sustainability

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Decentralisation and Resilience: A Multidimensional Approach

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Abstract: Multidimensional wellbeing is gaining momentum as a measure of socio-economic performance. Departing from common practice using income and employment, we investigate the resilience of 22 European countries on the occasion of the 2007 economic crisis in terms of multidimensional wellbeing. The potential effects of fiscal federalism-as measured by decentralised expenditure- on the ability to recover from the economic shock at the sectoral level are taken into account using data from the IMF's Fiscal Decentralisation dataset. Methodologically, using panel data from 2009 to 2017 the empirical analysis adopts a pooled regression (POLS) approach with Driscoll–Kraay standard errors to consider very general forms of cross-sectional/spatial and temporal dependence. The analysis shows that (i) the results in terms of multidimensional resilience along the so-called 4R (i.e., Resilience, Recovery, Reorientation, and Renewal) are rather sector-specific and (ii) generally speaking, the level of fiscal decentralisation mitigates the shocks. Although based on the 2007 financial crisis, we argue that the lessons learned from the current analysis could provide a stimulus for research and interesting general insights applicable to other shocks, including the current COVID-19 pandemic. Indeed, our novel approach based on multidimensional wellbeing provides a piece of robust evidence making the spatial unevenness of economic shocks more apparent. As a consequence, from a scholarship perspective, it questions the mainstream approach based on mainstream measures, such as GDP and employment, calling for a more granular approach to economic resilience; furthermore, from a policymaking perspective, it prompts policymakers and practitioners to pay higher attention to sector-specific effects of decentralised policies.

Keywords: multidimensional resilience; recovery; decentralisation; crisis; Europe; wellbeing

Citation: Arcidiacono, A.; Torrisi, G. Decentralisation and Resilience: A Multidimensional Approach. *Sustainability* **2022**, *14*, 9919. https://doi.org/10.3390/su14169919

Academic Editor: Ioannis Nikolaou

Received: 14 July 2022
Accepted: 4 August 2022
Published: 11 August 2022

1. Introduction

The notion of resilience has gained momentum both theoretically and empirically in recent years, attracting interest from different disciplinary fields. More specifically, resilience significantly surged following recent catastrophic events in all social and economic fields. For example, with reference to the global financial crisis of 2007–2009 the resilience analytical framework proved methodologically sound both from a descriptive and a predictive perspective. During the crisis, the resilience of local economies has been considered from a variety of standpoints, making even more apparent its multi-faceted nature. Indeed, the 2017 economic crisis showed a serious impact on wellbeing and quality of life. Consequently, in such a case, the policy response to the shock is complex and requires a significant amount of information in order to implement effective measures. In this regard, fiscal decentralisation might offer potential benefits to the extent it allows for better-tailored policies at the local level [1–3]. Therefore, in the current analysis, we conjecture that decentralisation is a potential driver for improved resilience behaviour. More generally, the extent to which strategies are based on local self-government could prove to be crucial in order to achieve social progress and economic growth; however, several caveats have been highlighted in this regard [4]. Moreover, quite interestingly, the economic, fiscal, and financial crisis has somewhat tended to lessen the decentralisation trend registered in the recent decades [3,5,6] in favour of a "recentralisation" in the central

government, therefore, reversing the process of decentralisation [5]. Indeed, the centralisation of power has a few key advantages, such as easier decision-making based on a limited number of authorities; smoother procedures and a unified vision resulting in a lower risk of splinter groups or discrepancies due to minimal room to make conflicting decisions. However, the centralisation of power also has disadvantages, for example, it is harder to act at a proper scale since it becomes more difficult for one authority to manage all action plans effectively; it entails less employee involvement due to less opportunity for feedback and reduced circulation of ideas; it might cause more strain on top management. For a critical discussion on the pros and cons of decentralisation the reader is addressed to Ashcroft et al. (2005) [7].

While the decentralisation process was mainly based on both equity and efficiency arguments, the recent recentralisation calls for a stronger role of central governments on the basis of a supposed better ability to rapidly respond to urgent issues in an effective manner [8–10]. Put differently, the decentralisation process dating back to the mid-1980s was mainly based on the rationale that getting the expected beneficiaries of the policies closer to policymakers would have improved their final outcome due to better information, increased accountability, and improved citizens' involvement. However, the tenet that the grass-root level of economic issues is relevant has been somewhat threatened by the recent economic crisis. While it is generally acknowledged that local economic development plays an important role, the argument that issues related to different areas of social, economic, political, and cultural life require a pronounced action at the national/central level gained momentum as a strategy to control the social and economic aspects of the recent economic and financial crisis [11–13]. Hence, the crisis somehow acted as a stimulus for a spatial restructuring of the state in favour of a more centralised setting.

Arguably, the ability of an economic system to retain its spatial structure following a shock contributes to defining–lato sensu–its degree of resilience. The notion of resilience more properly focuses on the assumption that different states of a system involve different equilibria. The switch from a stable domain to another one shapes the evolution of systems. The resilience depends both on the strength of perturbation and on the size of a given stable domain. More generally, the main drivers for resilience have been detected in past and current growth, adaptation to change, convergence, and sustainability [14–16]. Notwithstanding, we argue that a significant role largely ignored by the extant literature is played by the degree of decentralisation [17–19]. Since, as mentioned, the overall effect of the decentralisation setting depends on the actual balance between its potential benefits and costs, we argue that it is an aspect that is worth addressing on both theoretical and empirical grounds.

Theoretically, the decentralisation process could involve greater flexibility and more resilience. Indeed, decentralisation is among the dominant means to renew governance towards the possibility of "tailor-made policies", potentially based on co-operation with other local actors. The diffusion of these policies through the EU has determined a new paradigm of development [20,21]. From a shock-oriented standpoint, we hypothesise that a country could be more resilient if it could benefit from substantial power while mitigating and accommodating the impact of current shocks. According to this paradigm, such resilient countries would suffer less in an economic downturn and are likely to experience greater growth during a positive economic environment [22]. In summary, decentralisation involves the transfer of power from the central government to regional and local governments. The value of preserving and promoting decentralisation policy is motivated by different reasons. First, decentralisation is lauded as the main component of good governance and development [23,24]. Secondly, decentralisation is often declared to overcome a problem that has caused dissatisfaction with a centralised system. Indeed, after a national crisis such as a financial and economic crisis, or natural disaster, decentralisation is recommended as a useful tool to withstand the crisis. Third, decentralisation is also viewed as an indispensable part to rebuild an effective government and guarantee an efficient allocation of resources. Therefore, decentralisation design affects resilience.

However, as Martin et al. (2015) suggest regional and sub-regional economies do not exist in isolation and their ability to adapt may depend on the region's dependence on the economic and political system of which it forms part. Each political and administrative decentralisation process fits regions and sub-regions into territorial units with some degree of power and therefore the responsibility and ability to tackle social and economic problems at their own level became significant. Concerning the crisis at hand, the Great Recession has affected Europe more brutally than any other crisis [25,26]. The impact of the crisis has been highly irregular across Europe, both between countries as well as between regions within countries[14,27,28]. To date, many studies focused on the composition of the productive structure and the degree of specialisation [29,30] and the factors that drive this geographical variation. The main factors shaping the difference in resilience across Europe are: (i) the quality of governance; (ii) knowledge and innovation system factors; (iii) socio-demographic factors; (iv) labor market factors; (v) labor market institutions. In order to control for those aspects, additional controls have been included in the analysis. However, the impact of decentralised governance on wellbeing is mixed. Indeed, most of the determinants of economic resilience show regularities across time and space. Nevertheless, extant literature shows that the determinants for resilience detected in different countries mostly overlap, in particular, well-known aspects such as human capital and agglomeration economies. As shown by Fratesi and Rodrìguez-Pose (2016), the most resilient regions in times of crisis were more competitive before the crisis. Indeed, as a concern, this special issue, the factors of regional competitiveness in ordinary times, innovativeness, human capital, agglomeration economies, etc., are also the main determinants of the ability of regions to resist or react to crises [31]. Investigating what strategies could be used at the local level to fight the economic crisis, as well as understanding what the strength of local governments is and the impact of fiscal decentralisation in stimulating economic growth is of pivotal importance for both policymakers and academics [32,33]. The underpinning of this approach is inextricably related to the questions on what are the conditions that can promote local democracy, efficient public services, and regional development. Finally, it represents an advanced form of place-based policy. In short, if the shock spatially unevenly spreads over different dimensions of wellbeing, if one wants to understand the implications of decentralisation for resilience then a multidimensional analysis of resilience is needed.

