointly evolved across Italian regions. This is instrumental to the central question that we tackle in sections 4 and 5 where we present our analysis and comment the results. Section 6 concludes.

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[7] Cooperative groups are business groups which, according to Eurostat, are "associations of enterprises bound together by legal and/or financial links. A group of enterprises can have more than one decision-making center, especially for policy on production, sales and profits. It may centralize certain aspects of financial management and taxation. It constitutes an economic entity which is empowered to make choices, particularly concerning the unit it comprises" (European Regulation 696/93). On this, see the detailed account of the Italian cooperatives in 2015 by Borzaga *et al*. (2019).

2. Social cohesion, well-being and prosperity

Despite being a hugely investigated word, the very notion of *social cohesion* still retains broad margins of ubiquity. One may agree with Chan *et al.* (2006) in envisaging two discourses about it: one coming from academic social sciences, while the other originated from policy-oriented research. Needless to say, the two discourses often overlap even if they ultimately point to different targets and audiences. At any rate, in both types of discourses, social cohesion is seen as a *desirable* attribute of a community and the term continues to enjoy an increasing popularity in debates well beyond the boundaries of scholarly qualified arguments, e.g., in political discussions[8].

In this paper we pursue a much more limited goal than speculating on the most appropriate definition of social cohesion. We are interested in shedding light on an economic side of the intrinsically multifaceted concept of social cohesion, without questioning on it being a determinant, a consequence or a constituting element of the social cohesion itself[9].

We concentrate on one component of the (in)equality dimension featuring most definitions of social cohesion, i.e., the one dealing with the distribution of material resources across members of a community, (real) income ranking top among such resources[10]. In assessing well-being or the standard of living, a focus on income distribution is by now common practice. This is the case with 4 of the 12

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[8] This is attested also by the 40,000,000 results obtained by clicking *social cohesion* on Google (April, 27th, 2021, 12.50 am).

[9] An updated survey is Schiefer and van der Noll (2017).

[10] See Chan *et al.* (2006, p. 284) when citing proposals according to which income is a key index of *economic inclusion*, which is in turn considered as one of the dimensions of social cohesion. Economic inclusion belongs to the components of social cohesion that Durkheim (1893) labelled as "organic solidarity", based on dissimilarity amongst individuals. Incidentally, the same test as the one reported in fn. 8, for *economic inequality* and *income inequality* delivers, respectively, 98,500,000 and 93,600,000 results. This upsurge of interest for inequality and its geography is widely reflected also in academic research, as carefully documented by Cavanaugh and Breau (2018).

recommendations forcefully put forward by Stiglitz *et al.* (2009) in their influential Report. Even at the sub-national level, some measures of income inequality enter overall evaluations of economic inclusion (which in turn relates to well-being, social cohesion and standard of living) within communities.

In this paper we specifically try to detect, at the regional level, the nature of the association between our index of widespread prosperity and a measure of the cooperative presence, taking account, as we shall see in section 4, other relevant characteristics of the Italian regions. In view of such an enquiry, we briefly investigate our index of widespread prosperity *per se*, across regions and over time, in section 3.

The related literature can be roughly split in two overlapping streams. The first one deals with various measures of well-being only across *Italian* areas; the second one addresses similar issues within sets of regions across countries.

As for the first group, the only paper related to ours is Cannari and D'Alessio (2002). They consider 16 Italian areas (mostly coinciding with regions) in the period 1995-2000. Relying on periodical *Surveys of Household Income and Wealth* run by the Bank of Italy, they estimate, *inter alia*, the Gini index of household's disposable incomes which is then used to weight average incomes at the "regional" level (as in in the above Y). Ciani and Torrini (2019) use the same database as Cannari and D'Alessio (2002) to consider the time span between 2000 and 2016. They divide the country only in two macro areas and show that income inequality as measured by the Gini index is persistently greater in Southern Italy compared to the Centre-North area, although the gap seems to shrink in recent years (Ciani and Torrini, 2019, p. 11, Fig. 3a). Income distribution is also considered, for instance, by D'Urso *et al.* (2020), who focus on the measurement of well-being in Italian regions between 2010 and 2016, in Murias *et al.* (2012), who consider Italy and Spain mainly in 2005, and in Bertin *et al.* (2018) through selected opinions on 41 indicators of the Italian regions in 2012.

