Department of Political Science – Chair in *European Economics*

Regional Economic Resilience in times of Austerity: An Empirical Analysis of the Regions of Southern Europe

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Index

Introduction

Following the collapse of the American investment bank Lehman Brothers in 2008, the international financial system entered serious turmoil and, by the end of 2009, the Eurozone started experiencing a second – and possibly more problematic – shock, namely the outbreak of the debt crisis, which expanded from Greece to Ireland, Portugal, Spain and later Italy. The debt crisis consisted mainly in an internationally widespread collapse of internal demand due to a crisis crunch. European leaders in the Commission and international financial institutions including the IMF and the ECB responded by demanding, as a condition for their financial support, the implementation of fiscal consolidation policies ("austerity") in the affected countries, namely Greece, Ireland, Portugal, Spain and Italy (GIIPS), which consisted in a varying combination of tax raises and cuts in government expenditure (Alesina et al., 2019). The purpose of such supply-side policy approach was to reduce public debt, restore the international competitiveness of GIIPS countries and, eventually, restore their economic growth coherently with the rationale of "expansionary austerity", whereby in certain cases a fiscal contraction is considered capable of fostering economic growth (Kitson et al., 2011; Brazys and Regan, 2017).

In the aftermath of the Global Financial Crisis and, especially, the subsequent European debt crisis, the process of Economic convergence among Eurozone countries seemed to halt, as Southern European countries emerged as the worst off compared to Northern ones – including Ireland which, as opposed to the other GIIPS countries, underwent a rapid and successful economic recovery following the debt crisis and the austerity package. At the same time, wide gaps emerged also at the regional (sub-national) level, as the crisis had significant asymmetrical effects *within* countries, where social and economic inequalities seriously expanded (Groot et al., 2001; Ballas et al, 2017). This is true also for the Mediterranean rim of EMU which, together with *national* divergence with respect to the Eurozone, also experienced internal *regional* divergence (Couadrado-Roura et al., 2016). Such situation has drawn renewed academic attention on the ability of regions to respond to economic shocks and on the pre-crisis factors that influence such ability (Cuadrado-Roura et al., 2016). The advantage of a regional perspective on the economy is that if offers a more insightful than the one that emerges from aggregate figures at the national level. Indeed, national level data do not allow to appreciate the different spatial environments where capital-labour relations develop and which might have serious implications on the way in which one region is effected by a disturbance (Hadjimichalis, 2011).

The purpose of this study is to assess the heterogeneous performance of the regions of Southern European countries (Greece, Italy, Portugal and Spain) in the aftermath of the European debt crisis shock. By adopting a regional perspective, this study offers an original perspective on the post-crisis performance of this EMU area compared to previous research by not considering it as a monolithic environment to be labelled "Southern Europe" as previous studies have done, but rather as an internally diverse in terms of economic conditions. The added value of a regional perspective is that it offers a more insightful and accurate picture of the European economy compared to the one we obtain when looking at the level of Member States. Indeed, following the austerity period, data reveals the existence of significant economic discrepancies among the regions within Southern European countries in terms, for example, of GDP per capita and employment levels.

To pursue its purpose, this work draws from the literature on "regional economic resilience" (Martin and Sunley, 2015). Originally from other research fields, such as engineering and environmental science, the notion of resilience has found broad application in the context of (geographical) economics to study how different regions weather with respect to economic disturbances. In the absence of a consolidated definition, the literature usually refers to the one provided by Martin (2012), whereby regional economic resilience is understood as the capacity of regional economies to resist to and/or recover from recessionary shocks. Regional economic resilience is a compound concept that comprises various dimensions which, according to Martin and Sunley (2015), are the following four: "resistance", which refers to the capacity of a regional economy to withstand a recessionary shock; "recovery", which refers to the speed and the extent to which a regional economy is capable of returning to pre-shock levels of development; "re-orientation", which refers to the way in which the shock fosters change in the regional economic structure; "renewal/resumption", which looks at whether the regional economy restores is previous rate of growth or gains a different one (either higher or lower).

Coherently with the most empirical studies conducted in the European context, the conceptualisation adopted here is the "engineering" one, where resilience comprises the two distinct phases of resistance and recovery. The former refers to the period when the regional economy undergoes recession following a shock, while the latter refers to the period when the regional economy again experiences positive economic growth. Then work will present an econometric analysis of the resilience of Southern European "NUTS2" regions with respect to the European debt crisis. While the concept of regional resilience has been applied essentially applied with respect to the 2008 shock (Gong et al., 2020), this research focuses on the debt crisis disturbance. This seems appropriate because after the

2008 financial crisis, the European economy had largely recovered before the debt crisis caused a second and longer recession.

This study presents two main original contributions regarding the factors that influence regional resilience in Europe by addressing two main gaps in the literature, namely, the effect of export-dependence (i.e. the importance of exports in the regional economy) on regional resilience and the effect of austerity policies on regional resilience. Indeed, regarding the former, the relevant literature seems to provide contrasting visions. On the one hand, it has been argued that trade openness increases economies' vulnerability vis-à-vis international shocks (Briguglio, 2009), while on the other, empirical studies seem to confirm that exposure to external demand positively contributes to post-shock economic recovery (OECD, 2019). Regarding the latter, there is widespread theoretical agreement that national policies play a crucial role in shaping regional economic resilience (Martin and Sunley, 2015), yet empirical studies have not addressed this issue; not by chance, further research in this respect has been often advocated (e.g. Giannakis and Brggeman, 2017).

In addition, these two gaps appear particularly interesting given the historical context of the European sovereign debt crisis. Indeed, in a context of collapse of internal demand among highly interdependent economies, it seems reasonable to wonder if the post-crisis performance differed across regions with different degrees of reliance on foreign demand for exports. Furthermore, as noted above, the main policy response to the European debt crisis was contractionary fiscal policy, with the aim at fostering economic growth by fostering exports and restoring the faith of financial markets. While various studies have shown that fiscal consolidation had a largely recessionary effect, especially in the countries of the Mediterranean rim (Greece, Italy, Portugal and Spain), it is interesting to investigate if that was the case also across the regions of Southern Europe or if the picture was more nuanced. Then, this work is interested in the policies of austerity as a tool to stimulate economic growth rather than as a tool to reduce public debt and deficit. Furthermore, this study takes into consideration that, as it has been previously argued (e.g. Monastitiotis, 2011), national policies of fiscal consolidation can interact with different regions in different ways, thereby making some of them comparatively worse off. Thus, to appreciate the potentially uneven impact of fiscal consolidation at the regional level, this study will also investigate if its effect changes based on different degrees of export-dependence. Indeed, it has been argued that higher degrees of economic openness partially offset the early recessionary impact of fiscal consolidation.

As a result, the two main independent variables investigated in this study are the regional degree of export-dependence and the regional fiscal consolidation. The latter is operationalised only in terms of cuts in regional public expenditure, due to unavailability of tax-related data at the regional level.

Another significant contribution is that, in contrast with many empirical studies of regional resilience in Europe, this work considers the two sub-dimensions of resistance and recovery separately. Following Pudelko et al. (2018), there are two complementary reasons for this approach. Firstly, resistance and recovery are conceptually different in that they refer to two inherently opposite phases that the regional economy undergoes, namely recession and upward growth. Secondly, given this clear-cut difference, it could be expected that the same determinants of resilience have different impacts across the two phases, whereby treating resilience as a "monolithic" concept risks leading to imprecise (if not wrong) conclusions. Then, in this study, resistance and recovery will be treated as two distinct dependent variables, each one with its econometric model.

In light of what has been discussed above, this work carries three significant contributions. In the first place, it offers a more nuanced (and possibly) insightful picture on the economic performance of Southern Europe by focusing on its regions. In the second place, it contributes to the literature on regional resilience by filling the gaps discussed above. In the third place, it contributes on the literature on the macroeconomic effect of austerity policies by analysing the sub-national diffusion of their impact.

The rest of this work is organised as follows. Chapter 1 is dedicated to the historical assessment of the crisis, the description of austerity measures and to the post-crisis economic situation of Southern Europe both from a national and a regional perspective. Chapter 2 introduces the concept of regional economic resilience, discusses the theoretical framework, and presents the relevant hypotheses. Chapter 3 focuses on the empirical analysis: firstly, it presents the operationalisation of the variables; secondly, it describes the multiple regression models and the moderated multiple regression models used in the analysis and, thirdly, it discusses the results and highlights their theoretical and policy implications. The last section briefly sums up and concludes.

Chapter I

This first chapter provides an historical perspective on the financial *cum* sovereign debt crisis (Brazys and Regan, 2017) that affected Europe starting in late 2009. In doing so, it also discusses the policies of austerity adopted by GIIPS countries as well as the economic asymmetries that emerged in the aftermath of the crisis, both at the national and regional levels, whereby Southern European countries emerged as the worst off (Greece, Italy, Portugal and Spain). Finally, the theoretical contribution of this work is underlined at the end of the chapter.

1. The crisis

After some first signs in 2007, the US financial crisis was eventually triggered in 2008 by the fall of the investment bank Lehman Brothers (Naert et al., 2014). Following its bankruptcy, as the international financial system entered serious turmoil with the interbank market virtually closed and the skyrocketing risk premia of interbank loans, the crisis soon became global, thereby causing a world-wide economic recession (Welch, 2011). In this context, even the economy of the European Union started experiencing worsening conditions, despite the strong growth trends it had experienced in the previous years: banks faced severe losses and, in 2008, write-down in the Eurozone were somewhere between €500 and €800 billion. In 2009, as growth halted and the unemployment rate seriously increased, the overall EU economy contracted by about 4% (Welch, 2011). The situation became particularly difficult for the periphery of the Eurozone, namely Greece, Portugal, Spain, Ireland and later Italy which, in the previous years of economic growth had accumulated large sums of public and private debt, which was associated to serious current account imbalances and a boom of domestic credit, coupled with loose fiscal policy (Lane, 2011). In a moment of historical financial turmoil, these countries – that started being referred to as GIIPS – grew increasingly vulnerable in the eyes of the international creditors, as they questioned their solvability with respect to their international financial obligations (Naert et al., 2014). In a first moment, in order to counteract the recessionary effects of the crisis, European leaders responded by adopting anti-cyclical measures consisting in expansionary fiscal policy based on budget deficits to sustain demand, which further deteriorated the public finances of GIIPS countries (Naert et al., 2014). Indeed, from 2009 onwards, financial markets progressively lost confidence in the sustainability of their levels of deficit and debt, which led to large increases in the spreads of GIIPS countries as the annual yields of their government bonds rose consistently (Figure 1) and their financial credibility further deteriorated (Naert et al, 2014). About one year later, the distress of the financial systems of these countries, the credit crunch, the serious decline of foreign investments and their domestic consequent economic recession

ultimately resulted into what is known as the European sovereign debt crisis (Lane, 2011). In the literature regarding the causes of the crisis, a generally recognised crucial issue in explaining the dynamics of the debt crisis was the vicious cycle between banks and public debt, whereby, in debt countries in particular, banks held very large shares of public debt and, at the same time, governments faced the pressing need to save domestic banks in order to avoid disastrous consequences for their economies (Naert et al., 2014). This aspect is crucial in understanding the further deterioration of public finances – which is in turn related to the subsequent adoption of austerity policies – as the bailout costs that governments of GIIPS countries had to sustain were huge; for example, as of 2011, in Ireland the cost was almost 30% of 2010 GDP, 5% of 2010 GDP in Greece and 2% of 2010 GDP in Spain (Kitson et al, 2011). Overall, it can be argued that, in the Eurozone, the 2008 financial crisis interacted with high debt levels of the mentioned countries, which had accumulated it during the earlier years of economic improvement, thereby provoking a sovereign debt crisis and the consequent economic recession (Alesina et al., 2019). In some of these countries, like Italy and Greece, public debt was already high when the international financial system entered the crisis. In others like Spain and Ireland, as it has been shown above, the level of public debt was relatively low, in contrast with the large sums of private debt that related to inflating real-estate bubbles which, in turn, had been a major source of government revenues. However, when the international financial crisis begun and such bubbles consequently burst, the governments of these private-debt countries were forced to intervene to shield their economies, which led to the deterioration of their public finances and the accumulation of public debt (Naert et al., 2014; Alesina et al., 2019).

Looking more closely at the dynamics of the crisis, the turning point in the unfolding of the events was when, following the general elections of October 2019, the new Greek government revised its budget figures revealing worrisome deficit forecasts, which corresponded to a serious violation of EMU's fiscal rules (Lane, 2011). In addition, it was revealed that Greece had never met the convergence criteria required to join the EMU. Indeed, at the moment of its entrance in the EMU, Greece had provided wrong data regarding its debt and deficit levels: rather than below 3% of GDP as required, the Greek budget deficit was about 15% of GDP, largely owing to excessive expenditures, fiscal evasion and wrong predictions about future tax revenues (Alesina et al., 2019). When the real numbers were announced in 2009, financial markets lost their confidence, which led Greece into a triple crisis: a public debt crisis, a banking system crisis and a sudden stop of capital inflows (Gourinchas et al., 2017; Alesina et al., 2019).

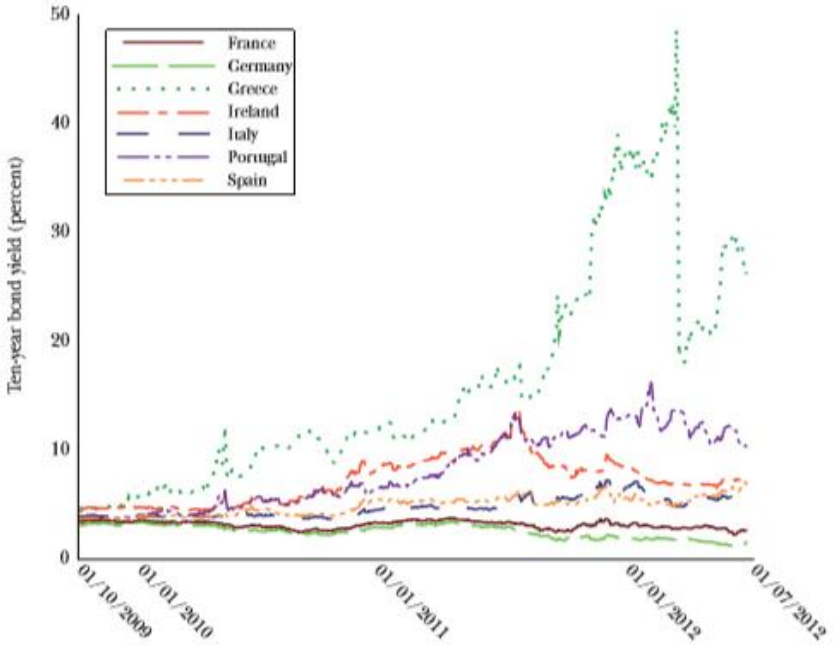


Figure 1. Yields on ten-year government bonds October 2009 – June 2012 (Lane, 2011)

In April 2010, Greek spreads were above 600 bpts and the country was paying about 10% interest rates on 10-year government bonds (Naert et al., 2014). According to Alesina et al. (2019) from the half of the 90's until the financial crisis, Greece had experienced remarkable economic growth, with an average growth rate in GDP per capita of about 4% between 2000 and 2007. This was largely due the expansionary fiscal policy, which allowed salaries to increase faster than productivity levels, meaning a loss in terms of international competitiveness and a progressive deterioration of public finances. In the following months, the crisis expanded beyond the Greek borders, as financial markets increasingly questioned the sustainability of the budgets and the solvency capacity of the other GIIPS countries, which were indeed characterised by high levels of debt – either public or private – and vulnerable financial systems (Naert et al., 2014). The crisis reached first Ireland and Portugal, which were shut out of the bond market respectively in November 2010 and April 2011. Indeed, in 2010, spreads in Portugal and Ireland skyrocketed, provoking a sudden stop of capital inflows from abroad similarly to what had happened in the Greek case; soon after, they were followed by Spain and Italy in 2012 (Lane 2011; Naert et al., 2014). The Irish economy had enjoyed sustained growth for the 20 years before the 2008 crisis. However, as the salaries grew steadily – to the detriment of the international competitiveness of the country – this positive economic trend had grown increasingly dependent on a real estate bubble which was fuelled by an expansion of credit. When the bubble burst, the government intervened by providing bank bailouts and by adopting anti-cyclical measures to counter the economic recession, thereby further deterioration public finances and, overall, public debt

raised from 24% in 2006 to 120% in 2012 (Alesina et al., 2019). Following the sudden stop of foreign financial inflows as a result of the unsustainability of the country's external debt – related to a deterioration of the balance of payments – Portugal was unable to borrow through operations on the sovereign bonds market until 2014 (Monastiriotis et al, 2013; Alesina et al, 2019). As in the Irish case, private debt played a crucial role in the Spanish crisis. Indeed, according to Alesina et al (2019), in the decade before the crisis, Spain experienced remarkable rates of growth which owed to a large extent to a real estate bubble inflated by cheap loans from Eurozone banks (especially German and French) to local banks. When the financial crisis reached Spain causing a sudden retrenchment of credit, banks faced huge losses as debtors were unable to repay their loans and the value of real estate assets fell. According to Monastriotis et al. (2013), the collapse of the real estate bubble hit especially those labour-intensive sectors, such as manufacturing, that had been the main responsible for Spanish rising rates of GDP and employment growth. Starting in 2011, the country experienced increasing rates of unemployment and deterioration of public finances, as the government had lost a major source of revenues and it had to intervene by bailing out banks in difficulty order to prevent a collapse of the whole economy (Monastiriotis et al 2013). As for Italy, the 2008 global financial crisis hit the country's already slow-growing economy and, causing a GDP loss of 5.5% in 2009 and a rise of more than 8% in the unemployment rate in the same year. In the next few months it appeared that Italian economy had begun a mild recovery but, after the Greek crisis, the trust in the sustainability of the largely accumulated Italian public debt deteriorated so as to provoke a sudden stop of capital inflows: interest rates of Italian sovereign bonds increased from 5% in June 2011 to 7% in November 2011 (Alesina et al., 2019).

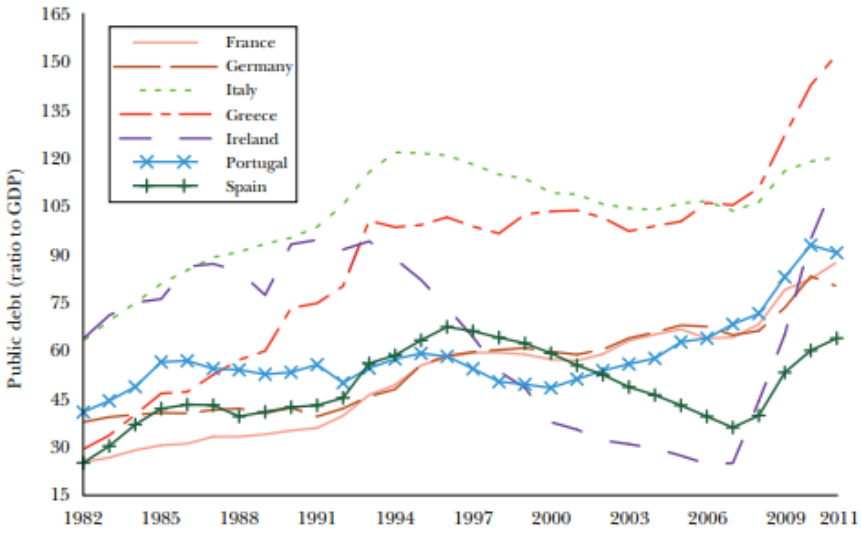


Figure 2: Public debt dynamics in selected European countries (Lane, 2019)

	Loans to private sector from domestic banks and other credit institutions (percent of GDP)		
	1998	2002	2007
Greece	31.8	56.5	84.4
Ireland	81.2	104.4	184.3
Portugal	92.1	136.5	159.8
Spain	80.8	100.1	168.5
Italy	55.7	77.3	96.5
Germany	112.2	116.7	105.1
France	81.0	85.6	99.3

Figure 3: Private debt dynamics in selected European countries (Lane, 2019)

2. Fiscal consolidation

The debt crisis marked a turning point in terms of policy approach. In fact, if right after the 2008 crisis European countries embarked in anti-cyclical measures to sustain demand coherently with the paradigm of Keynesian economics, a few years later, as a response to the sovereign debt crisis, European leaders pressured for the implementation of pro-cyclical fiscal consolidation ("austerity") policies (Naert et al., 2014).

2.1 Theoretical aspects

Before focusing on the historical aspects of austerity in the context of the European debt crisis, it is first useful to useful to assess the concept of austerity from a theoretical point of view. According to Alesina et al. (2019), the term "austerity" refers to fiscal consolidation, namely those fiscal policies that aim at a substantial reduction of public deficit and debt, which can be achieved either through cuts in public expenditure, increases in taxes – direct and indirect – or a combination of both. An episode of fiscal consolidation consists in a period of fiscal adjustments, where the beginning and the ending are identified by changes in the primary balance (cyclically adjusted); the length of the episode corresponds to the years between the above mentioned thresholds, whereas its size is understood as the cumulated improvement in the primary balance; the intensity of the consolidation is then given by the ratio between the size and the length, namely the average improvement of the primary balance in a unit time period (one year) (Molnar, 2013). Austerity finds it roots in the German economic doctrine of "Ordoliberalism" of the Freiburg school of economics in the 1930s, which emphasises the role of the state as a rule setter for the enhancement of competition and the smooth functioning of the

economy (Blyth, 2013). One of the main principles that uphold the idea of austerity policies is that, in general, national governments should aim at achieving balanced budgets in order to have the necessary resources to intervene to sustain the economy in the case of unforeseen hard times and/or exceptional circumstances, such as economic recessions, wars and natural catastrophes (Alesina et al., 2019). A second criterion that informs the logic of fiscal consolidation is that public finances need to be in order because excessive budget deficits may sometimes generate unsustainable levels of public debt that cannot be reduced only with economic growth and, in turn, high levels of debt represent a risk for countries' accessibility to international financial markets (Alesina et. al, 2019).

2.2 The rationale of fiscal consolidation

As the debt crisis spread, Greece and the other affected countries mentioned above were required by European leaders of creditor states to implement pro-cyclical austerity measures to reduce public deficits and debt, with the man aim of preventing their default and the potential break-up of the Euro area (Naert et al., 2014; Brazys and Regan, 2017). Starting in 2010, via explicit or implicit conditionality for their financial support (Perez and Matsaganis, 2018), the European Commission (EC), the European Central Bank (ECB) and the International Monetary Fund (IMF) pressured the national governments in Greece, Portugal and Ireland, as well as in Italy and Spain later on, to carry out tax raises and public sector cuts at both the national and local levels in terms of support for public services, investment in infrastructure and welfare expenditure (Kitson et al. 2011). In this way, these powerful international institutions fostered the adoption of what has been described as a "one-size-fit-all" policy in different countries as it was believed that they were undergoing essentially the same kind of crisis related to a deterioration of public finances and a loss in competitiveness (Boyer, 2012; Brazys and Regan, 2017). The factors behind the choice of such policy approach are various, as pointed out by the relative literature. They ranged from the influence the ordoliberal economic doctrine (Blyth 2013), to the imbalance of power in favour of creditor states (Blyth and Matthijs 2015), to the intention of shielding the banks of creditor states from serious losses (Thompson 2015) and even to a certain moral interpretation regarding macroeconomic imbalances according to which the current account surpluses of creditor states were considered an example of economic virtue whilst, on the contrary, deficits of debtor states were deemed to be a sign of economic vice (Perez and Matsaganis, 2018).