Since an economic shock involves dimensions of wellbeing going well beyond the GDP dimension, departing from the common practice, this work adopts a multidimensional approach. Indeed, the mainstream approach is rather limited to GDP, (un)employment or a combination of the two [34]. Yet, the potential benefits of a multidimensional approach to both resilience [35] and to the effects of decentralisation policies [36,37] are largely underexplored. Such an approach allows for a more comprehensive analysis of both the observed outcome and the underlying processes. Undeniably, such an approach is also able to contribute to the so-called beyond-GDP initiative. Indeed, according to 'The Commission on the Measurement of Economic Performance and Social Progress' [38], the Gross Domestic Product (GDP), or any other aggregate computed per capita, may not provide an accurate measure of the level of wellbeing due to its narrow view. Therefore, another perspective has been developed in recent years to push the analysis further going 'beyond-gdp' [39]. In this regard, the Commission suggests the need to improve some measure of economic performance which, from the one side, is indeed based on production such as employment level or the GDP but, on the other side, includes other factors which, admittedly, have a subjective interpretation and whose measurement is complex, multidimensional, and subject to change. The need to go beyond the maximisation of production and consumption has stimulated the use of other composite indicators or alike [40,41] such as the Sustainable Development Goals (SDGs) measurement framework and the OECD (Organisation for Economic Co-operation and Development) Better Life Index (BLI).

Building upon these attempts, we augment the analytical framework proposed by both Martin (2012) and Fingleton et al. (2012) to measure resilience according to a multidimensional perspective. In this regard, it is worth noticing that the levels of decentralisation

can potentially affect resilience. More specifically, since the overall outcome depends on the balance between its pros and cons (e.g., higher transaction costs, loss of economies of scale, lower local bureaucracy quality, and rent-seeking behaviour), the following research questions are addressed: (i) does the level of decentralisation mitigate the impact of the shock? (ii) does it affect the subsequent phases? (iii) to what extent have the different dimensions of wellbeing (re)acted differently, eventually? In addressing the above research questions, we apply pooled least squares econometric models taking into account spatial interactions between observations.

The remainder of the paper is as follows. Section 2 recalls the notion of resilience, links it to decentralisation, and introduces the multidimensional approach. Section 3 presents the data and the framework for the empirical analysis. Section 4 presents the main results. Section 5 concludes.

2. Resilience: A Multidimensional Approach

In general terms, the word resilience, from Latin "*resilire*", namely "to recoil or rebound", refers to "the act of rebounding, springing back". Hence, the term "resilience" refers to the ability of a system to adapt to change, following a disturbance or disruption of some kind. Specifically, resilience is the ability of a system to survive a series of shocks in all aspects of its functioning. In recent years, this concept has attracted a lot of interest from a spatial perspective, especially after the economic shock of 2008 [42,43]. Some recent works on the impact of shocks of different natures on national growth suggest that countries that have lived through recessions, financial crises, and political upheavals tend to have lower growth rates over the long run [44].

On economic grounds, uses of the term in regional analysis, spatial economists, and economic geographers, see resilience as "the ability of a region to recover successfully from shocks to its economy that either throw it off its growth path or have the potential to throw it off its growth path" ([45], pp. 4–5). Martin (2012, pp. 10–11) defines resilience as "the capacity of a regional economy to reconfigure, that is adapt, its structure (firms, industries, technologies, and institutions) to maintain an acceptable growth path in output, employment and wealth over time". The latter is the so-called "adaptive resilience". A different (and widely invoked) definition is that of so-called 'engineering resilience', which focuses on the ability to return to the steady-state following a perturbation. Holling et al. [46,47] cogently define it as "the magnitude of disturbance that can be absorbed before the system changes its structure by changing the variable and processes that control behavior". This interpretation of resilience used in the regional development context is strictly linked to the well-known "Plucking Model" of economic fluctuation by Friedman [48,49]. According to the "Plucking Model", shocks tend to be transitory and do not affect long-term growth. Specifically, the path of an economy's output is 'plucked' downward because of shocks, but the model predicts that the output will recover to the upward initial level. A system is assumed to be in "equilibrium" before the shock, but after the shock, an underlying stable state or "growth path" is required, to which the economy goes back.

Moreover, Martin and Sunley (2014) point out that the concept of evolutionary resilience is part of a dynamic process in which the reaction to the shock, depends on the cooperation and coordination of political, economic, and social elements both in time and in space[50]. A related approach based on Generalised Darwinism places particular pressure on the role of variety in shaping regional economic resilience [51].

Consistently with a variety of standpoints, economic resilience has been addressed according to several methodological frameworks. In more detail, there are studies exploring the empirical evidence on economic resilience considering measures of unemployment [9,31]. Other studies focus on GDP [52,53] or a combination of both[34]. Overall, the empirical evidence gathered across studies and approaches is far from conclusive. Rather, it proves to be case-specific.

Indeed, the reaction to an economic shock and the following recovery phase depends on a variety of factors including the nature of the shock and the affected spatial productive

structure. Moreover, as shown in Cellini et al. (2017) with respect to the Italian regional case, the variable used to measure the shock per se seems to be relevant. Martin and Fingleton (2011) with respect to the UK find that, in most cases, the proportionate decline in employment during a recessionary downturn tends to be significantly greater than that in output. Hence, the measurement of resilience in itself seems to depend on the measure considered.

The industry mix is another issue that has received increasing attention. In general, resilient regions are those in which firms can introduce new goods or services for export and have access to new technologies to produce such goods and services [54]. The existing literature covers some features of resilient regions, nonetheless, governance and institutional factors have largely been ignored in existing debates [55,56]. According to Hill et al. (2008), in this respect, resilient regions are those with the institutional capacity to make rapid transitions. This attitude is particularly important in economic downturns due to needing to mitigate the negative effects [55]. Hence, good governance is considered pivotal in adaptive capacity. For example, in Duval et al. (2007) policies related to the labor markets have proven to be very valuable in building the capacity to respond to economic shocks, while Christopherson et al. (2010) and Briguglio (2009) highlight the importance of fiscal policies and a supportive financial system. Foster (2007) focused on another issue: the ability of political authorities to put in place effective planning and implementation strategies in response to the economic disruption. More specifically, Eraydin (2015) focuses on attributes and regional policy measures that are influential in making one region more resilient than another one. Three main elements emerge. First, the response of regions to recessionary shocks and the way they recover from these shocks is associated positively with the resources available to tackle these shocks, while the vulnerabilities of regions make them more prone to the negative effects of recessionary cycles. Second, the sources of recessionary shocks identify the attributes that define the adaptive capacity of regions. Finally, regional policies do play a role in developing the resilience of regions to global and national recessionary shocks.

Therefore, more awareness is emerging of the need for closer scrutiny of traditional development strategies that are being increasingly regarded as ineffective in the integrated and globalised world [57]. Furthermore, the findings seem to support the argument that the effects of implemented policies are case-specific. Indeed, as Rodriguez-Pose (2013, p. 1101) argues, institutional interventions 'cannot be done via a one size fits all policy framework or simplistic criteria for intervention'. Finally, since the region's ability to respond to shocks depends upon its existing vulnerabilities and resources, the analysis prompts us to investigate specific policy areas that should be prioritised.