International samples of regions have been considered in other related empirical contributions, usually by building and estimating various indices of well-being still accommodating measures of income inequality, in addition to indicators of other dimensions aimed at catching the living conditions of communities. We mention, for instance, Palomino (2019) and Pinar (2019). Both rely upon the OECD Regional Well-being Database (*RWBD*), available only for the years 2000 and 2014, which provides figures also about disposable income dispersion across households. The sample includes 395 OECD regions, and 213 European regions, respectively. Veneri and Murtin (2016) also compare a group of 209 OECD regions in the period 2003-12 by means of the *MDLS* (Multi-Dimensional Living Standards) index (see their box 3 for details about this OECD Database). They conclude that differences in households' disposable income within regions are greater than differences in the other two components of the index (jobs and health), but the regional disparities in the *MDLS* exceed those in households' disposable income.

Finally, it is worth mentioning Ezcurra (2009) and Bouvet (2010). The former investigates the relationship between income polarization and GDP growth in 61 EU regions between 1993 and 2003, reaching the conclusion that the association is negative. The latter considers a group of European regions between 1977 and 2003 to examine trends in income inequality. While interesting in many respects, both papers use GDP per capita to describe income distribution; this does not seem to us an advisable choice at the regional level. The discrepancy between the production's location and the geographic distribution of factor revenue recipients is indeed usually greater, the smaller are the geographical units dividing a (not tiny) country. Hence, the use of GDP per capita instead of income casts some doubts on the interpretation of the resulting findings.

3. Regional widespread prosperity in Italy

To proceed with a preliminary analysis of Y_{it}, we plot 20 pairs in the income-Gini space for all regions in 2010 (Fig. 1A, A mnemonics for Appendix) and 2019 (Fig. 2A). The data about regional income distributions are retrieved from official datasets (Eu-Silc, based too on households' surveys). Since the Eu-Silc data cover up to 2017, we have estimated incomes and Gini values for 2018 and 2019. As for G_i, we employed the last 5 available values of G_{it} ($t = 2013$-17) to obtain the two subsequent years via a linear regression. As for as the regional average values of household disposable real incomes (y_i), we obtain the 2018 values by means of the yearly rate of change between 2018 and 2017 (source: Istat, *Regional accounts*) and then we replicate the same update by using the values of 2018 to derive the 2019 ones. Moreover, since the datasets provide separate figures for the two autonomous provinces of Bolzano and Trento (which the region Trentino-Alto Adige is divided into), we average their data using population sizes (15+) as weights.

[Insert Figure 1A about here]

We used the Consumers Price Index (Istat, Foi(nt)) to deflate money incomes. It is noteworthy that using a national deflator yields an underestimate of households' purchasing power in Southern regions where prices are notoriously lower than in the Centre-North of the country[11].

[Insert Figure 2A about here]

While in 2010 the scatter plot does not exhibit any clear pattern, in 2019 a negative association between the regional real income and the corresponding Gini index

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[11] See, for instance, Zamagni (2018, p. 76).

emerges quite clearly. Fig. 3 shows even more neatly that the correlation between regional real incomes and the Gini values of the corresponding distributions is negative and growing over time (the correlation coefficient increases from 0.59 to 0.67). A negative correlation has been detected also among countries[12].

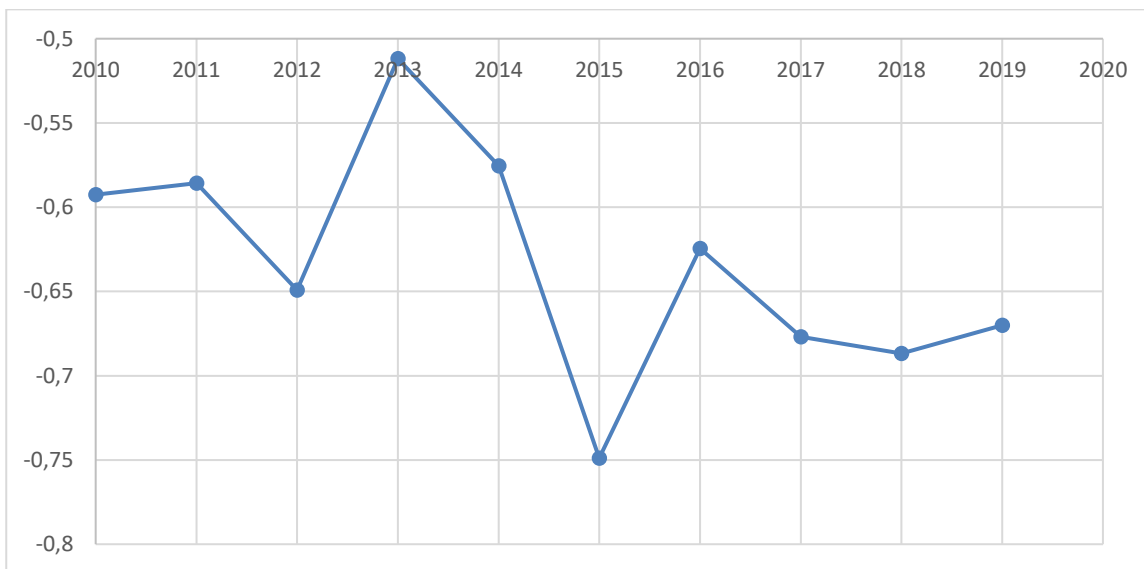Figure 3. Correlation between Gini index and regional average incomes, 2010-19