In this supply-side narrative, the main rationale was that austerity would have allowed debt countries not only to reduce their external debt, but also to resume economic growth according to the neoliberal

paradigm of "expansionary fiscal contraction"[1], (Kitson et al., 2011; Brazys and Regan, 2017; Botta and Tori, 2018; Perez and Matsaganis, 2018). More precisely, fiscal contraction pursued a strategy of internal devaluation aiming at restoring the level of international competitiveness of GIIPS countries, which was considered crucial to exit the crisis (Boyer, 2012; Matsaganis, 2014; Matthijs, 2015; Bista, 2001; Brazys and Regan, 2017). According to this view, the reason why the GIIPS countries were not able to weather the crisis was their lack of international-cost competitiveness, which was due to a combination of decreases in productivity, increases in wages and financial profligacy in the years preceding the crisis (Storm and Naastepad, 2014). To be sure, these were deemed to lie at the very foundation of the debt crisis because, so the argument went, previous decreasing competitiveness and fiscal expansion had led GIIPS countries to running large current account deficits, which caused increasing levels of external debt and, in turn, brought them into a crisis of (private and public) debt (Storm and Naastepad, 2014). In this Darwinist perspective, Germany was considered the role model for a competitive and "healthy" economic system, whereas GIIPS countries were seen as weak economies that had lost the necessary international competitiveness to deal with the crisis due to economic mismanagement in the previous decades (Figure 4) (Storm and Naastepad, 2014).

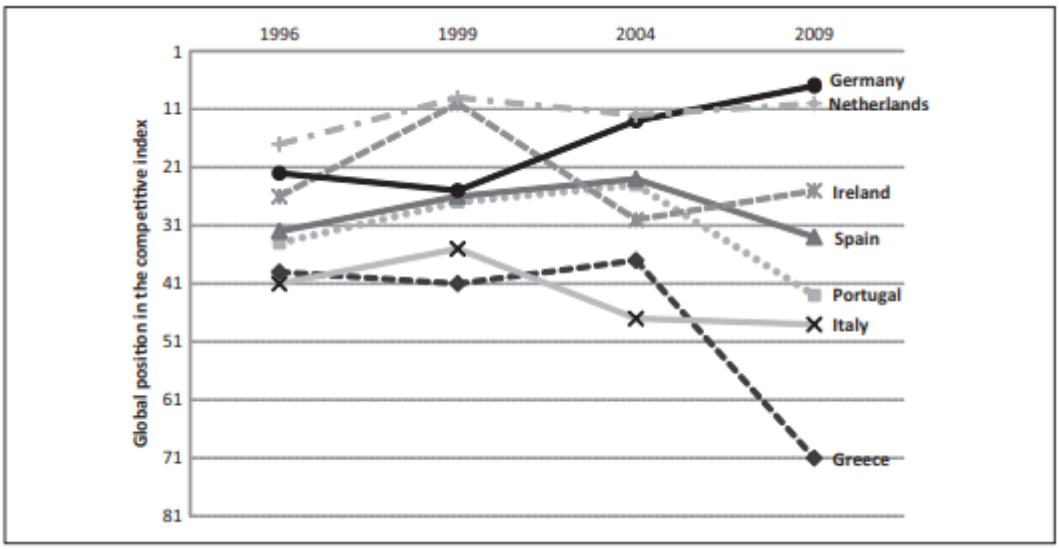


Figure 4: Ranking of selected European countries in terms of global competitiveness (Hadjimichalis, 2011)

[1] The concept of "expansionary fiscal contraction" will be discussed in further detail in Chapter 2.

This neo-liberal narrative did not only dominate the analysis of the roots and dynamics of the crisis, but also the formulation of policy responses, leading to the promotion of fiscal consolidation. Indeed, based on an understanding of the crisis in terms of loss in competitiveness, the solution followed suit: peripheral countries needed to implement contractionary fiscal policy to re-establish their international competitiveness and the trust of financial markets. Overall, Northern surplus countries promoted a line of argument whereby GIIPS' "irresponsible borrowing" was responsible for their crisis and that it was time for them to re-balance their economies via fiscal consolidation[2] (Matthijs, 2014).

2.3 Fiscal consolidation in GIIPS countries

To be true, while on the one hand fiscal consolidation measures were premised on the same supply-side criterion and pursued similar purposes – namely to bring public finances back in order and resume growth – on the other hand, they still displayed very significant differences across GIIPS countries, especially in terms of their magnitude and design, which often depended on national politics as well as on the specific features of the crisis in the respective domestic environments (Perez and Matsaganis, 2018). Indeed, Alesina et. al (2019) classify GIIPS countries according to the policy composition of their respective fiscal consolidation based on the dichotomy introduced above, according to which austerity can either be tax increase-based or spending cuts-based (or varying degrees of both). Although every country implemented a mix of both, measures in Ireland, Portugal and Greece were still predominantly based on cuts in public expenditure, whereas in Spain and in Italy they mainly consisted in tax raises (Alesina et al., 2019). Below, I will briefly discuss austerity policies in every country concerned.

In Ireland, austerity policies were implemented throughout the 5 years from 2010 to 2014 and, eventually, the size of the total fiscal correction was about 15% of GNP – meaning an intensity of 3% every year (Alesina et al., 2019). More precisely, spending cuts added up to about 11% of GNP, compared to a much smaller rise in taxes which amounted to about 4% of GNP. The fiscal consolidation started in 2009 – with tax raises – as a condition for financial support from the IMF and the EU. Then, from 2010 onwards until the end of the period, austerity measures regarded essentially spending cuts, which largely consisted in reduction of government transfers and current expenditure (Alesina et al., 2019), while the much more moderate tax increases came mostly in the form of indirect

[2] To be sure, there is now widespread agreement that the root of the debt crisis did not lie in the decreasing competitiveness of peripheral economies, but rather on structural macroeconomic imbalances within the EMU (Storm, 2014; Regan, 2017).

taxes such as VAT (Monastiriotis et al., 2013). The progression of the consolidation amounted to about €2.5 billion in 2010; almost €6 billion in 2011; more than €1.5 billion in 2012 and over €2 billion both in 2013 and 2014 (Alesina et al., 2019). In Spain, fiscal consolidation begun in 2009, although most of the measures were implemented between 2010 and 2014, for an overall size of about 12% of the country's GDP where, more precisely, spending cuts were about 5% and tax raises about 7% of GDP. (Alesina et al., 2019). Between 2010 and 2011 fiscal consolidation measures mainly consisted of VAT increases, cuts in public sector salaries, cuts in public investment and in current expenditure and they corresponded to a total of over €26 billion of government savings. In 2012, new policies included increases in direct taxes, cuts in current expenditure, in healthcare and education, in government transfers and in unemployment benefits, exceeding €27billion of total worth. In 2013 fiscal consolidation amounted to about €18 billion and the main measures consisted in tax increases while, in 2014 over € 10 billion were saved especially through further cuts in current expenditure (Alesina et al., 2019). In Portugal, fiscal consolidation started in 2010 and lasted until 2014 and its overall size was over €15 billion, which corresponded to about 17% of GDP, where spending cuts were equal to about 10% of GDP and tax raises to about 7% (Alesina et al., 2019). In May 2011, the Portuguese government extended the austerity programme by signing a Memorandum of Understanding with the EU and the IMF that established the conditions in exchange for €78 billion of loans (Monastiriotis et al., 2013). The main part of the agreement concerned the banking sector and provided for state-funded bank recapitalisations and for the reduction of bank credit (Monastiriotis et al., 2013). Other measures regarded some increases in VAT and property taxes as well as public service fees (including hospitals, courts and highways); these were accompanied by freezes in public sector hires and promotions. Following the MoU, other fiscal consolidation policies included cuts in public sector wages and pensions as well as further raises in taxes (Alesina et al., 2019). In Italy, fiscal consolidation seriously begun with the technical government that took office in 2011, following the collapse of the previous one under the pressure of the crisis, and lasted until 2012 with the goal of restoring the trust of financial markets (Alesina et al., 2019). The consolidation effort amounted about 6% of GDP, more than half of which (about 55%) consisted in tax increases. The main issue of the agenda for the reduction of public spending has been a pensions reform, which aimed at a serious reduction of the public expenditure for the pension system in the short-run and at ensuring its sustainability in the longer term (Monastiriotis et al., 2013). Other sectors were cuts were carried out included education, healthcare and public sector compensations, while the revenue side of the austerity package consisted both in increases of total revenues and in corrections of the distortions in the tax system, including tax evasion (Monastiriotis et al., 2013). Among GIIPS countries, Greece was a particularly special case because it experienced the toughest of all austerity

plans, which run from 2010 to 2014 and which was largely necessary in order to receive financial support from Troika institutions. The country implemented a fiscal consolidation that amounted to about 20% of GDP and that was mostly based on spending cuts (12%) vis-à-vis tax increases (8%). Indeed, debt restructuring had been excluded in to prevent the disastrous consequences of a potential Greek default for the other vulnerable GIIPS economies as well as for other EMU countries – especially France and Germany – whose financial systems enjoyed large credits towards Greece (Alesina et al., 2019). Some austerity measures were already introduced in 2010 before the first bailout, including freezes in recruitments of central government personnel, increases in direct taxes and relatively moderate reductions of public expenditure (Monastiriotis et al., 2013). Later, much harsher measures were implemented as a condition for financial support from Troika: indeed, the first bail out occurred in 2010 and it required actions for 59% cuts in public expenditure and 41% of tax increases (Alesina et al., 2019). More precisely, wages and salary bonuses were seriously reduced, VAT was raised to 23% and coupled with further levies on various items, including luxury goods, inelastic expenditures such as alcohol, cigarettes and fuel, property and profits; at the same time, public expenditure and public investment were drastically reduced and, in addition, the MoU also provided for an overhaul of the pension system (Alesina et al., 2019). Towards the half of 2011, the Greek government pursued fiscal consolidation even further, mostly relying on tax/revenue-based measures. As a new agreement for a second bailout was reached, in early 2012, the government introduced the so-called "Midterm package", which provided for further raises of property taxes and a series of cuts in social benefits – including health and social security. Overall, the three-year period from January 2010 to January 2013 witnessed a total decline in pensions and public sector-related pay of 25% on average, a total increase in tax rates of over 20% and freezes in public sector recruitment; at the same time, private sector wages decreased by more than 15% cumulatively (Monastiriotis et al., 2013).

2.4 The economic outlook at the national level

After having described the specific austerity plans, I now turn to the assessment of the economic outlook of the countries under analysis during and after the period of austerity.

In Ireland, 2008 marked the first year of a recession that reached its deepest point in 2009; then it slowed down until 2012; in 2013, the country's GNP rate of growth was again positive at 4.3% and 8.9% in 2014 (Alesina et. al, 2019). Production per capita went from 2.3% in 2009 to almost 2.3% in 2011. Between 2012 and 2013 it decreased significantly while, in 2014, it rebounded upwards beyond 4.3%. Consumption levels, instead, suffered a prolonged downturn until 2014, when their growth rate

was again positive (Alesina et. al, 2019). In Spain the recession started in 2008 – although signs of economic contraction were evident already in 2017 – it reached its lowest point in 2009 when the rate of growth was equal to – 4.5% and it ended in 2014, when the rate of growth was again positive and much higher compared to the other Mediterranean countries (Alesina et. al, 2019). In Portugal, the recession started in 2009 when the growth rate of GDP per capita was equal to – 3%; then, after a significant improvement in 2010 with a GDP per capita growth of 1.8%, the situation worsened again between 2011 and 2012, when GDP per capita fell to – 3.7% at its lowest point. Eventually, the economy begun recovering in 2014 (Alesina et. al, 2019). In Italy, the recession was at its deepest point in the second trimester of 2012, when the rate of growth of GDP per capita was – 3.2% and it remained negative until the end of 2013. At the same time, also the rates of consumption and investment decreased, reaching the lowest level of – 3.1% and – 9.4% respectively in 2012. Italian recovery only started in 2015, when the rate of growth was again positive albeit small (Alesina et. al, 2019). On its side, of all the austerity countries, Greece suffered the harshest recession, which reached its nadir in 2011, when the rate of growth of GDP per capita was about – 9% and which averaged about – 6.4% in the following two years. This period of strong negative growth lasted until 2014, when the rate of growth of GDP per capita was again positive although rather low at 0.37% (Alesina et. al, 2019). During the austerity years, Greece lost all the economic wellbeing that it had gathered during the pre-crisis years of economic growth, with a particularly prominent reduction of the investment level (Alesina et. al, 2019). Overall, when adopting a state-based approach, it is possible to draw two main conclusions regarding the situation of the real economy of GIIPS countries during the years of fiscal consolidation, namely the divide between Ireland and Mediterranean Europe on the one hand and, more broadly, the divide between Northern and Southern Eurozone.

As shown by Figure 5, it clearly appears that the Irish experience of recovery was remarkable compared to the other Mediterranean countries, where recession lasted much longer and where, later, the rates of positive economic growth were never quite as large. Indeed, following the implementation of its programme of fiscal adjustment and financial sector repair, Ireland started experiencing rising employment levels and became one of the fastest growing European economies, not only surpassing the rate of growth of Italy, Greece, Portugal, and Spain but even the EU average already in 2011[3] (Brazys and Regan, 2017).

[3] While this success was originally attributed to the successful implementation of fiscal consolidation, the empirical literature has pointed at the key role played by the Irish peculiar growth model which is largely reliant and on its capacity to attract foreign direct investments (Brazys and Regan, 2014 and 2015), which reveals a more nuanced picture regarding Ireland unique recovery in the aftermath of the debt crisis.

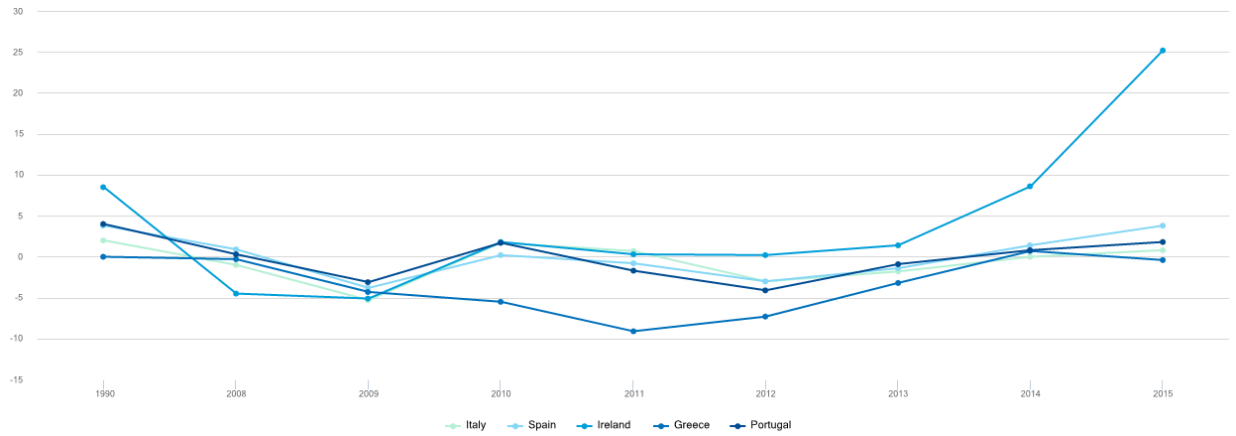


Figure 5. Yearly GDP % growth in GIIPS countries, 2008 – 2015

Source: World Bank

At the same time, this process of divergence among GIIPS countries added-up to a broader process of European "economic disintegration" in the Eurozone that begun in 2008, when the process of economic convergence that had characterised the Eurozone countries seemed to halt (Bolea et al., 2018; Alcidi, 2019; Grabner et al., 2020). In this context, a clear North-South divide appeared in the Eurozone, whereby, since the aftermath of the financial crisis, Southern Europe – Greece, Italy, Portugal, and Spain – has shown consistent weaker rates of growth and economic underperformance compared to the Northern EMU countries (Ballas et al., 2017; Alcidi, 2019). Indeed, according to Ballas et al. (2017), both the crisis and the policies of fiscal consolidation were also responsible for the poverty increases in Southern Europe. According to House et al. (2019), while the crisis provoked a serious and synchronous contraction of (almost) all national economies in Europe, in its aftermath their economic performance was highly diverse. The recovery experience has been much less successful in the case of Southern European countries compared to Northern European ones – with Greece laying at the lowest end of the spectrum in terms of GDP growth. While the former have progressively fallen behind the latter for the last 20 years, the decade that followed the 2008 crisis has accelerated this trend and it can be considered a lost decade for the Southern European economies, whose growth rates remained rather low (Kapeller et al., 2019). This critical socio-economic divide emerges clearly from various economic figures. By 2012, Mediterranean countries were all undergoing recession again., with Greece beginning in 2009, Portugal in 2011 and Spain and Italy in 2012. On the other hand, Germany's economy saw a strong growth rate of 3.1% in 2001, which was

followed by continued – albeit milder – economic expansion in the following years (Matthijs, 2014). Despite fiscal consolidation, the recession was accompanied by increasing debt-to-GDP ratios between 2007 and 2013: they rose from 2007 to 2013: in the Greek case, it went from 107.2% to 175.7%; in the Italian case, it went from 103% to 132.3%; in the Portuguese case, it went from 68.3% to 123.6%; in the Spanish case, it went from 36.3% to 93.7% (Matthijs, 2014). Given the deteriorating economic situation, Mediterranean countries experienced large losses in terms of employment while, the opposite was true for Germany. For example, in 2013, the unemployment rate in Greece and Spain reached about 29%, in Portugal 17.4% and in Italy 12.5%. In the same years, the unemployment rate in Germany reached an historical low of 5.5% (Matthijs, 2014). The picture of unemployment was even more discouraging if put in the perspective of trends in youth unemployment. Indeed, between 2007 and 2013, the unemployment rate for people under 25 years of age had gone from about 18% to about 56% in Spain; form about 23% to about 57% in Greece; from about 16.5% to about 37% in Portugal, and from about 20% to about 40% in Italy (Matthijs, 2014). Again, by contrast, your unemployment in Germany declined significantly from about 12% to about 7.5% over the same period of time (Matthijs, 2014). All this translated into a serious deterioration in the levels of personal economic well-being in all Southern European countries, meaning an increase in the risk of (child) poverty. The widening North-South economic gap was also evident in citizens public opinion, as revealed by the EU Commission's Eurobarometer surveys. Indeed, in 2013, the overwhelming majority of the citizens of Mediterranean countries considered the economy of their respective country to be in "bad" conditions, whereas the majority of North EMU countries considered the economy of their countries to be in "good" conditions (Matthijs, 2014).

3. A regional perspective

When it comes to the analysis of how economies react to exogenous shocks – namely, unpredictable events that alter fundamental macroeconomic variables – studies generally adopt a national perspective rather than a regional one and; indeed, most of the analyses of the impact of the debt-crisis have been country-based (Dijkstra et al., 2015; Pontarollo and Serpieri, 2018). However, as it will be shown below, a regional perspective can offer a more insightful picture of economic dynamics by highlighting the geographical nuances within states, which are often concealed by country-wide average data.

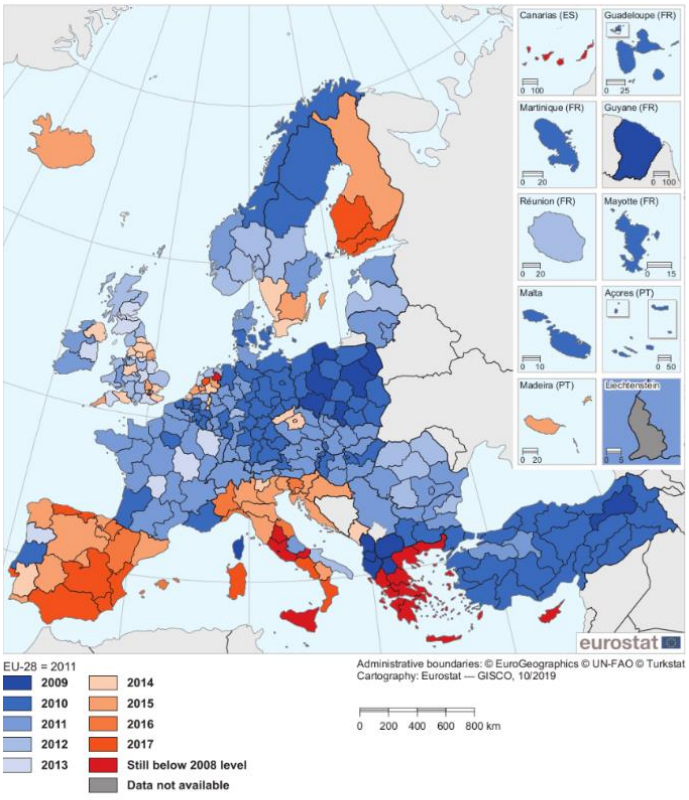
3.1 The economic outlook at the regional level

While the discussion above emphasised national disparities in the Eurozone following the debt crisis, there have also been significant asymmetric consequences at the level of regions and cities *within* Southern European countries (Groot et al., 2011; Cuadrado-Roura et al., 2016). Before going into further detail, it is first useful to look at the regional economic trends in the Eurozone before the debt crisis. In this way, two main issues can be observed. In the first place, a North-South gap was evident, whereby regions in Southern European countries were generally lagging behind the rest of Eurozone regions. Indeed, while some Southern European regions had succeeded in converging towards Eurozone average standards[4]., significant economic asymmetries remained, as a large share of low-growth regions (i.e. with a GDP growth lower than 75% of the European average) were located in the South (Hadjimichalis, 2011). In the second place, there were significant asymmetries also *within* Southern Europe, as this process of convergence with EU-average standards did not characterise all regions at the same degree (Cuadrado-Roura et al., 2016). Indeed, Italy was still experiencing the historical gap between regions in the north of the country and regions in the south ("Mezzogiorno"); in the case of Portugal there was significant asymmetry between the Portuguese regions of Azores and Madeira with the rest of Portugal (Cuadrado-Roura, 2016). Similar contrasts could be found also in Spain and Greece. In the former, the best performing regions were located in the North of the country (including Aragón, Asturias, Basque Country and Galicia), while at the other hand of the spectrum lied Andalusia and Canary Islands. In the latter, Athens, Central Macedonia, and the Ionian Islands had proved significantly more dynamic with respect to the rest of the country (Cuadrado-Roura et al., 2016).