To summarise: the issue of the uneven effects of an economic shock on different measures of economic performance (i.e., unemployment and GDP) along with the case-specific effects of anti-crisis policies remains rather underexplored and, undeniably, it calls for further research. More precisely, we deem that a multidimensional approach to economic resilience would potentially provide interesting insights into the most often under-reported effects of an economic shock. In this regard, as aforementioned, the work conducted by The Commission on the Measurement of Economic Performance and Social Progress [38] calling for a beyond-GDP analysis represents a promising starting point. Indeed, while it is worth noticing that "a universally accepted definition of well-being does not exist (yet)" [58] (Mazziotta, 2017, p. 1); Stiglizt et al. (2009) remark on the important progress in statistical measurement that has occurred in recent years, based on the multidimensional nature of some phenomena, such as the wellbeing of a country. The measurement of wellbeing, in turn, is an important prerequisite for the implementation of effective welfare policies. With this aim, institutions and researchers often adopt a so-called "composite index" approach, which is based on a collection of several indicators echoing the multidimensionality of the phenomena at hand [59]. Bandura (2008) reviewed 178 composite indices for evaluating the countries' performance and for ranking them in terms of political, social, and economic measures. Constructing a composite index, though, is very demanding. Indeed, it has been argued that the best composite index does not exist due to a list of challenging choices that researchers have to make [60]. Firstly, the choice of

the theoretical framework. Secondly, the availability of data, and, thirdly, the methodology to apply to aggregate and compare them (Franchette, 1974). The construction of the index involves the selection of a group of individual indicators, which is an extremely important phase to avoid overlapping information and redundancy. Furthermore, two other important steps are based on the normalisation of the individual indicators, to make them comparable and, finally, their aggregation, applying some mathematical functions, additive methods, and multivariate techniques, such as Principal Component Analysis [58,60]. Examples of composite indices are the United Nations' Human Development Index (HDI), the Italian Equitable-Sustainable-Wellbeing along each dimension (Italian acronym BES, Benessere Equo e Sostenibile), and the Better life index (BLI).

As for the measurement of resilience, it is not surprising that it has been mainly analysed in terms of either employment or GDP. Indeed, traditionally economic growth is measured through the GDP (and its relationship with employment). GDP represents an indicator of the economic wellbeing of an entire economic system since it measures the increase in the quantity of goods and services available to consumers to satisfy their needs. Consequently, for decades, the primary objective of economic policies has been the maximisation of GDP. In case of an economic downturn, therefore, the policy response has been mainly designed to recover the growth rate using supply-side and demand-side policies [61].

Notwithstanding, the beyond-GDP approach significantly challenges the mainstream framework. Indeed, the beyond-GDP approach at the same time as developing a methodological framework for a deeper measurement of the factors actually affecting the wellbeing, unavoidably calls for a coherent innovative approach to the analysis of economic resilience. On the measurement side, several promising initiatives are registered. For example, the BES has become part of the official economic planning in Italy. The official budgeting process includes the analysis of the most important BES indicators in order to include multidimensional wellbeing and sustainability in the public policy discourse. The process started formally with the Law n.163/2016 introducing equitable and sustainable wellbeing as measured by the BES dataset among the official objectives of the economic policy. On a larger scale, the World Summit on Sustainable Development in 2002 pointed out that sustainable development must meet the needs of the present without compromising the ability of future generations to meet their own needs [44]. Sustainable Development requires the integration of action in three following areas: economic growth and equity, conserving natural resources, and the environment and social developments. These arguments reverberate in the system of Sustainable Development Goals (SDGs). In recent years, the EU has embedded sustainable development into a wide variety of its policies. Already in 1997, the EU SDGs are based on the identification and on development of actions to enable the EU to achieve a continuous long-term improvement of quality of life. The key priority challenges are mainly about environmental issues such as climate change and clean energy, conservation, and management of natural resources. Furthermore, EU SDGs include objectives and concrete actions for sustainable transport, sustainable consumption and production, public health, social inclusion, demography and migration, and global poverty and sustainable development challenges. It is also acknowledged that education, research and public finance are important tools in facilitating the transition to more sustainable production and consumption designs. Furthermore, it is generally acknowledged the positive impact of monitoring on the achievement of SDGs.

On a similar premise, the OECD implemented the aforementioned BLI framework. Cogently, the BLI aims to measure the quality of life. More specifically, it evaluates the general wellbeing of individuals and societies, including a wide range of fields, such as the fields of international development, healthcare, environment, and politics. The standard indicators of the quality of life consist of not only wealth and employment, but also the built environment, physical and mental health, education, recreation and leisure time, crime rate, and social belonging. Furthermore, the quality of life is related to the issues of freedom, human rights, and happiness. Methodologically, the BLI allows comparing

wellbeing across countries based on 11 topics. Namely: 'income and wealth'; 'jobs and earnings'; 'housing'; 'health'; 'work–life balance'; 'education'; 'social connections'; 'civic engagement'; 'environmental conditions'; 'personal security'; and 'subjective wellbeing'.

Regardless of the specific initiative, the multidimensional measurement has many advantages for both scholars and policymakers. It presents important theoretical and statistical progress of recent years as compared to both GDP and employment levels, which can only provide some limited information. Indeed, GDP fails to capture the distribution of income across society. It cannot differentiate between an unequal and an egalitarian society. Further, GDP does not incorporate any measure of welfare and ignores externalities. The main challenges to sustainable development, which are global in character, include poverty and exclusion, unemployment, climate change, building strong institutions of governance, and supporting the rule of law. Building upon this argument, this paper analyses the resilience along several dimensions of wellbeing, departing from the traditional measures such as the Gross Domestic Product (GDP) and the employment rate. Indeed, one might expect to observe that if the GDP and the employment rate decrease during the crisis, the wellbeing of individuals could vary to a substantially different extent due to several reasons. For example, the available savings to cope with short-run variation in income or, on a more general premise, other factors, (including public policy), might affect the ability to mitigate the effects registered in terms of both GDP and employment. Moreover, in the attempt to overcome the above criticism, several alternative measures have been proposed such as the ones used in the current work belonging to the SDGs measurement framework.

3. Decentralisation and Resilience

3.1. Decentralisation: Conceptualisation and Measurement

Since the seminal contribution of Oates's theorem (1972), it is acknowledged that in the presence of uneven geographical preferences, different arrangements for the supply of local public goods are always preferable to a uniform solution. It has been argued that decentralisation can also promote more efficient markets [59,62]. More generally, it is also a way to increase participation, transparency, and accountability in policymaking. Rodriguez-Pose et al. (2011) recalled the argument that the global drive towards decentralisation has been increasingly justified on the basis that greater transfers of resources to subnational governments are expected to deliver greater efficiency in the provision of public goods and services and, in turn, to foster economic growth. Indeed, decentralisation is among the dominant means to renew governance towards the possibility of "tailor-made policies", which are based on co-operation with other local actors. In principle, this could apply in terms of (re-)allocation of resources in response to an economic shock. Put differently, this possibility of closely adjusting the policy to local conditions might be crucial in terms of crisis. Hence, it is worth analysing the eventual effects of decentralisation on the observed resilience [63–66].

To some extent (regional) public expenditures represent a measure of policy. More in detail, we consider the variation in regional public expenditure during the crisis as compared to the period preceding the crisis in order to measure to what extent this measure of policy affects resilience, eventually. As mentioned, the effects of decentralisation on economic growth have been addressed both theoretically and empirically. In addition to the arguments stemming from Tiebout (1956) and Oates (1972) seminal papers, there are arguments in terms of innovation and experimentation. Indeed, both innovation and experimentation are more likely at a lower scale and, in turn, the experimentation and innovation in the provision of local or regional public goods and services may generate greater producer efficiency[Feld et al., 2004]. Moreover, decentralising spending decisions can be seen as a tool to improve public sector efficiency, reduce the budget deficit, and promote economic growth (Bird, 1993; Gramlich, 1993; Oates, 1993). Empirically, a fiscal decentralisation' positive effect on growth, measured from either the revenue or the expenditure point of view, is found in, for example, in Silvestre et al. (2008), Rodríguez-Pose and Krøijer (2009), and Gemmell et al. (2013).

However, to the best of our knowledge, very limited attention has been paid to the effects of decentralisation on multidimensional wellbeing. Hence, our analysis attempts to bridge this gap in the extant literature explicitly considering the effects of decentralisation on multidimensional measures of wellbeing. Moreover, since reasonably the potential effects of decentralisation on wellbeing become more apparent in times of crisis, we focus on the effects of decentralisation on the–multidimensional measure of resilience and the subsequent recovery in the occasion of the recent economic financial crisis.

3.2. Methodology

The empirical analysis is based on 22 European countries over the years 2004–2017 and aims to test (i) whether a rebound effect can be empirically detected; (ii) the existence of sectors-specific effects, and, more specifically; (iii) the impact of the multidimensional policy measures on the multidimensional measure of the so-called 4R. The analysis is limited by the availability of internationally comparable data. The selected European countries are the OECD countries used to compare wellbeing through BLI.