Table 1 summarizes the (numerical) content of Figures 1 and 2 for the extreme years, appending the percentage changes in regional incomes, Gini values, as well as the value of Y, over the entire period.

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[12] In 2014, for instance, the correlation coefficient between average disposable income and *within-country* income inequality (as measured by the Gini coefficient) is equal to -0.79 in the European countries (Pinar 2019, p. 43, fn. 25).

Table 1. y_{it} and G_{it}; $\Delta\%$ changes in y_{it}, G_{it} and Y_{it}; t = 2010, 2019; (*: special status regions)

	2010		2019		2010/2019		
	y_i	G_i	y_i	G_i	$\Delta\% y_i$	$\Delta\% G_i$	$\Delta\% Y_i$
Italy	32370	0,33	31483	0,343	-2,74	4,00	-4,66
Piedmont	34600	0,32	30966	0,314	-10,50	-1,88	-9,72
Valle d'Aosta*	34608	0,282	30716	0,313	-11,25	11,13	-15,13
Liguria	31746	0,3	31263	0,314	-1,52	4,60	-3,46
Lombardy	37067	0,31	36322	0,329	-2,01	6,13	-4,71
Trentino-Alto Adige*	38483	0,298	37097	0,310	-3,60	3,89	-5,19
Veneto	34637	0,288	35669	0,307	2,98	6,53	0,26
Friuli-Venezia Giulia*	33431	0,285	34310	0,284	2,63	-0,28	2,75
Emilia-Romagna	37427	0,297	35411	0,290	-5,39	-2,29	-4,47
Tuscany	34442	0,304	33957	0,332	-1,41	9,21	-5,37
Umbria	32888	0,287	33536	0,291	1,97	1,25	1,46
Marche	34278	0,289	33128	0,299	-3,36	3,39	-4,69
Lazio	34270	0,345	32331	0,378	-5,66	9,68	-10,47
Abruzzo	26936	0,299	27900	0,315	3,58	5,35	1,21
Molise	27249	0,292	27242	0,321	-0,03	9,86	-4,09
Campania	26327	0,342	24912	0,362	-5,38	5,73	-8,19
Apulia	28306	0,33	27622	0,334	-2,42	1,21	-3,00
Basilicata	26731	0,344	25837	0,358	-3,34	4,19	-5,46
Calabria	25686	0,335	25421	0,382	-1,03	14,15	-8,09
Sicily*	22643	0,364	22753	0,371	0,49	1,82	-0,56
Sardinia*	29196	0,31	28099	0,346	-3,76	11,48	-8,72

While the country as a whole has not recovered yet from pre-financial crisis levels (−2.74% in real income) and the Gini index mildly moves up in the period, very different tendencies characterize the regional territories, both for the size of income contraction as well as for the variation in income dispersion. Table 2 collects the summary statistics of the tree variables under exam and to be used in the next section.

Table 2. Summary statistics

Variable	Obs	Mean	Std. Dev.	Min.	Max.
y	200	29911	4241	21628	38483
Gini	200	0.316	0.028	0.262	0.396
Y	200	20533	3409	13635	27015

Unsurprisingly, the Coefficient of Variation of *Y* exceeds the one of *y*, supporting our choice of the former instead of the latter to capture differences in regional prosperity.

The Southern regions (including islands) continue to experience *more uneven* distributions around a *lower* real income than the Centre-North ones[13]. The country as a whole performs quite poorly and, given the relative stability of the national Gini value, the driving factor seems to lay in the conspicuous fall in Italian GDP and real revenues observed after the financial crisis. Only a few regional territories experience (tiny) positive variations in Y_i, the greatest of those being Umbria.

Fig. 4A visualizes the remarkable decrease in the average regional *Y* between 2010 and 2013, followed by a modest recoupment. Such a pattern is accompanied by an increase over time in the standard deviation of Y.

