EFFECTS OF FISCAL CONSOLIDATION ON REGIONAL ECONOMICS RESILIENCE: INSTITUTIONAL DESIGN METTERS?

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Abstract

After the Great Recession, in the European Union (EU) emerges an heterogenous level of both national fiscal consolidation and regional economics resilience. The paper uses the EUROSTAT database of EU-27 at NUTS 2 level over the period 2000-2009 to test how fiscal consolidation affects the regional economics resilience. We find that the fiscal consolidation and regional economic resilience are negatively correlated. Moreover, we show that the negative effect of taxation is higher than the positive effect of public spending.

Keywords: Regional economic resilience, Fiscal consolidation, Institutions, European Union

JEL classification: R12, E62, H23, H72

1. Introduction

The recent crisis, called Great Recession, has led to two major novelties in the academic debate. The first novelty is the reconsideration of economic policies (e.g. Stilianos and Ladias, 2011; Duran, 2015). Monetary policies in the countries affected by the crisis have mainly differed on their times of application. Instead, fiscal policies have diverged a lot by countries from heterogeneity of budget and institutional constraints (Afonso and Jalles, 2011; Karjoo and Sameti, 2015). The second novelty in the academic debate is the use of new theoretical categories of analysis. In particular, the concept of resilience has also been adapted to the economy literature (Bailey and Turok, 2016). The paper tries to fit in both debates using the concept of resilience to assess different fiscal policies.

Literature offers different approaches for analyzing regional economic cycles (Partdrige and Rickman, 2005; Fingleton et al., 2012; 2015). Special attention has been dedicated to the concept of regional economic resilience to increased sense of risk and from perception that this phenomenon has made regions more permeable to the effects of what were once thought to be external processes (Christopherson et al., 2010). In this paper, we focused on the effects of fiscal consolidation on regional economic resilience.

Like Matin and Sunley (2015), we define the regional economic resilience as the capacity of regional 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.

Although regional resilience concept has been applied in a broader set of fields, it still represents a fuzzy concept (Gong and Hassink, 2017). The economics literature on resilience principally is focused on firm or regional level by using a private sector analysis probably because the firms are the main actors that react to shocks and hence the characteristics of the firms and the market where they operate is the crucial aspect to understand the level of resilience (Christopherson et al., 2010; Martin et al., 2016; Nyström and Viklund Ros, 2016; Rocchetta and Mina, 2017; Nyström, 2018). Few exceptions are Fingleton et al. (2015) that is focused on the monetary policy and Muštra et al. (2017) that is focused on the smart specialization strategy. In this paper, we analysis the specific actions by public sector just to

point out that also it can play a role to explore the level of regional resilience and above all in limiting the potential for response to shock by the private sector.

One of the most important shortcomings of the exiting concepts is neglecting the institutional design and the public policy on different spatial levels, especially not taking into consideration the decentralization framework (Swanstrom, 2008; Bristow, 2010). This issue has been especially raised due to concerns about the long-term (un)sustainability of public finances that has supported the implementation of budgetary consolidation measures, affecting governments on different institutional level in many countries.

Therefore, this paper represents the first attempt of investigating the role of institutional design of fiscal consolidation on regional economic resilience. More precisely, the paper tries to identify both the possible channels of influence of fiscal consolidations on regional economic resilience and the effects of these channels in different institutional designs.

During the last crisis, fiscal consolidation included rises in taxation, penalties for early retirement and pension cuts, reductions in the length and the size of unemployment benefits and other welfare payments, wage cuts in the public sector, reduction in the public expenditure on education and health and wealth reallocation from taxpayers to banks and debtors (Agnello et al., 2016). With all these measures, prominent not only because of their size but also because of the associated perception of unfairness, fiscal consolidation does not have only influence on the public debt levels, but also on the different aspects of economy.

These issues have been recognized by researchers that have published large number of papers looking at the potential impact on economic activity and lately on different distributional issues (among others Castro 2007; Heim 2010a; 2010b; Afonso and Jalles, 2011; Agnello and Sousa, 2014). In first place, they analyzed the individual (income) distributional effects but the spatial dimension has been mainly unexplored. At the best of our knowledge, the exception is the paper of Agnello et al. (2016) that investigates the influence of the national fiscal consolidation on regional inequalities.