Consistently with the multidimensional approach, therefore, our analysis considers additional dimensions with respect to the mainstream GDP/employment as measures of performance. Several variables potentially affecting multidimensional wellbeing have been included in this analysis [67–71].

3.2.1. SDIs

We use Sustainable Development Indicators (SDIs) provided by EUROSTAT. Indeed, the SDGs and their cognate 169 targets, which are at the heart of the UN's 2030 Agenda for Sustainable Development, offer a new policy framework worldwide. Table 1 reports the SDIs considered in this study and their polarity.

Table 1. Sustainable Development Indicators, 2004–2017. Source: authors' elaboration with data downloaded by EUROSTAT.

Indicators	Definition	Polarity
HOUSING	Average number of rooms per person by tenure status and dwelling type	+
INCOME	Adjusted gross disposable income of households per capita	+
JOB	Employment rate (%)	+
COMMUNITY	Person employed in Human resources (Thousand)	+
EDUCATION	Adult participation in learning by sex (%)	+
ENVIRONMENT	Greenhouse gas emissions per capita	−
CIVIC ENGAGEMENT	Population with confidence in EU institutions by institution (%)	+
HEALTH	Life expectancy by age and sex (year)	+
SATISFACTION	People at risk of poverty or social exclusion (%)	−
SAFETY	Death rate due to homicide by sex (%)	−
WORK-LIFE BALANCE	People who work on weekends by sex, age, professional status and occupation (%)	−

For the sake of comparability, all the variables have been normalised (using the populated land area) and standardised. Furthermore, for an easier interpretation of results, those indicators–with negative polarity-which represent an inverse measure of performance (such as the variable 'Greenhouse gas emissions per capita') have been subject to an inversion of polarity [58,72].

3.2.2. IMF's Fiscal Decentralisation

The above measures of performance are matched with policy measures in terms of public expenditure. As for expenditure, the IMF's Fiscal Decentralisation Dataset contains expenditure data classified by economic type from 2004–2017. Total expenditure, by economic type, is computed by summing up expenses and net investments in non-financial assets. In general, each measure captures the share of expenditures of the different levels of government as a proportion of overall (general) government spending. Each measure

considers the purpose for which the expense was incurred (e.g., on health, education, defence, environment, etc.). The considered expenditure categories are reported in Table 2.

Table 2. Decentralised Expenditures, 2004–2017. Source: authors' elaboration with data downloaded by IMF.

Expenditures's Type	Description
Housing and community amenities(hca_sng)	The proportion of public expenditure corresponding earmarked for urbanisation.
Use of good and service (ugs_sng)	The proportion of public expenditure for the utilisation of economic goods to satisfy needs.
Economic affairs (ea_sng)	The proportion of public expenditure for general economic,commercial and labour affairs, agriculture, forestry, fishing and hunting, fuel and energy, mining, manufacturing, construction, transport, communication, other industries.
Recreation (recreation_sng)	The proportion of the respective government spending on expenditure on shows, sports, and cultural activities.
Education (edu_sng)	The proportion of the respective government spending on education services, school and universities.
Environmental protection (ep_sng)	The proportion of the respective government spending on Waste management, wastewater management, pollution abatement, protection of biodiversity and landscape, R&D environmental protection.
Social protection (sp_sng)	The proportion of the respective government spending on sickness and disability, old age, survivors, family and children, unemployment, housing.
Health (health_sng)	The proportion of the respective government spending on say health activities, housing development, community development, water supply, streetlighting, R&D housing and community amenities.
Social benefit (sb_sng)	The proportion of the respective government spending for the main income replacement programmes in the unemployment, social assistance, disability old-age branches.
Public order and safety (pos_sng)	The proportion of the respective government spending on police services, fire-protection services, Law courts, Prisons, R&D public order.
General public service (gps_sng)	The proportion of the respective government spending on executive and legislative organs, financial and fiscal affairs, external affairs, foreign economic aid.

3.2.3. BLI

Moreover, in order to perform our robustness checks, we use the BLI indicators in lieu of the SDGs for the restricted sample in which the former are available. Table 3 reports the BLI considered in this study and their polarity.

Table 3. BLI, 2013–2017. Source: authors' elaboration with data downloaded by OECD.

Indicators	*Definition*	*Polarity*
HOUSING	The average number of rooms shared per person	+
INCOME	Total wealth of both financial and non-financial, net of liabilities held by households. ($)	+
JOB	Employment rate, aged 15 to 64 (%)	+
COMMUNITY	People who believe social network support (%)	+
EDUCATION	People, aged 25 to 64, having at least an upper secondary degree (%)	+
ENVIRONMENT	People reporting to be satisfied with the quality of local water (%)	−
CIVIC ENGAGEMENT	Percentage of the registered population that voted during recent election.	+
HEALTH	Life expectancy by age and sex (year)	+
SATISFACTION	Average self-evaluation of life satisfaction, on a scale from 0 to 10	−
SAFETY	Death rate due to homicide by 100,000 people (%)	−
WORK-LIFE BALANCE	Time devoted to leisure and personal care	+

For this analysis, we take into account the type of expense incurred according to the eleven economic processes involved and my contribution is the reorganisation of expenditure data following the eleven indicators of BLI. Table 4 reports these expenditures categories.

Table 4. Decentralised Expenditures, SDIs, and BLI categories, 2004–2017. Source: authors' elaboration.

SDIs/BLI	Decentralisation
HOUSING	Housing and community amenities (hca_sng)
INCOME	Use of good and service (ugs_sng)
JOB	Economic affairs (ea_sng)
COMMUNITY	Recreation (recreation_sng)
EDUCATION	Education (edu_sng)
ENVIRONMENT	Environmental protection (ep_sng)
CIVIC ENGAGEMENT	Social protection (sp_sng)
HEALTH	Health (health_sng)
SATISFACTION	Social benefit (sb_sng)
SAFETY	Public order and safety (pos_sng)
WORK-LIFE BALANCE	General public service (gps_sng)

Building upon Martin (2012), in order to compute the measure of resilience for each dimension of wellbeing, the national datum is compared with the one of the macro-area to which each state belongs. Hence, the measure of resilience is computed after a preliminary subdivision of the 22 European countries into five macro-areas. Namely, the four areas of the European Union Strategy for Regional Policy (EUSRP) plus a residual one to accommodate those countries not belonging to any of the EUSRP schemes. Specifically, the Baltic Sea Region (BSR), the Danube Region (DR), the Alpine (ALP), the Adriatic and Ionian Region (AIR), and an 'OTHERS' category. Each area and the related regions are reported in Table 5.

Table 5. Subdivision into five-macro area. Source: author's research and elaboration.

BSR	DR	ALP	AIR	OTHERS
Denmark	Czech Republic	Austria	Italy	Belgium
Estonia	Germany	France	Greece	Iceland
Finland	Slovak Republic	Switzerland	Slovenia	Ireland
Poland				Luxembourg
Sweden				Netherlands
				Portugal
				Spain
				United Kingdom

Hence, the macro-area datum will be considered the correspondent of the national datum which, in Martin (2012) the regional datum is divided by in order to obtain the measure of resilience. In more detail, to the case at hand, in which a multidimensional approach is proposed, building upon Lagravinese [73] the resilience index (β_RES), the recovery index (β_REC), and the reorientation/renewal indices (both β_REO^{SDI} and β_REO^{BLI}) for each dimension j are computed as follows:

$$\beta^{j}_{re[s][o]t,Tc} = \left| \frac{\frac{\Delta y^{j}_{t,Tc}}{\Delta y^{j}_{Tc}}}{\frac{\Delta y^{j}_{t,TA}}{\Delta y^{j}_{TA}}} - 1 \right| \quad (1)$$

where $\Delta y^{j}_{t,Tc[A]}$ represents the variation in the j-th dimension of wellbeing observed in country c [macro-area A] during the period from t to T and $y^{j}_{tTc[A]}$ represents its value at time t. Hence, the higher the index, the higher the reaction of each state with respect to the reference area. Similarly, the measure of decentralised policy is

$$\gamma_j = \left| \frac{\frac{\Delta Dec^{j}_{t,Tc}}{\Delta Dec^{j}_{Tc}}}{\frac{\Delta Dec^{j}_{t,TA}}{\Delta Dec^{j}_{TA}}} - 1 \right| \tag{2}$$

where, $\Delta Dec^{j}_{t,Tc}$ states for the variation in the j-th dimension of decentralised fiscal expenditures in country c [macro-area A] during the period from t to T and $Dec^{j}_{t,Tc[A]}$ represents its value at time t. As both a contraction and an increase in a given sector might represent a reasonable strategy to coordinate each sector to the overall policy goals, we consider the relative variation in absolute value.

