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Resilience in Europe: a multidimensional analysis

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Contents

- List of Figures** **v**

- List of Tables** **vii**

- Introduction** **1**

- I LITERATURE REVIEW AND METHODOLOGICAL ISSUES** **9**

- 1 Theoretical framework:**

 - Resilience, Well-being and Decentralisation** **11**
 - 1.1 Resilience: a review 11
 - 1.2 Regional economic resilience as an evolutionary process 15
 - 1.2.1 Resistance 17
 - 1.2.2 Recovery 18
 - 1.2.3 Reo-orientation 19
 - 1.2.4 Renewal 19
 - 1.3 Beyond-GDP analysis 20
 - 1.4 Quality of life 24
 - 1.4.1 Income and wealth 26
 - 1.4.2 Housing and quality of housing 27
 - 1.4.3 Availability and quality of jobs 28
 - 1.4.4 Physical and mental health 29

1.4.5	Education and skills	31
1.4.6	Community	32
1.4.7	Environment	33
1.4.8	Civic engagement	35
1.4.9	Life Satisfaction	37
1.4.10	Work-Life Balance	38
1.4.11	Safety	40
1.5	Decentralisation and resilience: trade-off and synergies	41
1.6	Concluding remark	48
2	Research approach and methodological aspect	51
2.1	Introduction	51
2.2	Building composite indicators in local economic development	54
2.3	Multidimensional measures: resilience and policy measures	59
2.4	The multidimensional measure of resilience: a preliminary analysis	60
2.5	The multidimensional measure of decentralization	62
2.6	Measuring resilience	68
2.7	Measuring decentralisation	68
2.8	A vis-à-vis comparison of the conventional approach using GDP and the resilience dimensions	70
2.9	Concluding remark	75
II	RESEARCH DESIGN AND APPLICATIONS TO EU CASE	79
3	Decentralisation and resilience: a multidimensional approach using fiscal data	81
3.1	Introduction	81
3.2	General framework	82
3.3	The empirical evidence with respect decentralisation and resilience	85

3.4	Concluding remark	93
4	Decentralisation and resilience: a multidimensional approach using the Regional Authority Index	95
4.1	Introduction	95
4.2	Decentralisation, economic development, and quality of governance	97
4.3	Data and empirical implementation	98
4.3.1	Regional Authority Index	98
4.3.2	The well-being's dimensions	103
4.4	Empirical evidence	108
4.5	Concluding remark	118
	Concluding remarks	121
	A Appendix	127
	Bibliography	149
	Acknowledgement	171

List of Figures

- 1.1 Plucking model. Source: Source: Friedman (1993) 13
- 1.2 Negative and Positive hysteresis cases. Adapted from Martin (2012) 14
- 1.3 Resilience as evolutionary process across an adaptive cycle. Source: Simmie and Martin (2010) 16
- 1.4 The OECD Conceptual Framework. Source: OECD (2020) 23
- 1.5 The BLI dimensions. Source: OECD (2021) 25
- 1.6 Environmental Kuznets Curve. Source: Dinda (2004) 35

- 2.1 Resilience index, comparison between Well-being and GDP 71
- 2.2 Recovery index, comparison between Well-being and GDP 72
- 2.3 Reorientation/Renewal index, comparison between Well-being and GDP 73

- 4.1 Decentralisation in EU regions along 4Rs 102
- 4.2 Marginal effect of Crisis using IMF’s indicators 114
- 4.3 Marginal effect of Crisis using RAI 115

List of Tables

- 1.1 Resilience definitions. Source: Adapted from Martin (2011) 12
- 1.2 Guidelines for decentralisation. Source: OECD (2019) 44
- 2.1 Pros and Cons of Composite Index. Source: author’s elaboration and research. 56
- 2.2 Sustainable Development Indicators, 2004-2012. Source: authors’ elaboration
with data downloaded from EUROSTAT 61
- 2.3 BLI, 2012-2017. Source: authors’ elaboration with data downloaded from OECD 62
- 2.4 Decentralized Expenditures,2004-2017. Source: authors’ elaboration data from
IMF. 64
- 2.5 Decentralized Expenditures, SDIs, and BLI categories, 2004-2017. Source:
authors’ elaboration 65
- 2.6 Macro-regions. Source: author’s research and elaboration 67
- 2.7 Decentralisation measures. Source: adopted by Torrasi and Pike (2011) 69
- 2.8 Conventional approach on GDP and resilience 76
- 3.1 The decentralization and resilience. Source: authors’ elaboration 87
- 3.2 Multidimensional approach, 2004-2008 90
- 3.3 Decentralisation and the 4Rs. Source: author’s elaboration. Pooled OLS.
Regression’s result with Driscoll-Kraay standard error. 92
- 4.1 Dimension of RAI. Adapted by Hooghe et. al.(2008) 100

4.2	Well-being's indicators. Source: Author's elaboration on Regional Statistics from Eurostat.	105
4.3	Asymmetrical decentralisation and resilience. Pooled OLS, 2004-2008.	109
4.4	Asymmetrical decentrasalition mitigates the shock, 2004-2008. Pooled OLS. Driscroll-Kraay standard errors in parentheses.	111
4.5	Decentralisation mitigates the shocks. Comparison at Country-Regional Level	113
4.6	Decentralisation and the 4Rs. Source: author's elaboration. Pooled OLS. Regression's result with Driscoll-Kraay standard error.	119
A.1	Descriptive Statistics on β_{RES}^j	127
A.2	Descriptive statistics on β_{REC}^j	128
A.3	Descriptive statistics on β_{REC}^j using BLI	129
A.4	Descriptive statistics on β_{REC}^j using SDIs	130
A.5	The decentralization and resilience. POLS, with fixed effect: 2004-2008	131
A.7	The decentralization and recovery. POLS, with fixed effect: 2009-2012	132
A.8	The decentralization and reorientation/renewal along SDIs. POLS, with fixed effect: 2012-2017	133
A.9	The decentralization and reorientation/renewal along BLIs. POLS, with fixed effect: 2012-2017	134
A.10	The asymmetrical decentralization and resilience. POLS, with fixed effect: 2004-2008	135
A.11	Pooled OLS where Y is the SDI for the years, 2009-2012.	136
A.12	Pooled OLS where Y is the SDI for the years, 2013-2017.	137
A.13	Pooled OLS where Y is the BLI for the years, 2013-2017.	138
A.14	Descriptive statistics on β_{RES}^j and RAI_{RES}^r	139
A.15	Descriptive statistics on β_{REC}^j and RAI_{REC}^r	140
A.16	Descriptive statistics on β_{REO}^j and RAI_{REO}^r	141
A.17	RAI Multidimensional approach with EQI, 2004-2008.	142

A.18 RAI Multidimensional approach, 2004-2008 143

A.19 RAI Multidimensional approach with EQI, 2009-2012. 144

A.20 RAI Multidimensional approach, 2009-2012. 145

A.21 RAI Multidimensional approach with EQI, 2013-2017 146

A.22 RAI Multidimensional approach, 2013-2017 147

Introduction

This thesis builds upon three main pillars: *resilience*, *multidimensional well-being*, and *decentralisation*. Resilience is a rather comprehensive and increasingly multidisciplinary concept, and its application to regional and local economic growth raises a series of significant questions about the performance and dynamics of local economies in times of crisis and distress. Understanding more about the local and regional impact of recessionary shocks has both academic and practical significance. Indeed, it is essential for policymakers, which can to find ways in which to overcome the more negative consequences but, mainly, to build on the new opportunities that may emerge for regions. Hence, the main purpose is to identify the factors that influence a region's resistance and ability to recover.

This analysis departs from common practices such as employment and/or output and focuses on well-being. Well-being is a growing area of research, and yet it is considered a complex phenomenon to monitor. As Mazziotta et al. (2018) suggest "a universally accepted definition of well-being does not exist (yet): each country (or areas) attributes importance to dimensions that for others may not be as relevant, consistent with their culture and social dynamics.". Moreover, it has been widely accepted that well-being is a multidimensional phenomenon (Fleurbaey and Blanchet, 2013) which requires consideration of many dimensions. The European Commission's "Going beyond GDP" initiative and Stiglitz et al. (2009) point out that the well-being progress should be examined by considering indicators that are beyond standard of living and should include dimensions such as health, education, governance,

environmental factors, work-life balance among other dimensions.

The underpinning of this research is the Great Recession. Indeed, the 2008-09 economic crisis hit all the European regions but to a different extent. As it is well-known, the trigger factor of the economic crisis was the 'credit crunch', also known as the subprime mortgage crisis that developed at the end of 2007 in the U.S. More specifically, the credit crisis was a global event not restricted to the U.S but, rather, it plunged the world into recession (Gamble, 2009; Martin, 2012). The crisis leads to the Great Recession, where housing prices went down and foreclosure and default rates went up. By the beginning of 2009 was clear that this event was the worst economic disaster since the Great Depression of 1929. The International Monetary Fund (IMF) predicted in January 2009 a drop in output of 2 % (IMF, 2009). Its effects were not confined to the financial sector. In particular, the crisis took different forms into national and international borders. In Europe, the first evidence of crisis emerged in Spain's real estate sector and Irish banking sector, as well as in some central and eastern European countries where the foreign investments and exports were affected by the spread of the crisis. In 2010, two events showed us that the crisis changed from the banking crisis to the sovereign debt crisis: (i) the private debts arising from the property-led credit crisis were transferred to the public sector; (ii) public expenditures affected the level of debt in the face of falling fiscal receipts and increasing social obligations. As a result, the increase in interest rates being indicted for public debt and the decrease the public expenditures to rebalance public finances worsened the crisis itself. Every European country experienced the crisis differently and, understandingly, it played a critical role in shaping the resilience and well-being outcomes.

In this respect, it is worth noticing that the resilience concepts have developed into regional development research so far. A growing interest in regional resilience is due to socio-economic and environmental uncertainties. Therefore, resilience highlights the importance of understanding how a region's response to shocks is conditioned by where it comes from; its history, and how economic change over a long period has influenced its ability to adapt to changes and renew itself. However, regional resilience is still underexplored.

The term 'resilience' invokes different meanings. Conceptually, the regional development literature uses a metaphoric definition of resilience as a positive regional quality. Hudson (2010), for example, defines 'resilient regions' as those regions that "have a lighter environmental footprint, display a greater degree of internal closure, less dependence on decisions taken elsewhere and less vulnerability to shocks emanating elsewhere". Further, it is particularly important to treat the concept of region, since it is a contested concept in a European setting. Indeed, the Maastricht Treaty from 1992 has emphasized the regional level in the EU. Therefore, there are many ways of defining regions. The Assembly of European Regions (AER), in its declaration of regionalism in Europe, defines the region as "the territorial body of public law established at the level immediately below that of the State and endowed with political self-government". This research draws on the definition of the region as "variable defined policy spaces, rather than a centrally implemented fixed unit of administration, has raised conceptual and practical questions about territoriality and boundedness of 'new' regions" (Herrschel, and Tallberg 2011, p. 7). Accordingly, regions are an integral part of democratic representation and governance within states, including different geographical scales and multi-level states.

To quantify resilience, the literature introduces resilience potential and vulnerability. In the regional studies literature, regional economic resilience is intertwined with both regional economic attributes and social and demographic ones. More specifically, regional economic resilience determinants are strong regional systems of innovation and learning, modern productive infrastructure; skilled, innovative, and entrepreneurial workforce, a supportive financial system providing patient capital, diversified economic base, high levels of trust among economic actors, and high levels of civic capital; and also, poverty, age, gender, rurality, land tenure, employment structure (Christopherson et al. 2010; Cutter and Finch (2008)).

As mentioned, this study considers economic resilience exploring its link with decentralisation. Adopting fiscal and asymmetrical decentralisation solutions may allow conditions of sustainability and resilience, indeed there are both benefits and challenges associated with

it. In general terms, benefits are linked to institutional and fiscal frameworks that allow better responses to local needs. Decentralisation policy also implements tailored governance frameworks and place-based regional policies. A well-defined and transparent system is a means to achieve multi-level governance goals.

The main concept behind decentralisation is the transfer of responsibility and the sharing of making decisions across various levels in an organization. Actually, government decentralization is one of the important practices in building democracy in a country. Our central hypothesis is that decentralisation has several benefits and drawbacks. The basic rationale behind decentralized governance exhibits that beyond benefits, decentralisation systems have revealed many pitfalls that should be considered in designing any decentralized governance. Essentially, the dangers of decentralisation are associated with three main controversies emerging from the literature on decentralization: (in) efficient, (un)equal, and (un)accountable service provision at the local level. Therefore, the risks of decentralization are highly significant, although there is evidence supporting both the decentralization-enthusiastic and the decentralization-skeptical views (Arends, 2021). Further, decentralization policy may not enhance or may even worsen well-being (Prud'Homme, 1995). Indeed, under certain circumstances decentralisation is not a sure gamble. Decentralisation places increased pressure on divisional heads to realize a profit at any cost, involving problems of control. It can make national policy coordination too complicated. Decentralisation marks a duplication of staff effort. It also determines an intensification of costs of law enforcement and resource conflicts in the absence of a higher level of authority. Decentralization demands a more complicated process that may be time-consuming and highly expensive. Therefore, specific decentralization policies have specific effects on well-being.

The thesis aims to present an empirical analysis conducted at the country level at the first stage, and then, more specifically, at the region level. The structure of the domains and the selection of indicators are derived mainly from the eleven dimensions of the OECD (Organisation for Economic Co-operation and Development) initiative Better Life Index (BLI) (OECD, 2020), controlling for institutional differences. The thesis contributes to the debate concerning

the socio-economics strategies for building European resilience to critical situations and external events.

Formally, this dissertation is divided into two main parts. The first part titled "Literature Review and Methodological Issues" includes two chapters. The first chapter, "Theoretical framework: Resilience, Well-being and Decentralisation" recalls the notion of resilience, the main arguments supporting the beyond GDP approach, focussing on the notion of multidimensional well-being; the chapter concludes exploring the link between decentralisation and resilience. The second chapter, titled "Research approach and methodological aspect" deals with the techniques for constructing indicators and illustrates the source of data. This chapter concludes with "A vis-à-vis comparison of the conventional approach using GDP and the resilience dimensions" to show empirical and visual evidence for the importance to adopt a multidimensional approach. The second part, titled "Research design and applications to EU case", is composed by chapter three, entitled "Decentralisation and Resilience: a multidimensional approach using fiscal data" and chapter four, entitled "Decentralisation and resilience: a multidimensional approach using the Regional Authority Index" respectively. Hence, firstly, we investigate the effects of fiscal decentralization on the resilience of 22 European countries to the 2007 economic crisis in terms of multidimensional well-being, using data from the IMF's fiscal decentralization dataset. Secondly, draws on the notion of regional resilience to examine the impact of decentralisation on well-being across European regions based on the Regional Authority Index (RAI) (Marks et al., 2008); This latter approach, therefore, rather than on simple fiscal measures uses a more comprehensive measure of regional authority. The empirical analysis is performed on a large sample made up of 169 EU NUTS-2 regions in 20 countries.

The analysis provides interesting insights for both academics and practitioners. To the best of our knowledge, this is the first attempt to analyse the relationship between decentralisation policy and economic resilience by focusing on the impact of the former on well-being. More specifically, the multidimensional approach to resilience along the so-called 4Rs (i.e. Resilience, Recovery, Reorientation, and Renewal) shows that the forces driving economic

resilience presents a case-specific effect with respect to both the shock and well-being dimensions. The strongest policy implication of these results is that national and regional governments should aim to better understand the resilience capacity of their locality. Indeed, our findings suggest that, although the correlation among dimensions, each of them suffers a different impact along with each phase. However, since the magnitude and impact of the shock seem to be different along the different dimensions and period, the asymmetric decentralisation of political regional authority lead to clear benefits to regions.

The dissertation focuses on economic resilience, investigating on 2008 Great Recession's impact on resilience in Europe. The economic vulnerability is associated with exposition to this external shock. However, the findings and approach used here, could in the future agenda take into account other external shocks. Among others, commodity price fluctuations, natural disasters, and the role of the international economy contribute to volatility in the well-being of regions. From a quantitative point of view, the output effect of an external shock is small in absolute terms, and significant relative to the historic performance of these countries (Raddatz, 2007). However, the weight placed on external shocks is reasonable given some structural characteristics of low-performance countries. Mainly their dependence on primary commodities, their higher exposure to natural disasters, and their reliance on aid flows. Further, the importance of the state of the world economy for the performance of countries suggests that there is a good-sized segment of the risk factors that is uninsurable. Hence, output fluctuations are also determined by factors that countries cannot control implying changes in their productive structures or their position in the international economy. In conclusion, although in this thesis, the economic resilience of European regions is investigated in the context of the 2009 recession, and by present-day criteria, it might be said to be thoroughly dated. Nonetheless, the analysis can shed some light also on the current Coronavirus disease (COVID 19¹). Indeed, each crisis 'simply reinforced old lessons learned from previous crises and a sense that it revealed new warts in the financial system' (Thakor, 2015). The most remarkable event is the COVID 19. Currently, the way regions are dealing

¹COVID-19 is an infectious disease caused by the SARS-CoV-2 virus

with the crisis depends on their structural performance. The current COVID-19 emergency has led to historic social and economic fallout, but the pandemic response can also learn from previous distress. More specifically, the analysis here conducted is narrowed down to an assessment of the regional resistance to and recoverability, renewal and reorientation from the financial crisis, but this retrospective look at the 2007–2009 crisis also offers some ideas for looking ahead.

Part I

LITERATURE REVIEW AND METHODOLOGICAL ISSUES

Chapter 1

Theoretical framework:

Resilience, Well-being and Decentralisation

1.1 Resilience: a review

The word resilience, from Latin *resilire*, “to recoil or rebound”, meaning “the act of rebounding, springing back”. The idea of 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. Several definitions of resilience are found in the extant literature.

Recently 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*” (Hill et al., 2008, p.4). Or again, Martin (2012, p.10) 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*”. This latter notion is the so-called “adaptive resilience”, in which the term ‘adaptive’ refers to the whole region’s economic structure. The most commonly invoked definition of the concept is that of so-called ‘engineering resilience’, which focuses on the ability to return to the steady-state following a perturbation, as Walker et al. (1969), 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 behaviour”.

<i>DIFFERENT INTERPRETATIONS OF RESILIENCE</i>	
<i>ENGINEERING RESILIENCE</i>	Ability of a system to return to, or resume, its assumed stable equilibrium state or configuration following a shock or disturbance. Focus is on resistance to shocks and stability near equilibrium.
<i>ECOLOGICAL RESILIENCE</i>	The scale of shock or disturbance a system can absorb before it is de-stabilized and moved to another stable state or configuration. Focus is on ‘far from equilibrium’ behaviour of system.
<i>ADAPTIVE RESILIENCE</i>	The ability of a system to undergo anticipatory or reactionary reorganization of form and/or function to minimize impact of a destabilizing shock. Focus is on adaptive capability of system.

Table 1.1: Resilience definitions. Source: Adapted from Martin (2011)

As an OECD report suggests (2016), the concept of resilience is inflected in terms of adaptive capacity, robustness, redundancy, flexibility, resourcefulness, inclusiveness, and integration. Another interesting definition is the so-called “ecological resilience”, where the measurement of resilience is “measure of the persistence of systems and of their ability to absorb change and disturbance and still maintain the same relationships between populations

or state variables” (Holling, 1973, p.14).

This interpretation of resilience is used in the regional development context and is strictly linked to the well-known “Plucking Model” of economic fluctuation by Friedman. (Friedman, 1993; Kim and Nelson, 1999). 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. This scenario, depicted in figure 1, shows on the vertical axis the regional output and on the horizontal axis the time.

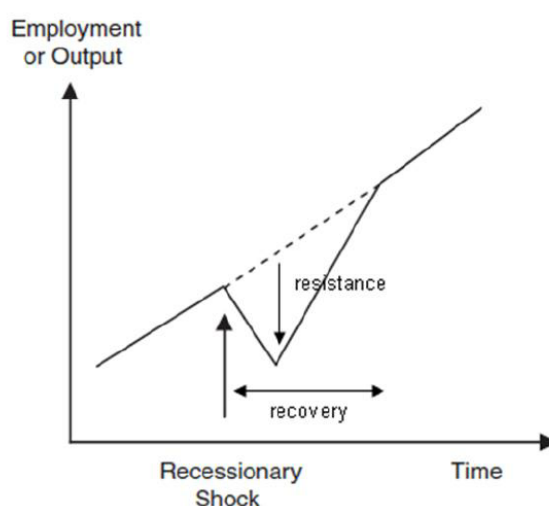


Figure 1.1: Plucking model. Source: Source: Friedman (1993)

The slope of the output curve reflects a steady rate of growth. Therefore, the system will tend to come back at least to their stationary state, or they improve their pattern through the re-allocation of resources, which be influenced by the region’s human, capital, and environmental resources.

The phenomenon based on the economy’s shift from one such equilibrium to another because of a shock is defined as ‘hysteresis’. Most economists have been associated with the impact of recessionary shocks on the (national) labour market. They focused on how recessions can lead to an upward shift for the natural (or no accelerating) inflation rate of unemployment. (Cross and Allan, 1988; Franz, 1990; Cross, 1993). In the case of a downturn

for a long period, the likelihood of long-term unemployment increases and limiting workers' skills, the possibility of being re-employed decreases. As a result, the negative impact of the shock on labour market is permanent, because when the economy recovers, it has a new higher natural (equilibrium) rate. Other economists, identify several possible 'hysteretic' outcomes of a recessionary disturbance (Cross et al., 2009; Fingleton et al., 2012).

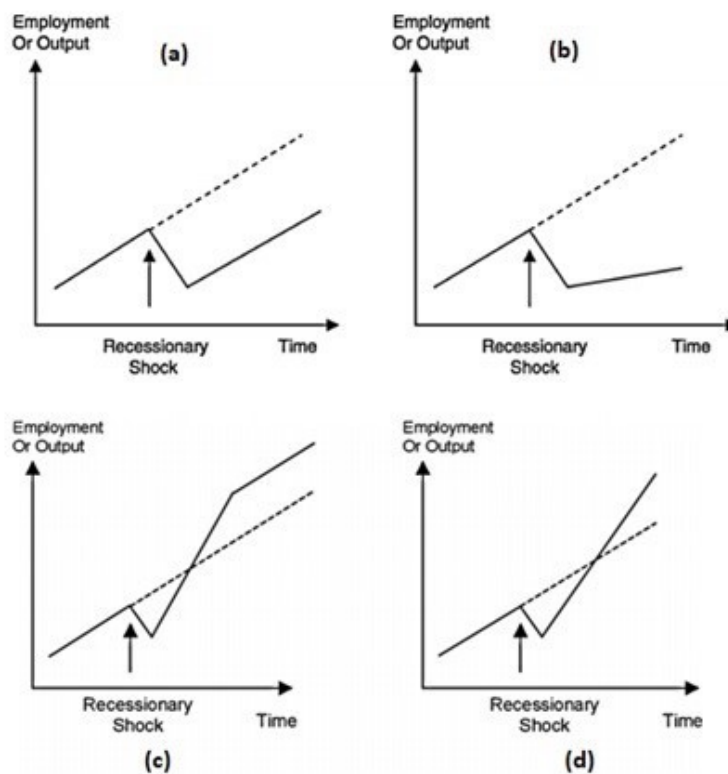


Figure 1.2: Negative and Positive hysteresis cases. Adapted from Martin (2012)

As Martin (2012) suggests employment and output responses could differ, depending on (i) labour productivity, (ii) the capital intensity of production, (iii) the labour hoarding strategies of firms, (iv) the relationship between the local firm of a region with others local firm in others regions. Figure 1.2 shows two cases of negative hysteresis and two cases of a positive one. In graph (a), the case in which the recession permanently lowers the level of output or employment, but over time the region growth rate recovers to its pre-shock rate. This first situation is a case in which the region's economies are able to recover, and,

at the same time, the recession is an opportunity to deepen their structural change. Indeed, according to Setterfield (2010), hysteresis almost invariably involves a structural change in the economy. In graph (b), the impact of the recessionary shock is permanently at a declining level and with a low growth rate. This situation highlights that the recession may affect several sectors of activity, causing a negative multiplier effect. Whereas both in the graph (c) and (d) there are two positive hysteresis cases. In the recovery phase, the growth rate appears above the pre-shock rate. This effect could be due, first, to optimistic expectations but also to new productions, new firms and a new labour force. Therefore, whether the regional economies are able to take advantage of these opportunities, then the higher level of growth rate could be sustainable effectively (graph d). Furthermore, regional economies that exhibit a positive hysteresis are more resilient. The possibility of positive hysteresis outcomes is linked to the notion of 'adaptive resilience', defined in Table 1. The adaptability depends on the rate of entrepreneurship and new firm formation in the region, the innovativeness of existing firms, and their ability and willingness to shift into new sectors and product lines, on access to finance for investment, on the diversity of the region's economic structure, on the availability of labour of the right skills, and similar factors (Martin, 2012).

However, the research question on growth could be widened to consider the effects of this process in terms of well-being and welfare of the affected population. The consideration that economies differ in their ability to cope with shocks prompts us to investigate the resilience notion with reference to its spatial dimension.

1.2 Regional economic resilience as an evolutionary process

Martin (2012) argues that resilience-thinking has made several important contributions to long-running regional research into the performance and adaptability of territories in the wake of damaging events and extreme pressures. Courvisanos et al. (2015) stress temporal and spatial dimensions of regional responses. Furthermore, an approach aiming to link the notion of the regional economy with an evolutionary perspective is based on

Generalised Darwinism, which places particular pressure on the role of variety in shaping regional economic resilience. Mainly, regional economics researchers focus on both the notion of adaptability to changing circumstances and on the degree of local sectoral variety. In general, resilience is a multifaceted process. Specifically, three basic mechanisms exist to define the adaptability level for each regional entity (Toulmin, 1981):

- The intentional response to the perception of circumstances
- The homeostatic mechanism, based on specific rules in relation to target behaviours
- The developmental mechanism, based on the cumulative unfolding of new behaviour patterns (such as innovation) within a specific set of constraints

As regards the degree of local sectoral variety, the main factor is the vulnerability of an economy to exogenous shocks. Specifically, each economy has a diversified economic structure, which varies also on a geographical basis. This variety implies different ways to react to shocks, changing the extent to which they recover from them. The model of adaptive cycles is graphically summarised in Figure 1.3.