Given this background, the debt-crisis and the policies of fiscal consolidation caused a further expansion of the above-discussed pre-existing gaps among the regions of the Eurozone, both *across* the North-South divide and *within* Southern Europe (Cuadrado-Roura, 2016). In the first place, the North-South divide increased because the largest economic declines were experienced by the regions of the Mediterranean rim (Ballas et al., 2017). Indeed, as shown by the maps reported below, it

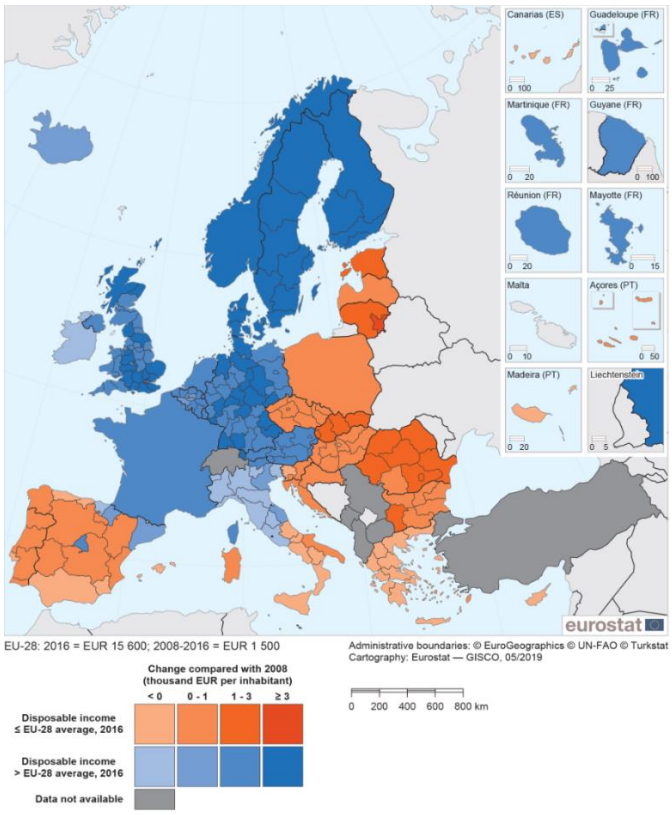
[4] Such economic convergence of regions of Southern Europe much to EU regional policy (Hadjimichalis, 2011). Indeed, they were particularly effective in stimulating growth in the largely agricultural regions of Southern Italy, in Canarias, Extremadura, Aragon and Navarra in Spain, in Algarve, Norte and Alentejo in Portugal, and the in the northern Aegean islands, Crete, the Ionian Islands and Eastern Macedonia and Thrace in Greece (Hadjimichalis, 2011).

appears that the highest losses in terms of GDP per inhabitant mainly found in the regions of Southern Europe (Map 1); a similar pattern is confirmed also in terms of household incomes and employment. These trends were accompanied by increases in rates of social exclusion and poverty, especially in Greece and Spain (Cuadrado-Roura et al., 2016). Making the picture even more complex, the increasing North-South interregional gap was also due to the impact that the debt crisis had on regional finances, in that, many local administrations saw an increase of their level of indebtedness vis-à-vis the central government due to the austerity-induced decline in local revenues (Angello et al., 2016). In turn, this reduced spending capacity in a moment when it was needed the most in terms of essential services, including health, education and social services, has not only exacerbated regional disparities, but contributed also to increasing economic, social and political tensions in the four Southern European countries (Rodriguez-Pose and Sandall, 2008). In the second place, the regional asymmetries *within* Southern Europe are particularly evident when looking at the highly heterogeneous rates of regional post-crisis recovery (Bristow et al., 2014; Alessi et al., 2018; Pontarollo and Serpieri, 2018), as confirmed by the maps reported below.



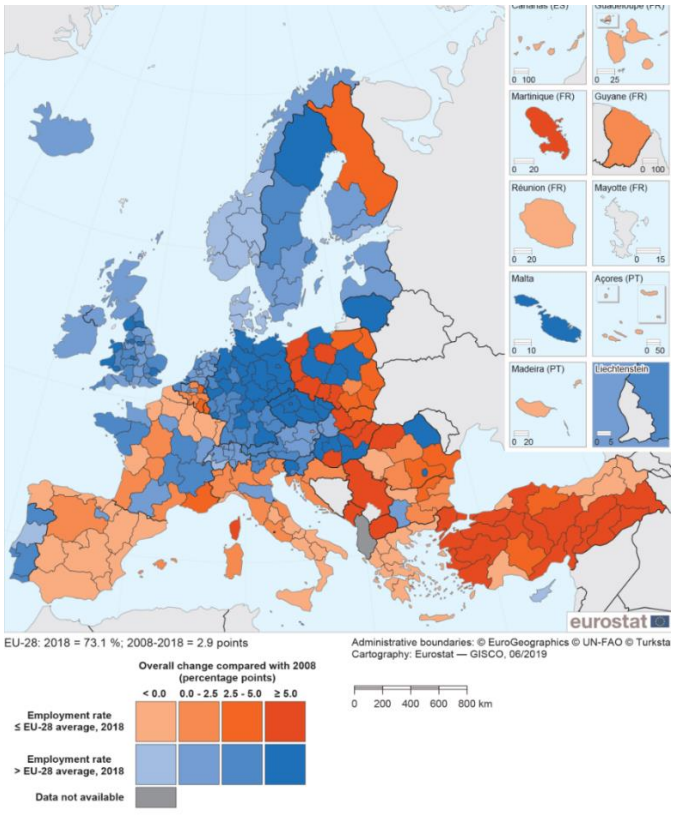
Note: Makroregion Województwo Mazowieckie (PL9), NUTS level 1. Switzerland and Serbia: national data. Germany, Ireland, Croatia and Slovakia: estimates. France, Lithuania, the Netherlands and Poland: Eurostat estimates. Greece, Spain, Cyprus, Romania and Albania: provisional. Romania: break in series.
Source: Eurostat (online data codes: nama_10r_2gdp and nama_10_pc)

Map 1: GDP per inhabitant, pace of economic recovery since 2008 by NUTS 2 region – first year after the crisis when GDP per inhabitant in PPS was above its 2008 level. (Source: Eurostat, 2020)



Note: Ireland, France, the Netherlands, Poland and Norway, national data. Lithuania: 2010-2016. Iceland: 2008-2014. Germany: estimates. Greece, Spain and France: provisional. Romania: break in series.
Source: Eurostat (online data codes: nama_10r_2hhinc, nasa_10_nf_tr and nama_10_pe)

Map 2: Private household disposable income – percentage change between 2008 and 2016 (Source: Eurostat, 2020)



Note: Közép-Magyarország (HU1), Makroregion Województwo Mazowieckie (PL9), London (UKI) and Scotland (UKM), NUTS level 1. Ireland, Lithuania and Serbia: national data. Slovenia and Serbia: 2010-2018. Montenegro: 2011-2018. Breaks in series for a majority of regions (too many to document).
Source: Eurostat (online data code: lfst_r_lfe2emprtn)

Map 3: Employment rate – percentage change between 2008 and 2018 (Source: Eurostat, 2020)

In terms of GDP per inhabitant (Map 1), Eurostat data show that the years needed for regional economies to recover largely varied in Italy, Spain and Portugal, whilst in Ireland and Greece the situation has been more homogeneous, with all of the Irish regions recovering by 2012 and all of the Greek regions still being below pre-crisis levels (with 2008 being the reference year) in 2017. Also, looking at the Mediterranean countries, by 2014, only 4 Italian regions and 3 Portuguese regions had returned to pre-crisis levels. In terms of private household income in Mediterranean countries (Map 2), namely the amount of money available to families net of taxes and contributions, Eurostat data show that, in 2016, 11 of the 13 Greek regions where still below pre-crisis 2008 levels, whilst Portuguese regions showed an increase in the level of disposable income, apart from 1, that experienced an overall loss from 2008 to 2016. In Spain and Italy, the picture was more nuanced. In the former, most regions had recovered while a minority had not, while in Italy the opposite happened as, by in 2016, all regions had a lower level of disposable income to 2008 except for 4; regional data are unavailable for Ireland. In terms of employment (Map 3)**,** with reference to the population between 20 and 64 years of age, Eurostat data show that, in Greece, all regions experienced an overall rise in the unemployment rate in the ten years between 2008 and 2018, meaning that none of them had recovered as for employment. In the other Mediterranean countries, the picture is again more nuanced. Indeed, in 2018 in Portugal all regions but one had restored their pre-crisis rate of employment; all Spanish regions except for two were still below 2008 employment levels and, in Italy, the rate of unemployment was still higher than in 2008 in the Southern regions and Sicily, whilst almost all regions in the Centre-North experienced upturns in the employment rates, except for two.

This heterogeneity in regional post-crisis performance *within* Southern European countries is confirmed also by empirical studies. For example, in Spain, Cuadrado-Roura and Maroto (2016) find that the recovery path of Spanish regions has been highly diverse. Indeed, they argue that regional economic disparities widened as certain regions were sufficiently flexible to adapt to the shock, whilst others were instead strongly and more permanently damaged by the crisis – which was especially true for regions specialised in the construction industry (Cuadrado-Roura and Maroto, 2016) and for those with lower levels of human capital (Martinez et al., 2019). In Italy, Mazzola et al. (2018) find that the regions showing better post-crisis performances were those characterised by high-levels of intangible capital, such as human capital, institutional-relational capital, and entrepreneurial capital. At the same time, Lagravinese (2015) shows that the Italian regional economies that were largely based on the manufacturing and construction industries suffered more during the crisis and that the Italian North-South divide has widened as a result of better post-crisis regional performance in the North than in the South of the country. In Greece, Psycharis et al. (2014) confirm a significant asymmetry in terms of regional post-crisis performance, with the islands of South Aegean Sea being the better off and the

Athens's region of Attiki being the worst-off. As a possible explanation, the authors look at sectoral composition of regional economies and find that, differently from Attiki, Southern Aegean Islands had specialised in the tourism industry, which has proven to be one of Greece's most resilient sectors. Overall, the least resilient regions have been mountainous and border prefectures; at the same time, regions with a highly urbanised regions with relevant ties to the international economy such as Attiki and Thessaloniki proved comparatively less resilient. In the case of Portugal, Hennebry (2020), finds that Portuguese agriculture-relying regions showed better post-crisis economic performance with respect to regions that focused on other sectors such as tourism and manufacturing.

4. The contribution of this study

This work is interested in the economic performance of Sothern Europe in the aftermath of the debt-crisis. However, it distinguishes itself form those approaches that focus on country-based economic patterns and, rather, follows the idea that "regional analysis must become far more central to research and policy formulation in competitiveness and economic development" (Porter, 2010, p. 571). Then, by adopting a regional perspective, this work intends to analyse how the regional economies of Southern European countries – Greece, Italy, Spain, and Portugal – performed in the aftermath of the debt crisis. In doing so, it avoids the potentially misleading effect of considering countries as embedded economic units that conceal insightful sub-national nuances (Hadjimichalis, 2011). This approach seems particularly adequate given also that the Global Financial Crisis and the European debt crisis revealed wide regional differences that are deeper than those emphasised by Magnifico (1973) in terms of regions' economic growth, productivity, and inflationary tendencies (Cuadrado-Roura et al., 2016). While those remain important, the crises have shown wide gaps in regions' capacity to react and adapt to economic shocks, which has attracted academic attention on the reasons why such interregional gaps exists (Cuadrado-Roura et al, 2016). This works follows this line of academic research and, for its analytical purposes, it will draw from the concept of "regional economic resilience" (Martin and Sunley, 2015), which will be introduced in Chapter 2.

The following chapter will be dedicated to the theoretical framework which will be adopted in the context of this research in order to attempt to give an answer the research question and, in this way, it will allow the formulation of the hypotheses.

Chapter II

The purpose of this chapter is to develop the theoretical framework in which this study on the heterogeneous economic performance of GIIPS regions in the aftermath of the debt crisis. The Chapter is organised as follows: Part I introduces the relevant theoretical aspects, while Part II discusses how the empirical model of this work is structured and the hypotheses that will be tested.

Part I: The conceptual framework

1. The notion of regional economic resilience

In the context on this work concerning the economic performance of European regions in GIIPS countries in the aftermath of the debt crisis, a particularly relevant concept is that of regional economic resilience.

1.1 Theoretical aspects

Firstly, it is useful to clarify the meaning of "resilience". Originally, the conceptions of resilience pertained to the remits of engineering and ecology, where they referred to the capacity of a system to withstand and/or to recover from a disturbance (Martin and Sunley, 2015). Then, in recent years, the notion became popular also in (geographical) economics where, however, it still lacks a universally agreed definition (Evenhuis, 2020). Still, it is possible to develop a conceptual framework for regional economic resilience by starting from two fundamental clarifications (Evenhuis, 2020): resilience *of what* and resilience *to what.* The first question might appear trivial, as subnational regions – more precisely, subnational regional economies – are clearly the unit of observation. However, it pays to underline that a regional economy is not an actor in itself; then, regional resilience depends on the choices and actions of the economic actors that operate both within it and outside of it, i.e.: firms, workers, institutions etc. In the case of empirical research focused on Europe, regions are generally identified with the official EU classifications of subnational administrative units "NUTS 2" and/or "NUTS 3". As regards the second point, it can be said that regional resilience is so defined in relation to an economic shock. In this sense, studies of regional economic resilience require the identification of the precise moment in time when such disturbance occurs as a point of reference to measure the resilience of different regions as well as to investigate its determinants (Rizzi et al., 2018). In addition, localising the economic shock in time and space is crucial to distinguish the idea of resilience from

the more general process of continuous change of regional economies which involves, for example, moments of accelerating and declining growth (Martin and Sunley, 2015). Economic disturbances can of course be of various types. These can include, for example, unforeseeable emergencies, such as natural disasters or terrorist attacks; structural changes that have a long-run impact for the economy of a region, such as changes in consumption habits or access to new technologies; macro-economic issues in terms of economic expansions and/or recessions which, intuitively, have been the main focus of most empirical analyses on regional resilience (Evenhuis. 2017). Considering what has been discussed so far, it clearly appears that the notion of regional economic resilience refers to the regions' economic performance following shocks and, indeed, it has proven useful to study regions' heterogeneous reactions to them (Bristow and Healy, 2018). This has been particularly true in the context of the Eurozone crisis where, due both to the crisis' severity and geographically uneven impact, the notion of regional resilience took a central stage in the academic debate that focused on the nature of and the reasons for the different experiences of the European regions with respect to the debt crisis and the related economic recession (Giannakis & Bruggeman, 2017). Then, it is from this strand of economic literature that the present work largely draws from. In this field, a seminal work by Martin and Sunley (2015) has offered what has become a very successful definition of regional economic resilience, namely "the capacity of a regional or local economy to withstand or recover from market, competitive and environmental shocks to its developmental growth path, if necessary by undergoing adaptive changes to its economic structures and its social and institutional arrangements, so as to maintain or restore its previous developmental path, or transit to a new sustainable path characterized by a fuller and more productive use of its physical, human and environmental resources" (Martin and Sunley, 2015, p. 13). Typically, regional economic resilience is measured by looking at macroeconomic indicators, such as changes in output and employment levels, although this might not always be the case. An insightful clarification should be made regarding the distinction between regional "economic resilience" and that of regional "adaptation" as, while the two are strictly related to each other, they should not be confused (Evenhuis, 2020). In fact, while the latter identifies an episodic event, namely the *specific process* of directly observable change that the region undergoes, the former refers to a region's characteristic which is present on a more continuous basis, namely its general *capacity* – or *potential* – to cope with a shock (Yamamoto, 2011). As such, regional resilience cannot be the object of direct observation; rather, it must be inferred from the analysis of regional adaptation following economic disturbances (Evenhuis, 2020).

According to the relevant literature, the concept of resilience presents different yet interrelated dimensions (Martin and Sunley, 2015). The first one is *vulnerability*, which can be understood as the likelihood of a regional economy to be impacted by a shock. To be true, this dimension is not formally

part of resilience, but it is surely connected with not only because it indicates how exposed a region is to a shock, but also since economic agents are usually able to anticipate disturbances up to a certain extent and adjust accordingly (Evenhuis, 2020). Once the region has been hit by a shock, its resilience can be assessed in terms of the following four dimensions: resistance, recovery, re-dependence and renewal/resumption. *Resistance* captures the capacity of regional economies to withstand to recessionary shocks. *Recovery* indicates the speed and the extent to which it is capable of returning to pre-crisis levels of development (Martin, 2012; Lagravinese, 2015; Crescenzi et al., 2016; Mazzola et al., 2018). *Re-dependence* refers to the way in which the shock causes, or reinforces, pre-existing processes of change in the underlying economic structure with consequences for output, jobs and incomes. *Renewal/resumption* focuses on the regional trend of economic growth, looking at whether regions resume their pre-shock growth trend or, rather, shift to new ones – higher or lower (Martin, 2012). In addition, drawing from other research fields, the economic literature has developed three different conceptualisations of regional economic resilience, namely "engineering resilience", "ecological resilience" and "evolutionary resilience" (Martin and Sunley, 2015; Giannakis and Bruggeman, 2017). Each one of them has its specific implications for the empirical analysis and for the use of the dimensions discussed above (Evenhuis, 2020). Mostly drawn from the physical sciences, "engineering resilience" emphasises the ability of a regional economy to resist a shock and to return to its original level of development. This conceptualisation is coherent with the idea of "self-restoring" economic equilibrium, as it assumes that there exists a pre-shock equilibrium state towards which the regional economy tends to return (Martin and Sunley, 2015). On its side, "ecological resilience" – drawn from the fields of ecology and social ecology – emphasises the ability of a regional economy to reach a state of equilibrium and a trajectory of growth that are different from the original ones that characterised it before the disturbance (Evenhuis, 2020). In other words, as Martin and Sunley (2015, p. 4) put it, here resilience is interpreted the capacity of the regional economy to "absorb" a shock, as opposed to the engineering conceptualisation that underlines how the regional economy "bounces back" from it. For this reason, "ecological resilience" is in line with the approach of "multiple equilibria" economics (Martin and Sunley, 2015). By contrast, "evolutionary resilience" is fundamentally different from the previous two in that it is based on the assumption that regional economies are never in a state of equilibrium (Martin and Sunley, 2015). Rather, based on the literature of psychological and organisational sciences, this conceptualisation emphasises the capacity of a regional economy to adapt to shocks by changing its structures to a varying extent in order to maintain its core performances and functionalities (Martin and Sunley, 2015). Although the distinction between the "ecological" and the "evolutionary" conceptualisations might seems blurred as both are concerned with modifications in regional economic features, the crucial difference is that

the *magnitude* of change under the "ecological" perspective is much more limited compared to the "evolutionary" one, which is particularly suitable to assess more fundamental alterations of the regional economy (Evenhuis, 2020). Importantly, a pivotal aspect distinguishing the first two conceptualisations from the "evolutionary" one is that they are mainly concerned with the dimensions of resistance and recovery, while the latter mainly problematises the dimensions of reorganisation and redependence in a perspective where the concepts of regional "resilience" and "adaptation" come to overlap (Evenhuis, 2020). Drawing form similar works focused on the reaction of European regions to the 2008 crisis (e.g.: Giannakis and Bruggeman, 2017; Pudelko et al., 2018), the present study will adopt the conceptualisation of "engineering resilience", which it also the most empirically feasible. In light of what has been described above, it follows that here the focus on will be on the resistance and recovery dimensions. More in terms of the operationalisation will be discussed in the next chapter.

1.2 The usefulness of the concept of regional economic resilience

To be true, the concept of regional economic resilience has received some criticism. To begin with, it has been deemed too confused to be purposefully used in empirical analysis (Hassink, 2010; Martin and Sunley, 2015; Gong and Hassink, 2017). In addition, some authors have underlined that the concept emphasises a form of "self-reliance" of the regional system based on which it only adjusts through market forces. Thus, it has been argued that the concept tends not to problematise the crucial issue of agency – as regards, for example, government intervention or politics more generally – in relation to structural features and processes (Evenhuis, 2020). Furthermore, others have claimed that the concept subtly promotes a conservative and neo-liberal approach to economic development, since it allegedly identifies the "status quo" as a point of reference towards which the regional economy is understood to return in the aftermath of a shock (MacKinnon and Derickson, 2013; Cretney, 2014). Despite these critics, however, regional economic resilience remains a useful notion and its potential value-added can be defended (Evenhuis, 2020). Indeed, there is much academic discussion to streamline the theoretical aspects of the concept and, as shown above, much progress has been made in this sense. Indeed, regional economic resilience has come to identify a particular quality of regional economies which allows to gauge their functioning and performances in the aftermath of a shock (Martin and Sunley, 2015; Evenhuis, 2020) and, as discussed above, its conceptual as well as empirical framework has been streamlined based on various dimensions and conceptualisation. In addition, the notion need not be restricted to the neo-liberal doctrine as, instead, it could allow research to focus on a much broader understanding of regional development compared to the one suggested by concurrent concepts such as "growth" or "innovation", which could thus be more long-

term oriented and more insightful regarding issues such as inclusiveness and sustainability (Cretney, 2014; Davoudi et al., 2013; Hudson, 2010; Thieme, 2017; Evenhuis, 2020). Also, and perhaps most importantly, regional economic resilience has provided an important theoretical and empirical contribution to economic geography and the related areas of research, since it offered scholars the opportunity to focus on the local-specific consequences of economic disturbances, on the way in which post-crisis economic performance vary across space and different territorial levels and, not least, on the determinants of such performances – which have crucial implications in terms of policymaking (Di Caro and Fratesi, 2017).

1.3 The determinants of regional economic resilience

When it comes to the determinants of regional economic resilience, the pivotal issue is to understand why certain regions are more resilient that others – without confusing the evolution of the factors involved with resilience itself (Martin and Sunley, 2015). The answer to the question regarding the determinants of regional economic resilience and how they change over time is very nuanced as, both at the theoretical and empirical level, they are surely contingent to the specific regional context itself (Kakderi and Tasopoulu, 2017). Nonetheless, as discussed below, the relevant literature has succeeded in identifying a set of factors that are quite broadly applicable to the study of resilience.

1.3.1 Theoretical perspective on the determinants

In general terms, according to Martin and Sunley (2015), regional economic resilience results from a variety of issues including compositional, collective and contextual forces. More precisely, the first group concerns how the region's economy is structured and it includes, for example, the industry mix, the size of the firms, their type of ownership and so on. The second group has to do with the way in which regional firms and labour markets relate to each other, thus shaping specific economic "cultures" and environments. Both these first two groups are influenced by the third one, namely contextual factors, which refer to the specific markets and institutional contexts that provide firms and workers with different constraints and opportunities. Of course, contextual forces can include issues found also beyond the regional level of analysis, such as national policies and/or international influences. For example, as it will be further discussed later in this chapter, central government policies aimed at fostering economic recovery from a crisis might have different effects on different regions, making some of them better off than others (Martin and Sunley, 2015). Drawing from the above, in order to better organise the framework regarding the determinants of regional economic resilience, Martin and Sunley (2015) go a step further and identify 5 broad and mutually influencing clusters of factors (Figure 1). Firstly, the regional industrial structure, which comprises issues such

as market dependence, the configuration of supply chains and the level of innovation. This cluster is particularly coherent with a long-lasting interest of the economic geography literature in how a region's sectoral structure—the range, types and degree of inter-relatedness of its industries—shapes its economic development (Martin and Sunley, 2015). Secondly, the financial arrangements at both the national and regional level, including aspects ranging from loan conditions and interest rates, to the attitudes of the financial environment, to state financial support for the local economy. Thirdly, the governance arrangements which have to do with, for example, national and regional economic policies, international regulatory arrangements and institutions in support of entrepreneurs and workers. In the fourth place, the labour market and the relative conditions in terms of, for example, the kind of skills of the workforce, labour mobility and flexibility, the level of wages and of job opportunities. The fifth and last cluster includes the discretionary and psychological factors of the actors involved in the processes of decision making, such as expectations, confidence and initiative.