3.3. Empirical Analysis

The multidimensional measures span the time sample from 2004 to 2017. More precisely, the whole sample 2004–2017 is divided into three sub-sample corresponding to 'resilience', 'recovery', and 'reorientation and renewal phase', with the latter using both the SDI and the BLI (details of the sub-samples considered along with the data used are reported in Table A1 in Appendix A).

Hence, t = 2004, 2009, 2013 and T = 2008, 2012, 2017 for β_{res}, β_{rec}, and both β^{SDI}_{reo} and β^{BLI}_{reo}, respectively.

Using the above data, suppressing, for the ease of notation, the information on both the dimension of wellbeing and the time, the baseline model is as follows:

$$\beta_i = \alpha_0 + \alpha_1 \gamma_i + Z_i + \epsilon_i \tag{3}$$

where, across specifications, as aforementioned the dependent variable $beta_i$ is the measure of variation in wellbeing, γ_i is the measure of decentralised policy, and Z_i is the set of control variables aiming to capture institutional aspects. Indeed, as mentioned, we conjecture that, *ceteris paribus*, the quality of (decentralised) institutions will affect the link between decentralisation and resilience. The control variables for government aspects stem from the Worldwide Governance Indicators (WGI) project, which reports aggregate and individual governance indicators for over 200 countries and territories. They aim to control the process by which governments are selected, monitored and replaced. In particular, firstly, the capacity of the government to effectively formulate and implement sound policies; and, secondly, the respect of citizens and the state for the institutions are an integral part of community life, quality of life and the whole wellbeing, which govern economic and social interactions among them. These aspects are crucial in shaping the effects of decentralised policies, especially in times of crisis.

3.4. Results

3.4.1. Preliminary Analysis

On this premise, we start with a preliminary analysis estimating the overall relationship between the multidimensional measure of wellbeing obtained by aggregation of the (standardised) 11 dimensions reported in Table 1 (W) and the overall decentralisation measure for the period 2004–2008 (Dec). In formula

$$W_i = \alpha_0 + \alpha_1 Dec_i + \alpha_2 D + \alpha_3 D \times Dec_i + \alpha_5 Z_i + \epsilon_i \tag{4}$$

Hence, this preliminary model includes the decentralisation of spending, the financial crisis, and the interaction between the two. More specifically, the coefficient α_2 captures the effect of the financial crisis. When the interaction term is included, the overall effect of fiscal decentralisation on wellbeing is determined by the simultaneous consideration of coefficients α_1 and α_3, where α_3 represents the difference between periods of financial crisis and period without this shock. Put differently, if the coefficient α_3 is statistically different from zero, it means that the impact of decentralisation measures, changes in times of financial distress. The regression method used is Pooled Ordinary Least Squares (POLS) with Driscoll–Kraay standard errors in order to control for the cross-section nature of the dataset [74]. In our opinion, this method represents the preferred available estimation technique strategy to account for the heterogeneity in our sample. It is the preferred alternative once the set of proper panel methods is not technically feasible. Indeed, although we capture some temporal dimensions in our sample, the analysis is not actually implemented with a dataset having a proper panel structure. More in detail, it is worth noticing that the reference dataset does show a panel structure, however, once the resilience and decentralisation indicators are computed (see Formulas (1) and (2)) the dataset collapses to a cross-section one. Moreover, our dataset is likely to exhibit cross-sectional dependence in the errors due to (i) the fact that all the units have been subject to a common shock (great recession) whose effects likely spread over the units and (ii) other unobserved elements which potentially imply strong interdependencies between cross-sectional units". Results are reported in Table 6.

The results reported in Table 6 show that while, as expected, the negative effects of the crisis are not limited to GDP and encompass the multidimensional measure of wellbeing here considered, decentralisation exerts a positive effect on multidimensional wellbeing. This somewhat confirms–on a multidimensional scale–similar results achieved considering GDP measures only [75,76]. However, in contrast with some evidence involving OECD countries [77], the interaction term between crisis and fiscal decentralisation shows a negative and statistically significant coefficient (−0.0679). Hence, we find evidence that in times of crisis the beneficial effects of decentralisation on multidimensional wellbeing fade. Put differently, the desirable effects of decentralisation, in times of crisis rather than enhancing the effectiveness of tailor-made policies, lower when the economy is facing an economic crisis. Nonetheless, in the case at hand its estimated net effect remains positive (the net estimated effect of decentralisation equals 0.441).

As for the variables controlling for government's quality, it is worth mentioning that our analysis finds that while the variables related to government efficiency (*Goveff*), political stability (*Polstab*), and rule of law (*Rlaw*) exert positive effects on wellbeing (though only the latter two are statistically significant), the variables related to both regulation (*Reggov*) and accountability (*Voice*) have a negative and statistically significant coefficient.

Table 6. The decentralisation and resilience. Standard errors in parentheses *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

	(**W**)
Dec_j	0.312 ***
	(0.0193)
D	−0.464 **
	(0.131)
$D \times Dec_j$	−0.0679 ***
	(0.0171)
5 goveff	1.653
	(1.040)
polstab	1.153 *
	(0.429)
reggov	−4.964 ***
	(0.763)
ruleoflaw	9.189 ***
	(0.541)
voiceaccount	−5.617 ***
	(0.719)
_cons	−1.561+
	(0.810)
N	110
R^2	0.687

3.4.2. Sector-Specific Analysis

Once considered the overall relationship between decentralisation and wellbeing, we augment our preliminary analysis with a regression exercise considering each sector individually to investigate the presence of sector-specific effects. This part of the regression exercise covers the years' equation from 2004 to 2012. More specifically, a set of 11 regressions is estimated based on the following Equation (5).

$$W_{ij} = \alpha_0 + \alpha_1 Dec_{ij} + \alpha_2 D + \alpha_3 D \times Dec_{ij} + \alpha_4 Z_i + \epsilon_i \quad (5)$$

where, differently from Equation (4) where an aggregate approach is followed, W_{ij} refers to the j-th dimension of wellbeing belonging to the SDIs described in Table 1. It is worth recalling that Deci stands for decentralised expenditures specifically related to each dimension of wellbeing reported in Table 2. D is, again, a dummy variable for the 2008 crisis, which assumes a value of 1 for the year 2008 and 0 otherwise; therefore, also in this case, $D \times Dec_{ij}$, the interaction term between decentralisation specific to one sector and the economic crisis, aims to capture the interaction effect between each category of expenditure and the crisis-specific effect on each measure of wellbeing; Z_{it}, as mentioned, is a matrix of controls taken from the Worldwide Governance Indicators (WGI) project. Moreover, in this case, a *POLS* with Driscoll–Kraay standard errors is used. Results of the models based on the specification reported in Equation (5) are shown in Table 7.

Focusing on our variables of interest, Table 7 shows that, except for education, job, life satisfaction, and work-life balance, sectoral decentralisation seems to have a positive and statistically significant impact on individually considered measures of wellbeing. Put differently, decentralisation confirms to have a rather generalised positive impact on wellbeing, even in the case in which the single dimensions of wellbeing are considered. As for the excluded sectors, while no statistically significant link is detected for jobs, life satisfaction, and work-life balance, decentralised expenditure shows negative and statistically significant effects on the educational outcome.