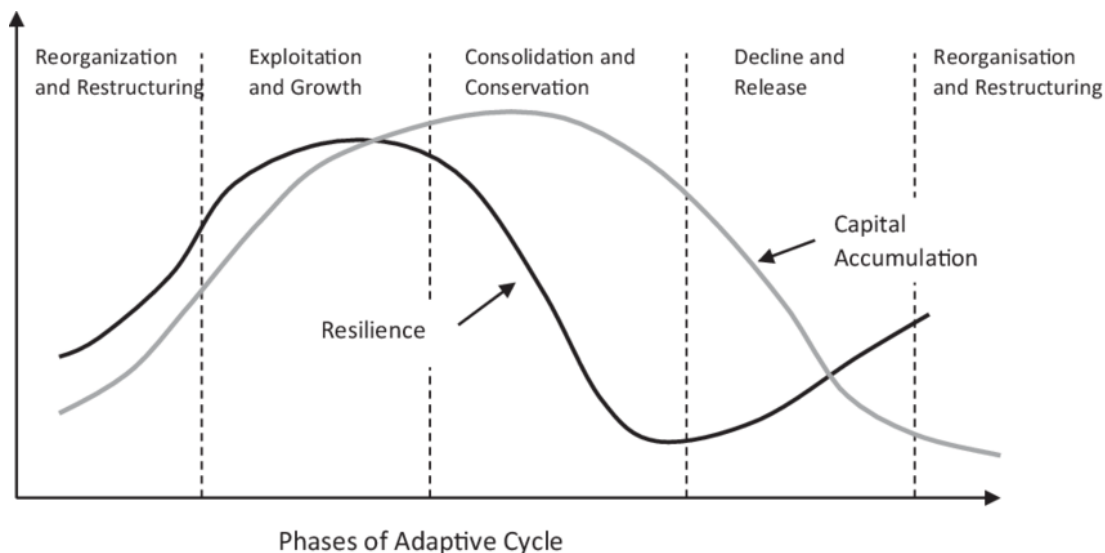


Figure 1.3: Resilience as evolutionary process across an adaptive cycle. Source: Simmie and Martin (2010)

Within this framework, regional economies are seen as complex adaptive systems. A crucial distinction is about more economically specialized regions and the economically

diversified ones, which are potentially equipped with a variety of economic activities able to counterbalance disturbances in one specific sector. However, each complex adaptive systems have important functions and relationships. More in detail, Figure 3 shows that the adaptive cycle model of regional resilience is made up of four phases of continual adjustment, namely reorganization phase, exploitation, conservation and release. In general terms, these phases identify the degree of resilience (high, high but decreasing, low, low but increasing, respectively) and refer to the time of innovation, growth, stability, and finally, time of “creative destruction” (Holling and Gunderson, 2002).

This scenario has the advantage of making more apparent the link between key attributes of regional development and the notion of resilience. Indeed, defining the notion of resilience as a process and across an adaptive cycle, allows us to identify four dimensions of regional economic resilience to a recessionary shock (the so-called 4R). Namely, resistance, recovery, reorientation, and renewal.

1.2.1 Resistance

The first dimension of Resilience is the *resistance*. Resistance refers to the vulnerability or sensitivity of a regional economy to disturbances and disruptions, such as recessions. The economic structure plays a crucial role in shaping a region’s sensitivity or resistance to shocks. Still, government quality and business innovation have a critical importance in shaping the resilience to economic shocks. Sunley (2013) has pointed out that there are very little empirical evidences on regional economies that are considered the most innovative and are more resilient, and also about their ability to cope with an economic shock or recover rapidly in face of a crisis event. The role of innovation and its manifestation through new products and processes may not be sufficient in the short-term to understand the ability of regions to resist and respond to an economic crisis. Indeed, the main reasons are related to the tendency to reproduce economic activities and to the dynamic capacity to develop new economic trajectories (Grabher and Stark, 1997; Pike et al., 2010). However, as Bristow et al.(2018) argue, the importance of innovation for long-term economic growth and regional

development is well established.

Therefore, an evolutionary approach suggests that a regional economy's resilience to an economic shock is likely to be multi-dimensional. A varied economic structure offers higher regional resistance to shocks because of different sensitivity to business fluctuations and a diversified degree of sectoral inter-relatedness.

1.2.2 Recovery

The expression economic *recovery* refers to the practice by which businesses and local economies return to conditions of stability following a disaster. More specifically, the recovery dimension refers to the speed and degree of recovery of the regional economy from a recessionary shock. Each economy after an unexpected catastrophe shows a multitude of disparities concerning demand and production and for these reasons, it may take months or years to recover. Some not exhaustive findings from the empirical literature provide us some strategic determinants on the economic recovery of business and community. These include (Chang and Rose, 2012) :

- Businesses and local economies are generally resilient to disasters, most businesses recover (Webb et al., 2000; National Research Council, 2006;).
- The degree of property damage to a business is one factor in explaining recovery, it is often not the most important one (Tierney, 1997; Webb et al., 2000; Chang and Falit-Baiamonte, 2002; Lam et al., 2009).
- Some types of businesses, sectors, and local economies tend to have greater difficulty recovering from disasters than others. Such as small business, locally oriented businesses, especially in retail and some service sectors, financially marginal businesses.

However, the analysis on to what degree do local economy recovers is crucial. It is necessary investigating determinants of resilience to inform policy-maker and implement recovery policy, taking into account size, diversity, growth trends for each local economy. Indeed, the analysis on what types of decisions and policies in smoothing business and

local economic recovery. Finally, the speed of recovery depends on the best relative mix of private, government and non-profit sector roles. Both the public and private sectors play a role in disaster recovery financing (Chandra et al., 2016). Indeed, the potential public-private collaboration is also particularly challenging to support recovery.

Furthermore, economic recovery provides necessities of life, jobs to sustain the economy in terms of income and tax revenues, and offers great opportunities for resilience capacity for coping with a future event.

1.2.3 Reo-orientation

As Martin (2012) suggests, a third dimension concerns the extent to which the regional economy undergoes structural *re-orientation*. Specifically, it refers to re-orientation and adaptation of the regional economy in response to recessionary shock. The emphasis upon structural factors is becoming a leading analytical concept and heuristic means for inspecting the abilities of local and regional economies to fight and recover from economic shocks. Besides, the structural factors affect the degree of adaptability on development paths. For example, the broad sectoral patterns of employment are a crucial aspect. The determinants to analyse are the following:

- Whether and to what extent such change restores a region's employment path following a major recessionary shock
- How fast and how successfully a region's economy adapts from slow-growing or declining sectors into fast-growing ones

1.2.4 Renewal

Renewal concerns the extent to which regional economy renews its growth path: resumption of prerecession path or hysteretic shift to the new growth trend. The main idea of this dimension is based on the possibility that each regional entity return to a pre-shock growth trend or can evolve to a different growth path. The main reason is that the regional productiv-

ity, after a shock, may respond by removing unproductive activities and opening up to new profitable sectors leading the economy in a new stationary state (Mustra et al., 2017). A limitation of this approach and that many researchers point out is that the regional economy should not be in equilibrium. However, the effects of a shock could be considered transitory and, soon or later, the economy will come back on its long-run growth path. The determinants to renew the regional growth path are, first of all, the level of output and/or employment which depend on economy's features such as resources endowments, the potential for innovation, quality of institutions and policy priorities, local attractiveness and in recent times, also the exposition to climate change (De Siano et al., 2020). Therefore, a system may move towards a worse path since the main economic variables suffer a permanent decline or, in the opposite case, they can suffer a temporary contraction which does so that the economy can resume its previous growth path. Of course, the future consequences on the system performances are affected by political, economic and institutional reforms (Martin and Sunley, 2015).

In summary, both quantitative and qualitative terms of the recovery depend on short-term measures implemented during the resistance phase, but also by the measures developed towards regional renewal and reorientation and oriented on long-term strategies.

1.3 Beyond-GDP analysis

Policymakers have focused strongly on measures of national production, such as Gross Domestic Product (GDP¹) (Among other Jaszi, 1986). Besides, Kuznets (1932) developed GDP as a means of measuring the impact of the Great Depression.

Today, limitations of measures based on production, such as GDP, as measures of well-being have been systemically documented (Stiglitz et al., 2009) leading to increased interest in holistic measurements of well-being. In general, GDP measures both the flow of goods and services produced within the market that is those traded for money and some 'non-market'

¹The most widely granted measure of a country's economic growth is the GDP. GDP measures all goods and services produced in the country whether by domestic or foreign companies. It excludes goods and services produced in other countries.

production, like defence spending by the federal government and non-profit spending on emergency housing and health care. But, some economic activities are excluded from GDP measurements, such as volunteer work, social capital formation within healthy family units, the costs of crime and an increasing prison population, and the depletion of natural resources (Costanza, 2009). Many economists² stated that GDP is a measure of economic activity, not economic well-being. According to the Council on Social Work Education (CSWE) the economic well-being is defined as having present and future financial security. Present financial security refers to the ability of individuals, families, and communities to satisfy their basic needs (including food, housing, utilities, health care, transportation, education, child care, clothing, and pay taxes), and have control over their day-to-day finances. Instead, future financial security is the ability to absorb financial shocks, meet financial goals, build financial assets, and maintain adequate income throughout the life-span.

Over the last 70 years, economic growth measured by GDP has become the *sine qua non* for economic progress (Costanza, 2009). Therefore, the use of GDP as an indicator of well-being and quality of life is dangerous and inappropriate. As Stiglitz et al.(2009) suggest GDP sends an inappropriate message if interpreted in term of wellbeing. More specifically, subjective well-being is an important conceptual framework for measuring the quality of life. In literature, there exist a different set of metrics collected by directly asking individuals to evaluate their happiness and/or life satisfaction, either as a whole or in particular domains. The traditional indicators for the economic growth indicators such as GDP and employment rate were never designed to be inclusive measures of prosperity and well-being. In 2007, the European Commission, the European Parliament, the Club of Rome³, the OECD, and World Wildlife Fund (WWF) hosted the pivotal conference “Beyond GDP”. Their main aim

²Among others, Kuznets, 1934; McCulla and Smith, 2007

³The Club of Rome addresses the multiple crises facing humanity and the planet. It is made up of 100 members, including economists, scientists, business leaders and former politicians. The Club is supported by the International Secretariat in Winterthur (Switzerland) a satellite office in Brussels (Belgium) and National Associations in more than 30 countries They seek to define comprehensive solutions to the complex, interconnected challenges of the world. More specifically, they do so through specific researches, concrete policy proposals and targeted meetings. Recently, the Club has prioritised five key areas of impact: Climate-Planetary Emergency, Reclaiming and Reframing Economics; Rethinking Finance; Emerging New Civilization(s); Youth Leadership

was to adequate indicators to address global challenges of the 21st century such as climate change, poverty, resource depletion, health, and quality of life. The 'Beyond GDP' initiative is, therefore, mainly about developing indicators that are at least as clear and appealing as GDP, but more comprehensive of environmental and social aspects of progress. As pointed to by Robert Kennedy in his speech in 1968 GDP measures everything "... except that which makes life worthwhile". More recently, the "GDP&BEYOND" approach (2021, European Commission) creates a new way to understand and measure well-being.

Further, as also, the OECD(2020) suggests, the measuring well-being agenda asks for novel and value-added statistical measures, aimed at filling the gap between standard macroeconomic statistics that sometimes are used as proxies of people's welfare and indicators that have a more direct attitude on people's life. Indeed, the question of how to measure people's well-being and societies' progress is one that the OECD has been addressing for more than a decade, resulting in the OECD Better Life Initiative in 2011.

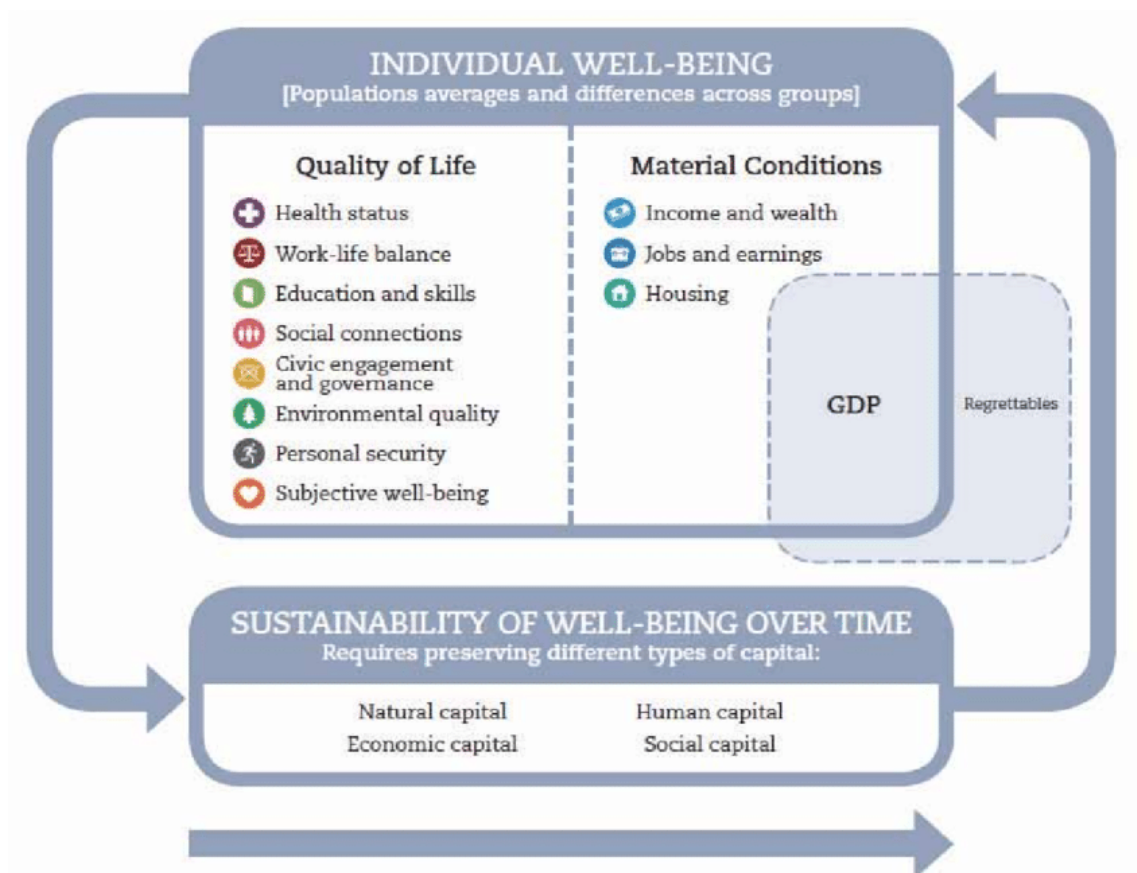


Figure 1.4: The OECD Conceptual Framework. Source: OECD (2020)

Figure 1.4 shows the key dimensions to define the current and resources for future well-being. Specifically, the current well-being is been computed through two domains, such as the material living conditions (i.e. income and wealth, jobs and earnings, and housing conditions) and quality of life (i.e. health status, work–life balance, education and skills, social connections, civic engagement and governance, environmental quality, and personal security and life satisfaction). As regards future well-being, the key dimensions are those resources that can to guarantee the sustainability of well-being over time. They require preserving the different type of capital, which is natural, human, economic, and social capital. However, OECD (2020) underlines the main techniques for measuring them, such as averages, inequalities between groups and between the top and bottom performers, deprivations for the current well-being. Despite the future well-being, the main drivers are the computation of stocks, flows, risk factors, and resilience.

Building on best practices for measuring well-being and progress, the recommendations from the Stiglitz–Sen–Fitoussi report, as well as on consultations with international experts and with National Statistical Offices represented in the OECD Committee on Statistics, the OECD well-being framework for measuring current well-being has four distinctive features, that is:

- *People* includes both individuals and households. Focussing on people, rather than the economy stem from the fact they are the main source of wealth. They guarantee economy-wide performance.
- *Well-being outcomes*, which provide relevant information on people's life. These outcomes include both objective and subjective measures.
- *Distribution* in well-being outcomes across the population taking into account disparities across age groups, gender, and individuals' socio-economic backgrounds.
- *Objective* and *subjective* aspect of well-being. They are supplementary information to compute outcomes in the various life dimensions

Therefore, moving beyond GDP is a need for action to measure well-being, progress and true wealth. (Dimas, 2007). GDP is generally inadequate as an indicator of the real state of well-being and/or distress of a country. We cannot reduce the complexity of the world to a single number (Giovannini, 2007).

1.4 Quality of life

The Club of Rome has launched a new policy brief on 21st Century Well-being Economics and its role in EU recovery. European governments will be alerted to the benefits of well-being economics as an anchor for recovery, renewal and resilience. Several frameworks of measurement have been developed over the years with the aim of going beyond GDP as the sole measure of a country's economic success. These include, for example, The Genuine Progress Indicator (GPI), The Happy Planet Index, World Bank Wealth Accounting and Valuation of Ecosystem Services (WAVES) and the OECD Regional Well-being and Better Life

Index. This latter initiative focuses on the quality of life, answering the following questions: «Are our lives getting better?»; «How can policies improve our lives?»; «Are we measuring the right things?».

The term quality of life is used to evaluate the general well-being of individuals and societies, including a wide range of fields, such as the fields of development, healthcare, environment, and politics. Specifically, the standard indicators of the quality of life consist of not only wealth and employment, but also the environment, physical and mental health, education, recreation and leisure time, crime rate, and social belonging. Besides, the quality of life is been related to issues of freedom, human rights, and happiness. The Better Life Index (BLI) allows comparing well-being across countries, based on 11 topics the OECD has identified as essentials, in the areas of material living conditions and quality of life. They allow understanding what drives the well-being of people and nations and what needs to be done to achieve greater progress for all.

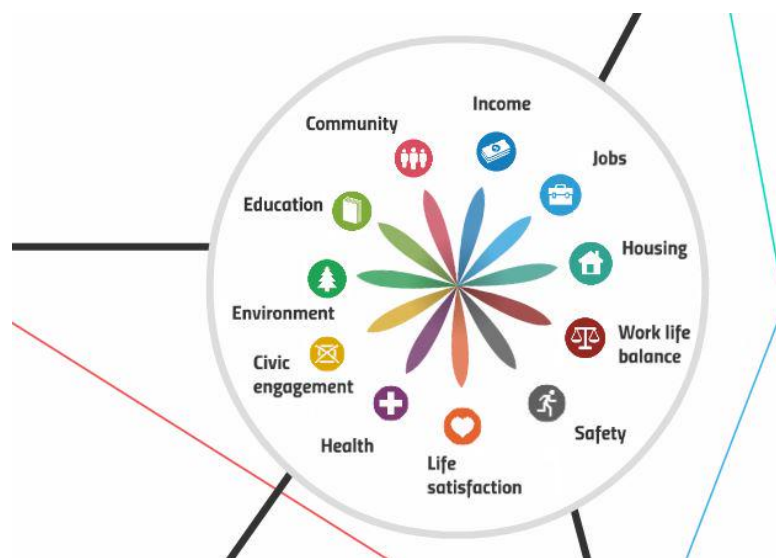


Figure 1.5: The BLI dimensions. Source: OECD (2021)

Figure 1.5 shows in what dimensions the material living conditions and quality of life are broken down. They are income and wealth; jobs and earnings; housing; health; work–life balance; education; social connections; civic engagement; environmental conditions; personal security; and subjective well-being. In the following sections, all dimensions will be described

in greater detail.

1.4.1 Income and wealth

Economics has largely focused to understand the relationship between utility, or overall well-being (Bentham, 1843), with consumption and income. Adam Smith, for instance, argued, “consumption is the sole end and purpose of production” (Smith, 1776). Further, economists model utility as a function of either consumption (direct utility function) or income (indirect utility function); where the indirect utility function also requires information on prices and inter-temporal income plus wealth. Consequently, the examination of whether consumption or income better predicts Subjective Well-Being (SWB) is a useful tool to study these two functions.

Preliminary, it is worth mentioning that the correlation between life satisfaction and income is well established (Deaton & Kahneman, 2010). Indeed, income and wealth measure the economic resources that people can use today or in the future to satisfy various human needs and wants, and to protect against vulnerabilities and risks during their life. In addition, Friedman’s permanent income hypothesis postulates that current consumption is determined by lifetime resources (which comprises current net wealth, the current income and discounted future earnings), and thus current consumption should be a better indicator than current income of lifetime living standards (Friedman, 1957). Deaton (2010; 2016) has demonstrated the authenticity of self-rated measures of material well-being. Indeed, the permanent income life-cycle hypothesis is a basis of work on the relationship between consumption and income. It has been argued that the current level of consumption is a better indicator of life satisfaction than the current level of income. Household income, indeed, is just one component of GDP. GDP per se is not an adequate proxy of people’s material resources, as, for example, it includes some production activities that simply offset some of the “disamenities” associated with economic growth (e.g., commuting) while excluding some welfare-enhancing production flows (e.g., services produced by households for their use, such as childcare).

As the Commission on the Measurement of Economic Performance and Social Progress suggests in recommendation 1 ‘when evaluating material well-being, look at income and consumption rather than production’, since material living standards are well described with measures of net national income, real household income and consumption. In recommendation 2, they underline the role of household perspective, since household income and consumption first, reflect better material living standards of people and secondly, also services provided by the government, such as subsidized health care and educational services. In recommendation 3, they argue ‘consider income and consumption jointly with wealth’, because a household that spends its wealth on consumption goods increases its current well-being but at the expense of its future well-being. (Stiglitz, et al., 2009). The use of GDP as an indicator implies some limitations to measuring people’s well-being.

The emphasis on well-being is important because of the lack of information within GDP data. Although they continue to provide information on general economic activity, market production and employment, today the new statistical system focused on measures based on well-being and sustainability. Therefore, to evaluate material well-being, the start point is the measurement of living standards looking at income and consumption.

1.4.2 Housing and quality of housing

The housing dimension is one of the major issues affecting the quality of life. The main reason is due to the consideration that a good housing condition should offer people an appropriate place to sleep and rest, where they are free of risks and hazards. Besides, housing should give a sense of personal security, privacy and personal space. Therefore, a suitable housing condition is vital to satisfy other needs, such as having a family. Yet, measuring housing conditions and investigating how it affects the quality of life is not a simple issue. The elements that could be valuable are those concerning both the physical characteristics of the dwelling (i.e. availability of water and energy supply) and the environmental characteristics of the area where the house is located (i.e. exposure to pollution or noises). Further, other determinants one has to take into account are the housing costs, which may give rise to

concerns especially for people in low-income brackets. Beyond their intrinsic importance, the access to housing and the quality of housing are two important determinants of health and subjective well-being, as well as of social relations and access to jobs and public services.

1.4.3 Availability and quality of jobs

A huge number of life circumstances govern individual well-being. One of the most important for most people is work. Indeed, the possibility to have a job is a crucial point in most people's lives. The most important aspect of the labour market in terms of well-being is whether individuals are able to find a job, given that they want one (Clark, 2010). Some empirical studies show that unemployment is strongly negatively correlated with different measures of well-being (Hoang et. al, 2020; Voßemer et al., 2017; De Witte, 2005;). In general terms, the life satisfaction of an unemployed person is lower than that of an employed one. More specifically, *ceteris paribus*, putting the unemployed into work will raise "National Well-Being"? As Clark suggests there are three main reasons underlying reasons for that:

A *"It is not unemployment that makes people unhappy, it is the unhappy who become unemployed"*.

This claim argues that well-being increase whether individuals find a job and when they lose it.

B *"It depends on when we put the unemployed back in work"*

A growing literature in Economics and Psychology focuses on the issues of human races become reconciled to a procession of changes, adjustments, and readjustments. In this discussion, the impact of longer-term unemployment makes individuals happier than the short-term ones, because of complete adaptation on the status of being without any work.

C *'It depends which unemployed we put back in work'*

The impact of unemployed that back to work on national well-being depends on many factors and circumstances. For example, one of them is the region where the individuals live. Indeed, the low or high rate of unemployment, impacts his or her satisfaction

to come back to work. However, another factor, no less important, is whether the individual does a job that loves.

Besides, the most relevant determinants are the job quality and the possibility to improve their own skills and abilities. A good job gives also the opportunity to pursue the workers' ambitions. Job quality is also of interest to firms and policymakers as well. The reason is that the job quality provides a measurement of how well people are doing in the workplace and what is their value-added to the society in which they live. Therefore, the quality of jobs is a key element of quality of life. The International Social Survey Programme (ISSP) Work Orientations modules hold information on both job values (what workers think is central) and job outcomes (what they truly get). The job values and outcomes cover six broad dimensions (Clark, 2005):

- pay
- hours of work (including any mismatch between actual and desired hours);
- future prospects (self-reported promotion opportunities and job security);
- hard work (self-reported exhaustion, hard physical work, stress, and working in dangerous conditions);
- job content (self-reported interesting job, a job helps other people, a job is useful to society, and autonomy);
- interpersonal relationships (with management and co-workers).

Undeniably, all dimensions contribute to conveying the sense of satisfaction with working conditions.