[Insert Figure 4A about here]

In Fig. 5A, we plot, for each region, the difference between its Y_i and the unweighted average value of all Y_i, in the two extreme years of our time frame. The territorial gap (Centre-North vs South) is confirmed once again. Moreover, it is worth underscoring

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[13] This is the conclusion reached also in Mussida and Parisi (2020) and Doran and Jordan (2013). However, in Doran and Jordan (2013, p. 27) the real gross value added per capita, instead of real income per capita, is used to measure living standards for each region. Hence, the abovementioned comments about this choice applies also to their findings.

the generalized increase in the size of differentials wrt to the average (whatever their sign) in the period.

[Insert Figure 5A about here]

4. Methodology and empirical analysis

For the arguments provided in the introductory section, we conjecture the presence of a positive association between the chosen index of regional widespread prosperity (Y) and the size of the cooperative movement in terms of cooperative employees and/or added value obtained by cooperative organizations.

We obtain novel data on the regional cooperative presence by elaborating the balance sheets from the *Bureau van Dijk-Aida* dataset, whereas we retrieve all the other data from Istat (*Labor Force Survey*, in Italian). As for the interpretation of figures about the cooperative employment figures, it is worth stressing that we collect data about employees of cooperative firms and cooperative groups which are registered in the various regions. Of course, some of them, especially the largest ones, employ labour force also outside the regional boundaries. This means that we shall emphasize the economic consequences of decisions taken in the corporate headquarters located in the relevant region, being obviously aware that they yield economic effects also elsewhere. However, the territorial gap between the company's location and the location of its employees is very small: in 2015, 99.6% of Italian cooperatives (and almost 85% of groups controlled by cooperatives) operate only in the region where they are registered (Borzaga *et al.* 2019, p. 10). Hence, we shall summarize the regional cooperative magnitude with the following variables[14]:

Cooperative employment (CEM): cooperative employees out of *pop[15, 64]*.

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[14] *pop[n, m]* will indicate the population share in the (closed) interval between *n* and *m*.

Cooperative Added Value (CAV): cooperative added value out of regional GDP.

To complete the construction of the dataset to be used, in addition to the one collected in Table 2, the choice of the other relevant variables reflects a broadly consolidated empirical literature. Indeed, various indicators capturing demographic factors (as the elderly dependence rate, life expectancy, mortality rates), the share of population with at least secondary or third education, the participation in the labour market ((un)employment rate, activity rates) and real GDP have been variously included into multidimensional indexes of well-being[15]. Here we select the following variables:

Activity Rate (AR): active *pop[15, 64]* out of *pop[15 ,64]*.

Education (EDU): *pop[25, 64]* with at least secondary education out of *pop[15, 64]*.

Elderly Rate (ER): population 65+ out of *pop[15, 64]*.

Italian Gross Domestic Product yearly rate of growth (GDP).

Table 3. Summary statistics

Variable	Obs	Mean	Std. Dev.	Min.	Max.
CEM	200	2.48	1.54	0.64	8.93
CAV	200	1.56	1.14	0.46	5.88
AR	200	64.32	7.99	46.30	74.61
EDU	200	29.83	3.21	22.59	36.55
ER	200	34.24	4.63	23.45	46.39
GDP	10	0.18	1.88	-4.33	2.54

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[15] See, for instance, Murias *et al.* (2012), Bertin *et al.* (2018), Pinar (2018), Palomino (2019), Mussida and Parisi (2020) and D'Urso *et al.* (2020). Notice, however, that the measures of households' income distribution (averages and/or indices of dispersion) are included among the indicators of well-being, whereas in our analysis such measures are embedded into an index (Y_{it}) that needs to be analysed wrt other indicators, the cooperative presence being the candidate mostly under scrutiny.

We begin by dividing the Italian regions into two groups according to their *CAV* (summarized by the mean over the period) wrt to the median. By means of the same criterion we classify regions wrt the median *Y*. The resulting Table 4 (where $\bar{Y}$ and σ_Y are the mean and the standard deviation of *Y*, respectively, in the relevant group between 2010 and 2019) shows that 8 low *CAV* regions out of 10 display also a low value of *Y* and 8 high *CAV* regions out of 10 feature also a high value of *Y*.

Very similar conclusions emerge with a taxonomy based on median *CEM*: 8 regions out of 10 share low values of *CEM* as well *Y* and 8 regions out of 10 share high values of both. Only four regions are located differently wrt to the classification based on median *CAV*.