Table 7. Multidimensional approach, 2004–2008. Driscroll-Kraay standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

	Education	***Jobs***	***Income***	***Safety***	***Health***	***Environment***	***Civic Engagement***	***Life Satisfaction***	***Housing***	***Community***	***Work-Life Balance***
Dec	−0.167 ***	0.189	0.199 ***	0.212 ****	0.14 ***	0.270 ***	0.126 **	0.029	0.251 ***	0.533 ***	−0.017
	(−0.037)	(−0.511)	(−0.279)	(−0.069)	(−0.029)	(−0.038)	(−0.069)	(−0.017)	(−0.0454)	(−0.046)	(−0.049)
D	−0.075	−0.094 **	−0.211 ***	−0.052	−0.08 ***	−0.029	0.157 ***	0.048 ***	0.144	−0.162 ***	0.003
	(−0.45)	(−0.05)	(−0.0597)	(−0.33)	(−0.017)	(−0.023)	(−0.042)	(−0.021)	(−0.85)	(−0.047)	(−0.21)
D × DEC	0.208 ***	−0.172 ***	−0.076 ***	−0.223 ***	0.021	−0.029 ***	0.161 ***	−0.04	−0.007 ***	−0.171 ***	0.08 *
	(−0.033)	(−0.353)	(−0.01)	(−0.036)	(−0.03)	(−0.037)	(−0.065)	(−0.0274)	(−0.072)	(−0.051)	(−0.28)
Goveff	1.406 ***	0.204	−0.822	−0.522 **	−0.321	0.109 ***	0.866 ***	0.71 ***	1.567 ***	−2.01 ***	1.092 ***
	(−0.081)	(−0.122)	(−0.598)	(−0.29)	(−0.446)	(−0.23)	(−0.262)	(−0.099)	(−0.141)	(−0.15)	(−0.223)
Polstab	0.208 ***	0.440 ***	0.276	−0.43	−0.481 ***	−0.032	0.921 ***	0.717 ***	−0.416 ***	−0.733 ***	0.440 ***
	(−0.017)	(−0.04)	(−0.209)	(−0.28)	−0.103	(−0.083)	(−0.377)	(−0.066)	(−0.114)	(−0.24)	(−0.123)
Reggov	−0.036	0.095	−0.219	−0.33	−1.83 ***	−1.39 ***	−1.144 ***	−1.19 ***	0.222	0.732 ***	0.68 **
	(−0.243)	(−0.094)	(−0.342)	(0.31)	(−0.444)	(−0.068)	(−0.128)	(−0.16)	(−0.43)	(−0.317)	(−0.388)
Rlaw	0.854 ***	1.75 ***	2.481 ***	1.933 ***	2.48 ***	0.470 **	−1.729 ***	1.165 ***	0.372 ***	2.142 ***	−1.12 ***
	(−0.114)	(−0.078)	(−2.441)	(−0.152)	(−0.13)	(−0.244)	(−0.082)	(−0.11)	(−0.085)	(−0.336)	(−0.149)
Voice	−2.39 ***	−2.07 ***	−1.24 ***	−0.963 ***	−0.635 ***	0.02	0.711 ***	−0.605 ***	−1.50 ***	−0.206 ***	−0.311
	(−0.161)	(−0.12)	(−0.117)	(−0.247)	(−0.032)	(−0.072)	(−0.223)	(−0.158)	(−0.49)	(−0.168)	(−0.29)
constant	−0.025	−0.485 ***	−0.443	0.17	0.812 ***	1.171 ***	0.871 ***	−0.85 ***	−0.068 ***	−0.040 ***	−0.90 ***
	(−0.086)	(−0.075)	(−0.313)	(−0.3)	(−0.245)	(−0.063)	(−0.352)	−0.036	(−0.263)	(−0.216)	(−0.074)
N	101	102	102	101	102	102	95	97	90	102	97
R^2	0.58	0.68	0.4	0.27	0.3	0.34	0.34	0.62	0.58	0.62	0.14

Turning the attention to the effects of the crisis a different picture emerges. A statistically significant effect is detected for jobs, income, health, and community. However, rather counter-intuitively, a positive and statistically significant effect is detected for both civic engagement and life satisfaction. The remaining cases fail to show a statistical significant coefficient.

Finally, the interaction term between decentralised expenditure and crisis with a sectoral breakdown allows to obtain a more nuanced picture as compared to that reported in previous Table 6. Indeed, the negative and statistically significant coefficient is confirmed for jobs, income, safety, environment, housing, and community. Instead, for education, civic engagement, and work-life balance a positive and statistically significant effect is detected. For both health and life satisfaction no statistically significant link is detected.

Hence, the empirical evidence seems to support the argument that, overall, a decentralised setting allows local economies to cope better with the effects of an economic downturn. However, this evidence holds only for a limited selection of the dimensions of wellbeing here considered. Indeed, apart from those two categories for which no statistically significant link is detected (i.e., health and life satisfaction), the effect of an economic shock seems to be enhanced in a decentralised setting for all the remaining dimensions.

3.4.3. The Sectorial Analysis along the 4Rs

Once the above preliminary analysis is performed, we turn our attention to specific dimensions of reaction to the economic shock. More specifically, we estimate to what extent the multidimensional measures of decentralisation impact the multidimensional measure of resilience, recovery, re-orientation and renewal dimensions, over the period 2013–2017. Hence, building upon the baseline model reported in Equation (3) we estimate a regression for each phase. Indeed, as mentioned, the dependent variable concerns the economic 'resilience' in the period from 2004 to 2008, the 'recovery' phase from 2009 to 2012, and the 'reorientation and renewal' phase from 2012 to 2017. Furthermore, as already stated, in addition to the SDGs ones, the data taken from the BLI initiative are used for the latter phase to check the robustness of our results. A summary of results limited to the effects of sectorial decentralisation (γ_i) are reported in Table 8 (while the full regression outcome is reported in Table A1 in Appendix A).

Table 8 shows that the effects of the sectorial decentralised policy are, indeed, uneven both across sectors and economic phases. As for the shock period (2004–2008), our analysis reports that the decentralised policy in the environmental and community sectors has statistically increased the impact of the crisis on the related dimensions of wellbeing. Indeed, -in times of crisis- a higher value of β_{res} means that the country experienced a (generally negative) variation of a magnitude higher than the reference macro-area. More precisely, β_{res} measures exactly the extent to which the variation in the country differs from the overall variation in the macro-area. In terms of engineering resilience, in turn, this means that the country has been less resilient to the perturbation caused by the economic shock. For all the remaining dimensions of wellbeing no statistically significant effect is detected.

The following (recovery) phase (2009–2013) shows a different pattern. In this case, only the estimated coefficients for education and income are negative and statistically significant, while the coefficients for life satisfaction, housing and community are positive and statistically significant, hence, showing a positive effect of decentralisation. The remaining ones are not statistically significant.

Table 8. Decentralisation and the 4R. Source: author's elaboration. Pooled OLS. Regression's result with Driscoll–Kraay standard error. Note: The reported coefficients refer to the variable y_i in Equation (2) indicates statistical significance at the 5% level with the corresponding sign. NO: indicates the absence of statistical significance at the 5% level, regardless of the estimated coefficient. Each regression also includes the variables *Goveff*, *Polstab*, *Reggov*, *Rlaw*, *Voice*, and a constant term. Full regression outcome available in Appendix A. *** $p < 0.01$, ** $p < 0.05$.

	Education	***Jobs***	***Income***	***Safety***	***Health***	***Environment***	***Civic Engagement***	***Life Satisfaction***	***Housing***	***Community***	***Work-Life Balance***
β_{res}	NO	NO	NO	NO	NO	0.805 *** (−0.295)	NO	NO	NO	0.197 *** (−0.096)	NO
β_{rec}	−0.068 *** (−0.029)	NO	−0.028 *** (−0.01)	NO	NO	NO	NO	0.063 ** (−0.034)	0.046 *** (−0.019)	0.813 *** (−0.37)	NO
β_{reo}^{SDI}	NO	−0.018 *** (−0.007)	0.0001 *** (−0.00005)	NO	NO	NO	NO	NO	NO	0.0167 *** (−0.008)	−0.040 *** (−0.009)
β_{reo}^{BLI}	−0.072 *** (−0.0104)	−0.051 ** (−0.025)	−0.0003 *** (−0.0001)	−0.189 *** (−0.047)	0.0735 ** (−0.36)	−0.128 ** (−0.061)	0.152 *** (−0.0381)	NO	−0.032 *** (−0.014)	NO	0.74 *** (−0.008)

Finally, in the reorientation/renewal phase (2013–2017), with the exception of income and community, for which the estimated coefficients are positive and statistically significant, in all other sectors, the policy shows to have either a detrimental (namely for job and work-life balance) or no statistically significant effect. As already mentioned, for the latter phase, in addition to the data from SDGs, the data from BLI are available. Hence, we repeated the regression exercise with data from BLI to test whether and, eventually, to what extent, our results depend on the data we used. Indeed, given the multidimensional nature of the measure of wellbeing at hand, the approach to the measurement itself could potentially make a substantial difference in terms of the estimated impact of selected policies. However, the last row of Table 8 shows that this applies to the case at hand. Indeed, using the data from BLI to estimate the impact of sectorial policy in the reorientation/renewal phase, with the only two exceptions of the coefficients for the community which proves to be not statistically significant and the coefficient for education which is negative and statistically significant in the BLI case. Put differently, we observe a pattern equal to the SDGs counterpart for job, income and work-life balance dimensions.