1.4.4 Physical and mental health

"A healthy mind in a healthy body" (or, in Latin, *mens sana in corpore sano*, from Satire X of the Roman poet Juvenal) is also in our own present time the prerequisites for human happiness. As OECD suggests good health is one of the most important things to people. Across the

OECD⁴, in 2020 about 69% of the adult population say their health is "good" or "very good" (OECD, 2020). A good physical and mental status depends on many factors and, in turn, it guarantees success in many personal and social activities involving a general Well-Being. The main indicators used in the literature to explain the health status are based on the life expectancy of people. On average, in 2020 the life expectancy at birth reaches 80 years across OECD European countries (OECD, 2020). Recent OECD analyses show that the determinants to improve life expectancy are health care spending growth and rising living standards, environmental improvements, lifestyle changes, and education (OECD, 2020). Further, an important issue is the performance of national Health Care Systems(HCS). HCS includes services, facilities, institutions/establishments, and organizations. In addition, it stems from specific political, historical, cultural and, socio-economic traditions (Jakubowski, 1998). Indeed, there are different HCSs models: the Beveridge model, the Bismarck model, and the Private Insurance model. The management for health care differ considerably between countries in the European Union because of the allocation of capital and human resources. Broadly speaking, health care is a combination of challenges and opportunities. On the one hand, each Member States has the need to offer equal, efficient, and high-quality services at a reasonable price. On the other hand, the increasing demand for health care involves the need to rationalise services and cut costs, through a decreasing tax base to pay for that demand. The performance of the national health care system depends on the strategies put in place, which differ from country to country. HCS are continuously evolving (Donev et al., 2013). The 2020 edition of Health at a Glance (OECD, 2020) focuses on an initiative organized by European Commission, in co-operation with OECD and the European Observatory on Health Systems and Policies to improve the health and the health care systems of EU countries. Following the COVID-19 pandemic, the vulnerabilities in health systems have been made clear. In order to improve people's health and quality of life, urgent actions are needed. The EU recovery plan from the COVID-19 crisis aims for a more sustainable and resilient economy.

⁴The World Health Organization (WHO) recommends using a standard health interview survey to measure it, phrasing the question as "How is your health in general?" with response scale "It is very good/ good/ fair/ bad/ very bad" (www.oecdbetterlifeindex.org)

Therefore, the COVID-19 pandemic has a socio-economic impact and it allows testing the resilience of every country's government and people.

1.4.5 Education and skills

Education (*EDU*) has a crucial role to play in developing the knowledge, skills, attitudes and values that enable people to contribute to and benefit from an inclusive and sustainable future (OECD, 2018). Moreover, education and skills are influential means to secure employment. In this regard, it is worth noting how the International Labour Organization (ILO) defines employment as a productive work in which rights are protected, which creates adequate income, and which offers social protection. As for the required skills, 21st-century crucial skills are critical thinking, creativity, collaboration, communication, flexibility, productivity, and social skills (Van Laar et al., 2017; Chalkiadaki, 2018; Scherer et al., 2019).

EDU is very important for the individual's life success, since the higher is the level of education reached, the higher is the probability to improve the own life quality (OECD, 2011a, Education at a Glance, 2011). Hence, the highest performing education system across countries are those that combine a high level of students' skills and knowledge. However, equity in education represents a crucial aspect. In particular, it refers on two dimensions: fairness and inclusion (Field, et al., 2007). Equity as inclusion guarantees that all students reach at least a basic minimum level of skills. Equity as fairness means ensuring social cohesion, that is personal or socio-economic conditions, such as gender, ethnic origin, or family background are not obstacles to educational success. Some educational policies create equitable and efficient system developing synergies among them (Woessman, 2008). The main reason stems on the relationship between goals of efficient and equity. Indeed some educational systems can be more efficient and less equitable, or vice-versa. However, as Idris et al. (2011) suggest, education is generally seen as the foundation of society, which brings economic wealth, social prosperity and political stability. Indeed, education provides knowledge and skills to the population and it has a crucial role in shaping national identity. A very recent study of Lacruz et al. (2020) focuses on how the educational level of young people from an urban district in

the city of Zaragoza (Casablanca) has an influence on their health-related quality of life. This study, therefore, highlights how the health-related quality of life and education incorporates the multidimensional potentialities of education for well-being. Education and skills are prerequisites and universal goals for all people, as well as being instrumental to achieving national success in terms of many other economic and non-economic well-being outcomes. In conclusion, an equitable education system tries to keep the effect of broader social and economic inequalities under control. Broadly speaking, such a system allows individuals to take full advantage of education and training irrespective of their background (Faubert, 2012; Field et al., 2007; Woessmann and Schütz, 2006). However, during the COVID-19 pandemic the impact on children's education is undergoing some consequences, among others the school closures. As Agostinelli et al., (2022) suggest the current crisis will affect the economic opportunities of today's children.

1.4.6 Community

The frequency of our contact with others and the quality of our personal relationships are essential determinants of our well-being. Social contacts between individuals from diverse ethnic, racial, and national backgrounds have long been thought of as a means to lessen prejudice and foster trust (Pettigrew et al., 2006). Empirical studies have found the role that social interactions play in a collective European identity (Stoeckel, 2018). Recent research has turned the attention to the intra-European student exchange program, Erasmus (King and Ruiz-Gelices, 2003; Mitchell, 2012). European students annually spend time at another European university; thereby they can enhance their relations skills in an international context. The analysis of Stoeckel (2018) backs the argument that social interaction among students from different European countries contributes to a collective European identity. In addition, as an OECD report suggests (OECD, 2021), a strong social network, or community, can provide emotional support during both good and bad times. Actually, 89% of people believe that they can contact their friends in case of need. In recent years, epidemics emerged as critical concerns (Vittori et al., 2020).

At the end of 2019, SARS-CoV-2, emerged in China provoking the coronavirus disease 2019 or COVID-19. The pandemic has had both health problems and psychological, sociological, and economic concerns worldwide (Yang et al., 2020). Self-isolation and quarantine were as key strategies to overcoming the spread of the disease. For example, according to OECD report (2020), the current health emergency caused by the spread of the COVID-19 virus pointed out these social constraints, that is:

- not being able to relate to people outside the house (51%);
- increase psychological discomfort (31%);
- not being able to do outdoor sports (27%);
- not having so many spaces available (24%);
- not being able to go to work (20%);
- having to live together forcibly (9%).

These limitations have damaged the well-being of the majority of individuals, involving in an economic and psychological emergency. People need to be made psychologically resilient and cope with the current crisis (Tabari et al., 2021). Particularly when there were difficulties, interpersonal relationship play a fundamental role in own lifestyle. As Thomas et al., (2017) suggests, for example, family relationships lead to a higher sense of well-being. In the context of social isolation, the WHO Department of Mental Well-being and Drug Use has established some principles to be utilised to promote psychosocial well-being.(WHO, 2020a). Indeed, because of the lack of direct support, new technologies may be helpful in order to recreate a sense of connection at the community level.

1.4.7 Environment

'Today, markets and market-like practices are extending their reach in almost every sphere of life'(Sandel, 1998), and ecological issues are dreadful and increasingly pressing. Neoclassical market economics draws its appeal from formal elegance, mathematical tractability, conceptual plasticity and normative premises. Nonetheless, as Goodwin et al. (2014) suggest,

contemporary markets allow many separate decision-makers, acting in a decentralized manner. Indeed, their purpose refers to coordinating their behaviour, ensuing in very complex designs of economic activity. The proper functioning of a market depends on different groups:

1. Individualist institutions related to property and decision making
2. Social institutions of trust
3. Infrastructure for the smooth flow of goods and information
4. Money as a medium of exchange

Markets can fail to deliver optimal social outcomes, but anyway, markets remain the cornerstone, market reasoning is the basis of contemporary mainstream economics. All these features apply to the environment (*ENV*) involve the so-called “environmental and resource economics”. The link between market and environment is addressed in terms of valuation, commodification and securitization. As Holz et al. (2019) suggest, these three issues are the basic level of abstraction involved in financializing environmental goods. The quality of the natural environment where people live and work is important for different reasons. First, for their status health and then for their ability to undertake a number of activities (raising children, social life, etc.). Therefore, the quality of our local living environment has a direct impact on our health and well-being. The main indicators are water quality and air pollution. Specifically, air pollution is set to become the top environmental cause of premature mortality by 2050, and, for example, as the OECD (OECD, 2021) suggests, access to clean water is fundamental to human well-being. Managing water to meet that need is a growing challenge in many parts of the world.

In this context, evidence of the Environmental Kuznets Curve (EKC) hypothesis has been discussed by a sizeable literature in the recent period. The EKC hypothesis explains as environmental issues impacts on the growth and well-being of a region. Originally, EKC derived from Simon Kuznets’s work on inequality in the 1950s. More specifically, as shown in Figure 4, when the income of an economy grows over time, environmental pressure grows first, reaches a peak, and then starts declining after the threshold level of income has been

crossed (Dinda, 2004).

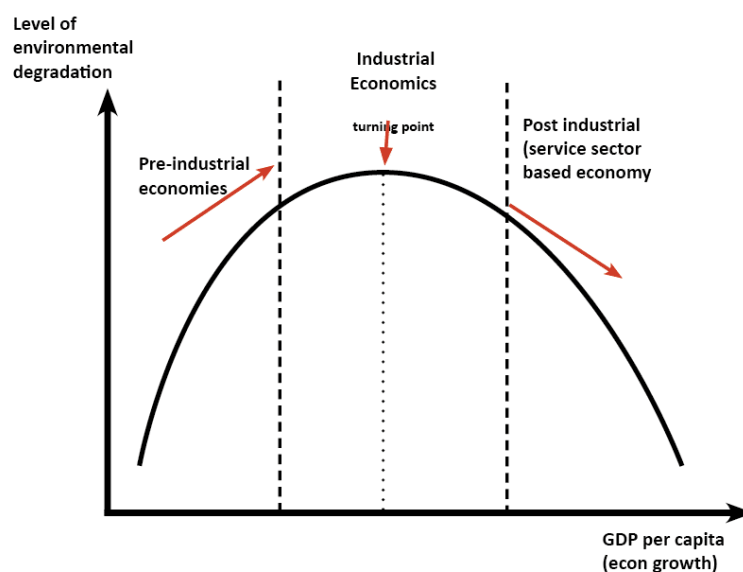


Figure 1.6: Environmental Kuznets Curve. Source: Dinda (2004)

In other words, in the early stage of the economy, that is the pre-industrial economy, the increasing and fastest growth causes a huge use of resources and pollution incidents, involving the degradation of the environment. Whereas, in the stage after industrialization, when income increases, people and governments become more caring towards the environmental issues so that the degradation of the environment decreases. Therefore, there exists a positive relationship between income and environmental pressure until the level of an economy is low. However, when a turning point is been reached, then this relationship becomes negative. With this relationship in mind, it is important considering environmental aspects alongside the other multidimensional measures of social and economic performance.

1.4.8 Civic engagement

Thomas Ehrlich, author of *Civic Responsibility and Higher Education* (2000: p. vi), offers the following definition for civic engagement:

‘Civic engagement means working to make a difference in the civic life of our communities and developing the combination of knowledge, skills, values and motivation to make that difference.

It means promoting the quality of life in a community, through both political and non-political processes. . . . A morally and civically responsible individual recognizes himself or herself as a member of a larger social fabric and therefore considers social problems to be at least partly his or her own; such an individual is willing to see the moral and civic dimensions of issues, to make and justify informed moral and civic judgments, and to take action when appropriate '.

The main aspect to take into account is the need for good governance. Indeed, good governance improves the general well-being of citizens and, in particular, civic participation is a key determinant in the social and community context. Many different strategies can promote civic participation, that is voting, volunteering, participating in group activities, community gardening, representing fellow citizens by appointment or election. All of these activities prove how civic engagement (*CE*) is about engaging people in a process of self-governance. Governments today try to involve the younger generation. Indeed, the social media platforms like Facebook, Twitter, and YouTube offer a new frontier for civic participation. Further, according to the Policy Circle, the values associated with fostering civic engagement are:

- Trusting and respecting how a community wants to take action for itself;
- Creating agency and power in people, particularly those most affected by an issue;
- Nurturing or fostering healthier, stronger, happier places to live;
- Engaging community members in processes that affect them and their communities;
- Promoting transparency and participation;

People engaged in their communities tend to be more interested in their communities' health and well-being. A study of 44 countries (including the United States) found that voter participation was associated with better self-reported health (Arah, 2008). The widespread existing means of measuring civic and political engagement is voter turnout, defined as the percentage of the registered population that voted during an election (OECD, 2021). Specifically, voter participation measure provides high-quality data and broad cross-country comparability. However, another indicator used by OECD (2021) to explain this dimension is the stakeholder engagement for developing regulations. The latter measures to what extent

a country's executive branch engages with stakeholders when developing primary laws and subordinate regulations. Therefore, the *CE* dimension takes into account the public engagement in decision-making, promoting government accountability, a friendly business environment, and public trust in government institutions. As Halliwell et al.(2008) suggest is the ability of governments to provide 'trustworthy environment, and to deliver services honestly and efficiently'. International evidence on the linking between good governance and well-being shows the variety of domain-specific trust has greater and direct well-being effect. The social capital literature (Putnam, 2000; Halpern, 2005) gives a central role to trust. Most studies of social capital and its effect have focused on the influence of family, friends, and community groups, and less importance is to workplace social capital. (Halpern, 2005). However, given the large time spend working, then is the workplace social capital linked to life satisfaction. In addition, trust in neighbours, trust in police, and workplace trust are all independently strong determinants of respondents' subjective well-being (Halliwell, 2008).

1.4.9 Life Satisfaction

As OECD (2021) suggests Life Satisfaction (*LS*) measures how people evaluate their life as a whole rather than their current feelings. Indeed, to evaluate the living condition and quality of life, it is crucial to consider how people feel about their life and experience. Surveys, in particular, are used to measure *LS* and happiness (Diener et al.(2012). Global *LS* scales ask respondents to evaluate their lives as a whole on a scale ranging from very satisfying to very dissatisfying. (Fujita et al.,2005). *LS* scales are nowadays receiving interest in terms of national accounts of well-being, with the scores potentially being used to inform policy deliberations. Fujita and Diener (2005) found in a sample of respondents followed for many years that the one-year stability coefficient for *LS*. They compute the stability of *LS* scores across time and situations, following the answers of people to survey. In a panel of respondents, it was about 0.56, and over greater numbers of years declined progressively to about 0.24 after 16 years. 24% percent of respondents showed a significant change in 5-year mean *LS* from the beginning to end of the period. Thus, there is considerable stability in *LS* judgments

over short time intervals but greater changes over time as circumstances in lives are likely to change. In the literature, many researchers have investigated determinants of LS.

Lucas et al. (1996) found, using multiple measures of each concept as well as longitudinal assessment, that LS showed clear discriminant validity from related concepts such as positive affect, negative affect, optimism, and self-esteem. Luhmann et al. (2012) found, using a multimethod approach, that sentimental and mental forms of subjective well-being are overlapping but somewhat distinct. Thus, LS shows discriminant validity from other related concepts. The general satisfaction with life on a scale from 0 to 10, on average across the OECD, gave it a 6.5 (OECD, 2021). However, LS scores also correlate through physiological variables that relate to positive moods. (Urry et al., 2004; Steptoe et al., 2005). More recently, the positive effect of LS on fertility behaviour can be traced. Perelli-Harris (2006) showed that in Russia, subjective well-being is positively linked to having additional children. Parr (2010) found that LS is a determinant of fertility in Australia and, for both sexes, there is a strong positive relationship between prior satisfaction with life and fertility two years later.

1.4.10 Work-Life Balance

Work-Life Balance (*WLB*) has always been a central trade-off issue for those interested in the quality of working life and the general well-being of quality of life. The ability to combine work, family commitments and personal life are important for people's well-being. An important feature of Work-Life Balance is the amount of time a person spends at work and the amount of time for leisure, personal care, and other non-work activities. Zedeck and Mosier (1990) and O'Driscoll (1996) describe five models to explain the relationship between working life and life outside the workplace. They are:

- Segmentation model, which assumes that work and non-work activities are two different domains of life
 - Spillover model, which conjectures that one world, can influence the other in either a positive or a negative way.
-

- Compensation model, whereby in terms of demands or satisfactions, work and no-work activities can be made up in the other
- Instrumental model, characterized by the fact that activities in one sphere facilitate success in the other
- Conflict model, which emphasizes the choices that have to be made and some conflicts and possible overlapping on an individual occur.

A relevant challenge is the need to find a way to measure *WLB*. An initial relatively definition might take the form of *“sufficient time to meet commitments at both home and work”*, which integrate objective and subjective meanings. As Clark (2000) suggests the term balance refers to *“satisfaction and good functioning at work and at home with a minimum of role conflict”*. Specifically, about the subjective part the literature refers on *“a perceived balance between work and the rest of life”*; whereas, for that objective, the European legislation fix to 48 working hours.

The main indicators to evaluate the work-life balance are the ‘time devoted to leisure and personal care’ and ‘employees working very long hours’. A full-time worker in the OECD devotes 63% of the day on average, or 15 hours, to personal care (eating, sleeping, etc.) and leisure (socialising with friends and family, hobbies, games, computer, and television use, etc.). Further, evidence suggests that 1% of employees in the OECD work 50 hours or more per week (OECD, 2021).

However, when a significant part of the day is devoted to working and work-related activities, the distributions of other elements of time-use, such as travel-to-work, housework, self-care, becomes relevant. Mainly the travel to work routine has an important impact in respect to the well-being (Diener et al., 1999). Indeed, it has been suggested that residential location choices can affect well-being through impacts on travel (De Vos et al, 2013) and, on the mode of transport. Delbosc and Currie (2011, p. 560-1), argue that lack of access to transport and/or greater levels of social exclusion (including living in non-urban/rural areas) have harmful impacts on well-being. In the current context of COVID 19 pandemic,

working from home is the only possibility to minimise the risk of infection. However, the opportunity to work from home became of great importance (Acemoglu et al.2020), because it allows workers to continue working and receive wage, by offering a service. As Bonacini et al., (2021) suggest a future increase in the working from home feasibility would be related to changes in labour income levels and inequality.

1.4.11 Safety

Safety is the state of being "safe", the condition of being protected from adverse outcomes. Nowadays, people desire to live in a secure environment. Violence is a significant public health problem. Conditions that contribute to violence are poverty, unemployment, lack of available resources, isolation, hopelessness, and loss. Given the impulsive nature of many types of violence, as Kravitz-Wirtz (2020) suggests, safety implies efforts concerning community-based violence intervention workers, which may be critical for reducing violence-related harm now and following other societal shocks.

However, personal security is an essential element for the well-being of individuals and includes the risks of people being physically attacked or falling victim to other types of crime. In particular, a determinant is social status, which has an impact on victimisation rates and perceptions of security. The main indicators used by OECD are taken from some surveys asking people whether they feel safe walking alone at night. According to recent data , about 68% of people in OECD countries say they feel safe walking alone at night. Another indicator is the homicide rate (the number of murders per 100 000 inhabitants), which is the most reliable measure of a country's safety level because, unlike other crimes, murders are usually always reported to the police (OECD, 2021). According to the latest OECD data ⁵ at the time of writing, the average homicide rate in the OECD is 3.7 murders per 100 000 inhabitants (OECD, 2021).

⁵www.oecdbetterlifeindex.org

1.5 Decentralisation and resilience: trade-off and synergies

Since the seminal contribution of Oates's theorem (1972) it is acknowledged that in the presence of uneven geographical preferences about the provision of public goods, different arrangements for the supply of local public goods are always preferable to a uniform solution as it increases the overall utility. It has been argued that decentralization can also promote more efficient markets (Marks and Hooghe, 2004). More generally, it is also a way to potentially increase participation, transparency, and accountability in policymaking. Rodriguez-Pose et al. (2011) recalled the argument that the global drive towards decentralization 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, decentralization 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 times of crisis. Hence, it is worth analysing the eventual effects of decentralization on the observed resilience. Nonetheless, this link between decentralisation and resilience is rather underexplored in the extant economic literature.

To some extent (regional) public expenditures represent a measure of policy and its intensity. More in detail, in this work we consider the variation in regional public expenditure during the crisis as compared to the period preceding the crisis to measure to what extent this measure of policy affects resilience, eventually. As mentioned, the effects of decentralization on economic growth have been addressed both theoretically and empirically. In addition to the efficiency arguments stemming from Tiebout's (1956) and Oates's (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, decentralizing spending decisions can be seen as a tool to improve the public sector efficiency, reduce the budget deficit, and promote economic growth (Bird, 1993; Gramlich, 1993; Oates, 1993). Empirically, a fiscal decentralisation's positive effect on growth, measured from either the revenue or the expenditure point of view, is found in, among others, 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 decentralization on multidimensional well-being. Hence, our analysis attempts to bridge this gap in the extant literature explicitly considering the effects of decentralization on multidimensional measures of well-being. Moreover, since quite reasonably the potential effects of decentralization on well-being become more apparent in times of crisis, we focus on the effects of decentralization on the – multidimensional - measure of resilience and the subsequent recovery in the occasion of the recent economic and financial crisis in 2007.

Indeed, it is worth noticing that decentralisation is among the most important policy trend of the past 50 years. It is also a tool used by policymakers to reconfigure the relationships between the central government and subnational governments towards a more cooperative and strategic role for national/federal governments. The regionalisation process surges the need for coordination across government tiers and the need for clarification in the assignment of responsibilities. One of the main limitations, indeed, is the potential overlapping of powers which is crucial to avoid.

Finally, decentralization is also unavoidably a multi-dimensional concept, since it covers three main distinct though interrelated dimensions: political, administrative, and fiscal. In general terms, fiscal decentralisation refers to how many central governments cede fiscal impact to non-central government entities (Schneider, 2003, p. 33). Political decentralisation refers to the degree to which central government allow non-central government entities to undertake the political functions of governance. Administrative decentralization refers to how much autonomy non-central government entities possess relative to central control (Schneider, 2003, p. 33). However, these dimensions are interdependent: there can (or should)

be no fiscal decentralisation without political and administrative decentralisation. On the other hand, without fiscal decentralisation, political and administrative decentralisation are meaningless (OECD, 2019). Additionally, this scenario includes three other dimensions that take the names of: “deconcentration”, “delegation”, “devolution”.(Torrise et al., 2011).

Decentralization reforms have been implemented over time for different reasons, such as political, historical, and economic. Therefore, it is worth pointing out that the current trend in decentralization reform is a potential political issue to be taken into account. Indeed, decentralization has been seen as a strategy of territorial development and a means to improve national well-being. Information revolution, technology, globalisation effect and urbanisation contribute to shaping the relationship among subnational governments. Similarly, crucial is the collaboration between public and private entities, citizens, businesses, and non-governmental organisations. Other types of multi-level governance reforms often accompany decentralisation reforms. Therefore, decentralisation systems require regular review and adjustment.

To better define the decentralization process, the following trends have to be taken into account:

- *Decreased subnational spending and revenues.* Subnational spending and revenue have increased especially in some countries to the global financial crisis. They are usually computed as a share of GDP and total public expenditure/total public tax revenue respectively.
- *Upscale in subnational governance.* As a result of regionalisation process the role of municipal fragmentation, the rising number of metropolitan governance authorities, and the rising role of regions is as a way to generate economies of scale, efficiency gains, and cost savings.
- *Increased asymmetric decentralisation,* which implies a greater convergence between unitary and federal countries in differentiated governance at the subnational level.

At the same time, the power of central governments should not be overlooked. It simultane-

<i>OECD'S RECOMMENDATIONS</i>	
<i>GUIDELINE 1</i>	Clarify the responsibilities assigned to different government levels
<i>GUIDELINE 2</i>	Ensure that all responsibilities are sufficiently funded
<i>GUIDELINE 3</i>	Strengthen subnational fiscal autonomy to enhance accountability
<i>GUIDELINE 4</i>	Support subnational capacity building
<i>GUIDELINE 5</i>	Build adequate coordination mechanisms across levels of government
<i>GUIDELINE 6</i>	Support cross-jurisdictional cooperation
<i>GUIDELINE 7</i>	Strengthen innovative and experimental governance, and promote citizens 'engagement
<i>GUIDELINE 8</i>	Allow and make the most of asymmetric decentralisation arrangements
<i>GUIDELINE 9</i>	Consistently improve transparency, enhance data collection and strengthen performance monitoring

Table 1.2: Guidelines for decentralisation. Source: OECD (2019)

ously operates guarantying better national performance. The role of central governments focuses on the management and control of each subnational level, guaranteeing balanced development of all parts. In this regard, the OECD has developed the following ten guidelines for implementing decentralisation. They are summarised in Table 1.2. The key issues are based on all those circumstances under which decentralisation can promote local democracy, efficient public services delivery, and regional development. In order to identify the conditions that help and support all countries toward decentralisation policies, the OECD has developed the following recommendations.

1. *Clarify the responsibilities assigned to different government levels.*

Clear assignment in roles and responsibilities is the statement for the first recommendation. Since a multi-level governance system and the need to ensure flexibility in the system, such responsibilities must be explicit, mutually understood, clear and shared across different government levels, for all actors, including citizens.

2. *Ensure that all responsibilities are sufficiently funded.*

Each functional responsibility has to be funded. Indeed, jurisdictional equity requires that in each order of government expenditures needs must be consistent with revenue means such as revenues, shared taxes and transfers. Should no exist unfunded or under-funded assignments or mandates.

3. *Strengthen subnational fiscal autonomy to enhance accountability.*

Fiscal autonomy guarantees to each subnational government more freedom and discretion with respect to the allocation of funds and the choice of public policies' implementation, within the limits of laws and regulations.

4. *Support subnational capacity building.*

As regards the subnational capacity building, the fourth recommendation refers to 'social and economic development' in subnational governments' plans. The implementation of a systemic approach between public officials and institutions could allow efficient local policies, good governance, and effective public management.

5. *Build adequate coordination mechanisms across levels of government.*

'Policy coordination is one of the oldest challenges for governments' (Guy Peters,2018). Many countries have faced the issues of institutional collaboration, innovation, and incentive systems into the recent Millennium Development Goals (MDGs). Moreover, the large scope of the SDGs is focused on new institutional and coordination structures. The success of long-term reform and the effectiveness of multilevel governance strongly depends on joint responsibilities and cooperation.

6. *Support cross-jurisdictional cooperation.*

The benefit that can be achieved from cross-jurisdictional cooperation is not only seen

in terms of ambitions and resources but also in creating transparency and multilateral rules (Charlton, 2003). Rural-urban governance promotes, for example, a form of cross-jurisdiction collaboration in order to guarantee increasing growth in each economic agglomeration through inter-municipal and interregional cooperation.

7. *Strengthen innovative and experimental governance, and promote citizens' engagement.*

The recent debate was focused on how to integrate citizen participation in cohesion policy. Citizen participation requires their access to information through political support, new capacities within public administration, and a conscious design for the engagement process. This latter provides a benefit in terms of investment decisions and societal support for initiatives and new policies. As described in a report's OECD (2019) 'participatory budgeting has the potential to strengthen inclusive governance'.