Table 4. Italian regions wrt to *Y* and *CAV* and wrt to *Y* and *CEM*, 2010-2019

	Low *CAV*	High *CAV*	Low *CEM*	High *CEM*
Low *Y*	Abruzzo Basilicata Calabria Campania Lazio Molise Apulia Sicily $\bar{Y}$=17188 σ_Y=1789	Liguria Sardinia $\bar{Y} = 19506$ $\sigma_Y = 1263$	Abruzzo Basilicata Calabria Campania Molise Apulia Sardinia Sicily $\bar{Y}$=16939 σ_Y=1456	Lazio Liguria $\bar{Y} = 20500$ $\sigma_Y = 269$
High *Y*	Lombardy Valle d'Aosta $\bar{Y} = 23183$ $\sigma_Y = 1022$	Emilia-Romagna Friuli-Venezia Giulia Marche Piedmont Tuscany Trentino Umbria Veneto $\bar{Y} = 23472$ $\sigma_Y = 1215$	Marche Valle d'Aosta $\bar{Y} = 22539$ $\sigma_Y = 378$	Emilia-Romagna Friuli-Venezia Giulia Lombardy Piedmont Tuscany Trentino Alto Adige Umbria Veneto $\bar{Y}$=23633 $\sigma_Y = 1216$

In either case, we can firmly reject the hypothesis of independence between regional widespread prosperity and either CAV or CEM. This descriptive result is confirmed by the statistics test $\chi^2_{\nu=1} = 7.20$, with associated probability $p(\chi^2) = 0.0073$, as well as by Fisher's exact test, with probability $p = 0.011$, which looks appropriate with fairly small samples as ours.

We now resort to a panel analysis allowing us to catch both the spatial and the temporal dimension of our data. Given the nature of our balanced panel, to test the aforementioned conjecture, we run the following linear panel regression:

$$Y_{it} = \alpha + Y_{i,t-1}\beta + X_{it}^{'}\delta + Z_t^{'}\lambda + \gamma_i + \varepsilon_{it} \qquad (1)$$

where X_{it} is the vector of variables at time t described in Table 3, Z_t is the vector of time-dependent, region-invariant variables, γ_i are regional fixed effects and ε_{it} is the residual component. The dependent variable $Y_{it} = y_{it}(1 - G_{it})$ is central to our research and has been illustrated in previous sections (and its summary statistics is in Table 2).

The presence of $Y_{i,t-1}$ captures the alleged dynamics of Y, without ignoring regional differentials. Some region-specific characteristics, such as the ones belonging to one of three geographic subsets (North, Centre and South) or being ordinary status type, or special status (the 5 starred regions in Table 1), are included in the regional fixed effects γ_i.

As for Z_t, we consider the Italian *real GDP yearly growth rate (GDP),* whose statistics is also summarized in Table 3. To ease the interpretation of the variables *X* and *Z*, all the above series are multiplied by hundred.

5. Results

In Table 5 we report the OLS estimates of eq. (1), distinguishing the entire group of regions from the relative subsets of the 10 ones featured by a high *CAV* and by a high CEM. The Hausman test for random effects vs fixed effects, reported in the last row of Table 5, indicates a strong preference for the fixed effects model to be used below. Notice that including lagged values of Y among the regressors allows us to consider the presence of autocorrelation; however, it cannot but lead a strong heteroscedasticity requiring us to resort to robust standard errors that we calculate by means of the Arellano HAC estimator.

Table 5. Panel regression, Italian regions, 2010-19

	Dependent variable: Y					
	all regions		10 regions high CAV		10 regions high CEM	
AR	96	(65)	11	(130)	-71	(121)
CEM	381**	(161)	904**	(289)	755**	(297)
EDU	-23	(58)	111	(100)	36	(91)
ER	-32	(64)	2	(109)	135	(122)
CAV	387	(361)	186	(256)	64	(224)
GDP	138***	(20)	123***	(29)	102***	(20)
Y(-1)	0.62***	(0.06)	0.68***	(0.07)	0.66***	(0.06)
R^2	0.98		0.96		0.95	
F statistic						
Common intercept	$F_{v=19,58.8}=1.76$	p=0.05	$F_{v=9,32.4}=1.39$	p=0.23	$F_{v=9,32.4}=1.79$	p=0.11
Hausman test	$\chi^2_{v=7}=54.05$	p=0.00	$\chi^2_{v=7}=25.69$	p=0.00	$\chi^2_{v=7}=39.80$	p=0.00

Robust standard errors in brackets. *** $p < 0.01$; ** $p < 0.05$; * $p < 0.10$

As we expect, *Y(-1)*, which greatly varies across territories, captures a portion of the differentials measured by the regional fixed effects γ_i. In the analysis of our 20 regions, the joint Welch's F test (reported in the last but one row of Table 5) rejects the presence of a unique intercept, hinting at significant regional fixed effects γ_i. Looking at the two subsets of regions featured by similar levels of *CAV* or *CEM*, the Welch's F test does not suggest any longer to reject the hypothesis of a common intercept and this looks consistent with dealing now with less heterogeneous groups of regions.