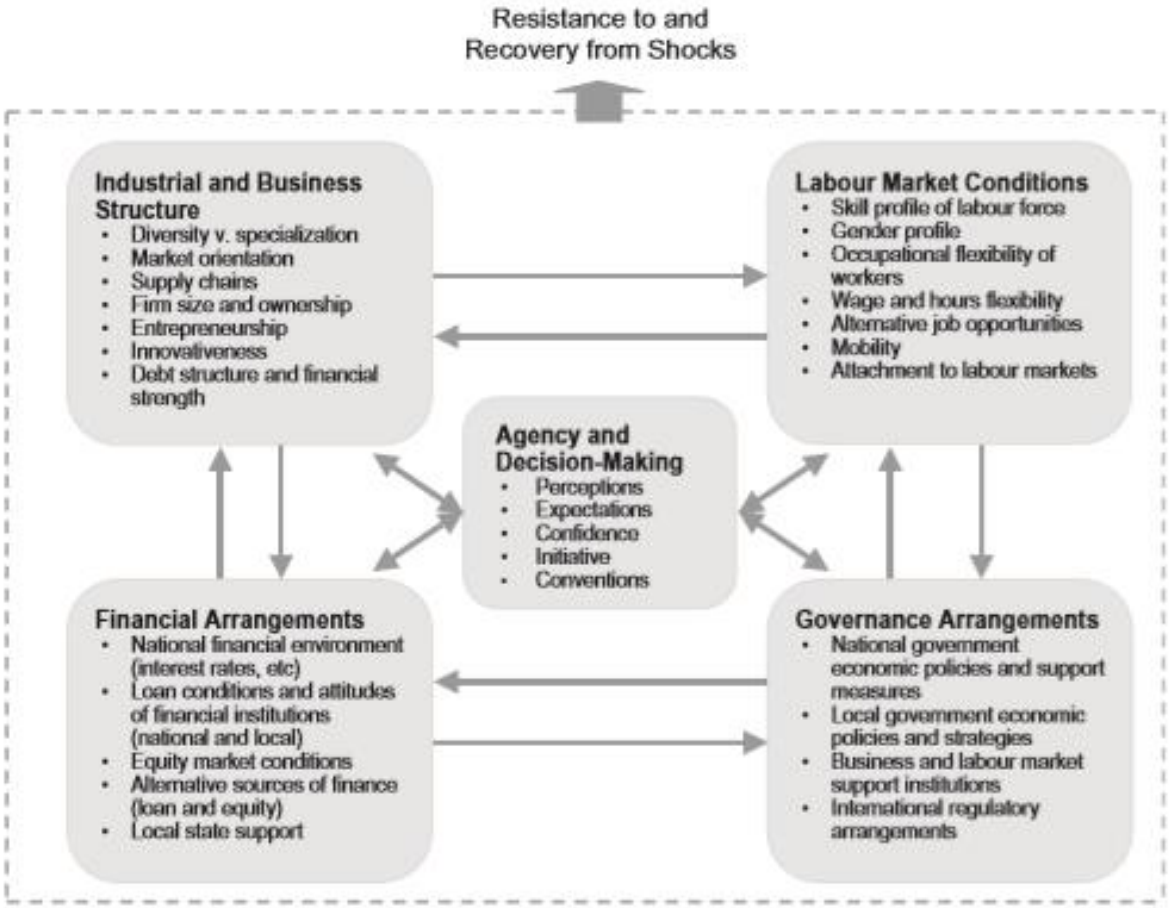


Figure 1: Determinants of regional economic resilience (Martin and Sunley, 2015)

1.3.2 Empirical perspective on the determinants

As we turn to the empirical research regarding the factors that shape regional resilience, it first pays to make some general statements. In the first place, according to Di Caro and Fratesi (2017), empirical evidence has demonstrated that the relevance of certain determinants remains constant across time and space. In addition, interestingly, empirical studies have proven that the factors that matter for regional economic resilience following a disturbance are typically those that contribute to regional economic growth also in normal times (Di Caro and Fratesi, 2017). Furthermore, empirical evidence confirmed two important insights offered by Martin and Sunely's theoretical framework (2015), namely that identifying the possible determinants depends also on the level of analysis (such as regional, national and international) and that government policies play a crucial role in shaping the resilience of regional economies by affecting them both before and after the economic shock (Di Caro and Fratesi, 2017).

Going more into detail, the seminal empirical work by Crescenzi et al. (2016) identified two sets of pre-crisis factors that affected economic resilience of NUTS 2 regions in the 27 Member States of the European Union (Croatia had yet to join the EU) vis-à-vis the 2008 crisis. To be true, their work only focuses on the dimension of "resistance", but their conclusions are nonetheless useful in understanding to what extent national- and regional-level issues before the crisis contributed to mitigate its contractionary effect on regions. The first group regards macroeconomic factors. Drawing from the "contextual" determinants as conceptualised by Martin and Sunley (2015), it includes those aspects that drive the transmission of an international crisis into the national and regional economies, such as the level of trade and financial integration, national fiscal policy and budget balance which, in the case of the Eurozone crisis, were related to episodes of fiscal consolidation (Crescenzi et al., 2016). The second group is related to quantitative aspects of the regional economy itself, and it comprises two main subdimensions. The first one consists of the region's industrial mix, in other words, the sectorial composition of the regional economy. Indeed, to a significant extent, regional resistance has been found to be a function of the relative way in which each sector copes with the crisis, weighed based on its share in the regional economy in terms of overall GDP and/or employment (Crescenzi et al., 2016). In addition, the various sectors that make up the regional economy have an impact on resistance (and thus resilience) also as a result of the different degree at which they can benefit from policies aimed at mitigating the economic shock (Crescenzi et al., 2016). An emblematic example of this is offered by policies aimed at shielding public employment, which help avoiding that the decline in output due to the economic disturbance causes a similar fall in employment in those regions with a larger proportion of the workforce absorbed by public sector jobs

(Crescenzi et al., 2016). The issue of how the composition of the regional economy influences the impact of policies is crucial for the present study, as it will be discussed later in this chapter. The second subdimension relates to a set of factors that determine the level of regional competitiveness and, especially, those of human capital and innovation. On the one hand, these latter two determine the ability of the regional economy to acquire higher level of knowledge and ideas and to transfer it to products and production processes, which is key for the competitiveness of the economy across the whole production chain (Crescenzi and Rodriguez-Pose, 2011; Crescenzi et al. 2016). In this sense, the capacity to innovate can play a central role in the adjustments of a region to a recession, not only by leveraging on the technology of its products and the efficiency of its processes, but also on itss connection with the national and/or global economy, as regions with high level of innovation and human capital typically host the most advanced and high-value-added phases of Global Value Chains (Crescenzi et al., 2014; Crescenzi et al., 2016). In turn, these knowledge-intensive functions are usually better able to cope with economic cries and, thus, exert a stabilising effect on the regional economy in question, to the ultimate benefit of its resilience (Crescenzi et al., 2016). Drawing from a wider literature, Giannakis and Bruggeman (2017) have provided one of the most complete empirical frameworks regarding the determinants of regional economic resilience by building on the one offered by Crescenzi et al. (2016). Indeed, they have improved it by extending the pool of pre-crisis factors that can shape regional economic resilience in terms of labour market performance, as illustrated by Figure 2. They include the following 10 factors: the sectoral composition of gross value added, the sectoral specialisation/diversity; the level of innovation, the level of human capital, the original level of development, the level of investment, the original labour market performance, the level of migration, the level of accessibility and the level of urbanisation.

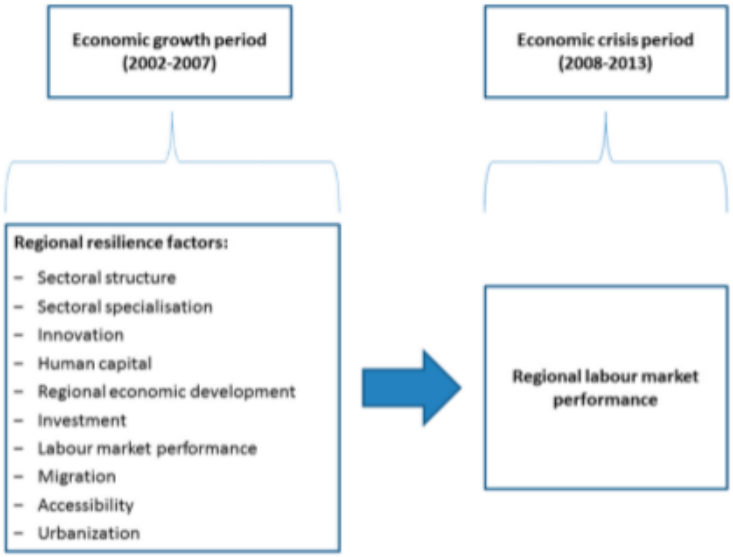


Figure 2: Pre-crisis resilience factors and during-crisis labour market performance (Giannakis and Bruggeman, 2017)

The first one is the type sectoral composition of the economy, whose inclusion builds on the insights offered by Martin and Sunley (2015) and by Crescenzi et al. (2016) on how different sectors cope with economic shocks, thereby affecting regional resilience. Indeed, for example, various empirical studies have highlighted that the construction and manufacturing sectors are more vulnerable in the face of an economic disturbance compared to the service sector (Marelli et al., 2012; Martin, 2012; Lagravinese, 2015). The second one is the degree of economic specialisation/diversity, whose impact on resilience has been found to be rather controversial, with some arguing that sectoral diversity has a positive effect (e.g.: Brown & Greenbaum, 2016; Crescenzi et al., 2016), and others stating that, instead, it is sectoral specialisation to be more beneficial for resilience (e.g.: Giannakis and Bruggemen, 2017). Some studies have offered a more nuanced and, thus, insightful picture on this issue. For example, it has been underlined that regions specialising in *highly productive* activities tend to be more resilient than others (Di Caro, 2015). At the same time, it was claimed that the degree of sectoral interrelatedness in the regional economy also matters, as it might increase the likelihood of the diffusion of the shock from one sector to another, thereby counteracting any potential positive effect exerted by sectoral diversification on resilience (Martin 2012; Giannakis and Bruggeman, 2015). In addition, others have emphasised that the impact of sectoral specialisation/diversification as well as sectoral linkages can change across the different dimensions of regional economic resilience (e.g.: Pudelko et al., 2018). The third and fourth determinants included in the model are, respectively, the levels of innovation and human capital, which have been confirmed to be key issues when it comes to increase regions' competitiveness as well as their resilience capacity (Chapple and

Lester, 2010; Crescenzi and Rodríguez-Pose, 2011; Rodriguez Pose, 2013; Di Caro, 2015; Crescenzi et al., 2016). In their empirical work, also Giannakis and Bruggeman (2017) confirm the role of human capital as a pivotal determinant of regional resilience. At least to a certain extent, the same argument applies to the fifth and sixth factor, namely the pre-crisis levels of overall regional economic development (Petrakos and Psycharis, 2016; Palaskas et al., 2015; Giannakis and Bruggeman, 2017) and, more specifically, of investment in assets both directly used – e.g.: machinery – and indirectly used – e.g.: schools – (Kolev et al., 2013). The seventh determinant discussed by the authors is the pre-crisis labour market performance, as its effect on regional resilience has resulted to be unclear from previous studies, with some indicating that a better pre-crisis performance enhances resilience (Martin, 2012) and others that it harms it (Marelli et al, 2012; Palaskas et al., 2015). The eight determinant that is taken into consideration in this framework is migration flows across different regions which, not by chance, have more generally been indicated as a source of regional growth (ESPON, 2008). Coherently with this insight, Giannakis and Bruggeman (2017) conclude that regional migration contributes also to regional resilience. Similarly, the latter seems stimulated also by the ninth determinant included in the framework, namely the pre-crisis level of regional accessibility – which describes the ease with which people in different regions can reach each other. Inded, higher accessibility favours the circulation of knowledge and the efficiency of the labour market (Östh et al., 2015; Giannakis and Bruggeman, 2017). Finally, the tenth factor discussed is the level of regional urbanisation, whose effect on resilience is, again, ambiguous. Indeed, on the one hand, some have found metropolitan regions to be less able cope with economic crises compared to rural regions (e.g.: Dijkstra et al., 2015) but, on the other hand, other authors have claimed that regional resilience increases proportionally to the size of the cities located in the region under analysis (Capello et al., 2015). Overall, according to Giannakis and Bruggeman (2017), both the significance and the magnitude of the determinants of resilience described so far are largely influenced by two aspects, namely country-specific effects and the size of regional economies. To be true, also other issues could be included in the pool of factors that arguably shape regional economic resilience, including governance set-ups, territorial capital, political leadership and policies (Evans & Karecha, 2014; Perucca, 2014; Wink et al., 2016). However, due to the lack of data, their effect could not be quantified in the framework developed by Giannakis and Bruggeman (2017).

Part II: Building the model

2. The dependent variables: disentangling resistance from recovery

As anticipated above, this study will adopt the "engineering" conceptualisation of regional economic resilience. This choice is coherent with most of existing empirical studies of this nuanced phenomenon. A crucial benefit of the "engineering" approach is that it makes the empirical analysis more straightforward. In addition, this approach seems particularly well-suited to analyse the impact of pre-crisis factors on regional performance in the aftermath of the crisis. Before entering further details, it seems necessary to make two important clarifications following the line of argument offered by Evenhuis (2017) and discussed earlier in this chapter. Firstly, in terms of "resilience of what" (Evenhuis, 2017), the unit of observation on which this work focuses are the administrative regions of GIIPS countries as established in the official NUTS2 statistical classification of the European Union. Regarding "resilience to what" (Evenhuis, 2017), regional resilience is here analysed with respect to the European debt crisis that affected GIIPS countries beginning in 2010. Here lies one original contribution of this work. Indeed, when it comes to regional economic resilience in the European context, empirical studies consider 2008 as a point of reference to investigate how European regions weathered with respect to the Global Financial Crisis (e.g. Crescenzi et al., 2017; Giannakis and Bruggeman, 2017). However, as explained more extensively in Chapter 1, after an early recovery, the European economy – and especially the GIIPS countries – undergone a subsequent shock around 2010, in coincidence with a crisis of sovereign and private debt. This study will assess regional performance in the aftermath of this second shock, which is especially appropriate considering that one of the aims is to investigate the role played by contractionary fiscal policies.

Having clarified these two critical points, this section will now look at how the concept of regional resilience is introduced in this work the dependent variable. While most empirical studies only analyse overall short-term resilience – without distinguishing at the different phases of resistance and recovery described above – it has been argued that they should not mixed together for two important intertwined reasons. The first one is conceptual, as there is now widespread agreement that "resilience" is not a monolithic phenomenon but, as shown, a nuanced and multidimensional one (Pudelko et al., 2018). The second one is heuristic, and it emphasises that the same determinants might have different effects in the different phases of resilience. Indeed, addressing causality in regional resilience without distinguishing the moment when the region is experiencing an economic downturn (resistance) from the moment when it is experiencing renewed economic expansion

(recovery) can lead to inappropriate conclusions both on the overall and phase-specific effect of determinants of regional resilience (Pudelko et al, 2018). Empirical studies where resistance and recovery feature as two distinct dependent variables have indeed demonstrated that the impact of the same factors is not coherent across the two dimensions (see for example Pudelko et al., 2018; Di Pietro et al., 2020).

The present work builds on these insights as it does not look at resilience on its own, but rather, it assesses resistance and recovery separately by making them two distinguished dependent variables and two corresponding distinguished models (Model A for resistance and Model B for recovery), which allows to better appreciate the process of regional resilience in its dynamic and nuanced aspects. To be sure, it should be reminded that, given the adoption of "engineering" conceptualisation, these two subsequent phases are components of *short-term* resilience, which refers to "the immediate reaction and velocity of coping with a shock event" (Pudelko et al. 2018, p. 145).

3. The independent variables and the hypotheses

The discussion regarding the determinates of resilience addressed by this study begins from the identification of what appear to be two important literature gaps, namely the role played by foreign demand and the role played by national austerity policies. While these two issues have yet to be addressed by empirical studies regarding the resilience of European regions, there are good reasons to consider them important factors in the post-crisis performance of GIIPS regions, especially if one considers the *nature* of the sovereign debt crisis. Indeed, it should be remembered that the nature of the crisis matters to make sense of regional resilience and its determinants (Martin and Sunley, 2015). As discussed more extensively in the Chapter 1, shortly after the financial crisis of 2008, GIIPS countries entered a crisis characterised by a credit crunch-induced collapse of internal demand (Palley, 2011), which was followed by contractionary fiscal policies that further curbed home demand with the aim (also) to promote an export-led recovery. In such a context, there emerges the interest for regions' reliance on foreign demand as a potentially counterbalancing factor with respect to the fall in internal demand and, also, for the subnational impact of fiscal consolidation, both of which are likely to have affected regional economic performance following the debt crisis shock. This interest in regional export-dependence and in the policies of fiscal consolidation are further discussed below.

3.1 Export-dependence

The first key determinant of regional economic resilience analysed in this work is the degree of export-dependence. In broad terms, export-dependence refers to that situation where a large share of economy's GDP is generated by exports (Jaffee, 1985), which is in turn indicative of the economy's

reliance on foreign demand. In this context, there exists a long literature of empirical studies demonstrating that dependence on exports has a positive effect on growth (Jaffee, 1985). Although this concept is usually referred to countries, the idea of international economic dependence through exports can still be applied to regional economies. Indeed, from a theoretical perspective, this is confirmed by those demand-based theories of regional development originating from the Keynesian doctrine and where macroeconomic equilibrium in regional economies "is determined by the equality of income generated by regional production and expenditure funded by this income" (Cochrane and Poot, 2014, p. 263), as represented by the equation below:

$$Y(r) = C(r) + I(r) + G(r) + X(r) - M(r)^5$$

Such frameworks highlight that impact of aggregate demand components – especially exports – on long-run regional growth trajectories (Cochrane and Poot, 2014). Particularly, in these frameworks, economic growth depends on the evolution of regions' internal demand, caused by endogenous and/or exogenous factors. In such framework, regional export-driven growth is ensured either by increases in external demand, which stimulates regional exports, or by productivity-related enhancements of regional competitiveness, which fosters net exports through direct increases in exports and/or decreases in imports (Cochrane and Poot, 2014). In addition, some empirical studies have confirmed the suitability of the concept of export-dependence for local (rather than national) economies and have also confirmed the same mechanism of export-led growth also for the subnational level (e.g. Jin, 2002).

While the level of export-dependence has not attracted much attention in empirical research on resilience, there are good reasons to believe that it has a meaningful impact worthy of being discussed here. A first broad reason is conceptual. As underlined above, export-dependence positively contributes to economic growth (Jaffee, 1985). This is crucial since Martin and Sunley (2015) argue that what matters for growth has implications also for regional resilience. In the context of the discussion regarding the relationship between the structure of the regional economy and its resilience capacity, a particularly interesting topic regards the way in which the latter relates to regional growth paths (Martin and Sunley, 2015; Webber, 2018). The concept of regional growth path refers to the various fundamental arrangements of a regional economy that affect its long-run patterns of economic growth and development, including economic openness, sectoral structure, export concentration, technological profile and linkages with external markets (Martin and Sunley, 2015). One approach to

[5] Where "Y" represents regional total income, "C" represents regional household consumption, "I" represents regional investment, "G" represents regional government expenditure, "X" represents regional exports and "M" represents regional imports

such issue looks at how the regional growth path is shaped by different experiences of regional resilience. Particularly, according to Martin and Sunley (2015), the different way in which regional economies adjust to shocks influences their different patterns of growth and development. In this sense, regions' resilience shapes – and thus it is fully part of – their long-run process of evolution and development (Martin and Sunley, 2015). By contrast, a second approach to this issue looks at the opposite dynamics, namely at how regional economic resilience is affected by the previous path of regional growth (Martin and Sunley, 2015; Webber, 2018). To be true, so far, this way of looking at the relationship between regional growth trajectories and regional resilience has received little attention, especially when compared to the other perspective (Webber, 2018). Indeed, while some studies have analysed the impact of pre-shock factors of regional economies on their resistance and recovery– in the fashion of the studies cited earlier in this chapter – they have not been retrospective enough to shed light on the influence that longer run regional growth paths have on resilience, nor on which kinds of growth paths are more likely to foster it (Webber, 2018).

The second reason is that, due to contrasting evidence, the role played by export-dependence on regional economic resilience appears ambiguous and thus it requires streamlining. Indeed, on the one hand, being export-dependence is a form of international economic dependence (Jaffe, 1985), it could be thought that export-dependent economies are less able to withstand an external economic shock because, typically, the higher the exposure to the global economy, the higher the vulnerability to the diffusion of such shock (Briguglio, 2009; Rodrik, 2010). In particular, for highly export-dependent economies, the risks of being worse of vis-à-vis and international crisis are associated with the unforeseen fluctuations in terms of export earnings and of the related economic growth, as exports contributes to finance imports and investment (Foxley, 2009; UNDP, 2011). This line of argument seems to be confirmed by some by empirical studies on regional resilience (e.g. Pudelko et al, 2018; Di Pietro et al, 2020). In contrast with this, though, it could be theoretically expected that, in the aftermath of a crisis, high exposure to external demand could in fact be "a source of strength thanks to the positive role played by international trade" (Di Pietro et al, 2020, p. 16). Interestingly, there seems to be empirical evidence also in this sense. Particularly interesting in this regard is the analysis conducted by the OECD (2019) according to which, in the aftermath of the financial crisis of 2007/8, export-dependent regions showed better economic performances compared to most of the other regions. In this sense, according to the study, the higher the growth rate in value added derived from exports with respect to the growth rate in overall gross valued added, the better regional economies fared after the financial crisis of 2008. Indeed, regions that did not experience any significant loss were distinguished by a yearly average rate of growth in export-related value added which was about 3 percentage points higher than the rate of growth in overall gross value added (OECD, 2019). In

turn, in regions that recovered pre-crisis levels of per capita income by 2011 this gap was about 2 percentage points, while it amounted to 0.5 percentage points for those that recovered in 2015; by contrast, this gap remained negative in the case of those regions that in 2015 were still below pre-crisis levels of per capita income (OECD, 2019). Broadly speaking, one of the main insights of this OECD study is formulated as follows: both in terms of output and employment levels, "regions with a focus on exports weathered the crisis better than those where growth came mainly from internal demand" (OECD, 2019, p.39). A crucial reason for this seems to be the importance of regional linkages with global markets as, indeed, regional economies that experienced smaller employment shifts from the tradable to the non-tradable sector before the crisis saw also smaller rises in unemployment in its aftermath (OECD, 2019). This explanation seems coherent with the emphasis that various authors have placed on a region's external linkages and openness to trade as a determinant of its economic resilience (e.g.: Capello et al., 2014; 2015; Petrakos and Psycharis, 2016).

Given this ambiguous theoretical and empirical background, in order to formulate the hypotheses regarding the role played by export-dependence regarding both resistance and recovery, it is useful to look at this issue in the perspective of the debt crisis to see which of the two lines of argument is more likely to apply. A crucial point here is that, in contrast with the Great Recession of 2008 – 2009, in the aftermath of the debt crisis, there was an asymmetry between the Eurozone and the rest of the world in terms of economic performance, whereby the former was not experiencing the same upward trend as the latter, due to the collapse in internal demand (Garbellini et al., 2014). Indeed, according to Gabellini et al. (2014), foreign demand – i.e. demand for Eurozone exports – was able to partially counterbalance the recessionary impact of the crisis and to mitigate the decline in income in all Eurozone countries – with the exception of Germany and Austria. In addition, looking at the intra-Eurozone trade, the authors underline that the decline in foreign demand for GIIPS exports was at best negligible (Garbellini et al., 2014). Given such empirical evidence on the role played by foreign demand in the aftermath of the debt crisis, it seems that that the degree of export-dependence might have exerted a positive effect on regions ability to cope with the crisis, rather than being a channel of crisis transmission. Accordingly, it is possible to formulate the following hypotheses:

- ***Hypothesis 1A:***
  Export-dependence had a positive impact on regional economic resistance
- ***Hypothesis 1B:***
  Export-dependence had a positive impact on regional economic recovery

3.2 Fiscal consolidation

The second gap in the literature regards the role of national policies. The lack of empirical evidence in this sense seems at odds with the widespread theoretical argument that national policies are crucial when it comes to regional resilience. Indeed, as highlighted previously in this chapter, government policies play an important role in shaping regional economic resilience and, indeed, there is growing academic interest in this sense (Wink, 2014). Particularly, government policies are impactful as, in the form of precautionary planning, they can shield regional economies vie-à-vis the advent of a future crisis; or because they can exercise a stabilising effect to mitigate the recessionary effect of a crisis; or because they can promote processes of change in terms of redependence and renewal – that help regional economies recover in the aftermath of a crisis (Bristow et al., 2013; Dawley et al., 2010; Hill et al., 2011; Kakderi and Tasopoulou, 2017). Not by chance, various authors have called for further research on this issue (e.g.: Giannakis and Bruggeman, 2017)). This work attempts to fill this in the literature on regional resilience by investigating the role played of austerity policies. Indeed, the wave of austerity policies implemented in GIIPS countries deserves attention as a potential factor that influenced different experiences of regional economic resilience. The reason is that as described in Chapter I, supply-side measures of fiscal consolidation turned out to be the main national policy instrument to respond to the debt crisis and, as such, it they have been at the centre of the academic debate regarding their impact on macroeconomic variables and growth. However, austerity has not featured studies on regional resilience, although there are reasons to believe that it has also an impact on local economies (see for example Monastriotis, 2011 and Capello et al., 2017). In order to assess the effect of austerity on regional economic resilience and to formulate the relevant hypotheses, it is first useful to briefly review the literature regarding its impact on macroeconomic variables and growth. This is addressed below, accounting both for theoretical and empirical perspectives on the issue.