8. *Allow and make the most of asymmetric decentralisation arrangements.*

According to Oates (1972), the choice between decentralisation and centralisation depends on the trade-off between the advantages and disadvantages in national government or subnational government. Since asymmetric decentralization can be simultaneously advantageous for both rich and poor regions through the design of appropriate equalization transfers (Fiorillo et al.(2020), then it can improve welfare. However, participation in an asymmetric arrangement should remain voluntary (OECD, 2019)

9. *Consistently improve transparency, enhance data collection and strengthen performance monitoring.*

The ninth recommendation refers to the need to develop performance-monitoring systems. The strategy for that is based on the collection of data, indicators to provide timely feedback. Indeed, transparency and accountability are essential for development results. However, the availability of the right information at the right time is essential for building mutual trust between partners and addressing power imbalances in the cooperation relationship (OECD, 2013).

10. *Strengthen fiscal equalisation systems and national regional development policies to reduce territorial disparities.*

Many countries follow financial equalization policies to reduce the disparities. More specifically, these policies focus on the notion of 'territorial equity' (Buchanan, 1950) based on the equality of benefit and tax effort ratio (Thurow, 1970), providing an equal opportunity between subnational governments. Therefore, the fiscal equalisation policies have the advantage to diminish the tax competition, reduce the uncertainty risks, and finally to moderate the vertical imbalances. However, the fiscal equalisation policies with pro-active regional development policies allow offsetting the potential negative incentives of such systems.

In summary, decentralization means 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 of all, decentralisation is lauded as the main component of good governance and development (White, 2011). Further, 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. Therefore, decentralisation is also viewed as an indispensable part to rebuild an effective government and guarantee an efficient allocation of resources. 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 decentralization 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.

With regard to the crisis at hand, the Great Recession has affected Europe more brutally than any other crisis (Fratesi and Rodriguez-Pose, 2016). The impact of the crisis has been highly irregular across Europe, both between countries as well as between regions within

countries (e.g. Capello et al., 2015; Christopherson et al., 2015). To date, many studies focused on the composition of the productive structure and the degree of specialization (i.e, Martin et al., 2016; Cuadrado-Roura and Maroto, 2016) and factors that drive this geographical variation (Gianmoena, et al., 2018). The factors shaping mainly 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. However, the impact of decentralised governance on well-being 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 Rodriguez-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 (Di Caro, 2017).

Therefore, investigating, what strategies could be used at the local level to fight the economic crisis as well as understanding what is the strength of local governments and the impact of fiscal decentralization in stimulating economic growth is of pivotal importance for both policymakers and academics. 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.

1.6 Concluding remark

This chapter aimed to investigate the relationship between the three pillars of this research: resilience, multidimensional well-being, and decentralisation. We summarize evidence from the literature in order to understand how and under what circumstances the impact of

decentralisation influences resilience. Besides, we also explore well-being dimensions by dimensions and conclude by describing the main conditions that can support all countries toward the decentralisation policy. The next chapter explores the link between decentralisation process and resilience, focussing on the uses of decentralisation policy in resilience literature. Indeed, decentralisation policy could ultimately benefit. Decentralisation has been promoted as a dominant means to renew governance, which may be more responsive following a crisis. Hence, decentralisation allows to overcome instability period and to increase system resilience (Kwasinsky et al, 2019; Tomilson et al., 2015). More specifically, the following section explores how decentralization can be used to promote resilience principles also from a methodological point of view.

Chapter 2

Research approach and methodological aspect

2.1 Introduction

As mentioned in the previous chapter, 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 has proven methodologically sound in a both 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 2007 economic crisis showed a serious impact on well-being and on the 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 (Allain-Dupré, 2018; Allain-Dupré, 2020; OECD, 2019). Therefore, in the current analysis, we conjecture that decentralization 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 (Rodriguez-Pose and Gill, 2005). Moreover, quite interestingly, the economic, fiscal, and financial crisis has somewhat tended to lessen the decentralisation trend registered in the recent decades (Sharpe, 1979; 1993; Bobbio, 2002; OECD, 2019) in favour of a "recentralisation" by the central government, therefore, reversing the process of decentralization (Bolgherini, 2014).

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 an urgent issue in an effective manner (Hodson 2011; Dyson, 2012; Fabbrini, 2013). Put differently, the decentralisation process dating back to 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 the 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. 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 (Christopherson et al.,

2010, Palekiene et al., 2015; Oprea et al. 2020). Notwithstanding, we argue that a significant role largely ignored by the extant literature is played by the degree of decentralisation (Feder and Mustra, 2018; Tselios and Tompkins, 2017). 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 decentralization process could involve greater flexibility and more resilience. Indeed, decentralization is among the dominant means to renew governance towards the possibility of “tailor-made policies”, potentially based on the cooperation with other local actors. The diffusion of these policies through the EU has determined a new paradigm of development (Boschmann, 2009; OECD, 2019). From a shock-oriented standpoint, we hypothesize that a country could be more resilient if it can 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 they are likely to experience greater growth during a positive economic environment (Batabyal, 1999).

Since an economic shock involves dimensions of well-being 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 (Cellini et al., 2017). Yet, the potential benefits of a multidimensional approach to both resilience (Stanickova and Melecký, 2018) and to the effects of decentralisation policies (Devas, 2005; Scott, 2009) are largely underexplored.

Such an approach allows for a more comprehensive analysis of both the observed outcome and of the underlying processes.

Undeniably, such an approach is also able to contribute to the so-called beyond- GDP initiative. Indeed, as discussed in the previous chapter, according to ‘The Commission on the Measurement of Economic Performance and Social Progress’ (Stiglitz et al., 2009), the GDP, or any other aggregate computed per capita, may not provide an accurate measure of the level of well-being due to its narrow view. Therefore, another perspective has been developed in the last years to push the analysis further going ‘beyond-GDP’ (Boarini e

d'Ercole, 2013). 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, multi-dimensional, and subjective. The need to go beyond the maximization of production and consumption has stimulated the use of other composite indicators or alike (Greco et al., 2019; Greco et al., 2018) such as the Sustainable Development Goals (SDGs) 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 decentralization can potentially affect resilience to a greater extent. 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 the different dimensions of well-being have (re)acted differently, eventually? In addressing the above research questions, we apply pooled least squares econometric models taking into account spatial interactions between observations.

2.2 Building composite indicators in local economic development

Composite indicators are increasingly popular as a tool in policy analysis. According to Nardo et al. (2008), the role of composite indicators is becoming very mainstream, especially due to their aims of summarising, focusing, and condensing the complexity of multidimensional phenomena. Besides, the debate about the measurement of multidimensional phenomena is a critical issue in recent years, due to their pros and cons (see Table 2.1). The

multidimensional measurement of complex phenomena involves some theoretical notions such as the rigorous and precise definition of the phenomenon of interest and its main features. In fact, the measurement of phenomena such as progress, development, poverty, well-being, and quality of life requires the combination of different dimensions (Mazziotta and Pareto 2013). In practice, the use of these indices is crucial. Specifically, they are used in several situations, such as country's competitiveness (World Economic Forum, 2017a), the quality of its governance (World Justice Project, 2016), the freedom of its press (Freedom House 2017), the global, regional, and national Human Development (The United Nations Development Programme 2016), the world's measure of global peacefulness (Institute For Economics & Peace 2017), the travel and tourism competitiveness (World Economic Forum, 2017b), the country's economy measure (World Development Indicators: The World Bank, 2017), the efficiency of its universities (the Academic Ranking of World Universities, the Times Higher Education World University Ranking or the QS World University Ranking), etc.

Further, the literature provides a wide range of methodological approaches, which, in turn, require the choice of statistical and methodological tools to compute a quality index with the following requirements: objectivity, coherence, accuracy, comparability, and usability. The quality of the composite index depends on some subjective judgments such as the selection of indicators, the choice of aggregation methods, and finally the choice of weights. Constructing a composite index is a strong challenge. The best composite index does not exist since there is a list of choices that researchers have to make and, perhaps more importantly, their validity depends on the actual issue to be addressed. 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). As Mazziotta and Pareto (2012) suggest, 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. Besides, two other important steps are based on the normalization 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. Examples of

widely recognised indices are the United Nations' Human Development Index (HDI), the Italian Equitable-Sustainable-Well-being (Italian acronym BES), and the Better Life Index (BLI). From a purely technical standpoint, the use of a composite index has some strengths and weaknesses points, which are summarised in Table 2.1 below.

COMPOSITE INDEX
<i>PROS</i>
<ul style="list-style-type: none"> • To summarise complex or multi-dimensional issues. • To place countries' performance at the centre of the policy arena • To offer a rounded assessment of countries' performance • To facilitate communication with ordinary citizens. • To stimulate the search for better data and better analytical efforts • To enable judgments to be made on countries' efficiency.
<i>CONS</i>
<ul style="list-style-type: none"> • May send misleading, non-robust policy messages. • May invite stakeholders to draw simplistic conclusions • Involve judgmental decisions • Increase the quantity of data needed • May disguise serious failings in some parts of some system • May rely on very feeble data in some dimensions • May ignore dimensions of performance that are not measurable

Table 2.1: Pros and Cons of Composite Index. Source: author's elaboration and research.

Although composite indexes can provide relevant information on aspects of the economy and the society, and on complex phenomena in a simple and unique form, they can lose credibility in some circumstances. Therefore, they are at the same time an opportunity and a risk. The composite index aims to provide simple summary information about multidimensional

phenomena both for policymakers and for citizens. However, implementing their design and reporting represents a current challenge. Actually, methodological choices affect their performance. However, uncertainty in the composite index arises both from methodically and conceptually reasons. Many dimensions of performance are not well measurable, and the missing data problem has to be explored. The greatest risks are to have unbiased informations and misleading and non-robust policy message.

In more detail, constructing composite indicators involves the following processes¹

1. *Setting a theoretical framework.* To decide the phenomenon to be measured and analyzing it for understanding its main features and whether it would benefit from the use of the composite measure. Ideally, the theoretical framework allows us to select appropriate indicators to describe the phenomenon.
2. *Data selection,* a delicate step because of the crucial features they have to satisfy. Specifically, they are policy relevance, simplicity, validity, sensitivity, reliability, and finally must be available.
3. *Correlation Analysis.* The correlation analysis is useful to identify the statistical dimensions in the dataset and to eliminate highly correlated indicators. Therefore, it is crucial to pay attention to the interrelationship between each other.
4. *Preliminary data analysis.* A preliminary analysis of available data is needed since some problems can occur, such as, for example, the missing data or truncate distribution. The main points to look at are the possibility to make variables comparable (for example, dividing data by populated land area, as we will do In this work later on), missing data imputation that can be solved through mean substitution, regression or using the nearest neighbour, or as the last solution ignoring the problem, finally, the truncation

¹<https://www.composite-indicators.jrc.ec.europa.eu>

distribution problem is solved avoiding that this case becomes a representative sample of population.

5. *Normalisation*. A normalisation is required whenever the indicators in a dataset have different measurement units (i.e. different metrics). The most common methods used to normalise the variables are standard deviation from the mean, distance from the best and worst performers, distance from the mean, categorical scale, min-max method.
 6. *Weighting*. The weights can have a significant effect on the overall composite indicator. They can be equal for each indicator, or otherwise, they are estimated in a different way, directly obtained by the data. The most popular methods are Unobserved Component Model (UCM) such as factor analysis, principal component analysis or data envelopment analysis, regression analysis, distance to the target, public opinion, Analytic Hierarchy Process (AHP).
 7. *Aggregation*. In the literature can be found two main methods, additive and geometric aggregation. Further, there are special techniques based on multi-criteria decision making (MCDM), which in turn involve the distinction between compensatory and non-compensatory methods.
 8. *Robustness/Sensitivity test*. The uncertainty analysis results imply the need to conduct a robustness/sensitivity analysis on results obtained. The main tests require for example, the selection of sub-indicators, to check data selection, data editing, data normalisation and weighting method, and the final composite indicator formula.
 9. *Link to other measures*. The scores of the composite index could be correlated with other indicators. Since the composite index measure well-known phenomena, the correlation test allows to get an explanatory power of a composite index.
-

10. *Visualisation*. “A well-designed graph can speak louder than words” (EC, 2021). Good visualisation helps to communicate the message well, gives a sense of professionalism and online data exploration tools give full transparency to the dataset and allow users to drill down to underlying data.

2.3 Multidimensional measures: resilience and policy measures

Social and economic phenomena are characterized by a multiplicity of dimensions, some of which are not easy to evaluate. “The Commission on the Measurement of Economic Performance and Social Progress” (Stiglitz et al., 2009) remarks on the important progress in statistical measurement that has occurred in recent years, based on the multidimensional nature of some phenomena, such as the well-being of a country. The multidimensional measurement has many advantages for policy-making. To begin with, it presents an important theoretical and statistical progress of the last years, and mainly, it represents an additional aid for government policies, compared to the widespread measures such as GDP and employment level, which can only provide some limited information. Building upon Hill et al. (2008) and Cellini et al.(2014), we apply a multidimensional approach to resilience, since the regional performance can be characterized by multiple equilibria “not all of which are efficient (in a static and/or dynamic sense)”. This analysis focused on the effect of resilience in terms of the multidimensionality of well-being, departing from the traditional measures such as the GDP and the employment rate. We might expect to observe that if the GDP and the employment rate decrease during the crisis, the well-being of individuals could (or could not) worsen as well, or, at least, not to the same extent. For example, we could expect that, in consideration of accumulated savings of individuals, their ability to deal with the crisis efficiently, until the next equilibrium is reached, eventually. Or, on a more general premise, other factors (including public policy), might step in to mitigate the effects registered in terms of GDP/employment. Moreover, it is worth recalling that as Mazziotta (2017) suggests, “a

universally accepted definition of well-being does not exist (yet)". Specifically, each country defines well-being taking into account risks and benefit for social, economic, and political dynamics. However, the measurement of well-being is an important prerequisite for the implementation of effective welfare policies. Currently, institutions and researchers elaborate on several composite indexes, including the multidimensionality of well-being. Bandura (2008) reviewed 178 composite indices for evaluating the countries' performance and for ranking them in terms of political, social, and economic measures.

2.4 The multidimensional measure of resilience: a preliminary analysis

We build upon composite indicators to explore the multidimensional (a measure of) resilience. Preliminarily, for reasons of simplification and data readability, two additional computations on data are needed. Firstly, the normalization of the indicators and secondly, the inversion of the polarity for those indicators which explain an indirect measure of well-being². This technical procedure allows us to delete both units of measurement and the variability effect; in particular, as it is well-known, once normalised, all indicators have the standard deviation equal to one and mean equal to zero. According to Mazziotta-Pareto (2015), the notion of 'polarity' of the indicator refers to the sign of the relation between the indicator and the phenomenon to be measured. This is a useful tool to make more intuitive the interpretation of regression coefficients later on. Indeed, if the index is "positive", increasing values of the index correspond to positive variations of the phenomenon. On the contrary, if it is "negative", increasing values of the index correspond to negative variations of the phenomenon. By adopting the polarity for each Sustainable Development defined in Table 2.2 and, for each BLI indicator, in Table 2.3, the inversion of polarity will be performed before normalizing the variables.

²We adopt non-linear transformation which takes the reciprocal of the value $x'_{ij} = \frac{1}{x_j}$

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

Table 2.2: Sustainable Development Indicators, 2004-2012. Source: authors' elaboration with data downloaded from EUROSTAT

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

Table 2.3: BLI, 2012-2017. Source: authors' elaboration with data downloaded from OECD

The above measure of performance are matched with policy measures in terms of public expenditure, as we will describe in the following section.

2.5 The multidimensional measure of decentralization

The IMF's Fiscal Decentralization Dataset contains expenditure data classified by economic type over 2004-2017. Total expenditure, for each 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 2.4.

EXPENDITURES'S TYPE	DESCRIPTION
<i>Housing&community ammenities</i>	The proportion of public expenditure corresponding to disbursements earmarked for urbanization.
<i>Use of good and service</i>	The proportion of public expenditure for the utilization of economic goods to satisfy needs.
<i>Economic affairs</i>	The proportion of public expenditure for general economic, commercial and labour affairs, agriculture, forestry, fuel and energy, mining, manufacturing and construction, transport, communication, other industries,R&D economic affair.
<i>Recreation</i>	The proportion of the respective government spending on expenditure on shows (cinema, television, theatre,etc); admission to museums and monuments; library services, expenditure related to sports; games of chance and gambling.
<i>Education</i>	The proportion of the respective government spending on pre-primary and primary education, secondary education, post-secondary non-tertiary education, tertiary education, education not definable by level, subsidiary services to education, R&D education, and education.
<i>Environmental protection</i>	The proportion of the respective government spending on Waste management, wastewater management,pollution abatement, protection of biodiversity and landscape, R&D environmental protection.
<i>Social protection</i>	The proportion of the respective government spending on sickness and disability, old age, survivors, family and children, unemployment, housing, R&D social protection, and social protection.
<i>Health</i>	The proportion of the respective government spending on say health activities, housing development, community development, water supply, streetlighting, R&D housing and community amenities.
<i>Social benefit</i>	The proportion of the respective government spending for the main income replacement programmes in the unemployment, social assistance, disability and old-age branches.
<i>Public order and safety</i>	The proportion of the respective government spending on olice services, fire-protection services, Law courts, Prisons, R&D public order.
<i>General public service</i>	The proportion of the respective government spending on executive and legislative organs, financial and fiscal affairs, external affairs, foreign economic aid; general services; basic research; R&D general public services.

Table 2.4: Decentralized Expenditures,2004-2017. Source: authors' elaboration data from IMF.

For this analysis, we take into account the type of expense incurred according to the eleven economic categories involved; more in detail, my contribution in this regard is the reorganization of expenditure data following the eleven indicators of BLI. Therefore, to the best of our knowledge, this is the first study matching expenditure categories (from IMF) with BLI and SDIs indicators, somewhat intended as a measure of the outcome of those expenditures incurred in each sector. The considered expenditure categories are reported in Table 2.5.

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

Table 2.5: Decentralized Expenditures, SDIs, and BLI categories, 2004-2017. Source: authors' elaboration

The EU regional policy is currently a prominent field of interest according to a variety of perspectives. In fact, it has a relevant impact on both governments and economic structures in many European regions. Indeed, it involves a variety of realms and it contains measures to increase economic growth and jobs and improve quality of life through strategic investments.

More specifically, EU regional policy has five aims: (i) to invest in people by supporting access to employment, education, and social inclusion opportunities. (ii) to support the development of small and medium-size businesses; (iii) to Strengthen research & innovation through investment and research-related jobs; (iv) to improve the environment through major investment projects; (v) to modernise transport and energy production to fight against climate change, with a focus on renewable energy and innovative transport infrastructure.

A crucial argument concerns the 'Added Value' of the European Union Cohesion Policy (CP). Actually, it is difficult to provide a comprehensive definition of 'added value'. At a first approximation, 'added value' can be defined as the 'value resulting from the Community assistance that is additional to that which would have been secured by national and regional authorities and the private sector' (European Commission, 2001a, p. 4). More specifically, it involves an assessment of the extent to which Community intervention is likely to add value to interventions through other administrations, organizations, and institutions. In such a context, the Structural and Cohesion Funds (CF) are two important tools to foster economic and social cohesion.

As Hoogle and Marks (2001) suggest, they are two instruments related to one another: they do not act in isolation. Consequently, a coordinated multilevel governance system that involves multiple actors and institutions is needed. The 'added value' of CP is often addressed in global terms. Further, CP aims to promote the development and structural adjustment of less-favoured regions, but at the same time, it is based on a shared competence between the EU and on redistribution policy (Mairate, 2006). Multi-annual programming is an essential element for preserving long-term added value. Indeed, it has been pointed out that

“[A]ccording to a recent evaluation [i.e. Tavistock Institute, 1999], the introduction of the partnership approach has encouraged the priorities of all the participants as a whole to be considered and reconciled, so resulting in more coherent policies, as well as the identification of a set of objectives which is shared by all those involved.(european commission, 2001c, p. 146)”.

Hence, CP implies also a positive impact on local governance, by promoting a dynamic process for the stimulation of local investment and that can lead, in the long-term, to the creation of sustainable development. On the other hand, an economic crisis impact the development trajectory. To what extent CP is able to mitigate the negative effects of a crisis depends on both internal and international factors. In what follows we use the macro-areas used for the implementation of the CP to compute a measure of the impact of the 2007 economic crisis across EU countries. More in detail, building upon Martin (2012), in order to compute a measure of resilience, for each dimension of well-being, the national datum is compared with the one of the policy macro-area to which each state belongs. Hence, the measure of resilience and alike (see next section) 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, Baltic Sea Region (BSR), the Danube Region (DR), the Alpine (ALP), the Adriatic and Ionian Region (AIR), and an 'OTHERS' residual category. Each area and the related regions are reported in Table 2.6.

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

Table 2.6: Macro-regions. Source: author's research and elaboration

2.6 Measuring resilience

The macro-area datum will be considered the correspondent of the national datum to which, in Martin (2012) the regional datum is divided by in order to get the measure of resilience. More in detail, to the case at hand, in which a multidimensional approach is proposed, building upon Lagravinese (2015) 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 dimension³ j are computed as follows:

$$\beta_{RE[S][O]t,Tc}^j = \left| \frac{\frac{\Delta y_{t,Tc}^j}{\Delta y_{Tc}^j}}{\frac{\Delta y_{t,TA}^j}{\Delta y_{TA}^j}} - 1 \right| \quad (2.1)$$

Where $\Delta y_{t,Tc[A]}^j$ 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 $y_{tTc[A]}^j$ represents its value at time t . Hence, the higher the index, the higher the reaction of each state with respect to the reference area.

2.7 Measuring decentralisation

The measurement of decentralisation is complex. The literature finds Schneider (2003)'s main contribution to the decentralisation measurement issue. Specifically, Schneider considering the three dimensions of decentralisation, empirically funds the assumption that these dimensions could be considered independent. Table 2.7 shows the general measures used to explain the decentralization policy.

³Descriptive Statistics are reported in appendix

<i>MEASUREMENTS</i>	
Political	Existence of elections at the municipal level or at the state/provincial level
Fiscal	Ratio of subnational government spending/revenue to general government datum
Administrative	Percentage of local revenue from taxes; percentage of total grants and revenue not accounted by transfer

Table 2.7: Decentralisation measures. Source: adopted by Torrisi and Pike (2011)

Fiscal Decentralization is a popular economic development strategy. Specifically, the empirical evidence suggests that subnational fiscal power is positively associated with economic activity. In particular, measures such as GDP, public investments made in physical and human capital, and education outcomes show a positive correlation with decentralisation. Revenue decentralisation appears to be more strongly associated with income gains than spending decentralisation. (OECD report, 2020).

Similarly, as the measures of resilience, recovery, reorientation, and renewal built before, the measure of decentralised policy is

$$\gamma_j = \left| \frac{\frac{\Delta Dec_{t,T_c}^j}{\Delta Dec_{T_c}^j}}{\frac{\Delta Dec_{t,T_A}^j}{\Delta Dec_{T_A}^j}} - 1 \right| \quad (2.2)$$

where, $\Delta Dec_{t,T_c}^j$ states for the variation in the j – *th* dimension of decentralized fiscal expenditures in country c [macro-area A] during the period from t to T and $Dec_{t,T_c[A]}^j$ 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.

2.8 A vis-à-vis comparison of the conventional approach using GDP and the resilience dimensions

Preliminarily to move to the proposed alternative multidimensional measurement of resilience with respect to GDP, we make a comparison between the latter and the former multidimensional measures, both graphically and according to a regression approach. More specifically, the graphs reported in Figure 2.1 below show a marked and rather generalised dissimilar patterns for the whole period of analysis: indeed, a reduction of the GDP (orange bars) does not imply a reduction of well-being (blue bars) neither in all the countries nor in all economic and social sectors. This visual inspection provides the underpinning of this approach further confirming both the rational and the importance to go beyond GDP.



Figure 2.1: Resilience index, comparison between Well-being and GDP



Figure 2.2: Recovery index, comparison between Well-being and GDP



Figure 2.3: Reorientation/Renewal index, comparison between Well-being and GDP

However, in order to test the impact in terms of GDP we run the following regression model:

$$\beta_i = \alpha_0 + \alpha_1 \gamma_i + Z_i + \epsilon_i \quad (2.3)$$

Where after Martin (2012)'s sensitivity index (beta) β_i is the dependent variable, which is the measure of variation in GDP, γ_i is the measure of decentralisation (both fiscal and asymmetrical decentralisation across specifications), Z_i is the set of control variables.

The table 2.8 below shows the results of the empirical exercise. In particular, during the resilience impact analysis only a change of fiscal decentralisation in JOB, SAFETY and CE dimensions provide a positive and statistical significance on GDP. Whereas during the reorientation and renewal phase the impact of asymmetrical decentralisation is negative and statistical significance on GDP at 5 %. Therefore, the findings show us that the response in terms of well-being across different sectors has been substantially different from the one in terms of GDP. Indeed, as will be described in Table 3.3 and Table 4.6 in the next two chapters the effects of the sectorial decentralised policy are uneven both across sectors and economic phases. In table 3.3, as for the shock period (2004-2008), our analysis reports that the decentralised policy in the environmental and the community sectors have statistically increased the impact of the crisis on the related dimensions of well-being. The following (recovery) phase (2009-2013) shows a different pattern. More specifically, in this case, the estimated coefficients for EDU and income are negative and statistically significant, while the coefficients for LS, housing, and community are positive and statistically significant, hence, showing a positive effect of decentralisation. Finally, in the reorientation/renewal phase (2013-2017) we observe that running the model both with BLI data and SDGs counterpart, JOB, INCOME and WLB dimensions present an equal pattern. In Table 4.6, as for the shock period, (2004-2008) asymmetric decentralisation of political authority in Income, WLB, SAFETY and LS has statistically decreased the impact of the crisis on the related dimension of well-being; JOB and HEALTH show a positive sign statistically significant. As regards the

recovery phases (2009-2012), the decentralisation policy is statistically significant, and it has a positive impact in well-being for INCOME, JOB, EDU, ENV, WLB and HOUSING; HEALTH and SAFETY sector exhibit a detrimental effect. Finally, in the reorientation/renewal phase (2014-2017) a different pattern emerges. More specifically, decentralisation has a positive and statistically impact on environment and safety dimension; in the remaining ones the decentralisation policy has a negative and statistically significant impact, except INCOME, COMMUNITY and HOUSING.