The significant differences across Italian regions, often documented by other researches, emerge also in our analysis. This is also true regarding the relevance of their geographic position and the ordinary vs special type of their statutes, as jointly specified by *Y(-1)* and γ_i.

GDP and *Y(-1)* are the most relevant explanatory variables, which positively and significantly affect *Y*. A unitary increase in *ΔGDP* yields an average increase of 100 euros in *Y*, which instead rises by 62 euros if *Y* goes up by 100 euros the year before.

In addition to *GDP* and *Y(-1)*, the most important variable is *CEM*: an increasing cooperative employment is positively and significantly associated to increases in *Y*: a unitary increase in *CEM* raises *Y* by about 380 euros.

As for the other variables, no significant association is therefore detected: conditionally on the effects of *GDP, Y(-1)* and *CEM*, neither the education ratio, nor the elderly rate seems to affect the regional prosperity. The same irrelevance is detected in the relationship between prosperity and the added value obtained within the cooperative boundaries. Indeed, it is worth noting that while *CEM* and *CAV* are highly correlated, the latter, as opposed to the former, is not significant. This is not surprising because it is well known that a vast portion of cooperatives operate in labor-intensive sectors featured by a relatively low added-value per worker[16].

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[16] According to Istat datasets, 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 (including cooperative groups), it was

If we estimate the equation (1) by restricting the sample to the 10 regions with high *CAV* (see Table 4), we obtain the results reported in columns 4-5 of Table 5. The previous findings stemming from the panel regression within the complete sample are strengthened. We notice that the impact of cooperative employment on prosperity more than doubles compared to the nation-wide one: for the top 10 regions in terms of *CAV*, a unitary increase in *CEM* increases Y by more than 900 euros. This finding is consistent with the tests performed relatively to Table 4 and indicates that the regions with the highest cooperative presence exhibit the highest levels of prosperity.

The same conclusions are reached if, instead of top-ranked regions in terms of CAV, we would focus on those featured by high levels of CEM. The cooperative presence is confirmed to be again positively and significantly associated to the regional prosperity.

6. Concluding remarks

Let us summarize the track followed in this paper. We briefly outlined the role of well-being in the broad research area explored within the fuzzy boundaries of "social cohesion" by both academic and policy-oriented scholars. We acknowledge and recognize in the literature that the "well-being" dimension is needed to establish a multidimensional index of social cohesion. Such a dimension, in turn, may be split into a set of indicators. The indicator that we choose to concentrate on is income distribution as summarized by our index of widespread prosperity. Hence, we first analyze the regional patterns of this index. Then, we measure the impact of the regional cooperative presence on it.

While testing the impact on prosperity of the cooperative movement as proxied by the relative number of its employees, we conjecture that the cooperative presence may also yield effects on other dimensions of well-being and social cohesion. Therefore, a richer

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24,851 euros (Borzaga *et. al.* 2019, p. 11). These figures about cooperative employees and added value exclude financial and insurance activities; for instance, they ignore the cooperative credit banks.

set of indicators of the cooperative presence may likely strengthen our findings as well as positively affect other dimensions considered in composite indexes. This is left for future research.

In the first part of this paper we show that Italian regions display wide differences in many social and economic spaces, including the distribution of prosperity across households. This amounts to confirming the conclusion reached by a vast literature using many indices of well-being and social cohesion. Within an income-based approach to well-being, we initially detected that income inequality rises in almost all Italian regions, especially in the South, and the presence of a negative (and increasing over time) correlation between income levels and the Gini values[17]. Lastly, the regional widespread prosperity declines almost everywhere, especially in the South.