3.2.1 Keynesian and Neo-Keynesian approaches

In the context of the standard Keynesian model, the effects of fiscal consolidation are unambiguous: cuts in public expenditure and tax raises cause aggregate demand to decrease by reducing private consumption; this causes a fall in output which, in turn, reduces disposable income via a multiplier effect; the fall of aggregate demand has a negative impact also on investment because it reduces firms' prospective revenues (Alesina et al., 2019). According to this framework, a raise in taxes has a more limited recessionary extent compared to cuts in public spending (Alesina et al., 2019). The reduction of aggregate demand provoked by austerity policies decreases also demand for credit which, in turn,

will cause a fall in the level of interest rates (Alesina et al., 2019). According to the model, even if lower interest rates will help the economy recover, their effect will not be sufficient to restore pre-austerity levels of output; indeed, an expansionary monetary policy would be required to foster liquidity and support consumption. However, such monetary policy will not be possible in the case where nominal interest rates were already at zero. At the same time, it should be noted that resorting to such monetary policy would be especially problematic in the case of European Member States, as they have lost their monetary sovereignty by joining the single currency, which makes impossible the opportunity for tailor-made monetary policy to balance fiscal consolidation plan (Lambertini and Proebsting, 2019). Even if the Neo-Keynesian approach has improved the standard Keynesian by making it less simplistic – for example, by breaking the assumption of constant prices and by considering market imperfections as well as the role of expectations – the basic conclusion that fiscal consolidation has recessionary effects has been left unchanged (Alesina et al., 2019). It is against this theoretical background that authors like Palley (2011) have argued that, in the case of crises of demand such as the Eurozone crisis, austerity policies (and supply-side ones more in general) that aim at compressing wages to stimulate firms profitability only worsen the situation. In this perspective, the only solution would be to restore the Keynesian virtuous circle with measures that stimulate consumption (Cochrane and Poot, 2014), coherently with the empirical evidence that fiscal multipliers associated with government expenditure are larger during recessions (Auerbach and Gorodnichenko, 2013).

3.2.2 Expansionary austerity theory ("EAT")

As regards the effects of fiscal consolidation, the theory of "expansionary austerity" (EAT) has offered a perspective that is in contradiction with the conclusions of Keynesian and Neo-Keynesian approaches discussed above. Indeed, the main EAT idea is that reductions in government deficits are able to stimulate economic growth (Bista, 2016). While having been the object of a long-lasting academic debate on the impact of fiscal policy, the current EAT was introduced in the early '90s, as some scholars pointed at the potential non-Keynesian effects of fiscal consolidation, which fostered sound public finances and financial system (Botta, 2018). In this sense, they argued that well-designed contractionary fiscal policies could succeed in fostering private consumption, investments and exports and, thus, the overall expansion of the economy (Botta, 2018). According to the EAT, the two main channels in which this can happen are the following. The first one is the so called "external" channel, whose mechanism works as follows: fiscal consolidation provokes an internal devaluation

by reducing wages in the labour market; in turn, this will improve the economy's international competitiveness and stimulate exports (Botta and Tori, 2018). In this stream of though, austerity-induced improvements in the performance of exports can be related, for example, to the successful austerity-induced promotion of private investment – on the basis of improved future expectations – which is indeed necessary to orient production towards foreign markets (Bista et al., 2016), or the successful austerity-induced internal devaluation which increases the international competitiveness of national firms (Lambertini and Proebsting, 2019). While empirical studies seem to confirm that improvement in exports owes to fluctuations in the exchange rate (e.g.: Bista et al, 2016; House et al., 2019), it has also been argued that that is not the only reason. For example, Bista et al. (2016), find that fiscal consolidation causes an increase in exports in terms of the *extensive* side, while it reduces the *intensive* margin. In other words, austerity results in "the exporting country increasing the number of products in exports to each trading partner, while the export volume in existing trade relations actually decreases" (Bista et al., 2016, p. 204). This shift to new export markets from previous trade relations holds true both for countries enjoying monetary sovereignty as well as for those with fixed exchange rates or those that share a common currency (as in the EMU case), which means that this effect of austerity is not only based on nominal exchange rate adjustments (Bista et al, 2016). The second one is the "expectation channel" (Botta and Tori, 2018), whereby fiscal consolidation can positively impact the activity of private economic actors (i.e. consumers and firms) by improving their expectations on the economy's future (Alesina et al., 2019; Botta and Tori, 2019). More precisely, this mechanism has to do with spending cuts, which signal to economic agents that future taxes will be lower, as the government will need less revenue; then, this will encourage consumers to consume more – in that they will perceive that their disposable income has increased – and firms to increase investment, as prospective profits increase (Alesina et al, 2019). Also, in light of the restored public finances and debt sustainability thanks to fiscal consolidation, also international investors will develop positive expectations on the future of the economy, which will foster investment from abroad and significantly reduce interest rates (Botta and Tori, 2018). A seminal work in the context of the EAT is the one conducted by Giavazzi and Pagano (1990) on the Danish case, which gave some prima facie evidence of the presence of the so-called expectation channel, whereby "cuts in government spending can be associated with increases in consumption even after controlling for wealth and income, and even in the presence of a substantial increase in current taxes" (Giavazzi and Pagano, 1990, p. 105). Another prominent study on the on the macroeconomic effect of fiscal consolidation is the one conducted by Alesina et al. (2019) on a sample of 16 countries over the period 1978 – 2014. Their main conclusion highlights the crucial relevance of the *design* of fiscal consolidation; indeed, they find that the average effect of austerity based on tax increases is much

more recessionary than the average effect of austerity based on cuts in public expenditure. In addition, the latter's recessionary impact comes to an end within two years from its introduction, whereas the former's last much longer (Alesina et al., 2019). In this way, the authors provide evidence in contrast with one of the intuitions of the Keynesian approach to austerity, namely that reductions in government spending have a worse impact on growth compared to tax raises. At the heart of the difference between the two forms of fiscal consolidation in terms of effect, the authors confirm the crucial role played by future expectations as conceptualised earlier from a theoretical point of view and, indeed, they find that especially private investment is more stimulated by expenditure-based fiscal contraction compared to the tax-based one (Alesina et al., 2019). What has been discussed so far highlights that, in the EAT perspective, that the impact of austerity could be different over time, in the sense the short run costs in terms of internal demand can yield benefits in the longer run through the channels discussed above (Alesina et al, 2019).

By distinguishing between the resistance and the recovery phases of regional resilience, the framework of this study seems well equipped to appreciate this potentially asymmetric effect of fiscal consolidation at the regional level. However, before formulating the hypotheses, the theoretical insights are not sufficient, and it seems necessary to look at the empirical literature on European austerity in the aftermath of the debt crisis.

3.2.3 Empirical studies on GIIPS countries' fiscal consolidation

As regards GIIPS countries, the empirical literature seems to broadly agree on the fact that the wave of fiscal consolidation in the aftermath of the debt-crisis had a largely recessionary effect, at least in the short-term (Alesina et al, 2019; House et al., 2019). This was especially true for 4 of them Italy, Spain, Greece and Portugal – with Ireland being relatively better off – where consolidation plans were particularly large and included tax increases to a significant extent (Botta and Tori, 2018; Alesina et al., 2019). Indeed, coherently with this argument, empirical investigations raise some scepticism regarding the presence of the expansionary mechanisms in the recent episodes of fiscal consolidation and thus on their capacity to foster economic recovery (e.g. Botta and Tori, 2018; Lambertini and Proebsting, 2019). For example, based on a study conducted on a sample of 28 developed economies over the period 2007 – 2016, Botta and Tori (2018) conclude that, when not directly recessionary, austerity was still ineffective in fostering economic growth. More precisely, the authors argue that the "expectation" channel was inoperative both in terms of stimulation to private consumption, which was rather found to be significantly curtailed (in line with Keynesian mainstream), as well as in terms

of stimulation to investment., which in the case of countries sharing a common currency also decreased as a result of contractionary fiscal policy[6]. Similarly, Botta and Tori (2018) find no evidence regarding the "external" channel, whereby austerity would foster exports (and thus growth) via an internal devaluation. Indeed, the same argument has been advanced by Lambertini and Proebsting, (2019). The authors find that while the austerity packages in the GIIPS countries between 2010 and 2014 were partially successful in generating a climate of internal devaluation in terms of declining nominal wages and depreciation of the real exchange rate, on the other hand, these policies were not able to increase the level of exports via lower prices. On the contrary, there was no deterioration in the terms of trade of austerity countries as export prices did not fall significantly (Lambertini and Proebsting, 2019). The reason for this seems to be that exporter firms absorbed domestic lower wages through higher markups on their exports (Lambertini and Proebsting, 2019). Keeping export prices unchanged gaining larger profit margins was possible considering that foreign demand for exports of austerity countries did not significantly decrease (Lambertini and Proebsting, 2019), in line with what has been argued above. Interestingly, via a counterfactual analysis, the authors also find that, had the fall in wages not been absorbed by higher markups, the overall impact of austerity on the economy would have been quite less recessionary.

Based on the empirical insights discussed above, it seems that, during the recent wave of European austerity, the expansionary mechanisms of EAT were not present; in other words, the costs in terms of curbed internal demand were not followed by benefits in terms of growth. For this reason, in terms of regional resilience, it can be hypothesised that the impact of austerity remained negative across the two phases of resistance and recovery. Then, we can formulate the following hypotheses:

- ***Hypothesis 2A:***

  Fiscal consolidation had a negative impact on regional economic resistance

- ***Hypothesis 2B:***

  Fiscal consolidation had a negative impact on regional economic recovery

[6] This seems to be due to three "indirect" channels of austerity: 1. the rise in the lending rate on loans (which has negative effect on private investments); 2. the slowdown in overall economic growth; 3. the fall in wages, given the significantly wage-led nature of investment in the analysed economies (Botta and Tori, 2018).

3.3 Interaction between austerity and export-dependence

While the section above allowed to hypothesis the effect of austerity on regional economic resilience in GIIPs countries, the picture could potentially be more nuanced given the regional socio-economic heterogeneity. Indeed, it has been argued that the impact of austerity is not geographically even, in the sense that costs and benefits of the same national policy of fiscal consolidation are not evenly distributed at the sub-national level (Martin, 2010, Rowthorn, 2010 and Giannakis, 2011). The central reason for this is that regions differ in terms of inner economic structures and processes, which interact with and influence the final outcome of austerity (Martin, 2010, Rowthorn, 2010 and Giannakis, 2011). In this sense, one could thus expect certain regions to be better off than others vis-à-vis the same national policy of fiscal consolidation. Indeed, analysing the first wave of Greek austerity measures in the aftermath of the debt crisis, Giannakis (2011) argues that "due to regional differences in specializations, incomes and economic capacities, horizontal measures can have significant spatial effects, affecting different regions disproportionately" (Giannakis, 2011, p. 323), following the same line of argument of Martin (2010) regarding the asymmetric effect of contractionary fiscal policy in the USA and the UK. By way of example, Giannakis (2011) claims that cuts in public expenditure could hit *particularly* hard Greek peripheral regions, as they have historically relied more extensively on public investment. In this sense, more broadly, Giannakis (2011) emphasises that such differentiated geographical impact could even exacerbate the degree of regional economic divergence in the longer run, especially in the case of weak cross-regional equilibrating mechanisms such as migration, capital mobility and adjustments in prices.

Based on these insights, this work will also investigate the potential geographical heterogeneity in the regional impact of austerity measures in GIIPS countries. More precisely, it seems interesting to discuss such impact in relation to regions' different degrees of export-dependence. In other words, there are reasons to expect that the expected recessionary impact of fiscal consolidation on the regional economy is in fact mitigated by its degree of export-dependence. The reasons for this are related to what has been discussed above regarding the dynamics of foreign demand in the aftermath of the debt crisis. Indeed, as discussed above, foreign demand kept sustaining GIIPS exports after the crisis, which partially counterbalanced the fall in domestic demand (when the fall in domestic demand was the ultimate responsible for output decrease (Garbellini et al, 2014)). Thus, it could be expected that relatively more export-dependent regions were better able to benefit from this partially offsetting effect of foreign demand on the austerity-induced contraction of internal demand, compared to relatively less-export-dependent regions. By the same token, relatively export-dependent regions could benefit relatively more from the increased markups on exported goods enjoyed by the local

exporting firms. Not least, it has been argued that the degree of an economy's openness to international trade influences the size of fiscal multipliers (House et al., 2019; Varthalitis, 2019). More precisely, according to House et al. (2019), while in a closed economy domestic consumers and firm bear all the adjustment related to changes in public expenditure, in an open economy, instead, part of the adjustment is absorbed by shifts in the exchange rate and by foreign trading partners, "both of which serve to reduce the impact of austerity" (House et al., 2019, p. 21).

To sum-up, given that foreign demand remained a source of income for GIIPS countries, it could be hypothesised that the higher the regional exposure to foreign demand, the milder the regional recessionary impact of fiscal consolidation. Indeed, while the offsetting impact of foreign demand on the overall recessionary impact of austerity seems negligeable when looking at the national level (Garbellini et al., 2014), it might be still sufficient to explain *relative* differences across regions. Thus, the following hypotheses are formulated:

- ***Hypothesis 3A:***
  The negative impact of fiscal consolidation on resistance was mitigated by the degree of export-dependence
- ***Hypothesis 3B:***
  The negative impact of fiscal consolidation on recovery was mitigated by the degree of export-dependence

The next chapter will be devoted to the empirical analyses conducted to test the hypotheses formulated in this chapter and to the discussion of the results.

Chapter III

This third chapter is dedicated to the empirical analysis conducted to test the hypotheses formulated in Chapter 2, and it is structured as follows. Section 1 discusses the operationalisation of the dependent, the independent and the control variables; section 2 presents the analyses and discusses the results with respect to the hypotheses; section 3 concludes. Before moving forward, it should be mentioned that, due to the lack of the necessary data for Greek regions, the empirical part of this study only takes into consideration Italian, Spanish and Portuguese regions[7]. Therefore, the final sample comprised a total of 45 NUTS 2 regions[8], as shown by the table in the Annex to Chapter III reported at the end of this work.

1. Data and operationalisation

This section discusses the operationalisation of the variables and the data used.

1.1 The dependent variables

For the reasons introduced in Chapter 2, the concept of resilience was not addressed as a monolithic phenomenon, rather, it was subdivided in is two underlying dimensions of resistance and recovery (as shown by Figure 1), both of which constitute a distinct dependent variable. This approach offers the opportunity to compare regional post-crisis performance across these two subsequent moments, since the same sample of NUTS 2 regions will be used.

Following Pudelko et al. (2018), regional resistance and regional recovery were measured on a continuous scale in terms of regional GDP change, which is the typical unit of measure applied in the field of regional resilience, together with regional employment levels (Martin, 2012). The advantage of a metrical measurement, as opposed to a categorical one (e. g., Giannakis and Bruggeman, 2017),

[7] While one the limits of this study is that the sample did not include Greek regions due to lack of data, this does not seem to be a major drawback. Indeed, both Greece's economic recession and its austerity package are generally considered a "special" case due to their exceptional severity comparted to the rest of Southern Europe (Alesina et al., 2019). For these reasons, not by chance, the Greek case typically receives attention in its own merit in empirical studies that investigate European austerity and post-debt crisis economic performance (e.g. Alesina et al., 2019).

[8] The Italian region "Trentino-Alto Adige" was also excluded from the sample as it was the only region that did not experience a recession in the aftermath of the debt crisis.

is that it is more nuanced and informative in terms of the intensity and the extent of both the regional downturn (resistance) and the following recovery (Pudelko et al., 2018). In addition, the reason for focusing on shifts in regional output rather than employment is that former seem to be a more prompt indicator of region's reaction to the debt crisis, as GDP levels react in a less deferred way to economic crises (Pudelko et al., 2018). Data on regions' annual GDP was retrieved from the Eurostat regional database (Eurostat, 2020). Drawing from Pudelko et al. (2018) and coherently with similar empirical approaches (e.g.: Bristow et al. 2014; and Reinhart and Rogoff 2014), for each individual region, resistance is measured as the percentage change in regional GDP from the crisis to the regional low point, which allows to compare regions in terms of relative economic decline. The formula is provided below:

$$\textit{Resistance}: (GDPt - GDPt\text{-}1) / GDP\ t\text{-}1 \qquad (1)$$

Where *t* represents the year when the regional GDP reached the lowest level, i.e. the regional low point, and *t-1* represents the year before the regional recession. The values yielded by this formula are negative numbers, whose absolute value indicated the depth of the post-crisis recession; thus, larger absolute values indicate lower resistance and vice-versa.

Similarly, regional recovery was measured as the percentage increase in regional GDP from the regional low point to the year when the *national* recession was over, as shown by the formula reported below:

$$\textit{Recovery}: (GDPt - GDPt\text{-}1) / GDP\ t\text{-}1 \qquad (2)$$

Where *t* represents the year when the recession came to an end in regions' respective country and *t-1* represents the year when regional GDP reached the lowest level (regional low point). The values yielded by this formula are positive numbers, thus, higher values indicate higher recovery with respect to the regional low point, and vice-versa. A helpful graphical representation of resistance and recovery is reported below by Figure 1 to better visualise what (1) and (2) are measuring.

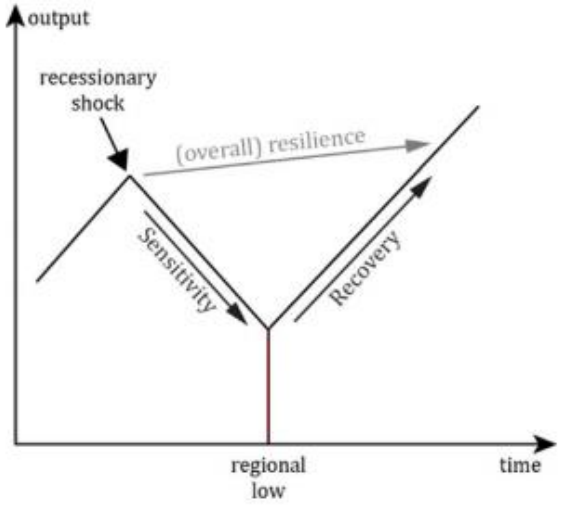


Figure 1: Two-component structure of short-term resilience (Pudelko et al., 2018)

As discussed in Chapter 2, dating the economic shock is crucial when assessing regional economic resilience. To establish the base year against which resistance was calculated, following the argument of Sensier et al. (2016), it was considered that that Southern European regions were not necessarily hit by debt crisis shock at the same time. For one thing, there was variation across the three countries, with 2011 being the first year of the recession for Portugal, while 2012 for Spain and Italy (Matthijs, 2014). However, differentiating across countries was still not enough, as data revealed that various regional economies experienced a downturn somewhat earlier or later compared to their own country. For this reason, the reference year to measure resistance was established for each individual reason on a case by case basis, which allows a more precise estimation of the fluctuations in GDP caused by the debt crisis at the regional level (Sensier et al, 2016). Similarly, while it was clear that the "recovery" phase started at the regional low point, it was necessary to establish where it ended. While these seems not to be academic consensus on this issue, it has been appreciated that there exists in fact some flexibility is establishing the window in which recovery (and resilience more in general) is measured (Ringwood et al, 2019). In this study, it was chosen to use the year when the recession was over at the country-level as an ending point for the recovery phase. According to Alesina et al. (2019), both Spain and Portugal exited the recession in 2014, while Italy only in 2015. For this reason, in formula (2), *t* represents 2014 for Spanish and Portuguese regions, while it represents 2015 for Italian regions. The period of time that is consequently established seemed appropriate to provide insights on the early aftermath of the economic disturbance – "short-term resilience" (Pudelko et al., 2018). In turn, this allows to grasp potentially asymmetric sub-national trends in a moment of economic

difficulty, which seems to offer a level-playing filed to compare the performance of regional economies.

1.2 The independent variables

The first independent variable is the region's degree of export-dependence, labelled "Export_share". Following Jaffee (1985), this variable is measured on a continuous scale in terms of the share of exports in the regional GDP. More precisely, this variable represents the average share of exports in regional GDP over the pre-crisis period going from 2002 to the year preceding the economic shock, which is same approach followed by Giannakis and Bruggeman (2017), with the only exception here being the case of Portuguese regions, whose export share was calculated starting from 2004 due to data unavailability. Data was retrieved from the regional databases of the relative national statistical offices, namely ISTAT (Istat Statistics, 2020) for Italy, Instituto Nacional de Estatistica (Statistics Portugal – Web Portal, 2020) for Portugal, and Instituto Nacional de Estadistica (Spanish Statistical Office, 2020) for Spain. As a reminder, the hypotheses associated with this independent variable are reported below:

- ***Hypothesis 1A:***
  Export-dependence had a positive impact on regional economic resistance
- ***Hypothesis 1B:***
  Export-dependence had a positive impact on regional economic recovery

The second independent variable is fiscal consolidation which, as mentioned in Chapter 1, can either consist in reductions in public expenditure, tax increases, or in a combination of the two – as it was the case of European austerity following the debt crisis. However, this empirical analysis focuses solely on the expenditure side. Besides the lack of tax-related data at the regional level, there is also an important conceptual reason for this choice. Indeed, as discussed in Chapter 2, the theoretical and empirical debates regarding the effect of austerity on economic growth mostly gravitate around the unclear role played by spending cuts, while there seems to be consensus that tax increases have a recessionary impact on the economy in both the (Neo-)Keynesian and the "EAT" perspectives. In addition, compared to tax raises, reductions in public expenditure are more strongly associated with the process of internal devaluation (Lambertini and Proebsting, 2019), which has been key for the formulation of the hypothesis on the impact of European fiscal consolidation on GIIPS regions. Then, "Spending_cuts" is a continuous variable calculated as the percentage reduction in regional public spending during the years of national austerity – as identified by Alesina et al. (2019). As already mentioned in Chapter 1, according to the authors, the period of fiscal consolidation in Italy comprised

2011 and 2012; in Portugal it lasted from 2010 to 2014; in Spain, despite some minor measures being implemented already in 2009, the bulk of the fiscal consolidation plan started in 2010 and lasted until 2014. Data on regional public expenditure was retrieved from the following sources: ISTAT (Istat Statistics, 2020) for Italian regions, Instituto Nacional de Estatistica (Statistics Portugal – Web Portal, 2020) for Portuguese regions, and the database of DataComex (DataComex - Estadísticas del Comercio Exterior, 2020) for Spanish regions. Again, as a reminder, the hypotheses associated with this independent variable are reported below:

- ***Hypothesis 2A:***
  Fiscal consolidation had a negative impact on regional economic resistance
- ***Hypothesis 2B:***
  Fiscal consolidation had a negative impact on regional economic recovery

To make sense of the possible interaction between fiscal consolidation and export-dependence, following the principles of moderation analysis (Hayes, 2017), an interaction term was calculated between "Spending_cuts" and "Export_share", with the latter being the moderator (W) of the effect of "Spending_cuts" on the dependent variables, namely resistance and recovery. Introducing the interaction terms in the model allows to see if the effect of fiscal consolidation on regional resistance and regional recovery varies based on the region's degree of export-dependence. In particular, in Chapter 2 it was hypothesised that the recessionary effect of fiscal consolidation on regional resilience is partially reduced as the degree of export-dependence increases, as represented by the hypotheses reported below:

- ***Hypothesis 3A:***
  The negative impact of fiscal consolidation on resistance was mitigated by the degree of export-dependence
- ***Hypothesis 3B:***
  The negative impact of fiscal consolidation on recovery was mitigated by the degree of export-dependence

1.3 The control variables

The empirical analysis includes also certain control variables. Given the relatively small sample size with 45 total observations, and the rule of thumb of multiple linear regression that there should be at least 10 observation per independent variables, it was possible to introduce at the most two control

variables per model. Drawing from the empirical literature on regional resilience discussed in the previous chapter, two such control variables were introduced here, namely regions' pre-crisis level of economic development ("Dev") and regions' pre-crisis level of innovation ("Inn"). Drawing from Giannakis and Bruggeman (2017), the former was operationalised in terms of regional GDP per capita, while the latter in terms of intramural total (public + private) expenditure on R&D as a share of regional GDP. Both of them are averages over the period going from 2002 to the year before the shock, following again Giannakis and Bruggeman (2017) as it was done for the variable "Export_share". Finally, both of them are based on data retrieved from Eurostat (2020). In the case of the moderated regressions used to test Hypotheses 3A and 3B, given the inclusion of the interaction term as anther predictor, there was only room for one control variable. Among the two discussed above, the initial level of development was introduced as a control variable. According to Heyes (2017), the purpose of introducing control variables in moderation analysis is to control for the impact that such factors could have on the interaction between predictor and moderator. Given enough space for only one control variable, the initial level for development was chosen for two main reasons. Firstly, conceptually, it seemed broad enough to subsume also other issues that could have an influence on the interaction between fiscal consolidation and export orientation, such as the level of human capital and the level of innovation itself. The second reason for this choice is empirical. Indeed, when the analyses were conducted keeping the initial level of innovation as a control variable, the model fit worsened and the results in terms of coefficients did not change.