In particular, during the resilience impact analysis only a change of fiscal decentralisation in JOB, SAFETY and CE dimensions provide a positive and statistical significance on GDP. Whereas during the reorientation and renewal phase the impact of asymmetrical decentralisation is negative and statistical significance on GDP at 5 %.

Therefore the findings show us that the response in terms of well-being across different sectors has been substantially different from the one in terms of GDP.

2.9 Concluding remark

This chapter offers an examination of existing research in the field of local development from the methodological point of view. We extend this analysis exploring the link between resilience and decentralisation, through a rigorous investigation into the main properties of composite indicators, which role is becoming very popular in local development studies. Although composite indicators can be a useful tool to summarise multidimensional phenomena, they can also lose credibility in some circumstances. However, the purpose of this study is to develop a new multidimensional measure of resilience and decentralisation. In the economic field, the concept of resilience has begun to spread from the 2008-2010 crisis and has been the subject of copious analysis. In particular, many researchers have analyzed the impact of resilience through the common practice used for the analysis of economic performance: income and employment. We focus on GDP in order to be more convinced about the importance to go beyond GDP. Nonetheless, we argue that a more desirable approach is

	Dec^{EDU}	Dec^{JOB}	Dec^{INCOME}	Dec^{SAFETY}	Dec^{HEALTH}	Dec^{ENV}	Dec^{CE}	Dec^{LS}	$Dec^{HOUSING}$	$Dec^{COMMUNITY}$	Dec^{WLB}	RAI
GDP_{RES}	NO	.00474* (0.0005)	NO	NO	.005* (0.006)	NO	.007* (.001)	NO	NO	NO	NO	NO
GDP_{REC}	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
GDP_{REO}	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	-.0222*** (.007)

Table 2.8: Conventional approach on GDP and resilience

based on the impact of resilience on the multidimensional well-being. This choice would be in line with recent tendencies on economic performance measurement using some indicators other than GDP. In the following section, we apply a multidimensional approach to resilience, using fiscal data. To the best of our knowledge, this is the first study matching expenditures categories (from IMF) with BLI and SDIs indicators.

Part II

RESEARCH DESIGN AND APPLICATIONS TO EU CASE

Chapter 3

Decentralisation and resilience: a multidimensional approach using fiscal data

3.1 Introduction

Departing from common practice using income and employment, we investigate the effects of fiscal decentralization on the resilience of 22 European countries to the 2007 economic crisis in terms of multidimensional wellbeing, using data from the IMF's fiscal decentralization dataset. The empirical analysis adopts a pooled regression approach with Driscoll-Kraay standard errors robust to general cross-sectional/spatial and temporal dependence forms. The analysis shows that although (i) the results in terms of multidimensional resilience along the so-called 4Rs (i.e. Resilience, Recovery, Reorientation, and Renewal) are rather sector-specific, generally speaking, (ii) the level of fiscal decentralization mitigates the shocks.

Nowadays there is an increase of attention from several international organizations to the concept of 'resilience' from different knowledge areas, including regional economic and fiscal resilience. More specifically, the notion of resilience is consistent with regional development goals. Indeed, in the face of shocks due, for example, to political and armed conflict, monetary and fiscal crisis, all economic systems fight conditions of an unstable global development. Along with European countries that have experienced the Great Recession and how they recover from it, it is necessary to understand the nature of resilience and raises some questions,

as described before. More generally, what determines the resilience of a region in the face of an external event.

Since the literature framework and foundation of this research were discussed in the previous chapter, the remainder of this chapter is as follows. Section 3.2, "General framework" presents the baseline model describing each variable of the model and the general setup. Section 3.3, "The empirical evidence with respect decentralisation and resilience" presents the empirical analysis and main finding. Section 3.4 concludes.

3.2 General framework

The empirical analysis is based on a balanced panel of European countries and regions over the years 2004-2017. The analysis is performed at EU NUTS-1 and EU NUTS-2 levels. For both, we apply a "resilience system analysis" (OECD, 2014) intending to investigate the impact of decentralised governance on well-being in times of financial shocks. More specifically, we divide our sample into three subsamples into the following periods:

1. From 2004 to 2008: to analyze the resilience impact
2. From 2009 to 2012: to analyze the recovery period
3. From 2013 to 2017: to analyze the reorientation/renewal phase

The empirical strategy consists of (i) computing several indexes of resilience (as described in section 2.6) and a measure of decentralised policy (as described in section 2.7); (ii) estimating several specifications of a well-established model enriched with variables capturing the quality of governance. The IMF's fiscal decentralisation dataset is used to collect data on the first EU NUTS-1 analysis, whereas the resilience measure is described by SDIs and BLI variables. The RAI dataset is used to collect data on the second EU NUTS-2 analysis, whereas EUROSTAT indicators, grouped according to the 12 dimensions of well-being, describe the resilience measure. We initially estimate our models with the Ordinary least squares (OLS) fixed-effects estimator with corrected standard errors robust to heteroscedasticity and then we estimate our models with the pooled regression approach with Driscoll-Kraay standard

errors robust to general cross-sectional/spatial and temporal dependence forms (Driscoll and Kraay, 1998). OLS fixed-effects result follow in the appendix (from table A5 to A10).

In what follows we present a discussion concerning the estimation strategy. The method used is Pooled OLS with Driscoll-Kraay standard errors. In our opinion, this 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 technical feasible. Indeed, although we capture some temporal dimension 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 sections 2.6 and 2.7) the dataset collapses to a cross section one.

Moreover, our dataset is likely to exhibit cross-sectional dependence in the errors due to (i) 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 a strong interdependencies between cross-sectional units. Nonetheless, we run a proper panel estimation on the whole dataset according to the following equation.

$$\beta_{i,t} = \alpha_0 + \alpha_1 \gamma_i + Z_{i,t} + \epsilon_{i,t} \quad (3.1)$$

Where, across specifications, $\beta_{i,t}$ is the measure of variation in well-being, $\gamma_{i,t}$ is the measure of decentralised policy, and $Z_{i,t}$ is the set of control variables aiming to capture institutional aspects. Following the aforementioned exercise, explicitly considering the presence of panel (fixed) effects the analysis returns results generally in line with the main conclusions of the cross-section estimations. Indeed, performing the regression using fiscal decentralisation, the analysis shows that the impact on our variable of interest is significant statistically only in two dimensions during the resilience impact analysis, that is INCOME and CE, at 5% and 1% respectively. They still have a positive impact. For the recovery period, EDU's dimension exhibits a positive and statistical significance on well-being measure at 5%, and

WLB's dimension and COMMUNITY dimension exhibit a negative and statistical significance at 5% and 10% respectively. Finally, during the reorientation and renewal period (along SDIs) is confirmed the negative impact of COMMUNITY dimension with respect our variable of interest (- 0.021) and, in addition, the regression analysis exhibits a negative and statistical significance for the HEALTH dimensions at 10%. Whereas, along BLIs, JOB's dimension is still negative and statistically significant at 5% (-0.163) and WLB exhibits a positive impact on well-being (0.893) at 10% of significance.

As concern the regression using the RAI, considering the fixed effects in analysing the impact of RAI on well-being although it is significant statistically (- 0.174), the analysis does not show a clear evidence in favour of the mitigation impact of the crisis through asymmetrical decentralisation policy.

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:

$$\beta_i = \alpha_0 + \alpha_1 \gamma_i + Z_i + \epsilon_i \quad (3.2)$$

Where, across specifications, as aforementioned the dependent variable β_i is the measure of variation in well-being, 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 (decentralized) institutions will affect the link between decentralization 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 well-being, which govern economic and social interactions among them. These aspects are crucial in shaping the effects of decentralised policies, especially in times of

crisis.

The multidimensional measures span over 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.

On this premise, we start by a preliminary analysis estimating the overall relationship between the multidimensional measure of well-being obtained by aggregation of the (standardised) 11 dimensions reported in Table 2.2 (W) and the overall decentralisation measure for the period 2004-2008 (Dec).

Admittedly, a limit of this analysis is the complete availability of relevant data before 2004 and after 2008. While the analysis can be augmented with further data once they will be available, at the time of writing, they are the larger available dataset. We interpret the analysis as exploratory in its nature.

3.3 The empirical evidence with respect decentralisation and resilience

The preliminary model (3.2) investigates whether or not the decentralization mitigate the shock. In formula:

$$W_{i,t} = \alpha_0 + \alpha_1 Dec_{i,t} + \alpha_2 D + \alpha_3 D \times Dec_{i,t} + \alpha_5 Z_{i,t} + \epsilon_{i,t} \quad (3.3)$$

Hence, this preliminary model includes the decentralization 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 well-being 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 measure, changes in times of financial distress.

The regression method used is Pooled Ordinary Least Squares (POLS) with Driscoll-Kraay standard errors to control for the cross-section nature of the dataset¹. Results are reported in Table 3.1.

¹The Pesaran (2004) CD test indicates that residuals are cross-sectionally correlated for consolidated

	(1)
	W_i
Dec_j	0.312*** (0.0193)
D	-0.464** (0.131)
$D \times Dec_j$	-0.0679*** (0.0171)
$Goveff$	1.653 (1.040)
$Polstab$	1.153* (0.429)
$Reggov$	-4.964*** (0.763)
$Rlaw$	9.189*** (0.541)
$Voice$	-5.617*** (0.719)
$Const$	-1.561+ (0.810)
N	110
R^2	0.687

Standard errors in parentheses

+ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 3.1: The decentralization and resilience. Source: authors' elaboration

The results reported in Table 3.1 show that while, as expected, the negative effects of the

crisis are not limited to GDP and encompass the multidimensional measure of well-being here considered, decentralisation exerts a positive effect on multidimensional well-being. This somewhat confirms – on a multidimensional scale – similar results achieved considering GDP measures only (between others OECD, 2013a, 2013b; Canavire-Bacarezza et al., 2020). However, in contrast with some evidence involving OECD countries (Bartolini et al., 2018), 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 well-being 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, to the case at hand its estimated net effect remains positive (the net estimated effect of decentralisation equals to 0.2441).

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*) exerts positive effects on well-being (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.

Once considered the overall relationship between decentralisation and well-being, 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 Eq. (3.3):

$$W_{ij,t} = \alpha_0 + \alpha_1 Dec_{ij,t} + \alpha_2 D + \alpha_3 D \times Dec_{ij,t} + \alpha_4 Z_{i,t} + \epsilon_{i,t} \quad (3.4)$$

Where, differently from Eq.(3.2) where an aggregate approach is followed, W_{ij} refers to the j -th dimension of well-being belonging to the SDIs described in Table 2.2. It is worth recalling

that Dec_i stands for decentralised expenditures specifically related to each dimension of well-being reported in Table 2.5 D is, again, a dummy variable for the 2008 crisis, which assumes value 1 for 2008s year 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 well-being; Z_{ij} , as mentioned, is the matrix of controls taken from the Worldwide Governance Indicators (WGI) project.

Also, in this case, a POLS with Driscoll-Kraay standard errors is used. Results of the models based on the specification reported in eq.(3.3) are shown in Table 3.2.

Focussing on our variables of interest, Table 3.2 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 well-being. Put differently, decentralisation confirms to have a rather generalised positive impact on well-being, even in the case in which the single dimensions of well-being 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.

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 statistically significant coefficient.

Finally, the interaction term between decentralised expenditure and crisis with a sectoral breakdown allows getting a more nuanced picture as compared to that reported in previous Table 10. 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.

	EDU	JOB	INCOME	SAFETY	HEALTH	ENV	CE	LS	HOUSING	COMMUNITY	WLB
<i>Decj</i>	-0.167*** (-0.037)	0.189 (-0.511)	.199*** (-0.279)	.212*** (-0.069)	.14*** (-0.029)	.270*** (-0.038)	.126** (-0.069)	0.029 (-0.017)	.251*** (-0.0454)	.533*** (-0.046)	-0.017 (-0.049)
<i>D</i>	-0.075 (-0.45)	-0.94** (-0.05)	-0.211*** (-0.0597)	-0.052 (-0.33)	-0.08*** (-0.017)	-0.029 (-0.023)	.157*** (-0.042)	.048*** (-0.021)	0.144 (-0.85)	-0.162*** (-0.047)	0.003 (-0.21)
<i>D*Decj</i>	.208*** (-0.033)	-0.172*** (-0.353)	-0.076*** (-0.01)	-0.223*** (-0.036)	0.021 (-0.03)	-0.029*** (-0.037)	.161*** (-0.065)	-0.04 (-0.0274)	-0.007*** (-0.072)	-0.171*** (-0.051)	.08* (-0.28)
<i>Goveff</i>	1.406*** (-0.081)	0.204 (-0.122)	-0.822 (-0.598)	-0.522** (-0.29)	-0.321 (-0.446)	.109*** (-0.23)	.866*** (-0.262)	.71*** (-0.099)	1.567*** (-0.141)	-2.01*** (-0.15)	1.092*** (-0.223)
<i>Polstab</i>	.208*** (-0.017)	.440*** (-0.04)	0.276 (-0.209)	-0.43 (-0.28)	-0.481*** (-0.103)	-0.032 (-0.083)	.921*** (-0.377)	.717*** (-0.066)	-0.416*** (-0.114)	-0.733*** (-0.24)	.440*** (-0.123)
<i>Reggov</i>	-0.036 (-0.243)	0.095 (-0.094)	-0.219 (-0.342)	-0.33 (.31)	-1.83*** (-0.444)	-1.39*** (-0.068)	-1.144*** (-0.128)	-1.19*** (-0.16)	0.222 (-0.43)	.732*** (-0.317)	.68** (-0.388)
<i>Rltw</i>	.854*** (-0.114)	1.75*** (-0.078)	2.481*** (-2.441)	1.933*** (-0.152)	2.48*** (-0.13)	.470** (-0.244)	-1.729*** (-0.082)	1.165*** (-0.11)	.372*** (-0.085)	2.142*** (-0.336)	-1.12*** (-0.149)
<i>Voice</i>	-2.39*** (-0.161)	-2.07*** (-0.12)	-1.24*** (-0.117)	-0.963*** (-0.247)	-0.635*** (-0.032)	0.02 (-0.072)	.711*** (-0.223)	-0.605*** (-0.158)	-1.50*** (-0.49)	-2.06*** (-1.168)	-0.311 (-0.29)
<i>Constant</i>	-0.025 (-0.086)	-0.485*** (-0.075)	-0.443 (-0.313)	0.17 (-0.3)	.812*** (-0.245)	1.171*** (-0.063)	.871*** (-0.352)	-0.85*** (-0.036)	-0.068*** (-0.263)	-0.40*** (-0.216)	-0.90*** (-0.074)
<i>N</i>	101	102	102	101	102	102	95	97	90	102	97
<i>R²</i>	0.58	0.68	0.4	0.27	0.3	0.34	0.34	0.62	0.58	0.62	0.14

Table 3.2: Multidimensional approach, 2004-2008

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 well-being 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 into a more decentralised setting for all the remaining dimensions.

Once performed the above preliminary analysis, we turn our attention to specific dimensions of reaction to the economic shock, using the formula reported in Eq.(3.1). 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 Eq.(3.3) 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 sectoral decentralisation γ_i is reported in Table 3.3 (while the full regression outcome is reported in appendix).

Table 3.3 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 the community sectors have statistically increased the impact of the crisis on the related dimensions of well-being. 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 well-being no statistically significant effect is detected.

	EDU	JOB	INCOME	SAFETY	HEALTH	ENV	CE	LS	HOUSING	COMMUNITY	WLB
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	-0.28*** (-0.01)	NO	NO	NO	NO	.063** (-0.034)	.046*** (-0.019)	.813*** (-0.37)	NO
β_{SDI}	NO	-0.018*** (-0.007)	.0001*** (-0.00005)	NO	NO	NO	NO	NO	NO	.0167*** (-0.008)	-0.040*** (-0.009)
β_{REO}	-0.072*** (-0.0104)	-0.051** (-0.025)	-0.0003*** (-0.0001)	-0.189*** (-0.047)	.0735** (-0.36)	-0.128** (-0.061)	0.152*** (-0.0381)	NO	-0.032*** (-0.014)	NO	0.74*** (-0.008)

Table 3.3: Decentralisation and the 4Rs. Source: author's elaboration. Pooled OLS. Regression's result with Driscoll-Kraay standard error.

Note: The reported coefficients refer to the variable $\hat{\epsilon}_i$ in Eq.(3.3) indicates statistical significance at the 5% level with the corresponding sign. NO: indicates 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 Tables A11,A12,A13,in appendix

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

Finally, the reorientation/renewal phase (2013-2017), except for 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 *WLB*) 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 well-being 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 for the coefficients for community, which proves to be not statistically significant, and the coefficient for *EDU*, 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 *WLB* dimensions.

3.4 Concluding remark

This preliminary analysis 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 well-being has been proposed. To this end, the novel indicators provided by both UN SDGs and the

OECD BLI have been used. Furthermore, the analysis is augmented with the inclusion of the different levels of decentralization. Indeed, since the effects of the shock might be spatially uneven, the response to the shock in different dimensions of well-being might well depend on the extent to which local economies can implement tailor-made policies. If so, decentralization 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) 4Rs phases.

While further research is needed to develop a closer analysis for each sector, the evidence already gathered shows a solid signal that a multidimensional approach can provide interesting insights unachievable employing the mainstream approach based on GDP only. Indeed, the multidimensional well-being 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 well-being has a potential impact on the way policymakers and practitioners operate in this field.

Chapter 4

Decentralisation and resilience: a multidimensional approach using the Regional Authority Index

4.1 Introduction

This section further draws on the notion of regional resilience to examine the impact of decentralisation on well-being across European regions based on the Regional Authority Index (RAI) (Hooghe et al., 2008), rather than on simple fiscal measures. The question of why one region is more vulnerable to economic shock than other, indeed, prompts us to investigate the effects of decentralisation on resilience according to the more comprehensive perspective represented by the RAI. We focus our analysis on the 4R over the 2004-2017 period. The empirical analysis is performed on a sample of 169 EU NUTS-2 regions in 20 countries.

As already mentioned, each regional economy perturbed by a shock may move onto a new growth path. The effects of each shock generally vary from region to region, as also the region's adjustments and recovery. Recent empirical research suggests that factors shaping regional resilience to economic shocks include their initial strengths and weaknesses (Huggins, Izushi, Davies & Shougui, 2010). More specifically, in their study of the impact of the post-2008 crisis on several European regions, Huggins et al. (2010) highlight the role of the size of the market, the endowments in natural resources, and human capital. In our

view, those are to be considered side by side with the results achieved in terms of well-being dimensions illustrated in the previous chapters.

The economic crisis impacts on the economic market have been heterogeneous within European regions. According to Martin (2012), regional economies that presented stable growth paths are likely to be more resistant to recessionary shocks or may recover faster. Doran and Fingleton (2014) showed that recessionary shocks yield permanent effects that lead economies not to return to the pre-shock path but rather adjust to new levels. Fingleton et al. (2012) found significant differences in the resilience of UK regions to recessionary employment shocks during the period 1971–2010. However, these differences principally refer to the initial resistance to shocks and not so much the recovery stage. Cellini and Torrisi (2014), about the effects of the recessionary shocks in the Italian regions in the long run (1890–2009) show that shocks have permanent effects and such effects differ across areas, arguing that there is limited heterogeneity in the way in which different regions react to and recover from major, common, recessionary shocks.

The following analysis will contribute through three directions to the literature on regional economic resilience: first, it builds a multidimensional resilience measure for the 4R (i.e Resilience, Recovery, Reorientation and Renewal); secondly, it applies a multidimensional approach exploring the link between the well-being dimensions and asymmetrical decentralisation policy; third, it investigates ways to enhance economic resilience through public policies.

The novelty of this research consists in the following aspects: (a) the choice of the twenty European states and their regions for a sum of 169 statistical units; (b) the study along the 4R of the mentioned regions; (c) the analysis of the impact of the RAI on regional resilience. More specifically, the relationship between decentralisation and development is recently explored in Lago (2021). To achieve the purpose of this study, after the introductory section, section 4.2 presents the main ideas developed about regional resilience in the extant literature, taking into account the role that governments assume. Section 4.3 describes the methodology and data used to reach the results, section 4.4 shows the main results obtained from the analysis

and the last section presents the main conclusions of the study.

4.2 Decentralisation, economic development, and quality of governance

As aforementioned, the Great Recession that followed the financial and economic crisis that erupted in 2007-2008 lead to harmful effects around the world. Extensive literature and empirical analysis exist about the Great Recession's impact on intergovernmental relations. Some researchers have focused on whether or not the Great Recession has accentuated pre-existing trends towards decentralization, and the extent to which it has led to more substantive changes to intergovernmental fiscal, economic, and political relations (Kincaid et al. 2010; Eccleston and Krever, 2017; Lago et al., 2020; de Mello and Jalles, 2020).

Regional and economic governments have a huge responsibility in social and economic policy, mainly in decentralized countries. It has been already stressed as, theoretically, decentralisation provides efficient costs and governments closer to the citizens. More specifically, it is worth recalling here how decentralisation produces more efficient and effective governance, macroeconomic stability, and adequate growth at all levels (Miller and Russek, 1997; Amagoh and Amin, 2012). As Ashcroft et al. (2005) suggest, the main expectation is that decentralisation promotes economic development by developing policies better reflect territorial preferences, by improving knowledge of territorial economic potential, by increasing public sector efficiency and service delivery and regulation. Further, democratic accountability implies efficiency in policy formulation and innovation, and the spread of fiscal autonomy leads to marginal changes to spending and taxation. Although the plenty of potential benefits, decentralisation has higher administrative costs due to the subnational level of government, reduced coordination with the rest of the country because of negative spillover effects, loss of scale economies in the policy formulation. However, more recently the argument in favour of better-tailored policies at the local level promoting a higher level of growth seems to find a preliminary confirmation. Indeed, as Lago et al. (2021) assert, a correlation exercise between

asymmetrical decentralization and dimensions of development shows a positive link. The link between the government's quality and the overall level of well-being is an important aspect to take into account. International evidence linking good governance and well-being shows that the efficient trade-off is reached with acceptable levels of efficiency, trust, and incomes and maintaining the institutions of electoral democracy (Helliwell et al., 2006). Good governance exists when the public sector is free of corruption; all decisions are fair and impartial; all citizens have equal treatment (Weber, 1922). The quality of government is a fundamental driver for socio-economic objectives, including economic development and equality (Kyriacou, 2020). Several studies focus on the extent decentralisation may affect governance quality. Fiscal decentralization may lead both a rise and a fall in the quality of governance. It may improve the information available to voters because of the proximity to public decisions (Salmon, 1987; Breton, 1996); it must tie local revenue and expenditures since vertical transfers may create incentives for local officials to ignore competitive pressures for better management (Oates, 1999; Zhuravksaya, 2000; Jin et al., 2005). By contrast, the multi-level of governments may involve duplication and a waste of resources (Treisman, 2002). Inter-jurisdictional competition may reduce tax pressure and the ability to collect sufficient taxes to provide basic public goods (Keen and Marchand, 1977; Oates, 1999). Local governments may compete for capital reducing the capacity to enforce regulations and collect taxes (Cai and Treisman, 2004). Governments in regions that are uncompetitive for some structural reasons may give up on business-friendly policies (Cai and Treisman, 2005). In what follows the above arguments will be subject to empirical scrutiny.

4.3 Data and empirical implementation

4.3.1 Regional Authority Index

In the following analysis, the fiscal widespread decentralisation measures used in the previous chapter are replaced in favour of the Regional Authority Index (RAI), as defined

by Hooghe et al. (2008). The RAI tracks asymmetric decentralisation of political regional authority on an annual basis from 1950 to 2018. Hooghe et al. (2016) measure each indicator on a scale ranging from 0-2 to 0-4 and add them to produce self-rule and a shared-rule score for each regional tier. The former ranges from 0-18 and the latter from 0-12, the sum of which gives an overall authority score ranging from 0-30. Country scores are computed by adding the scores of each tier, weighted by their population. Here some definitions serve our purpose.

- *Region as a unit of analysis*

Region refers to a given territory having a single, continuous and non-intersecting boundary. We refer to regional government, which is the government of a coherent territorial entity situated between the local and national levels which have a capacity for authoritative decision making (Hooghe et al., 2008).

- *Authority*

Dahl (1968) suggests that by the formal authority we mean authority exercised with explicit rules, written in constitutions and legislation. By authority, we mean legitimate power derived from the acceptable principle of governance. Nevertheless, formal authority is not the only tool to evaluate the regional government power since we would take into account also other factors, such as regional and national leadership and public opinion. However, a regional government has an elliptical authority, with respect to some territorial jurisdiction (A), some degree of authority (B) over certain actions (C). Indeed, we need to specify the territory over which the authority is exercised (A), the depth of that authority (B) and, finally, the sphere of action over which it exercises authority (C). A regional government may exercise authority in its regional jurisdiction or it may do so in the country as a whole. This is the distinction between “self-rule” and “shared -rule”¹ (Elazar, 1987).

¹Self-rule is the authority that a regional government exerts within its territory. Shared-rule is the authority that a regional government exerts in the country as a whole.

- *Dimensions of regional authority*

RAI is a measure of the authority of regional governments across ten dimensions: policy scope, institutional depth, fiscal autonomy, borrowing autonomy, law making, executive control, representation, fiscal control, borrowing control, and constitutional reform.