We then focus specifically on the contribution of a phenomenon like the Italian cooperative movement on a key dimension of regional well-being as the one captured by Y. Within such a relatively narrow frame and in a limited time span, notwithstanding the simplicity of our model, our new findings look encouraging and arguably worth further investigation. Indeed, we detect a large and significant association between the size of the cooperative employment and our index of widespread prosperity and such an association is not mitigated by standard economic and socio-demographic control variables entering our panel regression. Hence, we may cautiously claim that the Italian cooperative movement looks entitled to be considered one of the relevant factors of regional prosperity, also potentially capable of reducing regional divides, at least in terms of employment and income disparities within communities. Moreover, our findings suggest also an apparent positive association between the size of the regional cooperative movement and the resilience of regional economic system[18] with respect to sever shocks like the ongoing pandemics-driven one.

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[17] This evidence echoes some findings of the vast research stream on the macroeconomic relationship between growth and income inequality: see, for instance, Naguib (2017) for an interesting empirical research and an updated survey.

[18] Such an association is explored in Costa and Delbono (2021).

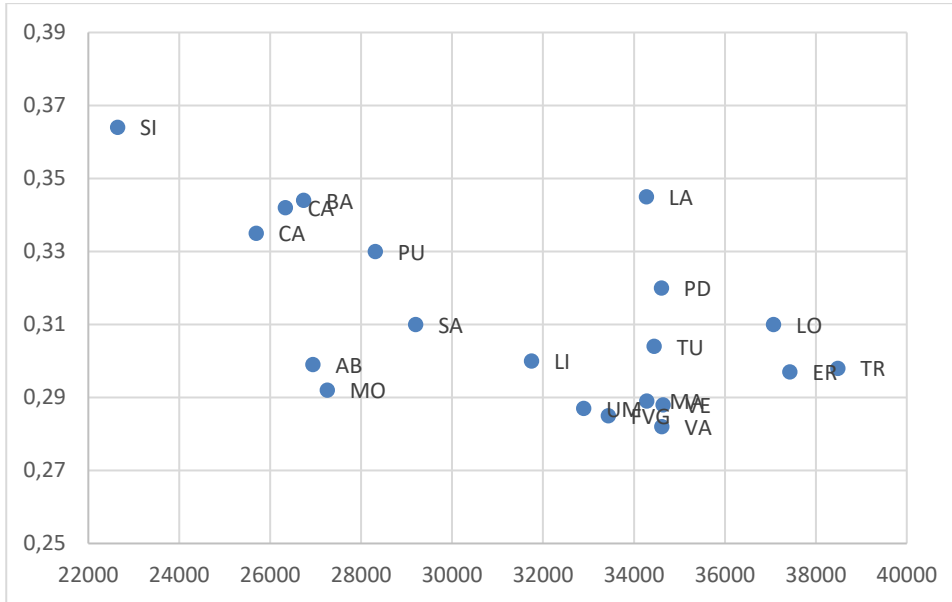Figure 1A. Gini index and average income, Italian regions, 2010