4. Discussion

The research proposed in this paper is based on the notions of (i) resilience which has been defined in a variety of ways in a broad body of disciplines; (ii) decentralisation, which significantly affecting the variety of policies implemented at the local level; and on the notion of (iii) multidimensional wellbeing.

Within this context, decentralisation can potentially be a source of higher resilience in several respects. Resilience has been a key focus of the Organisation for Economic Co-operation and Development (OECD) since the financial crisis of 2008 (OECD, 2014). Decentralisation of decision-making during a crisis is closely associated with both redundancy and resourcefulness. Indeed, decentralised decision-making contributes to resourcefulness since the occurrence of distress allows us to understand the needs of specific resources to have an effective response. Multi-level governance contributes significantly to resilience. The literature dealing with regional economic resilience raises interesting still open questions: why are some regions affected more by a crisis while others are hit by a lesser extent? What are the mechanisms that lead some regions to recover faster than others? [78].

The literature has not yet reached a consensus even regarding the construction of an indicator to measure regional resilience, although a significant number of studies have tried to do so. The extant literature generally uses two macroeconomic indicators for the calculation of resilience: GDP and (un)employment [21,52,79]. We argue that emphasising the role of multidimensional wellbeing is crucial because it appears to be a growing gap between the information contained in aggregate GDP data and what counts for common people's wellbeing. This is despite the most recent trend attempting to consider multidimensional wellbeing along with GDP (so-called 'GDP and beyond approach' [80–82]. The results highlight that decentralised governance matters positively for the quality of life of individuals–especially in times of crisis. Moreover, and perhaps more importantly, it shows that the effects of decentralisation depends also on the phase of the crisis and on the considered sector.

Therefore, our results somehow challenge both scholars and practitioners to adopt a more granular approach to this issue; one taking into account the different nuances of the effects of decentralisation, avoiding the so-called one-size-fits-all approach. Furthermore, to what extent the observed differences in the effects of decentralisation depend on sectoral intrinsic characteristics and-or on the political process is beyond the scope of the current analysis.

5. Concluding Remarks

This paper aimed to investigate the resilience of European countries on the occasion of the 2007 economic and financial crisis considering both the impact period and the long-run response to the recessionary shock. Departing from common practice focusing on GDP and/or employment measures, an approach focusing on multidimensional wellbeing has

been proposed. To this end, the novel indicators provided by both UN SDGs measurement framework and the OECD BLI have been used. Furthermore, the analysis is augmented with the inclusion of the different levels of decentralisation. Indeed, since the effects of the shock might be spatially uneven, the response to the shock in different dimensions of wellbeing might well depend on the extent to which local economies can implement tailor-made policies. If so, decentralisation can be an effective policy instrument to mitigate the shock.

Overall, our analysis shows preliminary evidence that in times of crisis the decentralisation lowers the effectiveness of implemented policies (as measured by public expenditure). Nonetheless, it is worth noting that the estimated net effect remains positive. However, at a more granular level, our empirical evidence suggests the presence of some sector-shock-specific effects, depending also on the (so-called) 4R phases.

While further research is needed to develop a closer analysis for each sector, the evidence already gathered shows solid evidence that a multidimensional approach is able to provide interesting insights unachievable by means of the mainstream approach based on GDP only. Indeed, the multidimensional wellbeing approach prompts us to further deepen the space-specific dimension of both territories and sectors. This evidence may represent an interesting insight also for policymakers and practitioners in designing and implementing policies to resist and recover from exogenous shocks in the long run. Therefore, we argue that a deeper understanding of the link between decentralisation and multidimensional wellbeing has a potential impact on the way policymakers and practitioners operate in this field.

Author Contributions: Data curation, Alessia Arcidiacono; Methodology, Gianpiero Torrisi; Project administration, Gianpiero Torrisi; Writing—original draft, Alessia Arcidiacono. All authors have read and agreed to the published version of the manuscript.

Funding: The APC was founded by the University of Catania.

Data Availability Statement: All the data used in this research are publicly accessible through the web (https://data.oecd.org (accessed on 13 July 2022); https://ec.europa.eu/eurostat/web/main/data/statistics-by-theme (accessed on 13 July 2022); https://data.imf.org/ (accessed on 13 July 2022)).

Conflicts of Interest: The authors declare no conflict of interest.

Appendix A

Table A1. Driscroll-Kraay standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Pooled OLS where Y is the SDI for the years 2004–2008.

	Education	***Jobs***	***Income***	***Safety***	***Health***	***Environment***	***Civic Engagement***	***Life Satisfaction***	***Housing***	***Community***	***Work-Life Balance***
Dec	47.1	−0.185	−3.322	−0.042	−1.32	0.805 ***	−0.015	0.558	−0.094	0.197 **	−1.47
	(−39.95)	(−0.206)	(−2.774)	(−0.038)	(−0.909)	(−0.295)	(−0.042)	(−0.504)	(−0.074)	(−0.096)	(−4.25)
Goveff	2.11	3.51	−10.8 ***	3.09 ***	−0.409 ***	5.262 ***	0.275	0.135	0.572 ***	−15.57 ***	25.06 ***
	(−5.91)	(−2.05)	(−1.171)	(−0.424)	(−0.074)	(−0.494)	(−0.325)	(−0.606)	(−0.249)	(−2.04)	(−2.273)
Polstab	−0.212	−0.232	−0.121	0.048 ***	−0.009	−0.001	0.0287	−0.025	−0.017	−0.095	0.932
	(−0.28)	(−0.169)	(−0.139)	(−0.018)	(−0.007)	(−0.017)	(−0.025)	(−0.028)	(−0.249)	(−0.14)	(−0.149)
Reggov	−8.38	−0.1.633	−0.688	0.378 ***	0.042	0.552	−0.285	−0.778	−0.11	0.657	1.45
	(−5.91)	(−1.411)	(−0.814)	(−0.132)	(−0.044)	(−0.332)	(−0.181)	(−0.478)	(−0.15)	(−0.99)	(−1.304)
Rlaw	−4.33	−5.1	−5.464	−0.162	0.05	0.899	−0.737	−3.18	0.319	11.13 ***	−4.47
	(−8.12)	(−4.38)	(−3.503)	(−0.404)	(−0.141)	(−0.526)	(−0.436)	(−2.7)	(−0.265)	(−4.48)	(−3.58)
Voice	−158.06	−59.83	−46.07 ***	0.671	−1.641	6.385 ***	−8.639 ***	−10.09	−4.74	−36.86	−13.6
	(−117.5)	(−34.74)	(−21.67)	(−2.2)	(−1.419)	(−2.942)	(−4.015)	(−11.2)	(−3.88)	(−24.78)	(−16.44)
Constant	80.99	57.5	37.7	−3.568	4.166 *	−0.082	10.53	16.27		24.25	−13.8
	(−64.41)	(−35.95)	(−3.26)	(−2.145)	(−1.469)	(−2.93)	(−4.36)	(−11.2)	−5.067	(−26.89)	(−12.55)
Obs	22	22	22	22	22	22	22	22	22	22	22
R	0.27	0.33	0.7	0.85	0.44	0.92	0.31	0.16	0.41	0.76	0.9

Table A2. Driscroll-Kraay standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Pooled OLS where Y is the SDI for the years 2009–2012.