SELF RULE	DEFINITIONS	SCORE
<i>Institutional depth</i>	The extent to which a regional government is autonomous rather than deconcentrated.	0-3
<i>Policy scope</i>	The range of policies for which a regional government is responsible	0-4
<i>Fiscal autonomy</i>	The extent to which a regional government can independently tax its population	0-4
<i>Representation</i>	The extent to which a regional government is endowed with an independent legislature and executive	0-4
SHARED RULE		
<i>Law making</i>	The extent to which regional representatives co-determine national legislation.	0-2
<i>Executive control</i>	The extent to which a regional government co-determines national policy in intergovernmental meetings	0-2
<i>Fiscal control</i>	The extent to which regional representatives co-determine the distribution of national tax revenues.	0-2
<i>Constitutional reform</i>	The extent to which regional representatives co-determine constitutional change	0-3

Table 4.1: Dimension of RAI. Adapted by Hooghe et. al.(2008)

Asymmetric decentralisation of political authority is commonly practiced among OECD countries. Such political asymmetric decentralisation mostly takes place at the regional (state/province) level. Politically-motivated asymmetry leads to clear benefits to regions,

although this may create competition among them. More specifically, asymmetric decentralisation refers to situations where some regions have been given political self-rule that deviates from the norm or typical assignments (Allain-Duprè, 2020). Usually, political asymmetry is conducted to alleviate tensions between regions and to weaken secessionist incentives (Rode et al., 2018). For example, Basque Country in Spain, Alpine regions and some islands in Italy, Scotland in the UK, Corsica in France, Aceh in Indonesia, Hong Kong in China, Aland Islands in Finland and Quebec in Canada have asymmetry for political reasons. Political and administrative asymmetric decentralisation can be distinguished into two types of policy, that is “*de jure*” and “*de facto*” arrangements (Martinez-Vazquez, 2007; Bird and Ebel, 2006). More specifically, “*de jure*” asymmetric decentralisation is based on the special legal status of a certain region, including in the constitution and ordinary law. Whereas, “*de facto*” arrangements are distinctive of relations in most federal political systems and based on all conditions affecting the relevant autonomy, power and influence. In such “*de facto*” circumstances, there are many administrative reasons to treat subnational governments in an asymmetrically. Therefore, the administrative asymmetry wishes to advance government policies so that the different aptitudes of subnational governments are taken into account. For example, among these activities they can include many policies such as additional revenue bases, special grants, or rights to extended service provision. However, each policy can be fulfilled top-down or in agreement with subnational governments. Indeed, bottom-up (or top-down) types of asymmetric decentralisation measures are consistent with bottom-up/top-down² decentralisation in general (Bird, 2003).

Asymmetric arrangements at the regional level still form an important share of all asymmetric arrangements (Hooghe et al., 2016). The degree of administrative asymmetry depends both on the impact of tasks delegated to regions and the differences in the administrative capacities in each region.

²A bottom-up approach to decentralisation includes local jurisdictions actively organising local services and asking higher level governments to be supportive of these efforts. A top-down process of decentralisation comprises policies where the central government devolves or delegates some of its responsibilities downwards (Shah and Thompson, 2004).

A box plot summarizing the degree of decentralisation in EU regions is shown in Figure 4.1. The data show a similar pattern in the regions. They are broadly decentralized during the overall period of analysis. The median is 10 for each phase of resilience. This perspective on decentralisation highlights that the social and economic effects of decentralizing power results comparable along the 4Rs phases.

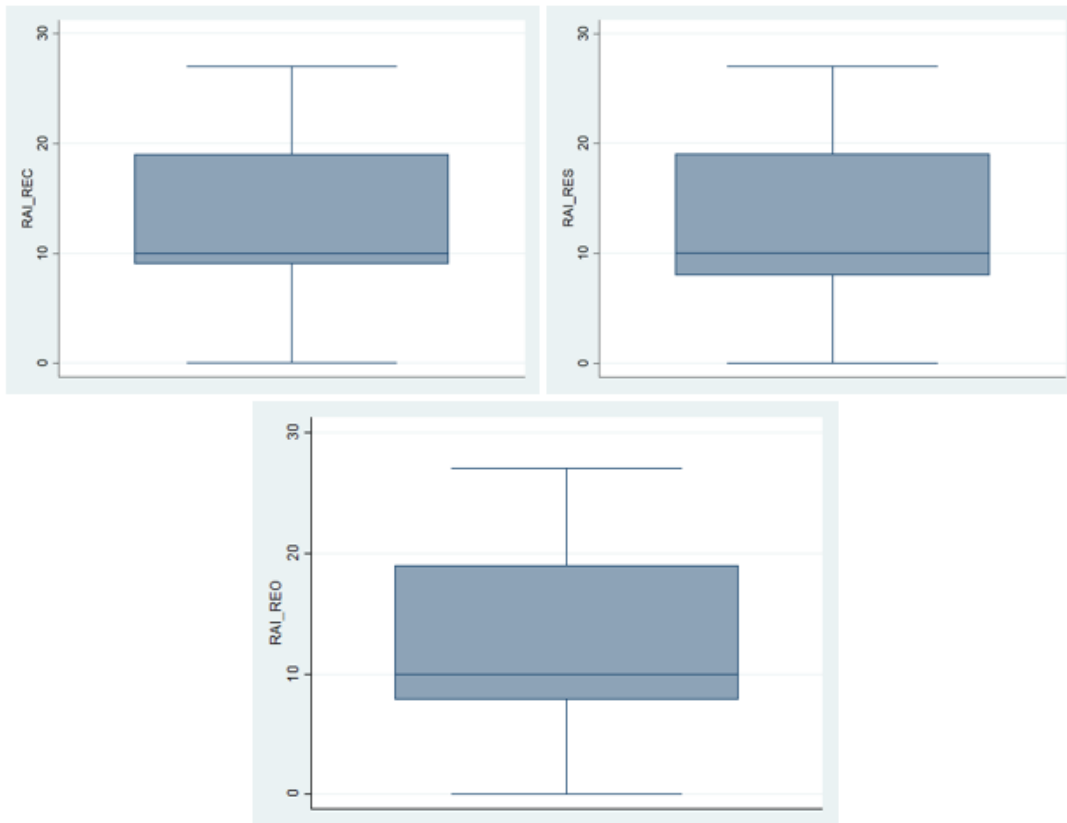


Figure 4.1: Decentralisation in EU regions along 4Rs

The Governance Finance Statistics database by the International Monetary Fund used as a measure of decentralisation in previous analysis raises two caveats concerning content validity. Although data present some missing at EU-NUTS 2 level, (i) Expenditure and revenue fiscal indicators fail to capture how much decision-making authority subnational governments have and do not differentiate between decision-making and implementation ; (ii) Fiscal indicators do not necessarily measure differences in implementation authority (Schakel, 2008; Ebel and Yilmaz, 2002). Their value as a proxy for decentralization presents

limitations. Indeed, expenditures and revenues are problematic measures to explore decision-making decentralisation since it is not easy to understand whether the expenditure comes from conditional or unconditional grants, whether the central government knows effectively how the money should be spent, whether it sets the specific legislation within which subnational governments implement, or whether each subnational government spends the money directly (Panizza 1999). Similarly, some problematic issues arise for revenue fiscal indicators. They do not help to understand whether authorities that can tax autonomously can also decide autonomously what to do with the money (Ebel and Yilmaz 2002; Panizza 1999). While the revenue might be collected freely, it may have to be spent on policies laid down by the central government. (Schakel, 2008). The link between the authority to collect revenues and the authority to decide and implement policies is missing, theoretically and empirically. Finally, as Oates (1999, p. 199-200) suggests:

“... even if there exists an identical allocation of functions among levels of government across two countries, their centralization ratios will generally differ if they do not have the same relative expenditure patterns on these functions. A country, for example, with an unusually large portion of its resources devoted to national defence will have, other things being equal, a relatively high degree of fiscal centralization. . . . centralization ratios may differ because certain services provided publicly in one economy are provided in the private sector in another”.

Hence, the authority implementation is not discernible between genuine political decentralisation or difference in political economy or also change in the size of government activities.

4.3.2 The well-being's dimensions

Consistently with the methodological choice adopted in the previous analysis using BLI indicators, the economic well-being is explored through a set of eleven indicators based on regional statistics of EUROSTAT. The BLI is replaced with such indicators presented in the Table 4.2 because of missing data for EU-NUTS 2 level and difficulties in finding data for each European region. For ease of comparison, the first column of Table 4.2 recalls also the

correspondent BLI dimensions used in the previous analysis. In summary, we have collected data for 169 EU NUTS-2 regions in 20 countries.

INDICATORS'BLI	EUROSTAT INDICATOR
<i>HOUSING</i>	Number of establishments, bedrooms and bed-places by NUTS 2 regions
<i>INCOME</i>	Income of households by NUTS 2 region
<i>JOB</i>	Employment by sex, age and NUTS 2 regions
<i>COMMUNITY</i>	HRST by category and NUTS 2 regions
<i>EDUCATION</i>	Population by educational attainment level, sex and NUTS 2 regions (%)
<i>ENVIRONMENT</i>	Cooling and heating degree days by NUTS 3 regions (annual data) and new planting for UK regions (https://www.forestresearch.gov.uk/)
<i>CIVIC ENGAGEMENT</i>	Economically active population by sex, age and NUTS 2 regions (age 15-74 years both sexes)
<i>HEALTH</i>	Hospital beds by NUTS 2 regions
<i>LIFE SATISFACTION</i>	Fertility rates by age and NUTS 2 region
<i>SAFETY</i>	Victims in road accidents by NUTS 2 regions
<i>WORK-LIFE BALANCE</i>	The stock of vehicles by category and NUTS 2 regions.(All vehicles, except trailers and motorcycles)

Table 4.2: Well-being's indicators. Source: Author's elaboration on Regional Statistics from Eurostat.

Building upon Martin (2012) and Lagravinese (2015), also in this case the resilience index, the recovery index and reorientation/renewal indices for each well-being dimension will be

computed³. In formula, a measure of regional resilience can be expressed as:

$$\beta_{RE[S][O]t,Tr}^j = \left| \frac{\frac{\Delta y_{t,Tr}^j}{\Delta y_{T_r}^j}}{\frac{\Delta y_{t,TA}^j}{\Delta y_{T_A}^j}} - 1 \right| \quad (4.1)$$

Where, as before $\Delta y_{t,Tr[A]}^j$ represents the variation in the $j - th$ dimension of wellbeing observed in region r [country A] during the period from t to T and $y_{t,Tr[A]}^j$ represents its value at time t . Hence, the higher the index, the higher the reaction of each state with respect to the reference area.

The European Quality Index (EQI) which was created by the Quality of Government Institute at the University of Gothenburg (Charron et al., 2014), in this analysis is used to mediate the link between decentralisation and the well-being economic. It is the result of a novel survey data regional level governance within Europe. The European Commission defines the quality of government as: ‘the absence of corruption, a workable approach to competition and procurement policy, an effective legal environment, and an independent and efficient judicial system’, as well as ‘strong institutional and administrative capacity, reducing the administrative burden and improving the quality of legislation’ (European Commission, 2014, p. 161). The EQI dataset was for the first time published in 2010 and it is available for only three years: 2013, 2017, 2021. The index ⁴ is built on the answers of European citizens about their perception and experiences with public sector corruption along with the extent to which they believe various public sector services are impartially allocated and of good quality. The theory of quality of government as impartiality is been implemented with respect to government laws and policies, reaching a greater interest(Rothstein & Teorell, 2008). Indeed, regional quality of government indicators is largely missing. In the regional literature, the quality of

³Descriptive statistics in Appendix

⁴Methodologically, since the correlation between the three years is equal to 95 % the arithmetic mean of these data is computed.

governance is been assessed by transparency, competition, efficiency, and corruption (Fazekas et al. 2021). More specifically, these dimensions are often related to each other in policy discussions. The principle of transparency requires that any information addressed to the public or the data subject be concise, easily accessible, and easy to understand. Transparency guarantees also an increasing level of legitimacy in the decision-making process. Generally, more transparency in European public procurement is deemed desirable (Bauhr et al., 2020). The principle of administrative efficiency is based on the provision of public services at a minimum cost. The incidence of corruption has taken a central problem in many circumstances. The common definition of corruption is the "misuse of public power for private or political gain". Measures of corruption and poor governance are correlated with per capita income and with the United Nations Human Development Index (HDI). Richer countries, on average, have less reported corruption and better-functioning governments. (Kaufman, 2003). Finally, the recent growth in research on "good governance" and the quality of government show that impartiality is the most important feature of government institutions. As discussed by Dahl (1989), impartiality is the norm on the output side that is most compatible with the normative principle of treating everyone with equal concern and respect.

The following predictions arises according Teorel (2009):

1. *Countries with impartial government institutions sustain higher levels of economic growth*
2. *Countries with impartial government institutions have higher levels of subjective well-being*
3. *Impartial government institutions are linked to higher levels of subjective well-being through their relationship with interpersonal trust, economic growth and civil war*

In summary, the *impartiality theory*, the *principle of administrative efficiency* and the *principle of transparency* support growth and economic development. For example, they give a contribution with the security of property and contract right. (Easterly and Levine 2003; Rodrik, Subramanian, and Trebbi 2004). These aspects will be taken into account in the following analysis.

4.4 Empirical evidence

Using the above data, the baseline model is as follows:

$$\beta_i = \alpha_0 + \alpha_1 \gamma_i + \epsilon_i \quad (4.2)$$

Where β_i is the dependent variable, which is the measure of variation in well-being, γ_i is the measure of regional authority index, Z_i is the set of control variables, using EQI aiming to capture the institutional aspects.

Through a preliminary analysis, we estimate also the overall relationship between the multidimensional measures of well-being obtained by aggregation of the (standardised) 11 dimensions reported in Table 4.2 ($w_{i,t}$) and the overall decentralisation measure for the period from 2004 to 2008 (RAI). In formula:

$$w_{i,t} = \alpha_0 + \alpha_1 RAI_RES_{i,t} + \alpha_2 D + \alpha_3 D \times RAI_RES_{i,t} + \epsilon_{i,t} \quad (4.3)$$

Hence, this model includes the asymmetrical decentralization from 2004 to 2008 (RAI_RES), the financial crisis (D), and the interaction between the two ($D \times RAI_RES$). The regression method used is Pooled Ordinary Least Squares (POLS) with Driscoll-Kraay standard errors to control for the cross-section nature of the dataset. Results are reported in Table 4.3

	(1)
	w_i
RAI_RES_i	2.379*** (0.0751)
D	0.000000169*** (3.82e-08)
$D \times RAI_RES_i$	0.285*** (0.0751)
_cons	-4.47e-08 (3.82e-08)
N	810
R^2	0.109

Driscoll-Kraay standard errors in parentheses

⁺ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 4.3: Asymmetrical decentralisation and resilience. Pooled OLS, 2004-2008.

The results reported in Table 4.3 shows that decentralisation seems to be positively correlated with multidimensional well-being. However, it seems that the shock has no relevant effect on overall well-being measure. Indeed, even if it is statistically significant, it is closer to zero. At the regional level, while it makes sense to decentralise responsibilities, on the contrary, the crisis has not had asymmetric impacts on regions and local government. Indeed, the capacities to fight the time of crisis have differed considerably between subnational governments (OECD, 2020). Therefore, the crisis would appear not to have had any significant identifiable effects in terms of multidimensional well-being.

Asymmetric decentralisation offers a method to tackle difficult challenges in each dimension of well-being. Outside Europe, examples of countries that have implemented sequenced

decentralisation in the past include India, Indonesia, Mexico, Russia, and Tanzania (Bahl and Martinez-Vazquez, 2005).

Once considered the overall relationship between decentralisation and well-being, we augment our preliminary analysis with a regression exercise considering each sector at the regional level individually to investigate the presence of sector-specific effects. This part of the regression exercise covers the years' equation from 2004 to 2008. A set of 11 regressions is estimated based on the following Eq.(4.4).

$$w_{ij,t} = \alpha_0 + \alpha_1 RAI_RES_{ij} + \alpha_2 D + \alpha_3 D \times RAI_RES_{ij,t} + \epsilon_{ij,t} \quad (4.4)$$

Where $w_{ij,t}$ refers to the j th dimension of well-being belonging to the well-being indicators described in Table 4.2. RAI_RES is the measure of decentralisation related to each region. D is, as in the previous case, a dummy variable for the 2008 crisis, which assumes value 1 for 2008s year and 0 otherwise. $D \times RAI_RES_{ij,t}$, is the interaction term between decentralisation specific to one sector and the economic crisis, aims to capture the interaction effect between the (asymmetric) decentralisation and the crisis-specific effect on each measure of well-being; Also, in this case, a POLS with Driscoll-Kraay standard errors is used. Results of the models based on the specification reported in Eq.(4.4) are shown in Table 4.4.

Focussing on our variables of interest, Table 4.4 shows that, except for satisfaction, sectoral decentralisation seems to have a positive and statistically significant impact on individually considered measures of well-being.

Turning the attention to the effects of the crisis emerges that a negative and statistically significant effect is detected for all dimensions, except for *LS*. Finally, analysing the interaction term between decentralisation and crisis we note the negative and statistically significant coefficient for income, *WLB*, safety. Instead, for job, health, *EDU,CE*, community and *LS* a positive and statistically significant effect is detected. For both *ENV* and housing, no statistically significant link is detected.

Therefore, the empirical evidence seems to support the reasoning that a decentralisation

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
	INCOME	JOB	HEALTH	EDU	ENV	CE	COMMUNITY	WLB	SAFETY	LS	HOUSING
RAI_RES _{<i>i,j,t</i>}	0.0369*** (0.0000704)	0.0327*** (0.00155)	0.0347*** (0.000116)	0.0362*** (0.00260)	0.00365* (0.00175)	0.0296*** (0.000974)	0.0358*** (0.000654)	0.0383*** (0.000270)	0.0178*** (0.000277)	-0.00476 (0.00495)	0.0294*** (0.000403)
D	-0.00349*** (0.00102)	-0.00310*** (0.000762)	-0.00336*** (0.000992)	-0.00342*** (0.000777)	-0.000327 (0.000294)	-0.00278*** (0.000721)	-0.00339*** (0.000928)	-0.00205+ (0.00112)	-0.00169*** (0.000474)	0.000451 (0.000599)	-0.00278*** (0.000818)
D × RAI _{<i>i,j,t</i>}	-0.00274*** (0.000579)	0.0341*** (0.0128)	0.00364*** (0.000959)	0.0944*** (0.0214)	0.0154 (0.0144)	0.0256** (0.00802)	0.0185*** (0.00538)	-0.0408*** (0.00222)	-0.0292*** (0.00228)	0.177*** (0.0408)	-0.000991 (0.00331)
_cons	-0.500*** (0.00156)	-0.445*** (0.0220)	-0.466*** (0.00218)	-0.491*** (0.0362)	-0.0495* (0.0236)	-0.401*** (0.0140)	-0.486*** (0.00987)	-0.532*** (0.00428)	-0.242*** (0.00414)	0.0646 (0.0671)	-0.399*** (0.00546)
N	810	810	775	810	790	805	810	785	810	810	810
R ²	0.092	0.077	0.086	0.102	0.001	0.063	0.090	0.093	0.020	0.005	0.059

Standard errors in parentheses

+ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 4.4: Asymmetrical decentralisation mitigates the shock, 2004-2008. Pooled OLS. Driscoll-Kraay standard errors in parentheses.

setting at the regional level can help to address the economic downturn at the subnational level of government. One solution is also that the central government undertakes some measures from the subnational government to dampen the pressure on subnational governments. However, it emerges also that a decentralised setting allows local economies to cope better with the effects of an economic downturn for some limited selection of the dimensions of well-being here considered. Such as income, safety and *WLB*. One preliminary interpretation of such evidence might be in the sense that the above dimensions for which a beneficial effect is detected are those representing the main focus of public policies in times of crisis.

In our opinion, the main contribution that now emerges is based on the comparison between decentralisation expenditures and the asymmetrical arrangement described by RAI. Recent research results show that asymmetric arrangements have become more common (Hooghe et al., 2016; Allain-Duprè, 2018). Between 1950 and 2016, the share of countries measured with the RAI having implemented asymmetric arrangements has doubled (Allain-Duprè, 2020).

The following Table 4.5 presents an overview of the comparison in detail by distinguishing between the impact of *Dec* and RAI on well-being. Table 4.5 below reports a comparison of the results achieved across specifications concerning each decentralisation measure. Both *RAI_RES* and *Dec*, based on decentralised expenditure, show positive and statistically significant coefficients for Income, Safety, and Housing. Hence, in this case (i.e. for these dimensions) decentralisation measured both in fiscal and in multidimensional terms can mitigate the shocks. While those similarities in the detected effects of decentralisation according to different measurements of it are important, perhaps more interesting for the sake of comparison are the differences emerging for other dimensions. Indeed, a different effect according to the measure of decentralisation used is detected for *ENV*, Community, and *WLB*. As for the first case, the positive effect of decentralisation detected with its fiscal measure is not confirmed with *RAI_RES*. Indeed, with *RAI_RES* no statistical effect is detected. While a similar pattern emerges in the Community case, in the case of work-life balance the pattern is reversed. That is to say, *RAI_RES* does show a positive and statistically significant

	EDU	JOB	INCOME	SAFETY	HEALTH	ENV	CE	LS	HOUSING	COMMUNITY	WLB
$RAI_RES_{i,t}$	NO	NO	0.0369*** (0.000007)	0.0178*** (0.000277)	NO	NO	NO	NO	0.0294*** (0.000403)	NO	0.0383*** (0.00027)
$Dec_{i,t}$	-1.67*** (-0.037)	NO	.199*** (0.279)	.212*** (-0.069)	NO	270*** (-0.038)	NO	NO	0.251*** (-0.0454)	0.533*** (-0.046)	NO

Table 4.5: Decentralisation mitigates the shocks. Comparison at Country-Regional Level

effect; the fiscal measure of decentralisation proves to be lack statistical significance in this instance.

Further, we plot the interactive effects using a marginsplot visualisation.

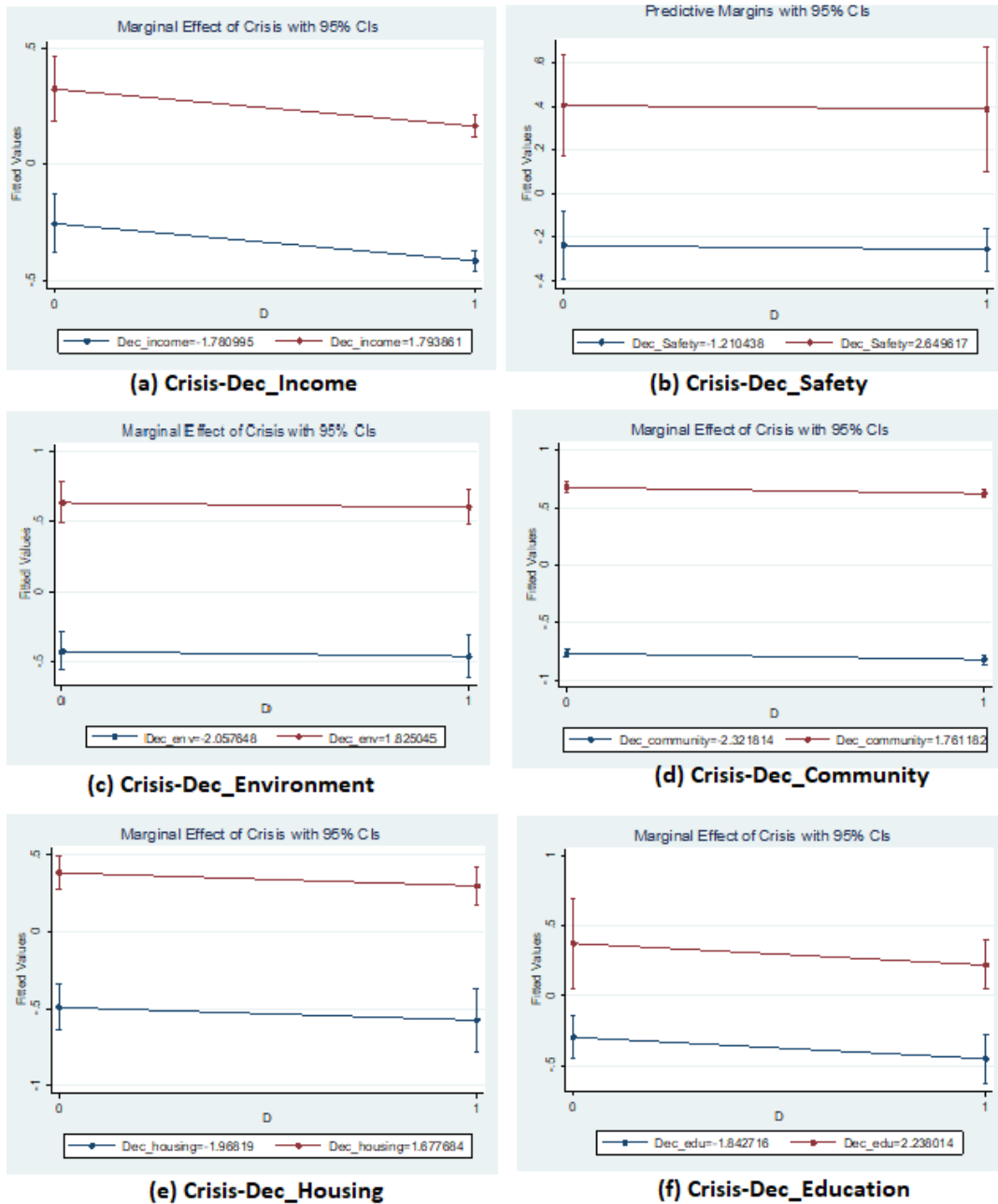


Figure 4.2: Marginal effect of Crisis using IMF's indicators

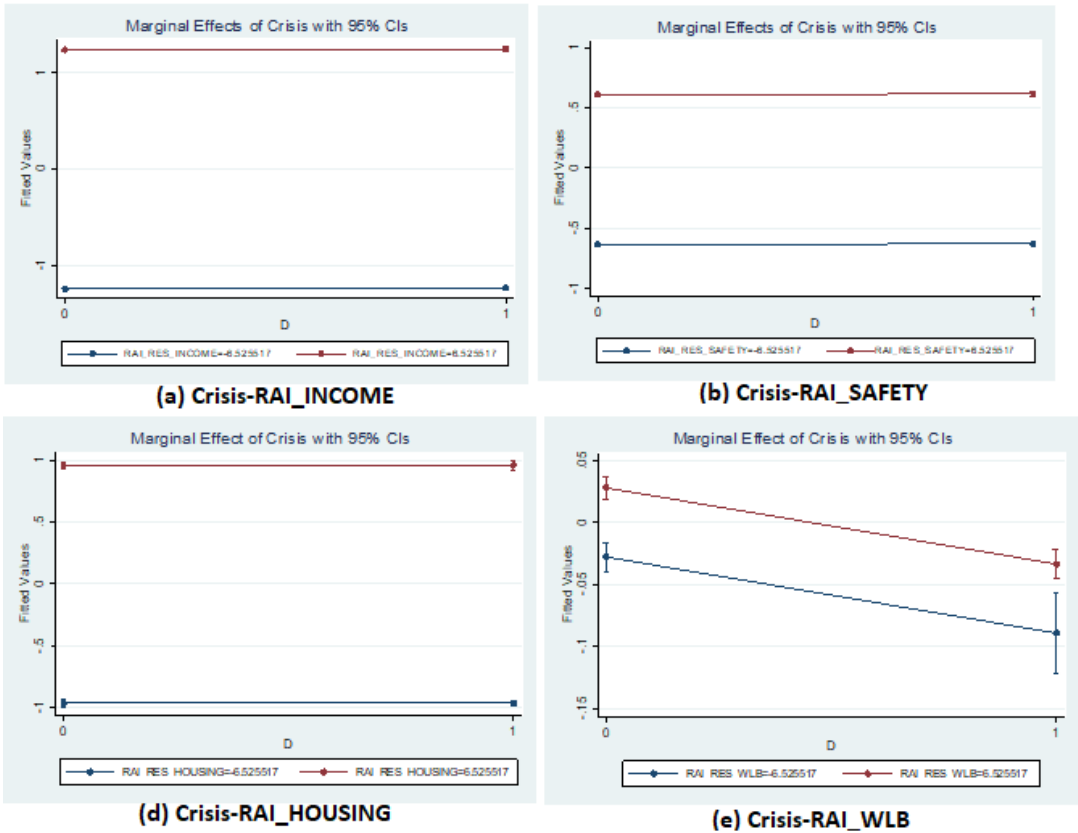


Figure 4.3: Marginal effect of Crisis using RAI

Figure 4.2 and 4.3 depict marginsplot for each well-being dimensions. They show the effect of each level of decentralisation and their confidence intervals over the crisis. The margins are plotted on the y-axis, and the factor covariates specified in the margins command is be placed on the x-axis (D). Put differently, the values on the x axis separate the effects of different levels of decentralisation in times of crisis (1) from the remaining periods under consideration (0). The effect of decentralisation differs by well-being dimensions. In general term, in each graph we see that in time of crisis the marginal effect of decentralisation is higher (red line) than in the latter case; therefore, this evidence is in favour ofthat decentralisation mitigating the shock. This main result holds both using fiscal decentralisation and asymmetrical decentralisation.