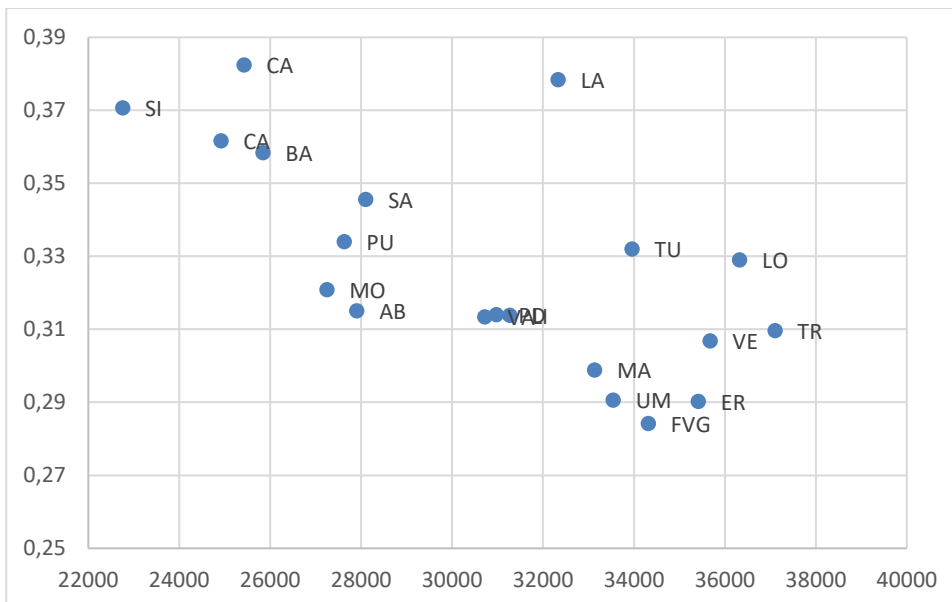Figure 2A. Gini index and average income, Italian regions, 2019
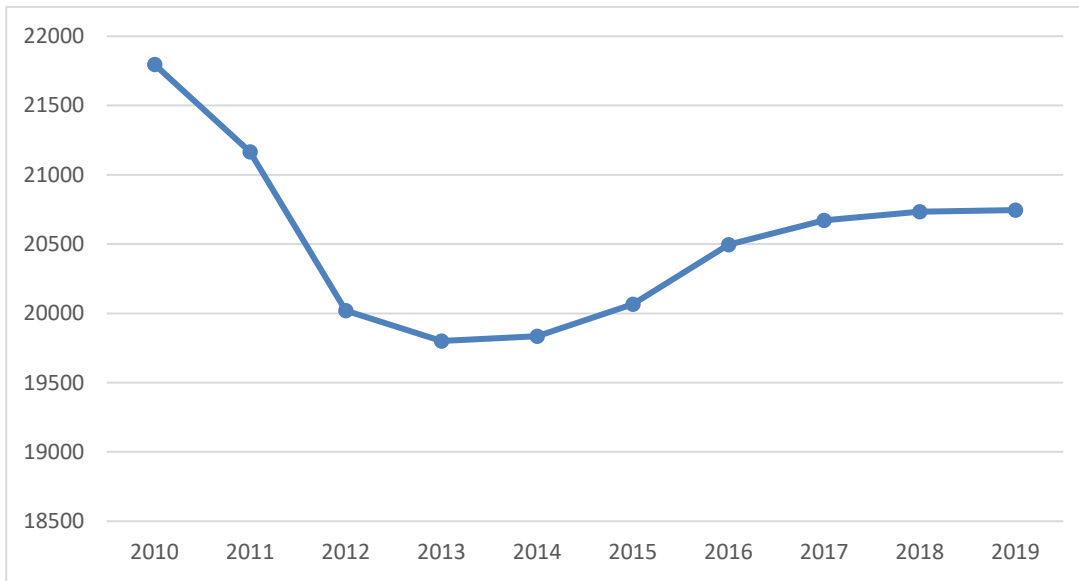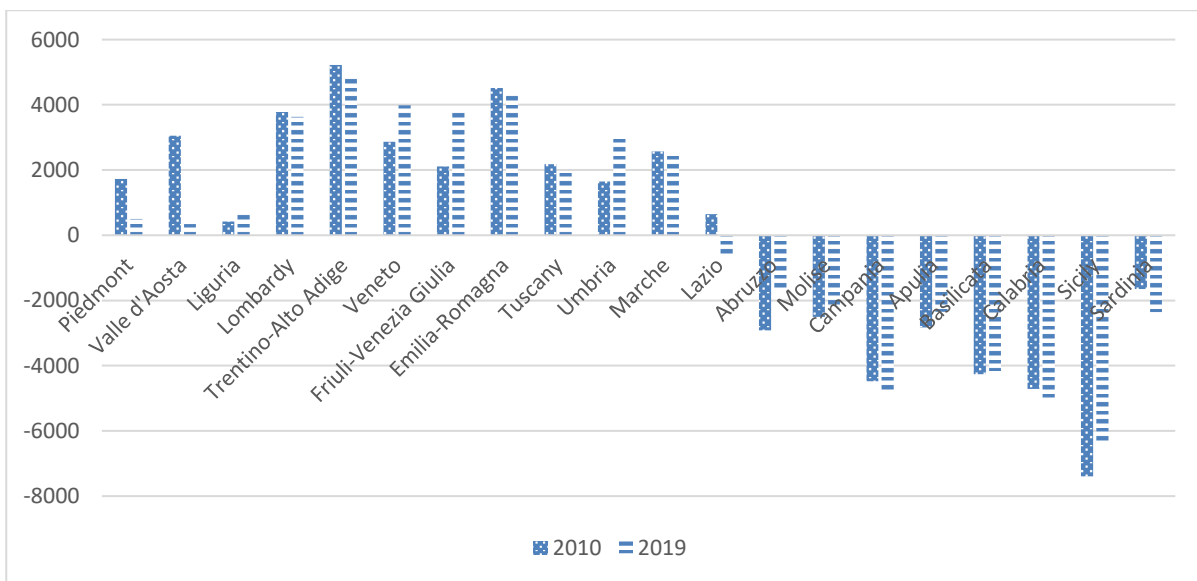
Figure 4A. Average *Y*, 2010-19

Figure 5A. Differences between Y$_i$ and average *Y*, 2010 and 2019

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