	Education	***Jobs***	***Income***	***Safety***	***Health***	***Environment***	***Civic Engagement***	***Life Satisfaction***	***Housing***	***Community***	***Work-Life Balance***
Dec	−0.068 ***	−0.004	−0.028 ***	−1.456	−0.075	0.616	0.494	0.063 **	0.046 ***	0.813 ***	−3.02
	(−0.029)	(−0.002)	(−0.01)	(−0.868)	(−0.19)	(−0.729)	(−0.57)	(−0.034)	(−0.019)	(−0.37)	(−5.4)
Goveff	−0.023	−0.190 ***	−0.031 ***	−0.847 ***	−0.069 ***	−1.8	−0.67	0.156 **	0.048	1.64	−2.34
	(−0.038)	(−0.039)	(−0.008)	(−0.38)	(−0.029)	(1.318)	(−0.424)	(−0.08)	(−0.034)	(−1.06)	(−1.67)
Polstab	4.02	−0.001	0.0004	−0.037	0.0001	−0.01	0.01	0.0002	−0.001 *	0.014	−0.41
	(−0.002)	(−0.002)	(−0.001)	(−0.034)	(−0.001)	(−0.041)	(−0.016)	(−0.002)	(−0.0008)	(−0.039)	(−0.076)
Reggov	−0.043 *	−0.01	0.018 ***	−0.43	−0.006	−1.15	−684	−0.046 ***	−0.012	−1.46 ***	−0.696
	(−0.024)	(−0.024)	(−0.005)	(−0.261)	(−0.022)	(−0.91)	(−0.434)	(−0.017)	(−0.018)	(−0.58)	(−0.935)
Rlaw	0.038	0.051	0.031 *	2.749 ***	0.035	−3.34 *	−0.1.844 **	−0.317 ***	−0.098 ***	−6.61 ***	−0.328
	(−0.066)	(−0.07)	(−0.169)	(−0.944)	(−0.037)	(−1.92)	(−0.895)	(−0.147)	(−0.04)	(−2.73)	(−1.95)
Voice	−0.541	−0.818 *	−0.407 ***	−3.165	−0.345	24.90 ***	11.22 **	0.991 **	0.586 **	44.97	33.90 **
	(−0.417)	(−0.433)	(−0.149)	(−4.431)	(−0.227)	(−10.75)	(−5.65)	(−0.501)	(−0.303)	(−12.81)	(−17.53)
Constant	1.949 ***	1.88 ***	0.744 ***	10.005	1.11 ***	9.15	7.47	1.05	0.960 ***	5.45	13.29
	(−0.498)	(−0.565)	(−0.149)	(−6.62)	(−0.512)	(−6.3)	(−4.41)	(−0.302)	(−0.255)	(−4.97)	(−8.57)
Obs	22	22	22	22	22	22	22	22	22	22	22
R	0.24	0.25	0.23	0.23	0.19	0.28	0.02	0.35	0.33	0.51	0.18

Table A3. Driscroll-Kraay standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Pooled OLS where Y is the SDI for the years 2013–2017.

	Education	***Jobs***	***Income***	***Safety***	***Health***	***Environment***	***Civic Engagement***	***Life Satisfaction***	***Housing***	***Community***	***Work-Life Balance***
Dec	−0.61	−0.018 ***	0.0001 ***	0.0018	0.019	0.107	−0.039	−50	−0.043	0.0167 ***	−0.040 ***
	(−0.063)	(−0.007)	(−0.00005)	(−0.003)	(−0.014)	(−0.111)	(−0.059)	(−0.4)	(−0.333)	(−0.008)	(−0.009)
Goveff	−0.314	−0.032 ***	−0.024	−0.011 ***	0.031	−0.218 ***	−0.552 ***	0.077 *	−0.146	−0.055 ***	0.421 **
	(−0.503)	(−0.011)	(−0.046)	(−0.03)	(−0.021)	(−0.057)	(−0.151)	(−0.44)	(−0.118)	(−0.013)	(−0.206)
Polstab	−1.316	−0.025	−0.151	0.089	−0.011	−1.21 ***	0.345	−0.28 ***	−0.238	0.147 **	−1.123 ***
	(−2.668)	(−0.055)	(−0.186)	(−0.119)	(−0.083)	(−0.386)	(−0.632)	(−0.085)	(−0.45)	(−0.072)	(−0.271)
Reggov	0.102 ***	0.001 ***	0.009 ***	−0.001	−0.0001	0.011 ***	0.028 ***	−0.002 ***	−0.011 ***	0.002 ***	−0.001
	(−0.0231)	(−0.002)	(−0.0008)	(−0.001)	(−0.0004)	(−0.002)	(−0.006)	(−0.001)	(−0.004)	(−0.0005)	(−0.002)
Rlaw	7.78	0.003	0.313 ***	−0.255 ***	−0.160 ***	1.11 ***	−1.02 *	−0.065 ***	0.347	0.021	−0.204
	(−2.91)	(−0.062)	(−0.086)	(−0.133)	(−0.042)	(−0.222)	(−0.585)	(−0.001)	(−0.647)	(−0.04)	(−0.12)
Voice	4.57	0.095 ***	0.232	−0.031	−0.058	0.275	−0.083 *	0.07	0.609	0.044	0.407
	(−2.84)	(−0.043)	(−0.138)	(−0.078)	(−0.047)	(−0.391)	(−0.408)	(−0.1)	(−0.375)	(−0.049)	(−0.248)
Constant	−2.06	−0.697 ***	0.59	1.56 ***	0.867 ***	0.597	6.584 ***	1.30 ***	2.27	0.347 ***	2.259 ***
	(−7.99)	(−0.095)	(−0.247)	(−0.372)	(−0.137)	(−0.732)	(−1.919)	(−0.253)	(−1.47)	(−0.126)	(−0.46)
Obs	22	22	22	22	22	22	22	22	22	22	22
R	0.32	0.37	0.51	0.29	0.28	0.33	0.24	0.27	0.12	0.57	0.49

Table A4. Driscroll-Kraay standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Pooled OLS where Y is the BLI for the years 2013–2017.

	Education	***Jobs***	***Income***	***Safety***	***Health***	***Environment***	***Civic Engagement***	***Life Satisfaction***	***Housing***	***Community***	***Work-Life Balance***
Dec	−0.072 ***	−0.051 **	−0.0003 ***	−0.189 ***	0.0735 **	−0.128 **	0.152 ***	−0.076	−0.032 ***	0.057	0.74 ***
	(−0.0104)	(−0.025)	(−0.0001)	(−0.047)	(−0.36)	(−0.061)	(−0.0381)	(−0.57)	(−0.014)	(−0.034)	(−0.008)
Goveff	−0.0.54 **	0.298 ***	0.0166	−0.049	0.051	−0.28	−0.109 *	0.319 ***	−0.12	−0.152	0.024
	(−0.26)	(−0.021)	(−0.017)	(−0.051)	(−0.35)	(−0.269)	(−0.063)	(−0.146)	(−0.035)	(−0.134)	(−0.039)
Polstab	−0.444 ***	0.13	0.08	−1.199 ***	−0.025	0.345	−0.126	−0.857	−0.107	−1.86 ***	−0.2
	(−0.106)	(−0.095)	(−0.052)	(−0.357)	(−0.109)	(−0.837)	(−0.232)	(−0.765)	(−0.164)	(−0.864)	(−0.182)
Reggov	0.001	−0.002	0.002 ***	0.002	−0.001	0.113 ***	0.04 ***	−0.012 **	−0.0007	0.069 ***	0.0006
	(−0.001)	(−0.001)	(−0.00072)	(−0.002)	(−0.0007)	(−0.005)	(−0.003)	(−0.006)	(−0.001)	(−0.134)	(−0.002)
Rlaw	1.39 ***	0.031	0.116 ***	3.79 ***	−0.025	0.211	0.063	2.169	0.109	2.504	−0.083
	−0.226	−0.11	−0.045	−1.041	−0.107	−0.978	−0.505	−0.011	−0.113	−2.449	−0.097
Voice	0.167 *	−0.296 ***	−0.099	0.872 ***	−0.19 ***	1.172	−0.149	−0.237	0.027	0.515	0.252
	(−0.097)	(−0.13)	(−0.057)	(−0.254)	(−0.065)	(−0.945)	(−0.197)	(−0.586)	(−0.162)	(−0.762)	(−0.19)
Constant	0.167 *	−0.296 ***	−0.099	0.872 ***	−0.19 ***	1.172	−0.149	−0.237	0.027	0.515	0.252
	(−0.097)	(−0.13)	(−0.057)	(−0.254)	(−0.065)	(−0.945)	(−0.197)	(−0.586)	(−0.162)	(−0.762)	(−0.19)
Obs	22	22	22	22	22	22	22	22	22	22	22
R	0.27	0.33	0.7	0.85	0.44	0.92	0.31	0.16	0.41	0.76	0.9

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