2. Analyses

In this section of the chapter, I will present the analyses and discuss their results. To test hypotheses 1A, 2A, 1B and 2B, the method used was that of multiple linear regression. Multiple regression requires various assumptions to be satisfied; all of them have been successfully verified and they are reported with comments in the Annex to Chapter III at the end of this work. To test hypotheses 3A and 3B, the method used was that of moderated multiple linear regression. Again, the assumptions were verified and reported in the Annex to Chapter III.

2.1 Regional resistance

This section discusses the analyses conducted on the dependent variable "regional resistance". Model A tests hypotheses 1A and 2A, while Model A1 tests hypothesis 3A.

2.1.1 Model A: Hypotheses 1A and 2A

The multiple regression model for the dependence variable "resistance" is specified by equation below:

Resistance = b1*Export_share + b2*Spending_cuts + b3*HC + b4*Inn + b5*Dev + error term

Figure 2 provides the summary information of the model. As it can be seen, the model has very satisfying R-squared of 0.44 as well as an adjusted R square of about 0.38, which confirm a good adequacy of the model.

```
Residual standard error: 0.01566 on 38 degrees of freedom
Multiple R-squared:   0.44,     Adjusted R-squared:  0.3811
F-statistic: 7.466 on 4 and 38 DF,  p-value: 0.0001535
```

Figure 2: Multiple Regression: Model A (Resistance) – Summary

Figure 3 below reports the table of the coefficients. As it can be seen from the p-values, which are based on heteroscedasticity-consistent standard errors, there is one variable worthy of attention, namely "Spending_cuts". Indeed, "Spending_cuts" appears to have a statistically significant impact on regional economic resistance, given a p-value of 0.001 (<0.05). The effect is negative, as revealed by the sign of the coefficient, which means that an increase in public expenditure cuts during austerity years causes a reduction in the level of regional post-shock resistance. As regards the variable *Export_share*, interestingly, the direction of the effect is positive, which is in line with what had been hypothesised. However, the coefficient is not statistically significant – given the p-value 0.231>0.05, which means that no general inference can be made regarding the positive impact of the degree of export-dependence on regional resistance. Overall, with respect with the hypothesis, we can thus conclude that there is evidence in support Hypothesis 1B, thereby confirming the recessionary impact of fiscal consolidation in the immediate aftermath of the debt crisis – as discussed in the Chapter 2. On the contrary, there seems to be no evidence to support Hypothesis 1A. In other words, the results suggest that the degree of export-dependence did not play a significant role in shaping regional resistance. At the same time, though, this result seems to rule out a scenario where higher regional exposure to foreign demand caused larger reductions in regional GDP in the aftermath of the debt crisis, coherently with the expectations of illustrated in Chapter 2.

```
                Estimate  Std. Error t value  Pr(>|t|)
(Intercept)   -5.1036e-02  9.9087e-03 -5.1507 8.285e-06 ***
Export_share   3.9185e-02  2.7681e-02  1.4156  0.165040
Spending_cuts -2.4531e-01  6.9383e-02 -3.5356  0.001089 **
Dev            5.6338e-07  5.4000e-07  1.0433  0.303397
Inn            2.4361e-03  7.4744e-03  0.3259  0.746264
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

Figure 3: Multiple Regression: Model A (Resistance) – Coefficients Table

While the above results confirm the negative impact of fiscal consolidation on regions' resistance, this might not be the end of the story, as further discussed in the next section.

2.1.2 Model A1: Hypothesis 3A

To test Hypothesis 3A regarding the possible variation in the negative effect of fiscal consolidation on regional resistance based on the degree of regional export-dependence, a moderated multiple regression model is built, which is specified as follows:

Resistance = b1*Spending_cuts + b2*Export_share + b3*Spending_cuts*Export_share + b4*Dev + error term

Figure 4 below reports the summary information of the moderated multiple regression model for regional resistance.

```
Residual standard error: 0.01708 on 39 degrees of freedom
Multiple R-squared:  0.358,     Adjusted R-squared:  0.2921
F-statistic: 5.436 on 4 and 39 DF,  p-value: 0.001411
```

Figure 4: Moderated Multiple Regression: Model A1 (Resistance) – Summary

Again, both the R-squared of about 0.36 and Adjusted R-squared of 0.29 are quite satisfying, albeit somewhat smaller compared to the previous model where the interaction term was not present. However, it is difficult to make a precise comparison between Model A and Model A1 in terms of fit to the data because, while the former controls for the level of innovation, the latter does not.

```
                            Estimate  Std. Error t value  Pr(>|t|)
(Intercept)               -5.8481e-02  1.1855e-02 -4.9328 1.548e-05 ***
Export_share               1.4036e-02  4.4715e-02  0.3139   0.75527
Spending_cuts             -2.3018e-01  9.3371e-02 -2.4652   0.01820 *
Dev                        9.3508e-07  5.4855e-07  1.7046   0.09622 .
Export_share:Spending_cuts 3.8130e-01  6.1662e-01  0.6184   0.53992
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

Figure 5: Moderated Multiple Regression: Model A1 (Resistance) – Coefficients Table

Figure 5 above reports the table of the coefficients the moderated multiple regression model for regional resistance; the coefficients are calculated based on heteroscedasticity consistent standard errors. In moderation models, the coefficients of the independent variable of interest and of the moderator are the so-called conditional coefficients, namely the effect that one variable takes when the other equals to 0 (Hayes, 2017). In this case, the independent variable of interest is "Spending_cuts" and the moderator is "Export_share". The conditional coefficients do not necessarily have a meaningful interpretation (Hayes, 2017) as it is in this case, where the table reports the effect that public expenditure cuts would have on regional resistance in the hypothetical (and unrealistic) case where the regional economy had no exports whatsoever. While it seems that the interaction term is not statistically significant (p-value 0.82 > 0.05), a simple slope analysis of the conditional effect of spending cuts on regional resistance (Figure 6) reveals, instead, some interesting insights.

SIMPLE SLOPES ANALYSIS

Slope of Spending_cuts when Export_share = 0.06 (- 1 SD):

Est.	S.E.	t val.	p
-0.21	0.08	-2.68	0.01

Slope of Spending_cuts when Export_share = 0.16 (Mean):

Est.	S.E.	t val.	p
-0.17	0.08	-2.05	0.05

Slope of Spending_cuts when Export_share = 0.25 (+ 1 SD):

Est.	S.E.	t val.	p
-0.13	0.13	-1.04	0.31

Figure 6: Simple slope analysis for the conditional effect of "Spending_cuts" on regional resistance

Figure 6 reports a simple slope analysis that illustrates how the effect of spending cuts on regional resistance, i.e. "Slope of Spending_cuts", changes by different levels of the moderator "Export_share". More precisely, the table reports three conventionally used levels of the moderator, namely 1 standard deviation below the mean, the mean and 1 standard deviation above the mean. Three key insights can be derived from the table. Firstly, since all slope estimates are negative, it can be clearly seen that the impact of spending cuts on regional resistance remain negative across all levels of export-dependence, which supports the expectation that the overall effect of fiscal consolidation on regional resistance was negative. Secondly, it can be seen that when the level of "Export_share" is below the mean (0.16), the negative effect of fiscal consolidation on regional recovery becomes significant (p-values 0.01 and p-value 0.05). In other words, if regions are classified in terms of "low export-dependence" and "high export-dependence" taking the mean of "Export_share" (0.16) as a cut point, there is some evidence to argue that the resistance of regions with "low export-dependence" was hampered by fiscal consolidation. In the third place, interestingly, as the level of "Export_share" increases from the minimum (0.06) to the mean (0.16), the negative effect of austerity becomes progressively "less negative", albeit very slightly, in a statistically significant way. In other words, for those regions with "low export-dependence", as the level of export dependence increases, the negative impact of fiscal consolidation becomes milder. Overall, these results suggest that there is some evidence in support of Hypothesis 3, namely, that the negative effect of fiscal consolidation was partially mitigated by the degree of export-dependence[9]. This is confirmed also by the plot displayed below.

[9] As for the reason why this statistical significance was not reported by the table of the coefficients, it can be hypothesised that the magnitude effect was too small and/or that it only applies to a small part of the sample.

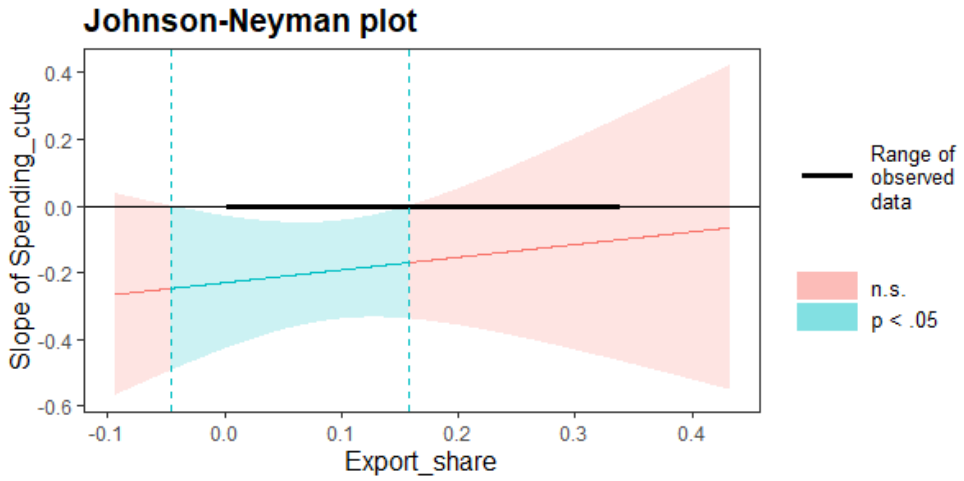


Figure 7: Johnson-Neyman plot for the conditional effect of "Spending_cuts" on regional resistance

Figure 7 illustrates the Johnson-Neyman plot showing for which values of "Export_share" the variation in the effect of "Spending_cuts" on regional resistance is statistically significant. The diagonal line indicates that as the degree of export-dependence increases, the effect of spending cuts on recovery becomes "less negative" (i.e. austerity is less harmful for the regional economy). The blue-shaded area indicates that for the for the values of "Export_share" that are below the mean, the associated variation in the effect of fiscal consolidation on regional resistance is statistically significant (p-value < 0.05). In other words, the is evidence for the mitigating effect of export-dependence on fiscal consolidation only in the case of regions with "low export dependence". Indeed, this seems not to be statistically significant for the rest of the sample (pink-shaded area), even though the mitigating trend is the same across the observation, as shown by the diagonal line that approaches zero.

2.1.3 Discussion: regional resistance

We have defined regional resistance as that dimension of the resilience process that refers to a region's capacity to withstand an economic disturbance and it is measured in terms of GDP loss, whereby larger GDP declines indicate lower resistance and vice versa. The empirical analysis discussed above delivered some interesting results in terms of our hypotheses, summarised as follows. There is no evidence that relatively more export-dependent regions were relatively more resistant to the recessionary shock of the debt crisis. In other words, we do not find evidence to conclude that a higher reliance on foreign demand helped regions withstand resist the debt crisis by reducing the GDP loss

– albeit the positive sign of the coefficient of "Export_share" could be a hint in this direction. On the other hand, this result is still is in line with the broader expectation that, in the case of the debt crisis and subsequent Eurozone crisis, region's exposure to foreign demand did not act on the detriment of their economies, which is in contrast with the diffused argument that in a moment of international crisis open economies are more "vulnerable" to the diffusion of the shock. The reason why more open GIIPS regions were not comparatively worse off in this case could be found in the role played by foreign (and especially extra-Eurozone) demand which, as underlined by authors like Garbellini et al. (2014), remained an important source of income when domestic demand fell following the debt crisis. Differently from Hypothesis 1A, Hypothesis 2A on the negative impact of austerity on regional resistance receives empirical support. Indeed, this study found that regions that experienced higher cuts in local public expenditure also experienced lower levels of resistance, meaning that they suffered larger recessions following the debt crisis. This result provides sub-national evidence in line with the literature discussed in Chapter 2 that emphasises that that austerity had a recessionary impact in GIIPS countries, at least in the immediate aftermath of its implementation. Against this background, the picture of the relationship between regional spending cuts and the regional economy could become more nuanced by investigating *what factors* cause a region to experience higher of lower reductions in terms of local expenditure as well as *what types* of spending cuts are implemented, issues that have not been problematised by this work. In their empirical analysis, for example, Alesina et al. (2019) distinguish among cuts in public spending for goods, services, investments and transfers, and find that the latter have the lowest costs in terms GDP loss. Further academic attention is thus needed on this topic, which becomes even more nuanced at the sub-national level, since the form and the extent of spending cuts at the regional level could depend also on the specific institutional arrangements that regulate the finances and the responsibilities of sub-national authorities vis-à-vis the central government (see, for example Molina, 2016). Regarding Hypothesis 3, the empirical analysis has yielded some evidence that – at least for a part of the regions – the degree of export-dependence has mildly mitigated the recessionary effect of fiscal consolidation. While it could be thought that this was because – for any reason – more export-dependent regions were those that experienced relatively smaller cuts, in fact, the scatterplot reported below in Figure 5 shows that this was not the reason.

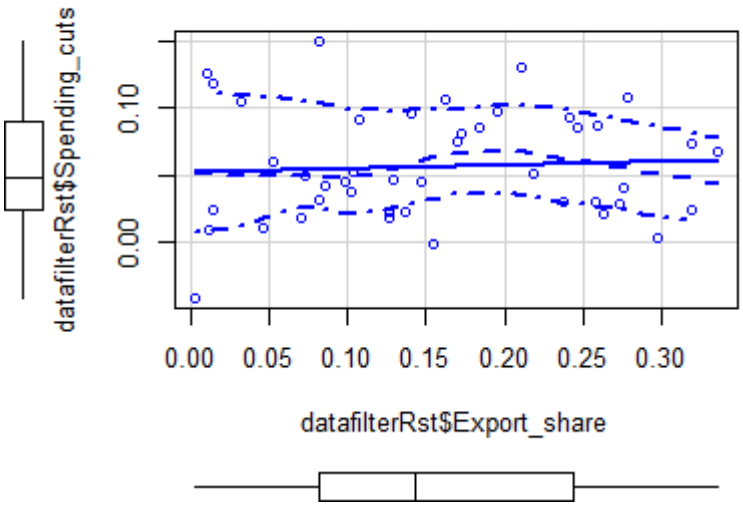


Figure 8: "Spending_cuts" as a function of "Export_share"

The plot above shows the levels of cuts in public expenditure as function of the level of export dependence. As it can be seen, there is no trace of a negative relationship between the two (at the most, one could spot a slight positive relationship), as it also confirmed by the non-significant Person correlation coefficient of 0.053 (p-value 0.73 > 0.05).

2.2 Recovery

This section discusses the analyses conducted on the dependent variable of regional economic recovery. Model B tests hypotheses 1B and 2B, while Model B1 tests hypothesis 3B.

2.2.1 Model B: Hypotheses 1B and 2B

The multiple regression model for the variable "Recovery" is specified by equation below:

Recovery = b1*Export_share + b2*Spending_cuts + b3*Dev + b4*Inn + error term

Figure 9 provides the summary information of Model B for regional recovery, whose R-squared and Adjusted R-squared are respectively 0.176 and 0.089.

```
Residual standard error: 0.01306 on 38 degrees of freedom
Multiple R-squared:  0.1766,    Adjusted R-squared:  0.08994
F-statistic: 2.038 on 4 and 38 DF,  p-value: 0.1085
```

Figure 9: Multiple Regression: Model B (Recovery) – Summary

As it can be clearly seen, these figures are well below those reported by Model A for regional resistance. Considering that Model A and Model B are symmetrical, this decrease of model fit provides evidence that the explanatory power of the same predictors falls significantly from regional resistance to regional recovery. In turn, this supports a key line of argument of this work, namely that the two dimensions of regional resilience should be treated separately in order to obtain a more insightful picture on the determinants of regional post-crisis performance.

```
                Estimate  Std. Error t value Pr(>|t|)
(Intercept)    1.7474e-02  1.1279e-02  1.5493 0.129607
Export_share   5.0396e-02  2.8608e-02  1.7616 0.086178 .
Spending_cuts -5.9248e-02  5.9721e-02 -0.9921 0.327433
Dev            5.6556e-07  5.5525e-07  1.0186 0.314851
Inn           -1.3721e-02  4.6935e-03 -2.9235 0.005805 **
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

Figure 10: Multiple Regression: Model B (Recovery) – Coefficients Table

Figure 10 reports the table of the coefficients associated with each independent and control variable. Again, the estimates are based on heteroscedasticity consistent standard errors. Regarding the independent variables, two main information can be drawn from the table. Firstly, "Export_share" has a positive effect on regional recovery that is marginally significant (p-value 0.058 < 0.1), which is in fact border line with the conventional significance level of 0.05. Therefore, it seems appropriate to report this result as empirical evidence in support Hypothesis 1B, whereby higher export-dependence enhanced post-crisis regional recovery in Southern Europe. Secondly, while the effect of "Spending_cuts" on regional recovery has the hypothesised negative direction, due to its large p-value, it cannot be considered statistically significant. Therefore, it can be argued that no evidence was found in support of Hypothesis 2B, i.e. there is no evidence that fiscal consolidation had a detrimental effect on the recovery of regional economies in Southern Europe. At the same time, though, this result points also against any potentially expansionary effect of contractionary fiscal policy on regional economies, coherently with the sceptical perspectives in this regard reported in the previous chapter. Something interesting has emerged also regarding the control variables. Indeed, the initial level of innovation was found to have a statistically significant negative effect on regional

recovery (p-value 0.005 < 0.05). In other words, this result suggests that higher levels of innovation in the period before the crisis are associated with slower recoveries in its aftermath.

2.2.2 Model B1: Hypothesis 3B

To test Hypothesis 3B regarding the possible variation in the effect of fiscal consolidation on regional recovery based on the degree of export-dependence, a moderated multiple regression model was conducted, which is specified as follows:

$$\text{Recovery} = b1*\text{Spending\_cuts} + b2*\text{Export\_share} + b3*\text{Spending\_cuts}*\text{Export\_share} + b4*\text{Dev} + \text{error term}$$

Figure 11 below reports the summary information of the moderated multiple regression model for regional recovery.

```
Residual standard error: 0.01261 on 38 degrees of freedom
Multiple R-squared:  0.1827,    Adjusted R-squared:  0.09671
F-statistic: 2.124 on 4 and 38 DF,  p-value: 0.09669
```

Figure 11: Moderated Multiple Regression Model B (Recovery) – Summary

As it can be seen, the R-squared and the adjusted R-squared of Model B1 are, respectively, 0.1827 and 0.096. As it was the case between Model B and Model A, comparing these measures of fit of Model B1 with those of Model A1 reveals that the explanatory power of the same predictors has decreased, thereby providing additional support to the argument that regional resistance and regional recovery should be disentangled from one another.

```
                            Estimate  Std. Error t value Pr(>|t|)
(Intercept)                2.0304e-02  1.0227e-02  1.9854 0.054354 .
Export_share               1.0114e-01  3.4715e-02  2.9133 0.005961 **
Spending_cuts              2.3620e-02  8.5786e-02  0.2753 0.784549
Dev                       -4.2995e-07  4.8057e-07 -0.8947 0.376595
Export_share:Spending_cuts -8.3010e-01  5.6363e-01 -1.4728 0.149044
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

Figure 12: Moderated Multiple Regression Model B (Recovery) – Coefficients Table

Figure 12 above reports the table of the coefficients for the moderated multiple regression model. The coefficients are calculated based on heteroscedasticity-consistent standard errors. While at first sign

it seems that the interaction term is not statistically significant (p-value 0.149 > 0.05), the simple slope analysis table reported below by Figure 13 offers two interesting insights.

SIMPLE SLOPES ANALYSIS

Slope of Spending_cuts when Export_share = 0.06 (- 1 SD):

Est.	S.E.	t val.	p
-0.03	0.06	-0.48	0.63

Slope of Spending_cuts when Export_share = 0.16 (Mean):

Est.	S.E.	t val.	p
-0.11	0.06	-1.71	0.09

Slope of Spending_cuts when Export_share = 0.25 (+ 1 SD):

Est.	S.E.	t val.	p
-0.19	0.10	-1.95	0.06

Figure 13: Simple slope analysis for the conditional effect of spending cuts on regional recovery

In the first place, starting from the mean value of "Export_share" (16%), the negative effect of fiscal consolidation on regional recovery becomes marginally significant (p-values 0.09 and p-value 0.06). In other words, if regions are classified in terms of "low export-dependence" and "high export-dependence" taking the mean of "Export_share" (16%) as a cut point, there is some evidence to argue that the recovery of regions with "high export-dependence" was hampered by fiscal consolidation. In the second place, it can be noticed that such negative effect exacerbates as "Export-share" rises above the mean, as indicated by the increasing absolute value of the slope estimate, which go from -0.11 to -0.19. This second result points against our expectation that the negative impact of contractionary fiscal policy is mitigated by the degree of export-dependence; rather, the opposite seems to be true. These insights are confirmed by the plot displayed below.