Further analysis is performed turning attention to specific dimensions of reaction to the

economic crisis using the following model:

$$\beta_i^r = \alpha_0 + \alpha_1 RAI_i^r + Z_i^r + \epsilon_i \quad (4.5)$$

Where, β_i^r is the measure of the variation of well-being computed at the regional level (r) and according to Equation 4.1 building, as aforementioned on Martin(2012) and Lagravinese (2015), RAI_i^r is the measure of decentralisation, and Z_i^r is the set of control variables aiming to capture the quality of government. More specifically, the variables used are the European Quality Index (EQI), and some measures to the extent of the quality of governance, impartiality and corruption. The multidimensional analysis span over the time sample from 2004 to 2017, but the whole sample is been divided in three sub-sample to describe the resilience, recovery, and reorientation/renewal phase.

Accordingly, we denote $t = 2004, 2009, 2013$ and $T = 2008, 2012, 2017$ for RAI_{RES}^r and β_{RES}^r , and both RAI_{REC}^r and β_{REC}^r , RAI_{REO}^r and β_{REO}^r , respectively.

Table 4.6 below⁵ give us an overall picture about the effects of sectorial decentralised policy across sectors and economic phases from 2004 to 2017.

As for the shock period, (2004-2008) asymmetric decentralisation of political authority in *INCOME*, *WLB*, *SAFETY* and *LS* has statistically decreased the impact of the crisis on the related dimension of well-being; *JOB* and *HEALTH* represent a notable exception to the extent they show a positive sign statistically significant at the 10% level. For all the remaining dimensions of well-being, no statistically significant effect is detected.

As regards the recovery phases (2009-2012), the decentralisation policy is statistically significant, and it has a positive impact in well-being for *INCOME*, *JOB*, *EDU*, *ENV*, *WLB* and Housing; for Health and Safety sector, a detrimental effect is confirmed along it. The remaining dimensions are no statistically significant.

Finally, in the reorientation/renewal phase (2014-2017) a different pattern emerges. More

⁵Full regression outcome available in Table A18, A20, A22 using both EQI and other control variables. Whereas, in tables A17, A19, A21 the models are performed using only EQI

specifically, decentralisation has a positive and statistically impact on environment and safety dimensions; for *INCOME*, *COMMUNITY*, and *HOUSING* prove to be not statistically significant. In the remaining ones, the decentralisation policy has a negative impact and statistically significant.

The actual balance between positive and negative aspects of decentralisation might depend on the way the decentralisation process is implemented along the lines of the guidelines recalled in chapter 1. More specifically, to support countries in developing and in identifying the conditions under which decentralisation can promote local democracy, efficient public service delivery, and regional development, the ten recommendations defined by OECD are useful practical guidance.

Multi-level governance systems are evolving, clarify the responsibility assigned to different government levels should be made to guarantee flexibility in the system. However, clarity means that responsibilities are shared, should be explicit and mutually understood for all actors, including citizens. All responsibilities should be sufficiently and fairly funded. Subnational governments should have autonomy in the design and delivery of the public service responsibilities and they need to develop a source of revenues beyond grants and tax.

Further, adequate coordination mechanisms across levels of governments, creating a shared system with cooperation and regular communication is essential for the success of long-term reforms. Indeed, to establish effective multilevel governance, the decision-making process should be managed through a set of tools such as dialogue platforms and commissions, and intergovernmental consultation boards. Specific support subnational, to assess capacity challenges in the different regions, should be adapted. In addition, each governance system (inter-municipal, interregional, metropolitan governance) should be promoted and be supported as well, using specific matching grants. Moreover, a central point in the guidelines is focused on the need to access informations both for citizens and for national governments. Indeed, this latter should develop performance-monitoring systems to monitor decentralisation and regional development policies. Finally, the need to design and promote fiscal equalisation systems and national regional development policies to reduce territorial

disparities represent important challenges, which if it is accompanied by pro-active regional development policies should avoid negative incentives.

In summary, successful outcomes of asymmetrical decentralisation depend on the implementation of public policy and finding balance between heterogeneity and equity aspects may diminish unwelcome effects. If asymmetric decentralisation is carried out as part of a wider decentralisation policy (Congleton, 2006; Bahl and Martinez-Vazquez, 2005; Congleton, 2015) some unintended effects, such as corruption and favoritism, may be mitigated. Hence, keeping a rational number of asymmetric arrangements within the same country to limit coordination costs and complexity should involve a well-defined system.

4.5 Concluding remark

Our analysis aims to shed light on policies that can help to reap the benefit and to reduce risks following a shock, linked to asymmetric decentralisation. Regional difference and economic development gaps prompts us to investigate about the broader strategy of multi-level governance and territorial development. Asymmetric decentralisation supports and implements tailored governance frameworks and place-based regional policies. The effects of exogenous shocks such as natural disasters, climate change, and financial crisis, generally affects regions differently. The response to 2008s crisis has shown regional resilience which is mainly sector-specific. Although many benefits are linked to the institutional framework, the asymmetrical decentralisation favours innovation and experimental in policy-making. In general, it allows better and positive responses to the quality of life. The optimal strategy is, therefore, likely to be case-specific and potentially depends on local circumstances. All governments obtain benefits from decentralisation, such as responsiveness to local needs, administrative efficiency, innovativeness, transparency, accountability, and cost efficiency. However, considering the risks related to asymmetric decentralisation mainly due to the fact that it does not promote equal treatment of subnational governments and citizens. Therefore, the mixed empirical evidence found here might well depend on the actual balance between

	INCOME	JOB	HEALTH	EDU	ENV	CE	COMMUNITY	WLB	SAFETY	LS	HOUSING
RAI_{RES}^T	-0.00614*** (0.00155)	0.0873+ (0.0468)	0.0200+ (0.0110)	NO	NO	NO	NO	-1.645** (0.512)	-0.941** (0.306)	-0.0236*	NO
RAI_{REC}^T	0.0378*** (0.0274)	0.0254* (0.0111)	-0.0908+ (0.0453)	0.0293*** (0.00703)	0.0142* (0.00545)	NO	NO	1.381* (0.0372)	-0.0911* (0.0372)	NO	0.0260*** (0.00520)
RAI_{REO}^T	NO	-0.253** (0.0815)	-0.150+ (0.0826)	-0.0536** (0.0181)	0.108*** (0.0282)	-0.353+ (0.179)	NO	-0.820*** (0.199)	0.757*** (0.107)	-0.0748** (0.0198)	NO

Table 4.6: Decentralisation and the 4Rs. Source: author's elaboration. Pooled OLS. Regression's result with Driscoll-Kraay standard error.

Note: The reported coefficients refer to the variable i in Eq.(4.4) indicates statistical significance at the 5% level with the corresponding sign. NO: indicates absence of statistical significance at the 5% level, regardless of the estimated coefficient. Each regression also includes the variables EQI, quality, impartiality, corruption. Full regression outcome available in Tables A17, A19, A21

heterogeneity and equity aspects across well-being dimensions such as education, health, labour market, and social services.

Concluding remarks

The research proposed in this thesis is based on the notions of (i) *resilience* that has been defined in a variety of ways in a broad of disciplines, (ii) *decentralisation*, which constitutes a significant affecting the variety of policies implemented at the local level, and, finally the notion of (iii) *multidimensional well-being*.

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 the crisis is closely associated with both redundancy and resourcefulness. Indeed, decentralized 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, raising 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? (Brakman et al., 2015).

The regional development for the EU Member States among others were studied by Lagravinese (2015) for the period 1995–2009 and concludes that the determinants of resilience are extremely varied: infrastructure, human capital, innovation, and urban agglomeration. Moreover, Lagravinese (2015) investigates the UK regions for the period 1970–2010 and finds that

the resilience is a dynamic process consisting of several stages: resistance, recovery, renewal, and reorientation, with different repercussions on companies, individuals, and institutions. Furthermore, 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 unemployment (Martin, 2012; Ezcurra, 2011; Cellini et al., 2014; Rios, 2017; Fingleton et al., 2017).

In this analysis, we depart from common practice conducting this research through the selection of domains from the OECD Better Life Index (BLI), which represent the multidimensional measurement of well-being.

Indeed, we argue that emphasizing to multidimensional well-being 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 well-being. This is despite the most recent trend attempting to consider multidimensional well-being along with GDP (so-called 'GDP& beyond approach' (Terzi, A., 2021; Giovannini et al., 2018; Kalimeris et al., 2020). The results highlight that both fiscal and asymmetrical decentralisation matter. On the whole, decentralised governance matters positively for the quality of life of individuals.

There are several dimensions of well-being, but the following eleven "dimensions" measure the quality of life and support beyond-GDP goals according to the OECD approach have been here closely followed: 'Housing', 'Income', 'Job', 'Community', 'Education', 'Environment', 'Civic Engagement', 'Health', 'Life Satisfaction', 'Safety', 'Work-life balance'. Indeed, all these dimensions define people's well-being, and yet many of them are missed by conventional income measures (Stiglitz et al., 2009).

The following conclusions can be drawn at the country level and then have been tested at the regional level. First, the economic recession arising from the global financial crisis of 2008–2009 has produced important changes in the economy of European states and their regions. The analysis was performed for three distinct periods: the period of economic downturn, in which the phenomenon of resistance manifested itself (2004–2008), the recovery

period (2009-2012), and re-orientation/renewal (2013-2017), which differed in the analysed states and regions. Since the effects of the shock are spatially uneven, the response to the shock in different dimensions of well-being depends on the extent to which local economies can implement tailor-made policies. If so, decentralization reflects an effective policy instrument to mitigate the shock. At a more granular level, our empirical evidence suggests the presence of some sector-shock-specific effects, depending also on the (so-called) 4Rs phases.

However, according to Schakel (2008), since (i) expenditure and revenue fiscal indicators fail to capture how much decision-making authority subnational governments have and do not differentiate between decision-making and implementation and (ii) fiscal indicators do not necessarily measure differences in implementation authority, fiscal decentralisation should present some limitations.

Therefore, since asymmetric decentralisation supports and implements tailored governance frameworks and place-based regional policies, we perform the second application through the Regional Authority Index (RAI) that tracks asymmetric decentralisation of political regional authority on an annual basis from 1950 to 2018.

The analysis confirms, that the response to the 2008s crisis has shown a regional resilience sector-specific. Although many benefits are linked to the institutional framework, the asymmetrical decentralisation favors innovation and experimental in policy-making. The mixed empirical evidence found here might well depend on the actual balance between heterogeneity and equity aspects across well-being dimensions such as education, health, labour market, and social services.

Based on the analysis, it can be concluded that policymakers should focus on specific determinants with a positive influence on resilience and performance. Our analysis can also help to develop new actions to prevent certain critical negative resilience behaviours, helping those at risk to adopt better approaches to deal with shocks. Each specific actions on the resilience have been translated into policy and programming. The results of the econometric analysis give clear European policy implications, and suggest that stimulating all economic activities, improving the quality of education, the healthcare system, and guaranteeing an

equitably functioning labour market could foster growth and could give fresh impetus for a competitive European economy in the future. However, the decentralisation is as a possible tool to hold well-being problems and its influence on quality of life will be highly dependent on the quality of the government providing the public goods and services.(Rodriguez-Pose et al., 2019). This analysis also raises a number of interesting issues that will need to be attempted as the theoretical tools and the data improvent. Indeed, the key challenge is to find better means to model the complex organizational and incentive problems that are involved. The most important conclusion of the thesis is that the statistical analyses confirm some assumptions by introducing innovative elements and original ideas:

- It is suggested the computation of a resilience indicator as a measure of complex phenomena, such as the well-being phenomenon.
- It is suggested to exploit the economic planning of the territory through both the fiscal decentralisation measure and the asymmetrical decentralisation measure.
- The regional economic resilience, more deeply, must enter the political debate, because it is only through such a coherent and multidimensional approach that cooperation can constructively move forward.
- Exploring the link between the government decentralisation and regional resilience, we found that the first might have direct and indirect effects on ex-ante resilience (the vulnerability to severe shocks) and ex-post resilience (the capacity to absorb and overcome the shocks).

Finally, we highlight the key policy implications that emerge from our research and the extant literature. In general term, the literature on resilience identifies the strategies and policy instruments that can help countries and regions to absorb the impacts of shocks, adapting to changes and renew the current economic system towards a longer sustainable development. Indeed, the capacity to adapt in response to shocks and the capacity to transform and to eliminate the risk, rapresent the main features of resilience policy. However, several issues emerged to explain how policy-makers can integrate resilience into policy frameworks.

Governments have a relevant role in planning and coordination. The basis for a more holistic resilience policy framework (Trujillo and Baas, 2014) involve the evaluation of the trade-offs and interaction effects of any given policy with respect to the type of risk, the specific sectors, and the time frame. Therefore, because of the important capacity to plan, governments have to be able to develop socio-economics strategies for building European resilience to make each socio-economic system capable of withstanding critical situations and external events. A well-accepted *ex ante* plan of action represents an opportunity to not be lost. Decentralisation policies reconfigure the relationship between central and subnational government, sharing responsibilities among the different levels of government, through better tailored-policy, which has been a rising interest in resilience in several specific policy fields, such as climate change, risk management and environmental policy. However, there is evidence for the success of the resilience perspective that policy-makers have to take into account policy interventions that support all purely economic structures, which lead, directly, to enhancing well-being in all case-specific sectors. Resilience can be increased by developing different types of capacities. First, the ability of a system to prepare for, mitigate or prevent negative impacts, using predetermined coping reactions in order to preserve and restore essential basic structures and functions. Second, the ability of a system to adjust, transform or change its features and actions to adequate potential future damage and to take advantage of opportunities. Third, the ability to create a new system so that the shock will no longer have any impact.

Ultimately, this research could be deepened across many different policy areas, for example in middle-income developing countries, which are undergoing rapid change in their economies, governance systems, and societies. The research at the regional level will allow to take into account different determinants such as regional differences in well-being and political decentralisation, exploring how regional disparities between each country could affect the findings. The analysis of each sectorial strategic response with respect decentralisation policy under is out of the scope of this study and is left for future research.

Appendix A

Appendix

Variable	Obs	Mean	Std. Dev.	Min	Max
$\beta_{RES}^{HOUSING}$	22	2.164	3.935	.43	16.278
β_{RES}^{INCOME}	22	17.492	43.014	.072	156.93
β_{RES}^{JOB}	22	15.486	44.607	.062	200.182
$\beta_{RES}^{COMMUNITY}$	22	18.257	49.795	.09	210.15
β_{RES}^{EDU}	22	33.368	147.303	.027	692.724
β_{RES}^{ENV}	22	5.717	15.361	.22	73.283
β_{RES}^{CE}	22	3.063	5.168	.094	21.505
β_{RES}^{HEALTH}	22	2.446	2.301	.174	8.633
β_{RES}^{LS}	22	5.42	11.086	.097	45.246
β_{RES}^{SAFETY}	22	3.815	8.359	.455	40.796
β_{RES}^{WLB}	22	19.399	69.253	.104	320.959

Table A.1: Descriptive Statistics on β_{RES}^j

Variable	Obs	Mean	Std. Dev.	Min	Max
$\beta_{REC}^{HOUSING}$	22	1.33	.972	.442	4.4
β_{REC}^{INCOME}	22	.624	.419	.013	1.307
β_{REC}^{JOB}	22	1.471	1.337	.002	5.678
$\beta_{REC}^{COMMUNITY}$	22	14.368	31.041	.004	106.382
β_{REC}^{EDU}	22	1.236	1.073	.077	5.05
β_{REC}^{ENV}	22	10.585	26.909	.155	121.444
β_{REC}^{CE}	22	7.096	14.038	0	51.588
β_{REC}^{HEALTH}	22	.706	.731	.003	3.527
β_{REC}^{LS}	22	1.32	1.355	.036	5.5
β_{REC}^{SAFETY}	22	6.848	13.98	.03	58.513
β_{REC}^{WLB}	22	14.799	40.935	.22	164.44

Table A.2: Descriptive statistics on β_{REC}^J

Variable	Obs	Mean	Std. Dev.	Min	Max
$\beta_{REO}^{HOUSING}$	22	1.624	1.106	0	3.893
β_{REO}^{INCOME}	22	1.09	.514	.268	2.338
β_{REO}^{JOB}	22	1.282	1.446	0	6.321
$\beta_{REO}^{COMMUNITY}$	22	4.994	9.215	0	35.574
β_{REO}^{EDU}	22	1.959	2.317	0	10.45
β_{REO}^{ENV}	22	4.99	7.563	0	29.81
β_{REO}^{CE}	22	2.489	2.965	0	11.395
β_{REO}^{HEALTH}	22	.998	.557	.197	2.211
β_{REO}^{LS}	22	3.957	6.168	0	25.565
β_{REO}^{SAFETY}	22	2.394	6.085	0	29.308
β_{REO}^{WLB}	22	.966	1.247	.011	4.245

Table A.3: Descriptive statistics on β_{REC}^j using BLI

Variable	Obs	Mean	Std. Dev.	Min	Max
$\beta_{REO}^{HOUSING}$	22	2.586	3.548	.184	14.143
β_{REO}^{INCOME}	22	1.248	.924	.006	3.39
β_{REO}^{JOB}	22	.646	.327	.102	1.089
$\beta_{REO}^{COMMUNITY}$	22	.63	.526	.021	2.022
β_{REO}^{EDU}	22	14.342	20.222	.705	63.348
β_{REO}^{ENV}	22	2.41	2.663	.083	8.275
β_{REO}^{CE}	22	4.435	4.852	.189	14.444
β_{REO}^{HEALTH}	22	.651	.39	.046	1.365
β_{REO}^{LS}	22	.966	.669	.111	2.601
β_{REO}^{SAFETY}	22	1.007	.771	.016	2.849
β_{REO}^{WLB}	22	1.757	2.254	.084	10.506

Table A.4: Descriptive statistics on β_{REC}^j using SDIs

(1)	
WELL-BEING	
<i>Dec_j</i>	0.163 (0.116)
<i>D</i>	-0.000000838 (0.233)
<i>D × Dec_j</i>	-0.0173 (0.0386)
<i>Goveff</i>	1.623* (0.803)
<i>Reggov</i>	-1.883* (0.815)
<i>Rlaw</i>	1.961 (1.381)
<i>Polstab</i>	-1.216** (0.384)
<i>Voice</i>	0.256 (1.399)
<i>_cons</i>	0.000000307 (0.104)
<i>N</i>	110
<i>R²</i>	0.226
<i>F</i>	2.913

Standard errors in parentheses

+ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table A.5: The decentralization and resilience. POLS, with fixed effect: 2004-2008

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	INCOME	JOB	COMMUNITY	EDU	ENV	CE	HEALTH	LS	SAFETY	WLB
Dec _j	-0.104 (0.257)									
Goveff	-0.168 (0.159)	0.123 (0.236)	-0.102 (0.114)	-0.103 (0.192)	-0.142 (0.162)	-0.282 (0.582)	-0.166*** (0.0164)	0.0593 (0.208)	0.131 (0.536)	-0.381 (0.765)
Reggov	0.128 (0.124)	-0.00286 (0.201)	0.141 (0.0938)	0.143 (0.158)	-0.0607 (0.134)	0.737 (0.605)	0.0610* (0.0240)	0.458* (0.203)	0.110 (0.464)	-0.529 (0.603)
Rlaw	0.977** (0.284)	1.236** (0.427)	-0.347 ⁺ (0.200)	0.505 (0.333)	-0.415 (0.284)	2.357* (1.011)	0.0622 (0.0844)	0.156 (0.368)	-1.106 (0.943)	-1.393 (1.378)
Polstab	0.0557 (0.0984)	-0.0855 (0.166)	-0.0869 (0.0749)	-0.0913 (0.126)	-0.0262 (0.106)	-0.428 (0.401)	-0.0273*** (0.00673)	-0.0875 (0.132)	-0.354 (0.386)	0.369 (0.502)
Voice	0.461 ⁺ (0.255)	0.363 (0.356)	-0.0104 (0.172)	-0.0888 (0.286)	0.217 (0.240)	0.738 (0.886)	-0.0668 (0.115)	0.409 (0.313)	1.164 (0.806)	-1.340 (1.073)
Dec _j		0.0261 (0.0766)								
Dec _j			-0.231 ⁺ (0.119)							
Dec _j				1.072* (0.526)						
Dec _j					0.00502 (0.0274)					
Dec _j						0.903 (1.592)				
Dec _j							0.150 (0.238)			
Dec _j								-0.328 (0.647)		
Dec _j									-0.0616 (2.381)	
Dec _j										-1.286* (0.501)
_cons	0.0468* (0.0184)	0.0741** (0.0252)	0.0147 (0.0124)	0.0143 (0.0199)	0.0774*** (0.0168)	-0.405 ⁺ (0.205)	-0.0235*** (0.00100)	8.14e-08 (0.0159)	-0.0304 (0.0800)	-0.184* (0.0759)
N	84	84	84	84	84	76	84	88	82	84
R ²	0.404	0.257	0.144	0.124	0.100	0.248		0.216	0.085	0.196
F	6.444	3.286	1.599	1.345	1.054	2.801	5.893	2.761	0.854	2.311

Standard errors in parentheses

⁺ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table A.7: The decentralization and recovery. POLS, with fixed effect: 2009-2012

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	INC	JOB	COMMUNITY	EDU	CE	HEALTH	LS	SAFETY	WLB	HOUSUNG
Dec _j	-0.0170 (0.0241)									
Goveff	0.0744 (0.0555)	0.132 (0.108)	0.0376 (0.0257)	0.0592 (0.100)	-0.734* (0.319)	-0.111** (0.0381)	0.161 (0.194)	-0.130 (0.0976)	-0.00835 (0.101)	0.0290 (0.0520)
Reggov	0.0569 (0.0584)	-0.0163 (0.113)	-0.0221 (0.0293)	-0.108 (0.105)	0.840* (0.366)	0.0209 (0.0814)	0.0921 (0.221)	-0.0313 (0.102)	0.0618 (0.107)	-0.0712 (0.0605)
Rlaw	0.120 ⁺ (0.0705)	0.148 (0.142)	-0.00448 (0.0346)	0.151 (0.136)	-0.0575 (0.451)	0.337*** (0.0459)	-0.0368 (0.253)	0.231 ⁺ (0.131)	-0.0525 (0.134)	0.195** (0.0635)
Polstab	-0.0306 (0.0267)	0.140* (0.0540)	0.0340* (0.0131)	-0.0692 (0.0505)	0.367* (0.161)	-0.0186 (0.0224)	0.00754 (0.0981)	0.0276 (0.0489)	-0.0794 (0.0506)	-0.00516 (0.0210)
Voice	-0.0976 (0.0990)	-0.0125 (0.207)	-0.111* (0.0493)	0.143 (0.190)	-0.276 (0.609)	0.0383 (0.0551)	-0.543 (0.367)	0.347 ⁺ (0.184)	-0.478* (0.192)	0.134 (0.147)
Dec _j		0.00564 (0.0405)								
Dec _j			-0.0211* (0.0101)							
Dec _j				0.00921 (0.0389)						
Dec _j					0.232 (0.202)					
Dec _j						-0.0715 ⁺ (0.0387)				
Dec _j							-0.189 (0.141)			
Dec _j								-0.0186 (0.278)		
Dec _j									-0.0464 (0.109)	
Dec _j										-0.00136 (0.0127)
_cons	-0.00796 (0.00815)	0.00305 (0.0117)	0.00581* (0.00283)	0.000950 (0.0110)	0.0860 (0.123)	-0.00341*** (0.000421)	-0.000435 (0.0208)	0.00783 (0.0106)	-0.0133 (0.0111)	-0.00924*** (0.00227)
N	102	109	109	109	101	109	109	109	109	109
R ²	0.133	0.151	0.145	0.049	0.175		0.064	0.106	0.151	
F	1.917	2.401	2.284	0.701	2.618	65.10	0.924	1.605	2.395	29.25