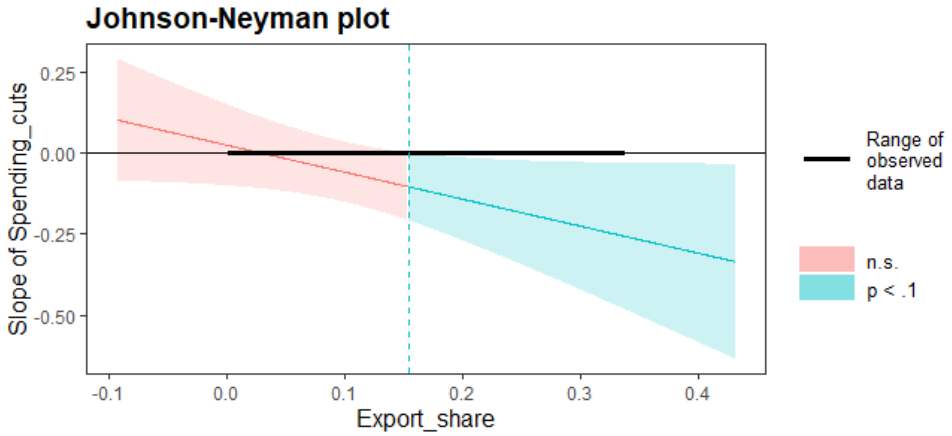


Figure 14: Johnson-Neyman plot for the conditional effect of "Spending_cuts" on regional recovery

Figure 14 illustrates the Johnson-Neyman plot showing for which values of "Export_share" the variation in the effect of "Spending_cuts" on regional recovery is statistically significant. The diagonal line indicates that as the degree of export-dependence increases, the effect of spending cuts on recovery becomes "more negative" (i.e. austerity is more harmful for the regional economy). The blue-shaded area indicates that for the values of "Export_share" that are above the mean, the associated variation in the effect of fiscal consolidation on regional recovery is marginally significant (p-value < 0.1). In other words, there is *no* evidence regarding the mitigating effect of export-dependence on fiscal consolidation. Rather, there seems to be marginal evidence of the opposite, i.e. that higher export-dependence exacerbates the negative effect of fiscal consolidation on the regional economy. To be true, this seems to apply only for regions with "high export-orientation" and not for the rest of the sample (pink-shaded area), even though the exacerbating trend appears constant across the observations, as shown by the diagonal line that is increasingly farther from zero.

2.2.3 Discussion: regional recovery

Regional recovery was defined as that dimension of the resilience process where the region experiences renewed GDP growth following a period of recession in the aftermath of a disturbance. The empirical analysis discussed above delivered some interesting results in terms of the hypotheses, summarised as follows. There emerged evidence in support of Hypothesis 1B regarding the positive impact of export-dependence on regional recovery. Indeed, based on this analysis, it can be concluded that regions that originally relied relatively more on foreign demand were also those that were better able to grow out of the recession in the aftermath of the debt crisis. Given the empirical evidence on export-led growth discussed in the previous chapter, this result suggests that the capacity of a region

to benefit from the export-induced growth stimulus following the shock was proportional to the relative importance of exports in regional aggregate demand.

On the contrary, there seems to be no evidence to support Hypothesis 2B on the negative effect of fiscal consolidation on regional recovery. Indeed, it appears that fiscal consolidation simply did not influence the capacity of a regional economy to grow out of the recession. Then, comparing this result with the one obtained for resistance, it appears that the impact of austerity was not constant across regional resilience, as its impact was negative during the resistance phase but not during recovery phase. There could be two not necessarily alternative reasons for this. In the first place, empirical studies have confirmed austerity to have larger costs in terms of GDP loss during a period of economic downturn (Auerbach and Gorodnichenko, 2012; Alesina et al, 2019). In the second place, the bulk of the fiscal consolidation measures in GIIPS countries was implemented in the earlier years of the consolidation plans (Alesina et al., 2019), namely when regions were experiencing a downturn, while the "lighter" measures were carried out at a later stage, when regions were already experiencing improving economic conditions. Both these points are related to an aspect that has been emphasised by Alesina et al. (2019) following the line of argument of Auerbach and Gorodnichenko (2012), namely that the timing of contractionary fiscal policies with respect to the business cycle is crucial to understand their effect on growth. In any case, this result seems to dismiss the potential expansionary effect of fiscal consolidation in the post-debt crisis context at a regional level, coherently with the national-level studies reported in Chapter 2.

As regards Hypothesis 3B, no evidence was found in support of the idea that the negative impact of fiscal consolidation on regions' recovery was mitigated by their degree of export-dependence. Rather, Model B1 has revealed some interesting counterintuitive insights. Indeed, if on the one hand fiscal consolidation on its own does not have an effect on regional recovery (see "Spending_cuts" in Figure 10), on the other hand, when it is combined with an above-average level of export-dependence, we can observe the following: first, its effect on recovery is marginally significant and negative; second, such negative effect exacerbates as the level of export-dependence increases. In other words, this indicates that fiscal consolidation made the recovery of high export-dependent regions harder than it did for low export-dependent regions.

Finally, the analysis revealed a negative effect of the pre-crisis innovation level on post-crisis regional recovery. This seems counterintuitive, and also in contradiction with previous findings on regional resilience (e.g. Chapple and Lester, 2010; Crescenzi et al., 2016). As a possible explanation, it could be argued that, in fact, this result conceals an indirect effect. Indeed, it is possible that high-innovation sectors/industries struggled more to recover in a context where the necessary investment in R&D was

made difficult by the credit crunch and the fall of internal demand. Indeed, empirical research has emphasised that both financing constraints and demand uncertainty discourage R&D investment (Hall et al., 2016).

3. Concluding remarks and further research

Taking an overall look at the post-shock economic performance of GIIPS regions, various insights can be drawn from the empirical analysis described in this chapter. Regarding the determinants of regional economic resilience introduced here, the following can be said.

Firstly, there exists evidence to support the argument that the degree of export-dependence helped regions perform better in the aftermath of the debt crisis, in that, while it did not play any significant role in exacerbating their recession in terms of GDP loss, it proved to be a stimulus for their recovery. While this study has provided prima-facie evidence regarding the impact of export-dependence on regional resistance and recovery, this topic seems to be broad enough to receive further attention. Indeed, future research could focus on issues that make the picture more nuanced, such as the regional degree of export diversification and/or specialisation as well as the direction of regional exports (see for example Psycharis et al., 2020). In any case, this result could have implications for policymaking. Indeed, if the degree of export-dependence enhances regional performance in the following a crisis of demand (as in this case), policymakers should be aware of a rather persistent asymmetry in the extent and length of regions' adjustment to a shock on the basis of the relative importance of external demand for their economies, which might be reflected in a difference in the post-shock level of wages and prices (Monastitiotis, 2011). This persistence is because patterns of regional specialisation and international trade participation are quite durable over time (Malmberg and Maskell, 1997). In turn, this could be a reason to encourage the implementation of balancing policies that, for example, facilitate the cross-regional flow capital and investments from more export-dependent regions into less export-oriented ones, or that directly sustain internal demand in less export-dependent regions in the case of a crisis.

Secondly, it seems that fiscal consolidation in the aftermath of the debt crisis was not an appropriate strategy to foster economic growth. Indeed, the analysis shows that the overall effect of spending cuts was negative across the whole resilience period, as it had a significant negative effect on the capacity of regions to withstand the crisis (resistance) while it had no impact on their recovery. In other words, it seems that the initial costs imposed by contractionary fiscal policy in terms of internal demand were not counterbalanced later by gains in terms of economic growth. To assess the potentially asymmetric

role played by regional consolidation at the sub-national level, a moderation analysis was also conducted to see if spending cuts interacted with the degree of export-dependence of GIIPS regions, thereby making some of them comparatively worse off. While the results have provided some evidence that such interplay does exist, this is not without ambiguity. Indeed, while it seems that during the resistance phase export-dependent regions were less affected by the recessionary impact of fiscal consolidation, the opposite seems to be true during the subsequent recovery phase, when they were made comparatively worse off by fiscal consolidation. In the realm of speculation, a potential explanation for this ambiguity could be related to a concealed indirect effect, whereby, during regional recession, austerity negatively impacted a factor that was particularly crucial for export-dependent economies, thereby indirectly making their recovery relatively harder. A good example could be the austerity-induced decrease in both public and private R&D expenditure (as discussed above), which has often found to be positively correlated with the level of exports (e.g. Zhao and Li, 1997; Ganotakis and Love, 2010). Another example could be the austerity-induced reduction in imports (Lambertini and Proebsting, 2019), which might have caused a significant decrease in the availability of the intermediate goods used as inputs in regions' exports, which then fell (see, for example, Bas and Strauss-Kahn, 2013; Feng et al., 2016). In any case, while providing some hints regarding the possible interaction between fiscal consolidation and exposure to foreign demand, more broadly, these results underline the complexity related to the distribution of the costs and benefits of contractionary fiscal policy not only across the subnational sphere, but also across time, thus calling for further research.

To be true, one of the limits of this study is that, as pointed out earlier, this work only considers the expenditure side of fiscal consolidation, without focusing on the tax-side of the issue. In fact, introducing the changes in tax levels into the equation is likely provide more details on the impact of European austerity on GIIPS regional economic resilience, as authors like Alesina et al (2019) have emphasised that the composition of consolidation plans is an important determinant of their final impact. In any case, this work has offered some fist insights on the uneven distribution of the costs of austerity at the subnational level, an issue that can have important implications in terms of policymaking when it comes to the design of contractionary fiscal policy. Indeed, the exposure of regional economies to foreign demand seems to be a promising direction in this sense and it could offer new insights to an already flourishing field that analyses contractionary fiscal policies in light of international economic relations (e.g. House et al., 2019).

In addition to the above, the empirical analysis has proven another important point discussed in Chapter 2, namely that resistance and recovery should be analysed in their own merit and considered

two distinct moments, where different processes are at play. As discussed above, this is suggested by the change in the significance of the predictors' effects as well as by change in the model fit across resistance and recovery. Then, there are reasons to focus future research on regional economic resilience also on how the former dimension interacts with the latter. For example, Pudelko et al. (2018) found a negative relationship between resistance and recovery, meaning that, in a "bounce back" fashion, those regions undergoing a sharper recession during the resistance face tend to experience higher levels of recovery, and vice versa. This seems to be coherent with the argument that temporary economic downturns are not expected to have a persistent impact on a regional economy's growth trend[10] (Martin, 2012).

[10] A Pearson correlation test was conducted, revealing a negative but non-significant correlation between the two dimensions, which still points in the direction where lower resistance is associated with higher recovery.

Conclusion

The purpose of this work was to assess the economic performance of regions of Southern Europe – Greece, Italy, Portugal, and Spain – in the aftermath of the debt-crisis, which struck Europe beginning in Greece in late 2009. To do so, this study carried out an empirical analysis drawing from the framework of "regional economic resilience", a concept that is becoming increasingly diffused in the economics literature to study how sub-national regional economies react to a disturbance.

Chapter 1 provided a description of the historical context, addressing the dynamics of the Global Financial Crisis and of the subsequent European debt crisis, the fiscal consolidation as the main policy response, and the asymmetric impact of the crisis at the national level and, especially, at the regional one. Chapter 2 was dedicated to the theoretical framework of regional economic resilience and to the formulation of the hypotheses against the relevant literature. Finally, Chapter 3 was dedicated to the operationalisation of the variables and to the empirical analysis via multiple regression and moderated multiple regression. The results yielded by the analysis allow to draw three main conclusions.

In the first place, those regions that were more exposed to external demand in the years before the crisis were also those that performed better in its aftermath, as export-dependence seems to have a positive influence on their recovery capacity – while it does not have a significant impact on their resistance capacity. In the second place, contractionary fiscal policies did not appear to be a valid growth strategy, since cuts in regional public expenditure always had a negative effect on regional resistance, with larger spending cuts causing larger recessions following the debt crisis shock – while they did not have a significant impact on regional recovery. In the third place, there was some evidence to argue that the degree of export-dependence influences the distribution of the costs of austerity across regions, even though thus effect is not particularly large. However, this result is not without ambiguity, as it seems not coherent across the two phases. Indeed, while, during the resistance phase, export-dependent regions experienced a milder negative effect of spending cuts on regional GDP growth, on the contrary, during the recovery phase, the higher the degree of export orientation, the harsher the impact of spending cuts on regional GDP growth. While some pure speculations about the possible reasons for this ambiguity have been advanced, this issue does call for further research. In any case, this results still offers an insightful and original perspective on the relationship between contractionary fiscal policy and international economic ties, which seems to influence the sub-national distribution of the costs of national austerity plans.

Together with the insights on regional economic performance in Southern Europe in the aftermath of the debt-crisis, this work also offers the opportunity to draw some broader conclusions regarding the conceptual framework of regional economic resilience.

As mentioned previously in this work, while not being immune to some critics, the concept of regional economic resilience allows to analyse the performance of regional economies in the context of a crisis in quite a holistic and systematic way. When adopting the "engineering" conceptualisation of resilience, this work has shown that the opportunities to understand post-shock regional economic dynamics increase if the two underlying phases of resistance and recovery are treated separately, as Pudelko et al. (2018) have argued. Indeed, the results of the analyses showed that the impact of the predictors was uneven across the two phases both in terms of magnitude and statistical significance.

While this demonstrates that the "engineering" conceptualisation does require further empirical streamlining, there are also more challenging and, potentially, more insightful horizons for research in regional resilience. Indeed, while most of the empirical studies so far have adopted the engineering and/or ecological conceptualisations and carried out analysis on large samples, recently, there have been increasing attempts to give more substance to the "evolutionary" paradigm of resilience (e.g., Boschma, 2015; Cowell, 2013, 2015; Evans and Karecha, 2014). In turn, such research developments could be able to fully exploit the explanatory potential of regional resilience by shifting the attention from the dimensions of resistance and recovery and directing it towards those of reorganisation and reorientation (Evenhuis, 2017). Indeed, for one thing, such shift of focus allows to investigate the underlying *mechanisms* and inner *processes* that shape reorganisation, reorientation and, ultimately, resilience. These mechanisms and processes could be related to a wide range of aspects of the regional economy, including the economic base, labour market structure, institutional arrangements and, of course, policymaking (Evenhuis, 2017). At the same time, this perspective would allow to make sense of the role played by agency in regional post-shock economic performance, since actors including enterprises, politicians, labour unions, universities etc. do have the ability to anticipate economic disturbances and act accordingly before, during and after them, both individually and collectively (Bristow and Healy, 2014). This interest in agency could lead into complex studies that assess the multiscalar nature of reorganisation and reorientation which, for example, could be due to the strategies of multinational corporations whose production chain is geographically dispersed, or the policy choices of supranational organisations like the European Union (Evenhuis, 2017).

Furthermore, future research in the field of regional resilience could lead to a broader range of research methodologies. A promising direction in this sense is represented by carrying out case-study comparisons (e.g. Hu, 2015; Cowell et al., 2015). The advantage of comparative designs is that they

allow researchers to dig deeper into the qualitative processes of resilience, including the impact of actor's decisions, across time and space (Evenhuis, 2017). To be true, even in the case where the dimensions of reorganisation and reorientation became the primary focus, it would still be useful to parallelly consider the more "quantitative" dimensions of resistance and recovery, since the latter two are ultimately informative regarding the success of lack of success of the processes of change in preserving economic "health" following a disturbance (Evenhuis, 2017). In any case, distinguishing between resistance and recovery appears to be an adequate also in order to merge quantitative and qualitative research designs on regional resilience. For example, as argued in Chapter 3, the degree of regional recovery is likely to depend not only on the depth and length of the recession in a bounce-back fashion (Martin and Sunley, 2020), but also on the *changes* that underlying economic structures and processes undergo during the recession.

Moreover, while most empirical studies have adopted it with respect to macroeconomic disturbances (and, especially, the Global Financial Crisis), the concept of regional resilience has enough flexibility to be applied to different contexts and crises (Evenhuis, 2017). The current pandemic could be one such example. Indeed, the Covid-19 outbreak can surely be considered a global shock – meaning a "rapid onset event with severely disruptive consequences covering at least two continents" (OECD 2011, p. 12). While pandemics are first and foremost health crisis, they obviously have crucial negative consequences for the economy, both on the side of supply and demand (Rubin, 2011; OECD 2011). The reasons behind the economic consequences of pandemics are various, and they include, for example, the reduction in the workforce, the spill-over effects of mobility restrictions on mobility-related and trade-related industries, the shift of public expenditure from other sectors to healthcare etc, whose negative impacts are amplified by systemic economic interdependencies (Gong et al, 2020). In such context, regional resilience could prove effective in understanding the spatially heterogenous consequences of the pandemic crisis. Indeed, as shown by the recent events, both the effects of the pandemic as well as the policy response have a strong regional configuration. For example, given the uneven spatial organisation of capital and labour at the subnational level (Hadjimichalis, 2011), the fact that certain kinds of industries are hit more than others, could be reflected in certain regions being worse off compared to others (Gong et al., 2020). In addition, national policymakers have often implemented region-based measures, such as lockdowns and travel restrictions, that considered the geographical location of the virus outbreaks (Gong et. al, 2020). While some first academic attention for the regional dimension of the Covid-19 crisis has emerged (e.g. Ascani et al., 2020; Wilson et al, 2020), on the other hand, systematic studies that adopt the notion of regional resilience are still lacking. A notable exception to this is the empirical work carried on Chinese regions by Gong et al. (2020), who find that short-term regional resilience in terms of

GDP was negatively impacted by regions' population density, their dependence on foreign trade and the severity of the disease in their territory. Coherently with what has been argued above, the authors underline that, while their results give a preliminary "quantitative" picture of how Chinese regional economies reacted to the pandemic, more insights would come from the analysis of the reorientation and reorganisation stages, which will require further qualitative data.

Overall, it seems that the concept of regional resilience deserves the increasing attention it is receiving, as it promotes a geographically-embedded vision of economic trends and policy effects, which is coherent with fundamental recent theoretical developments in macroeconomics, such as the New Trade Theory by Paul Krugman (1994), and as it offers a solid framework to understand the shock-prone processes of regional development (Martin, 2012) which, in turn, is crucial to the overall economic performance of nations (Porter, 2003).

Annex to Chapter III

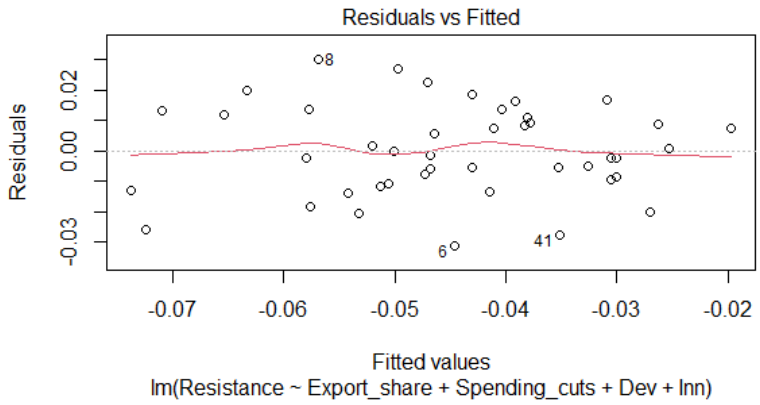
NUTS 2 regions included in the sample:

Region	**NUTS2 code**
Norte	PT11
Algarve	PT15
Centro	PT16
Lisbon Metropolitan Area	PT17
Alentejo	PT18
Autonomous Region of Azores	PT20
Atonomous Region of Madeira	PT30
Piemonte	ITC1
Valle d'Aosta	ITC2
Liguria	ITC3
Lombardia	ITC4
Veneto	ITH3
Friuli-Venezia Giulia	ITH4
Emilia-Romagna	ITH5
Toscana	ITI1
Umbria	ITI2
Marche	ITI3
Lazio	ITI4
Abruzzo	ITF1
Molise	ITF2
Campania	ITF3

Puglia	ITF4
Basilicata	ITF5
Calabria	ITF6
Sicilia	ITG1
Sardegna	ITG2
Galicia	ES11
Asturias	ES12
Cantabria	ES13
Basque Community	ES21
Navarre	ES22
La Rioja	ES23
Aragon	ES24
Madrid	ES30
Castile-Leon	ES41
Castile-La Mancha	ES42
Extremadura	ES43
Catalonia	ES51
Valencian Community	ES52
Balearic Islands	ES53
Andalusia	ES61
Region of Murcia	ES62
Ceuta	ES63
Melilla	ES64
Canary Islands	ES70

Assumptions: Model A (Multiple Regression, *Resistance)*

1. **Linearity**



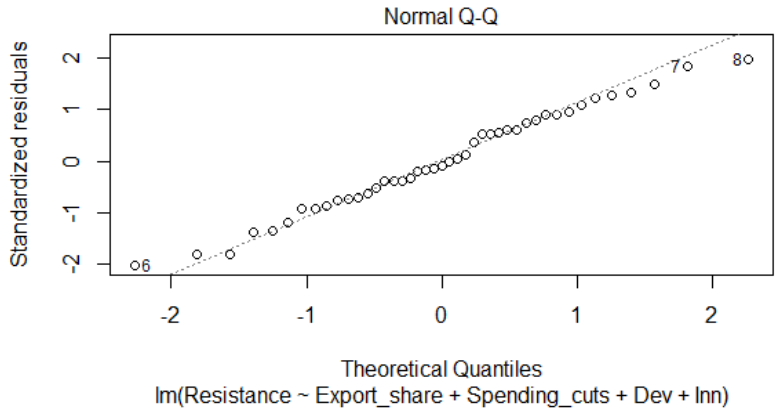
The red line is approximately horizontal at zero, which indicates the existence of a linear relationship between the dependent variable (regional resistance) and all the predictors.

2. **Absence of multicollinearity**

```
> vif(modelRst)
 Export_share Spending_cuts          Dev          Inn
     1.657486      1.367847     2.027835     1.925348
```

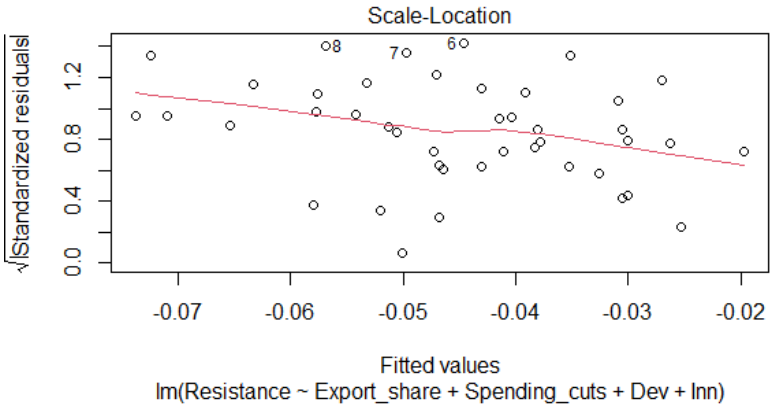
The figure reports the Variance Inflation Factors (VIF) associated with each predictor. As it can be seen, they are all well below 10, which confirms the absence of multicollinearity.

3. Approximately normal distribution of residuals



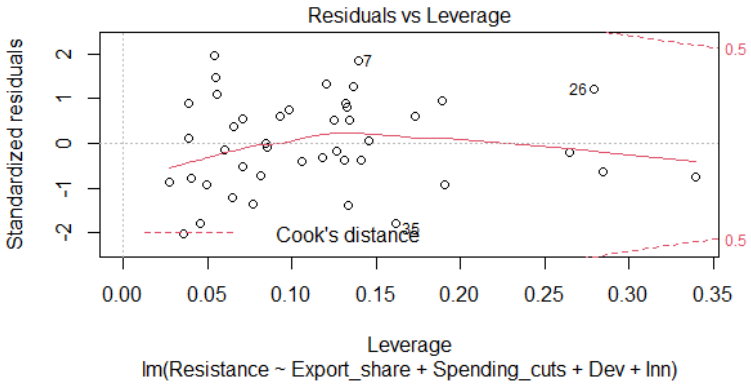
As it appears from the visual inspection of the Normal QQ plot, the distribution of residuals is approximately normal, as they generally follow the dashed diagonal line.