Standard errors in parentheses

⁺ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table A.8: The decentralization and reorientation/renewal along SDIs. POLS, with fixed effect: 2012-2017

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	INCOME	JOB	COMMUNITY	EDUCATION	ENV	CE	LS	SAFETY	WLB
Dec _j	0.0621 (0.107)								
Goveff	-0.432 ⁺ (0.241)	0.0112 (0.161)	-0.862 (0.660)	0.122 (0.235)	0.604 (0.513)	-0.303 (0.215)	0.303 (0.257)	-0.00835 (0.678)	0.232 (0.506)
Reggov	-0.00310 (0.242)	0.162 (0.169)	0.182 (0.750)	0.114 (0.247)	-0.165 (0.540)	0.359 (0.234)	-0.153 (0.280)	-0.908 (0.707)	-0.489 (0.513)
Rlaw	-0.0985 (0.303)	0.0926 (0.211)	0.779 (0.887)	0.150 (0.318)	-1.764* (0.674)	0.0423 (0.286)	0.217 (0.337)	0.737 (0.906)	-0.510 (0.656)
Polstab	-0.000222 (0.114)	-0.00719 (0.0808)	0.240 (0.339)	-0.0619 (0.119)	-0.146 (0.261)	-0.0331 (0.109)	0.0439 (0.132)	-0.170 (0.342)	0.155 (0.248)
Voice	0.407 (0.433)	0.0430 (0.310)	1.681 (1.273)	-0.658 (0.450)	1.669 ⁺ (0.977)	-0.0266 (0.413)	-0.641 (0.494)	0.542 (1.289)	1.128 (0.933)
Dec _j		-0.163** (0.0609)							
Dec _j			0.142 (0.259)						
Dec _j				0.0521 (0.0913)					
Dec _j					0.151 (0.169)				
Dec _j						0.151 (0.136)			
Dec _j							-0.0482 (0.182)		
Dec _j								-0.115 (1.926)	
Dec _j									0.893 ⁺ (0.528)
_cons	-0.0241 (0.0332)	0.00693 (0.0179)	0.0341 (0.0742)	-0.00432 (0.0265)	-0.00977 (0.0572)	-0.0170 (0.0243)	-0.0000380 (0.0279)	0.0112 (0.0762)	0.0184 (0.0606)
N	104	108	108	108	108	108	109	108	106
R ²	0.062	0.104	0.065	0.042	0.129	0.071	0.042	0.029	0.077
F	0.846	1.539	0.933	0.591	1.975	1.018	0.588	0.396	1.078

Standard errors in parentheses

⁺ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table A.9: The decentralization and reorientation/renewal along BLIs. POLS, with fixed effect: 2012-2017

(1)	
WELL-BEING	
RAI	-0.174*** (0.0339)
D	-0.117 (0.112)
D×RAI	0.00975 (0.00704)
_cons	2.369*** (0.461)
<i>N</i>	810
<i>R</i> ²	0.042
F	9.335

Standard errors in parentheses

+ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table A.10: The asymmetrical decentralization and resilience. POLS, with fixed effect: 2004-2008

	EDU	JOB	INCOME	SAFETY	HEALTH	ENV	CE	LS	HOUSING	COMMUNITY	WLB
<i>Decj</i>	-0.068*** (-0.029)	-0.004 (-0.002)	-0.028*** (-0.01)	-1.456 (-0.868)	-0.075 (-0.19)	0.616 (-0.729)	0.494 (-0.57)	.063** (-0.034)	.046*** (-0.019)	.813*** (-0.37)	-3.02 (-5.4)
<i>Goveff</i>	-0.023 (-0.038)	-1.90*** (-0.039)	-0.031*** (-0.008)	-8.47*** (-0.38)	-0.069*** (-0.029)	-1.8 (1.318)	-0.67 (-0.424)	.156** (-0.08)	0.048 (-0.034)	1.64 (-1.06)	-2.34 (-1.67)
<i>Polstab</i>	4.02 (-0.002)	-0.001 (-0.002)	0.0004 (-0.001)	-0.037 (-0.034)	0.0001 (-0.001)	-0.01 (-0.041)	0.01 (-0.016)	0.0002 (-0.002)	-0.001* (-0.0008)	0.014 (-0.039)	-0.41 (-0.076)
<i>Reggov</i>	-0.043* (-0.024)	-0.01 (-0.024)	.018*** (-0.005)	-0.43 (-0.261)	-0.006 (-0.022)	-1.15 (-0.91)	-68.4 (-0.434)	-0.046*** (-0.017)	-0.012 (-0.018)	-1.46*** (-0.58)	-0.696 (-0.935)
<i>Rlaw</i>	0.038 (-0.066)	0.051 (-0.07)	.031* (-0.169)	2.749*** (-0.944)	0.035 (-0.037)	-3.34* (-1.92)	-1.844** (-0.895)	-.317*** (-0.147)	-.098*** (-0.04)	-6.61*** (-2.73)	-0.328 (-1.95)
<i>Voice</i>	-0.541 (-0.417)	-8.18* (-0.433)	-.407*** (-0.149)	-3.165 (-4.431)	-0.345 (-0.227)	24.90*** (-10.75)	11.22** (-5.65)	.991** (-0.501)	.586** (-0.303)	44.97 (-12.81)	33.90** (-17.53)
<i>Constant</i>	1.949*** (-0.498)	1.88*** (-0.565)	.744*** (-0.149)	10.005 (-6.62)	1.11*** (-0.512)	9.15 (-6.3)	7.47 (-4.41)	1.05 (-0.302)	.960*** (-0.255)	5.45 (-4.97)	13.29 (-8.57)
<i>N</i>	22	22	22	22	22	22	22	22	22	22	22
<i>R²</i>	0.24	0.25	0.23	0.23	0.19	0.28	0.02	0.35	0.33	0.51	0.18

Standard errors in parentheses. Driscoll-Kraay standard errors in parentheses.

+ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table A.11: Pooled OLS where Y is the SDI for the years, 2009-2012.

	EDU	JOB	INCOME	SAFETY	HEALTH	ENV	CE	LS	HOUSING	COMMUNITY	WLB
<i>Decj</i>	-0.61 (-0.063)	-0.18*** (-0.007)	.0001*** (-0.00005)	0.0018 (-0.003)	0.019 (-0.014)	0.107 (-0.111)	-0.039 (-0.059)	-50 (-0.4)	-0.043 (-0.333)	.0167*** (-0.008)	-.040*** (-0.009)
<i>Goveff</i>	-0.314 (-0.503)	-.032*** (-0.011)	-0.024 (-0.046)	-.011*** (-0.03)	0.031 (-0.021)	-.218*** (-0.057)	-.552*** (-0.151)	.077* (-0.44)	-0.146 (-0.118)	-.055*** (-0.013)	.421** (-0.206)
<i>Polstab</i>	-1.316 (-2.668)	-0.025 (-0.055)	-0.151 (-0.186)	0.089 (-0.119)	-0.011 (-0.083)	-1.21*** (-0.386)	0.345 (-0.632)	-.28*** (-0.085)	-0.238 (-0.45)	.147** (-0.072)	-1.123*** (-0.271)
<i>Reggov</i>	.102*** (-0.0231)	.001*** (-0.002)	.009*** (-0.0008)	-0.001 (-0.001)	-0.0001 (-0.0004)	.011*** (-0.002)	.028*** (-0.006)	-.002*** (-0.001)	-.011*** (-0.004)	.002*** (-0.0005)	-0.001 (-0.002)
<i>Rlato</i>	7.78 (-2.91)	0.003 (-0.062)	.313*** (-0.086)	-.255*** (-0.133)	-.160*** (-0.042)	1.11*** (-0.222)	-1.02* (-0.585)	-.065*** (-0.001)	0.347 (-0.647)	0.021 (-0.04)	-0.204 (-0.12)
<i>Voice</i>	4.57 (-2.84)	.095*** (-0.043)	0.232 (-0.138)	-0.031 (-0.078)	-0.058 (-0.047)	0.275 (-0.391)	-.083* (-0.408)	0.07 (-0.1)	0.609 (-0.375)	0.044 (-0.049)	0.407 (-0.248)
<i>Constant</i>	-2.06 (-7.99)	-.697*** (-0.095)	0.59 (-0.247)	1.56*** (-0.372)	.867*** (-0.137)	0.597 (-0.732)	6.584*** (-1.919)	1.30*** (-0.253)	2.27 (-1.47)	.347*** (-0.126)	2.259*** (-0.46)
<i>N</i>	22	22	22	22	22	22	22	22	22	22	22
<i>R</i>	0.32	0.37	0.51	0.29	0.28	0.33	0.24	0.27	0.12	0.57	0.49

Standard errors in parentheses. Driscoll-Kraay standard errors in parentheses.

+ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table A.12: Pooled OLS where Y is the SDI for the years, 2013-2017.

	EDU	JOB	INCOME	SAFETY	HEALTH	ENV	CE	LS	HOUSING	COMMUNITY	WLB
<i>Decj</i>	-0.072*** (-0.0104)	-0.051** (-0.025)	-0.0003*** (-0.0001)	-0.189*** (-0.047)	.0735** (-0.36)	-0.128** (-0.061)	.152*** (-0.0381)	-0.076 (-0.57)	-0.032*** (-0.014)	0.057 (-0.034)	.74*** (-0.008)
<i>Goveff</i>	-0.54** (-0.26)	.298*** (-0.021)	0.0166 (-0.017)	-0.049 (-0.051)	0.051 (-0.35)	-0.28 (-0.269)	-0.109* (-0.063)	.319*** (-0.146)	-0.12 (-0.035)	-0.152 (-0.134)	0.024 (-0.039)
<i>Polstab</i>	-.444*** (-0.106)	0.13 (-0.095)	0.08 (-0.052)	-1.199*** (-0.357)	-0.025 (-0.109)	0.345 (-0.837)	-0.126 (-0.232)	-0.857 (-0.765)	-0.107 (-0.164)	-1.86*** (-0.864)	-0.2 (-0.182)
<i>Reggov</i>	0.001 (-0.001)	-0.002 (-0.001)	.002*** (-0.00072)	0.002 (-0.002)	-0.001 (-0.0007)	.113*** (-0.005)	.04*** (-0.003)	-0.012** (-0.006)	-0.0007 (-0.001)	.069*** (-0.134)	0.0006 (-0.002)
<i>Rlatw</i>	1.39*** (-0.226)	0.031 (-0.11)	.116*** (-0.045)	3.79*** (-1.041)	-0.025 (-0.107)	0.211 (-0.978)	0.063 (-0.505)	2.169 (-0.011)	0.109 (-0.113)	2.504 (-2.449)	-0.083 (-0.097)
<i>Voice</i>	.167* (-0.097)	-.296*** (-0.13)	-0.099 (-0.057)	.872*** (-0.254)	-.19*** (-0.065)	1.172 (-0.945)	-0.149 (-0.197)	-0.237 (-0.586)	0.027 (-0.162)	0.515 (-0.762)	0.252 (-0.19)
<i>Constant</i>	.167* (-0.097)	-.296*** (-0.13)	-0.099 (-0.057)	.872*** (-0.254)	-.19*** (-0.065)	1.172 (-0.945)	-0.149 (-0.197)	-0.237 (-0.586)	0.027 (-0.162)	0.515 (-0.762)	0.252 (-0.19)
<i>N</i>	22	22	22	22	22	22	22	22	22	22	22
<i>R</i>	0.27	0.33	0.7	0.85	0.44	0.92	0.31	0.16	0.41	0.76	0.9

Standard errors in parentheses. Driscoll-Kraay standard errors in parentheses.

+ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table A.13: Pooled OLS where Y is the BLI for the years, 2013-2017.

Variable	Obs	Mean	Std. Dev.	Min	Max
$\beta_{RES}^{HOUSING}$	168	2.227	4.97	0	44.693
β_{RES}^{INCOME}	168	.213	.705	0	8.922
β_{RES}^{JOB}	168	2.91	6.931	.01	71.328
$\beta_{RES}^{COMMUNITY}$	168	.5	.445	.003	2.529
β_{RES}^{EDU}	168	3.017	4.539	0	39.378
β_{RES}^{ENV}	168	.587	.74	.007	4.355
$\beta_{RES}^{COMMUNITY}$	168	1.707	3.389	.001	32.415
β_{RES}^{CE}	168	2.251	6.67	.004	70.115
β_{RES}^{LS}	168	1.131	4.681	0	59.742
β_{RES}^{SAFETY}	168	6.63	32.065	0	273.981
β_{RES}^{WLB}	168	23.711	85.997	0	533.036
RAI_{RES}^r	168	13.324	8.146	0	27

Table A.14: Descriptive statistics on β_{RES}^j and RAI_{RES}^r

Variable	Obs	Mean	Std. Dev.	Min	Max
$\beta_{REC}^{HOUSINGC}$	168	1.175	1.596	0	12.811
β_{REC}^{INCOME}	168	.757	1.196	0	6.926
β_{REC}^{JOB}	168	1.685	2.688	.009	21.653
$\beta_{REC}^{COMMUNITY}$	168	1.205	1.988	0	20.166
β_{REC}^{EDU}	168	1.655	1.771	.015	9.782
β_{REC}^{ENV}	168	1.07	1.226	0	8.856
β_{REC}^{CE}	168	4.755	15.773	.017	142.642
β_{REC}^{HEALTH}	168	3.736	7.986	0	47.872
β_{REC}^{LS}	168	1.134	1.309	0	9.537
β_{REC}^{SAFETY}	168	2.498	6.775	0	80.502
β_{REC}^{WLB}	168	18.562	183.797	.004	2381.949
RAI_{REC}^r	168	13.551	8.079	0	27

Table A.15: Descriptive statistics on β_{REC}^j and RAI_{REC}^r

Variable	Obs	Mean	Std. Dev.	Min	Max
$\beta_{REO}^{HOUSING}$	167	1.077	1.527	0	11.789
β_{REO}^{INCOME}	167	.634	3.446	0	43.616
β_{REO}^{JOB}	167	3.543	10.802	0	125.298
$\beta_{REO}^{COMMUNITY}$	167	.618	1.252	0	14.373
β_{REO}^{EDU}	167	1.293	2.681	-15.789	16.839
β_{REO}^{ENV}	167	1.151	2.924	-16.331	16.419
β_{REO}^{CE}	167	3.567	13.206	-5.855	130.918
β_{REO}^{HEALTH}	167	5.813	19.463	-1.052	140.306
β_{REO}^{LS}	167	1.394	3.625	0	24.074
β_{REO}^{SAFETY}	167	8.36	25.731	-19.565	242.786
β_{REO}^{WLB}	167	8.979	25.75	0	158.789
RAI_{REO}^r	167	13.483	8.186	0	27

Table A.16: Descriptive statistics on β_{REO}^j and RAI_{REO}^r

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
INCOME											
RAI_{RES}^T	-0.00575** (0.00192)	0.0853+ (0.0451)	0.0174 (0.0107)	-0.0501+ (0.0282)	0.00792 (0.0142)	-0.0388 (0.0394)	-0.00428 (0.00316)	-1.608** (0.478)	-0.950* (0.379)	-0.0182 (0.0190)	0.0218 (0.0178)
EQI	-0.0586*** (0.0137)	0.705 (0.646)	-0.587* (0.274)	-0.218 (0.388)	-0.0818 (0.0722)	-0.567** (0.198)	0.0791*** (0.0160)	29.62+ (14.33)	-1.478 (1.021)	0.114 (0.0860)	0.764 (0.663)
_cons	0.293*** (0.0447)	1.724*** (0.327)	2.060* (0.886)	3.699*** (0.718)	0.487*** (0.108)	2.263* (0.866)	0.552*** (0.0461)	43.08** (11.68)	19.39*** (6.720)	1.365*** (0.318)	1.882** (0.562)
N	168	168	168	168	168	168	168	168	168	168	168
R^2	0.013	0.025	0.006	0.012	0.012	0.041	0.024	0.089	0.067	0.001	0.024

Driscoll-KraayStandard errors in parentheses

+ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table A.17: RAI Multidimensional approach with EQI, 2004-2008.

This model was performed taking into account as institutional aspects the EQI

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
	INCOME	JOB	HEALTH	EDU	ENV	CE	COMMUNITY	WLB	SAFETY	LS	HOUSING
RAI_{RES}^r	-0.00614*** (0.00155)	0.0873+ (0.0468)	0.0200+ (0.0110)	-0.0533 (0.0363)	0.00838 (0.0119)	-0.0470 (0.0305)	-0.00534 (0.00318)	-1.645** (0.512)	-0.941** (0.306)	-0.0236* (0.00983)	0.0208 (0.0199)
EQI	0.296 (0.384)	-9.058 (17.91)	14.08+ (8.191)	-7.792+ (3.910)	2.154 (1.882)	-9.658+ (4.887)	0.873*** (0.202)	67.37 (68.70)	132.6+ (73.31)	-9.092 (7.632)	1.060 (5.404)
quality	-0.286 (0.193)	4.685 (6.652)	-5.778 (3.408)	2.300** (0.636)	-0.856 (0.855)	1.646* (0.784)	-0.651** (0.202)	-28.31 (22.70)	-56.21 (40.17)	2.300 (2.509)	-0.329 (2.274)
impartiality	-0.230* (0.0818)	0.255 (1.821)	-4.654 (2.973)	1.081 (1.015)	-0.621 (0.407)	3.164* (1.476)	-0.0226 (0.0276)	-15.98 (10.71)	-31.99+ (16.85)	0.608 (0.711)	1.132*** (0.259)
corruption	0.130 (0.261)	4.952 (9.136)	-4.596+ (2.346)	4.226+ (2.096)	-0.807 (0.731)	4.341+ (2.511)	-0.158** (0.0521)	4.029 (48.91)	-48.80* (21.69)	6.240 (4.552)	-1.043 (2.347)
_cons	0.307*** (0.0431)	1.636*** (0.276)	2.137+ (1.163)	3.722*** (0.836)	0.496*** (0.0643)	2.357*** (0.734)	0.579*** (0.0524)	44.31** (12.46)	20.25** (6.152)	1.436*** (0.354)	1.889** (0.615)
N	168	168	168	168	168	168	168	168	168	168	168
R^2	0.029	0.036	0.032	0.027	0.050	0.095	0.057	0.094	0.128	0.039	0.031

Driscoll-Kraay standard errors in parentheses

+ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table A.18: RAI Multidimensional approach, 2004-2008

This model was performed taking into account institutional aspects through the following determinant variables: corruption, impartiality, quality of governance and EQI

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
INCOME											
RAI_{REC}^T	-0.00575** (0.00192)	0.0853+ (0.0451)	0.0174 (0.0107)	-0.0501+ (0.0282)	0.00792 (0.0142)	-0.0388 (0.0394)	-0.00428 (0.00316)	-1.608** (0.478)	-0.950* (0.379)	-0.0182 (0.0190)	0.0218 (0.0178)
EQI	-0.0586*** (0.0137)	0.705 (0.646)	-0.587* (0.274)	-0.218 (0.388)	-0.0818 (0.0722)	-0.567** (0.198)	0.0791*** (0.0160)	29.62+ (14.33)	-1.478 (1.021)	0.114 (0.0860)	0.764 (0.663)
_cons	0.293*** (0.0447)	1.724*** (0.327)	2.060* (0.886)	3.699*** (0.718)	0.487*** (0.108)	2.263* (0.866)	0.552*** (0.0461)	43.08** (11.68)	19.39** (6.720)	1.365*** (0.318)	1.882** (0.562)
N	168	168	168	168	168	168	168	168	168	168	168
R^2	0.013	0.025	0.006	0.012	0.012	0.041	0.024	0.089	0.067	0.001	0.024

Standard errors in parentheses. Driscoll-Kraay standard errors in parentheses.

+ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table A.19: RAI Multidimensional approach with EQI, 2009-2012.

This model was performed taking into account as institutional aspects the EQI

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
	INCOME	JOB	HEALTH	EDU	ENV	CE	COMMUNITY	WLB	SAFETY	LS	HOUSING
RAI_{REC}^2	0.0378*** (0.00274)	0.0254* (0.0111)	-0.0908+ (0.0453)	0.0293*** (0.00703)	0.0142* (0.00545)	0.0570 (0.162)	0.0188 (0.0163)	1.381* (0.552)	-0.0911* (0.0372)	-0.0113 (0.00908)	0.0260*** (0.00520)
EQI	-0.841+ (0.427)	-3.343 (2.065)	-26.24*** (3.482)	-6.752** (2.015)	5.443** (1.702)	-27.66** (8.734)	-1.532 (1.029)	-76.58 (122.1)	7.563+ (3.996)	2.579+ (1.390)	0.00362 (0.950)
quality	-0.422 (0.253)	0.548 (0.868)	9.479** (2.654)	3.104*** (0.516)	-2.568* (1.009)	23.31** (7.635)	1.859*** (0.386)	97.74 (138.6)	-2.948+ (1.480)	-1.116 (0.999)	-0.941*** (0.118)
impartiality	-0.00780 (0.0519)	0.426+ (0.248)	3.492*** (0.508)	0.303+ (0.158)	-1.167*** (0.270)	0.0770 (1.170)	0.972 (0.626)	15.96 (22.16)	-0.698 (0.791)	-0.627*** (0.0870)	-0.0883 (0.173)
corruption	0.535 (0.497)	2.829* (1.353)	13.99*** (1.354)	3.165* (1.356)	-2.063*** (0.479)	3.148* (1.380)	-1.457*** (0.230)	3.441 (13.64)	-4.150+ (2.090)	-0.934 (0.580)	0.556 (0.804)
_cons	0.306 (0.179)	1.314*** (0.0503)	4.822** (1.500)	1.233*** (0.104)	0.939* (0.386)	3.669 (3.143)	0.917*** (0.208)	-4.700 (3.193)	3.778*** (0.782)	1.310*** (0.136)	0.875*** (0.113)
N	168	168	168	168	168	168	168	168	168	168	168
R^2	0.252	0.075	0.055	0.093	0.093	0.058	0.104	0.043	0.022	0.021	0.063

Standard errors in parentheses Driscoll-Kraay standard errors in parentheses

+ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table A.20: RAI Multidimensional approach, 2009-2012.

This model was performed taking into account institutional aspects through the following determinant variables: corruption, impartiality, quality of governance and EQI

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
INCOME											
RAI_{REO}^T	-0.0344 (0.0248)	-0.250*** (0.0830)	-0.0353 (0.116)	-0.0447 (0.0264)	-0.110*** (0.0209)	-0.311+ (0.160)	0.00698 (0.00567)	-0.908** (0.270)	0.784*** (0.140)	-0.0839* (0.0308)	-0.0105 (0.00867)
EQI	0.250 (0.237)	-2.250*** (0.424)	-3.134 (1.835)	-0.306** (0.0909)	-0.124 (0.503)	0.926 (1.390)	-0.142** (0.0376)	4.344* (1.675)	-9.710*** (2.064)	-0.900* (0.337)	0.101 (0.118)
_cons	1.082+ (0.530)	7.056*** (1.762)	6.491 (4.981)	1.915*** (0.273)	2.640*** (0.315)	7.705* (3.119)	0.533*** (0.127)	20.94** (6.301)	-1.580 (0.939)	2.583** (0.757)	1.212*** (0.259)
N	167	167	167	167	167	167	167	167	167	167	167
R ²	0.007	0.100	0.023	0.041	0.106	0.031	0.009	0.071	0.110	0.120	0.004

Driscoll-Kraay standard errors in parentheses

+ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table A.21: RAI Multidimensional approach with EQI, 2013-2017

This model was performed taking into account as institutional aspects the EQI

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
	INCOME	JOB	HEALTH	EDU	ENV	CE	COMMUNITY	WLB	SAFETY	LS	HOUSING
RAI_{REO}^*	-0.0318 (0.0209)	-0.253** (0.0815)	-0.150+ (0.0826)	-0.0536** (0.0181)	-0.108*** (0.0282)	-0.353+ (0.179)	0.00688 (0.00521)	-0.820*** (0.199)	0.757*** (0.107)	-0.0748** (0.0198)	-0.0106 (0.00895)
EQI	2.977*** (0.766)	6.682 (7.716)	-63.28 (39.10)	-6.437** (2.012)	5.235*** (0.976)	-5.115 (12.02)	1.514 (0.901)	77.71*** (8.327)	8.058 (12.05)	11.85*** (2.996)	-0.0861 (1.683)
quality	-0.811* (0.386)	-4.935 (3.669)	7.514* (2.856)	1.358 (0.992)	-2.212*** (0.496)	-4.587 (6.853)	-0.808** (0.259)	-18.50** (4.882)	-12.71 (16.47)	-4.366*** (0.957)	0.0582 (0.762)
impartiality	-0.837 (0.493)	2.065 (1.536)	23.19 (15.15)	0.214 (0.304)	-1.353*** (0.334)	4.328* (1.607)	0.0361 (0.308)	-19.97*** (3.283)	-7.581** (2.219)	-2.414* (1.027)	0.140 (0.248)
corruption	-1.124*** (0.262)	-6.073* (2.651)	29.88 (19.59)	4.506*** (1.166)	-1.915 (1.191)	6.025 (3.949)	-0.901* (0.421)	-35.65*** (4.695)	1.452 (5.741)	-6.130*** (1.461)	-0.00277 (0.830)
_cons	1.061* (0.480)	7.161*** (1.719)	7.990+ (4.592)	2.036*** (0.193)	2.661*** (0.414)	8.397* (3.409)	0.546*** (0.118)	19.99*** (5.030)	-0.891 (1.402)	2.524*** (0.573)	1.212*** (0.248)
N	167	167	167	167	167	167	167	167	167	167	167
R^2	0.010	0.116	0.116	0.109	0.118	0.048	0.023	0.113	0.122	0.166	0.005

Driscroll-Kraay standard errors in parentheses

+ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table A.22: RAI Multidimensional approach, 2013-2017

This model was performed taking into account institutional aspects through the following determinant variables: corruption, impartiality, quality of governance and EQI

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