4. Homoscedasticity



The plot illustrates if the residuals are equally spread along the ranges of predictors. The red line yielded by the Scale-Location plot has a slightly decreasing trend, which might raise doubts regarding the absence of heteroscedasticity. For this reason, the regressions' coefficients were all based on heteroscedasticity-consistent standard errors.

5. Absence of extreme outliers/leverage points



As it can be seen from the plot, there are no extreme outliers, as the Cook's distances are all smaller than the absolute value of 3, nor high leverage points, as no observation falls within the top and bottom angles on the right hand-side of the plot.

6. No autocorrelation of residuals

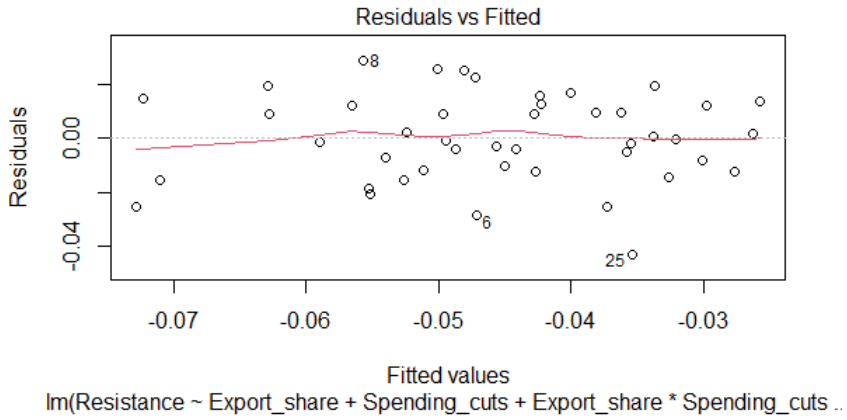
```
        Durbin-Watson test

data:  modelRst
DW = 2.3997, p-value = 0.8967
alternative hypothesis: true autocorrelation is greater than 0
```

The Durbin-Watson test yields a value of 2.39, which is below the conventional upper threshold of 2.5, and non-significative (p-value > 0.05), which supports the absence of autocorrelation among the residuals.

Assumptions: Model A1 (Moderated Multiple Regression, *Resistance*)

1. Linearity



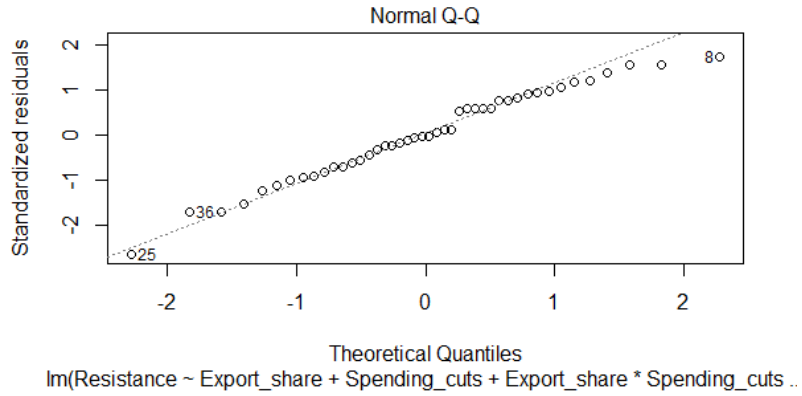
The red line is approximately horizontal at zero, which indicates the existence of a linear relationship between the dependent variable (regional resistance) and all the predictors.

2. Absence of multicollinearity

```
> vif(intermodelRst)
            Export_share             Spending_cuts                       Dev Export_share:Spending_cuts
                3.858295                  2.451088                  1.902379                  4.831996
```

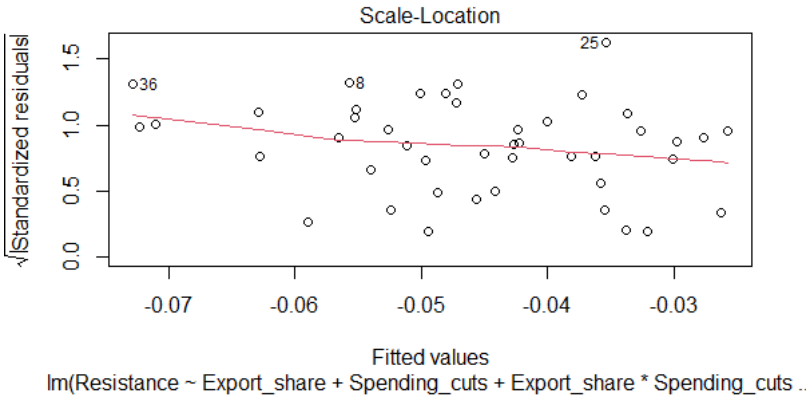
The figure reports the Variance Inflation Factors (VIF) associated with each predictor. As it can be seen, they are all well below 10, which confirms the absence of multicollinearity.

3. Approximately normal distribution of residuals



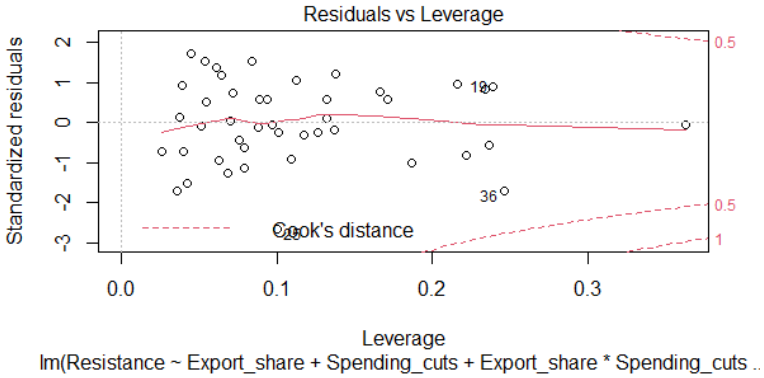
As it appears from the visual inspection of the Normal QQ plot, the distribution of residuals is approximately normal, as they generally follow the dashed diagonal line.

4. Homoscedasticity



The plot illustrates if the residuals are equally spread along the ranges of predictors. The red line yielded by the Scale-Location is approximately horizontal, which seems to confirm the absence of heteroscedasticity. In any case, the regressions' coefficients were nonetheless all based on heteroscedasticity-consistent standard errors.

5. **Absence of extreme outliers/leverage points**



As it can be seen from the plot, there are no extreme outliers, as the Cook's distances are all smaller than the absolute value of 3, nor high leverage points, as no observation falls within the top and bottom angles on the right hand-side of the plot.

6. **No autocorrelation of residuals**

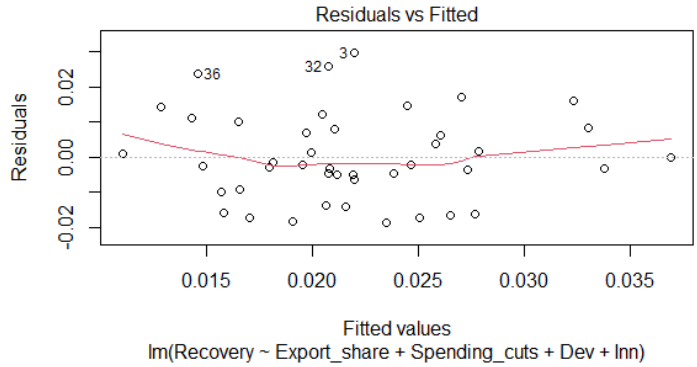
```
        Durbin-Watson test

data:  intermodelRst
DW = 2.3546, p-value = 0.8675
alternative hypothesis: true autocorrelation is greater than 0
```

The Durbin-Watson test yields a value of 2.35, which is below the conventional upper threshold of 2.5, and non-significative (p-value > 0.05), which supports the absence of autocorrelation among the residuals.

Assumptions: Model B (Multiple Regression, *Recovery*)

1. Linearity



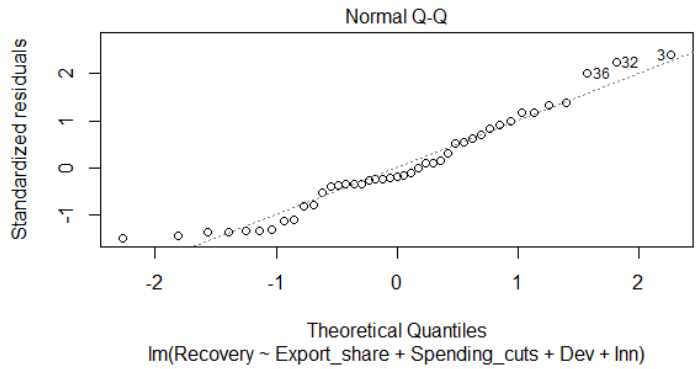
The red line is approximately horizontal at zero, which indicates the existence of a linear relationship between the dependent variable (regional recovery) and all the predictors.

2. Absence of multicollinearity

```
> vif(modelRcv)
 Export_share Spending_cuts          Dev          Inn
     1.673034      1.336184     2.314112     2.138447
```

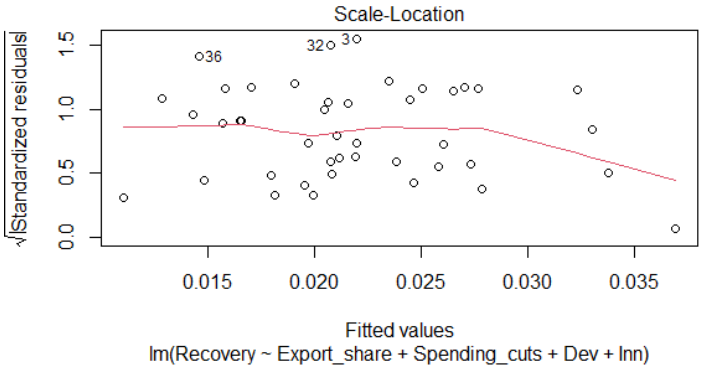
The figure reports the Variance Inflation Factors (VIF) associated with each predictor. As it can be seen, they are all well below 10, which confirms the absence of multicollinearity.

3. Approximately normal distribution of residuals



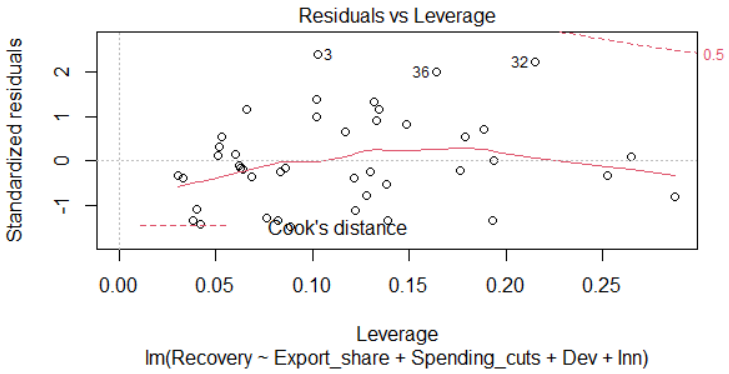
As it appears from the visual inspection of the Normal QQ plot, the distribution of residuals is approximately normal, as they generally follow the dashed diagonal line.

4. Homoscedasticity



The plot illustrates if the residuals are equally spread along the ranges of predictors. The red line yielded by the Scale-Location plot shows a decreasing trend at the end, which might raise doubts regarding the absence of heteroscedasticity. For this reason, the regressions' coefficients were all based on heteroscedasticity-consistent standard errors.

5. Absence of extreme outliers/leverage points



As it can be seen from the plot, there are no extreme outliers, as the Cook's distances are all smaller than the absolute value of 3, nor high leverage points, as no observation falls within the top and bottom angles on the right hand-side of the plot.

6. No autocorrelation of residuals

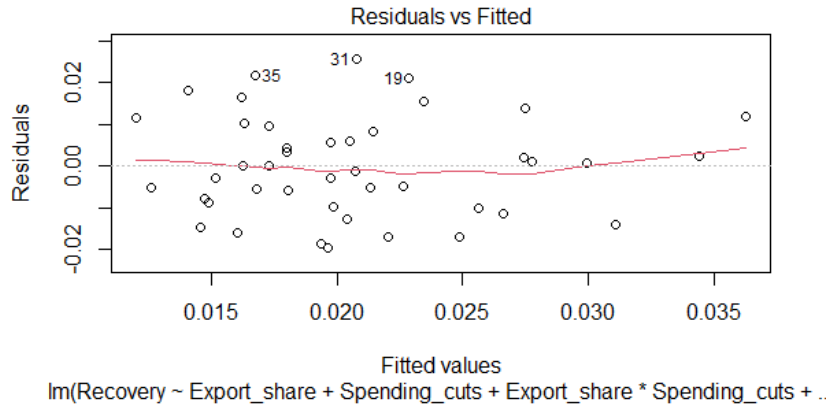
```
        Durbin-Watson test

data:  modelRcv
DW = 2.1872, p-value = 0.716
alternative hypothesis: true autocorrelation is greater than 0
```

The Durbin-Watson test yields a value of 2.18, which is below the conventional upper threshold of 2.5, and non-significative (p-value > 0.05), which supports the absence of autocorrelation among the residuals.

Assumptions: Model B1 (Moderated Multiple Regression, *Recovery*)

1. Linearity



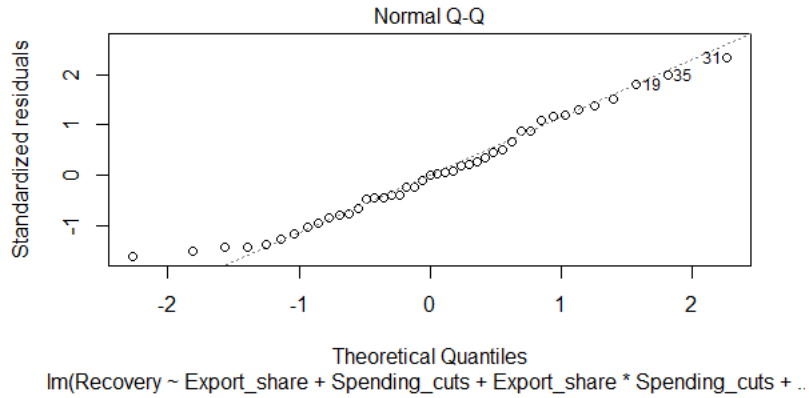
The red line is approximately horizontal at zero, which indicates the existence of a linear relationship between the dependent variable (regional recovery) and all the predictors.

2. Absence of multicollinearity

```
> vif(intermodelRcv)
             Export_share             Spending_cuts                       Dev Export_share:Spending_cuts
                 3.766004                  2.442659                  1.872447                  4.744521
```

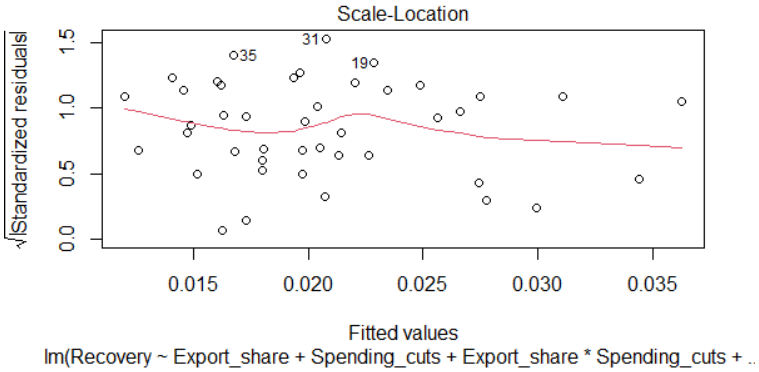
The figure reports the Variance Inflation Factors (VIF) associated with each predictor. As it can be seen, they are all well below 10, which confirms the absence of multicollinearity.

3. Approximately normal distribution of residuals



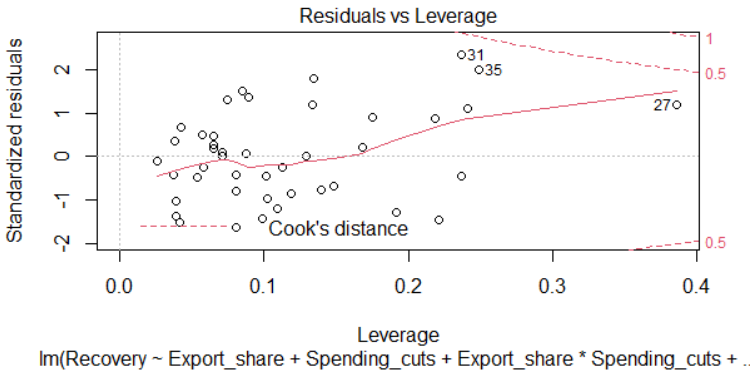
As it appears from the visual inspection of the Normal QQ plot, the distribution of residuals is approximately normal, as they generally follow the dashed diagonal line.

4. Homoscedasticity



The plot illustrates if the residuals are equally spread along the ranges of predictors. The red line yielded by the Scale-Location plot shows a somewhat ambiguous pattern, which might raise doubts regarding the absence of heteroscedasticity. For this reason, the regressions' coefficients were all based on heteroscedasticity-consistent standard errors.

5. Absence of extreme outliers/leverage points



As it can be seen from the plot, there are no extreme outliers, as the Cook's distances are all smaller than the absolute value of 3, nor high leverage points, as no observation falls within the top and bottom angles on the right hand-side of the plot.

6. No autocorrelation of residuals

```
        Durbin-Watson test

data:  intermodelRcv
DW = 2.506, p-value = 0.946
alternative hypothesis: true autocorrelation is greater than 0
```

The Durbin-Watson test yields a value of 2.50, which is border line with the conventional upper threshold of 2.5; however, since it has a non-significative p-value (> 0.05), the tests supports the absence of autocorrelation among the residuals.

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Summary

The purpose of this work was to assess the economic performance of regions of Southern Europe – Greece, Italy, Portugal, and Spain – in the aftermath of the debt-crisis, which struck Europe beginning in Greece in late 2009. To do so, this study carried out an empirical analysis drawing from the framework of "regional economic resilience", a concept that is becoming increasingly diffused in the economics literature to study how sub-national regional economies react to a disturbance.

Chapter 1 provided a description of the historical context.

It discussed the dynamics of the Global Financial Crisis and of the subsequent European debt crisis, emphasising how the financial turmoil caused by the former triggered, later, the latter in those countries that had accumulated large sums of private and public debt, i.e. Greece, Ireland, Italy, Portugal and Spain (GIIPS). In addition, the chapter discussed the main policy response, i.e. fiscal consolidation ("austerity"), describing both the specific measures implemented in GIIPS countries as well as the "expansionary" rationale on which they were based. Then, the economic situation in the aftermath of the debt crisis was discussed, underlining the growing socio-economic divide between Northern European countries, including Ireland, and the Southern European countries (Greece, Italy, Portugal and Spain). Furthermore, the chapter offered a regional perspective, emphasising that the debt crisis halted the process of regional convergence and exacerbated pre-existing socio-economic asymmetries at the regional level, especially across Southern Europe.

Chapter 2 was dedicated to the theoretical framework underpinning the formulation of the hypotheses and, thus, the empirical analyses.

The first part introduced the notion of regional economic resilience as a nuanced concept, discussing the three different conceptualisations ("engineering resilience", "ecological resilience", "evolutionary resilience") and the four sub-dimensions ("resistance", "recovery", "re-orientation", "renewal/resumption"). In addition, it completed the picture by discussing the literature on the determinants of regional resilience, from both a theoretical and empirical point of view. The second part described how the model used in the empirical analyses was built, by discussing the dependent variables, the independent variables, and the hypotheses based on the relevant literature. Following Pudelko et al. (2018), the "engineering" conceptualisation of resilience was chosen to guide the analyses, and the two sub-dimensions of "recovery" and "resistance" were presented as two distinct – yet interrelated – dependent variables. Then, the two independent variables were introduced, namely, regional export-dependence before the crisis and regional fiscal consolidation. The hypotheses regarding their effect on "resistance" and "recovery" were formulated as follows:

- Export-dependence:

Hypothesis 1A:

Export-dependence had a positive impact on regional economic resistance

Hypothesis 1B:

Export-dependence had a positive impact on regional economic recovery

- Fiscal consolidation:

Hypothesis 2A:

Fiscal consolidation had a negative impact on regional economic resistance

Hypothesis 2B:

Fiscal consolidation had a negative impact on regional economic recovery

- Interaction between fiscal consolidation and export-dependence

Hypothesis 3A:

The negative impact of fiscal consolidation on resistance was mitigated by the degree of export-dependence

Hypothesis 3B:

The negative impact of fiscal consolidation on recovery was mitigated by the degree of export-dependence

Finally, Chapter 3 was dedicated to the empirical analysis.

The sample included the Italian, Portuguese and Spanish administrative regions as identified by the official EU statistical classification "NUTS2". Unfortunately, due to missing data, Greek regions could not be taken into consideration, although this did not appear to be a major setback, considering that Also other empirical studies consider the Greek case a special one given the severity of the recession and of the measures of austerity (Alesina et al., 2019). The first part discussed how the dependent, the independent, and the control variables were operationalised and were relevant data was retrieved from (mostly from regional databases of Eurostat and national statistical institutes). The second part presented the multiple regression analyses and the moderated multiple regression analyses, and discussed their results, based on which the various conclusions can be drown.

Three main points can be stressed regarding the predictors introduced in the models. In the first place, those regions that were more exposed to external demand in the years before the crisis were also those that performed better in its aftermath, as export-dependence seems to have a positive influence on their recovery capacity – while it does not have a significant impact on their resistance capacity. In the second place, contractionary fiscal policies did not appear to be a valid growth strategy, since cuts in regional public expenditure always had a negative effect on regional resistance, with larger spending cuts causing larger recessions following the debt crisis shock – while they did not have a significant impact on regional recovery. In the third place, there was some evidence to argue that the degree of export-dependence influences the distribution of the costs of austerity across regions, even though thus effect is not particularly large. However, this result is not without ambiguity, as it seems not coherent across the two phases. Indeed, while, during the resistance phase, export-dependent regions experienced a milder negative effect of spending cuts on regional GDP growth, on the contrary, during the recovery phase, the higher the degree of export orientation, the harsher the impact of spending cuts on regional GDP growth. While some pure speculations about the reasons for this ambiguity have been advanced, this issue does call for further research. In any case, this results still offers an insightful and original perspective on the relationship between contractionary fiscal policy and international economic ties, which seems to influence the sub-national distribution of national austerity plans.

Regarding the analytical framework of resilience itself, it is possible to conclude that treating resistance and recovery as two distinct moments is a sound strategy to assess post-crisis economic resilience, in support of Pudelko et al. (2018). Indeed, the results yielded by the analysis showed that the impact of the predictors was uneven across the two phases both in terms of magnitude and statistical significance. Thus, this approach allows to better understand the process that regions undergo by appreciating the different role that the same factors might play in the different moments. In addition, this approach could allow to combine quantitative and qualitative methods towards regional economic resilience, since the degree of recovery could depend not only on the depth and length of the recession, but potentially also on the *changes* that underlying economic structures and processes undergo during the recession. Of course, such changes could be better appreciated in a qualitative perspective (Evenhuis, 2017). While some conceptual clarifications are still needed (Evenhuis, 2017), "regional economic resilience" is a field that offers wide opportunities for further research and, potentially, crucial implications for policymaking. Part of the reason for this is that the resilience framework can be applied with respect to shocks various nature (Martin and Sunley, 2015).

A particularly interesting example of such flexibility is offered by the work of Gong et. al (2020), who successfully refer to the concept of regional resilience to carry out a preliminary assessment of the heterogeneous impact of the Covid-19 crisis across Chinese regions.