The European Union (EU) is a great case studies. Indeed, during the Great Regression the EU adopted different fiscal policies to react at the same crises. The implementation of the fiscal consolidation measures has been the result of the last crisis, when many governments attempted to implement large fiscal stimulus programs, which, coupled with revenue falls. In the paper, we explore the impact of fiscal consolidation on regional economic resilience under different institutional designs among the EU member countries for period 2000-2009.

The results of the paper highlight that fiscal consolidation is not only the matter of the public debt levels or economic growth, but also an important regional issue. Indeed, we show that the fiscal consolidation and regional economic resilience are negatively correlated. Moreover, we show that the negative effect of taxation is higher than the positive effect of public spending. Finally, the paper provides the evidence of different effects of fiscal consolidation on regional economic resilience, emphasizing the relevance of the study of the economic cycle. Indeed, we observe that the economic cycle considerately affects the effect of the level of public spending on regional economic resilience.

The paper is structured as follows. Section 2 develops a set of testable hypotheses. Section 3, presents the data, the estimation strategy and the results. Section 4 concludes.

2. <u>Regional implication of the fiscal consolidation</u>

To study the effects of fiscal consolidation and resilience we followed two steps. First of all, we analyze separately the effects of a decrease in public spending and an increase in taxation on the degree of regional resilience. Second, we analyze the total effect as a sum of the two previous effects.

During the crisis periods, the private sector receives less demand on the market and therefore focuses its attention on corporate restructuring and in particular on long-term innovations (Slavtchev and Wiederhold, 2016). Given the level of taxation, when the public spending decreases, we probably observe a reduction of the share of public sector on the economy and an increase of the share of the private sector.

In other words, reducing the relevance of public sector on the economy, raises the relevance of the private sector and then, during the crisis periods, this should have an anti-cyclical effect, or in other words, it has a positive effect on resilience. Vice versa, if the

government increases the level of taxation, the private sector reduces its tools to positively affect the resilience and then we probably observe a reduction of level of regional resilience.

Assuming that both sentences hold, the total effect of fiscal consolidation depends on what of the two previous effects dominate. When the main public tool is the public spending, then the fiscal consolidation increases the resilience. Vice versa, when the main public tool is the taxation, then the fiscal consolidation decreases the resilience.

Although the debate is still open (Martinez-Vazquez and McNab, 2003; Sacchi and Salotti, 2014; 2016; Agnello et al., 2016), some scholars argue that greater decentralization increases regional inequality (Rodríguez-Pose and Gill, 2004; Lessmann, 2009). The explanation for this phenomenon is that greater institutional heterogeneity differentiates the effects on external shocks. However, other scholars find the opposite empirical evidence (Ezcurra and Pascual, 2008; Freedman, 2012), arguing that policy tailored allows regions to better respond to external shocks. Indeed, each region can find its best answer without mimic other regional strategies. It follows that probably the financial crisis has led to more diversified effects in more decentralized countries, but then the individual regions could better respond to the crisis, thus leading to greater regional resilience.

3. <u>Empirical implementation</u>

3.1. Dataset

Before explaining the methodology, we will first describe the data set. Data has been collected for selected number of the EU NUTS 2regions. It covers regions in the 13 EU member countries from Eurostat database, QoG EU Regional dataset (Charron et al., 2016), World Bank dataset, World Development indicators and new dataset of fiscal consolidation (Devries et al., 2011) in the period 2000-2009.

3.2. Variables

Since the aim of the paper is to investigate the effects of fiscal consolidation on regional economic resilience under different institutional framework, three variables are of particular importance for study: fiscal consolidation, regional economic resilience and institutional framework measured by fiscal and political decentralization. In the process of choosing proxies for these three variables the papers by Devries et al. (2011), Martin and Sunley (2015), Moddica and Reggiani (2015), Sensier et al. (2016), Hooghe et al. (2016), Rodriguez-Pose and Kroier (2009) and Rodriguez-Pose and Ezcurra (2010) have been considered.

For measuring the fiscal consolidation, the standard concepts available in literature like the statistical concept that measures the increase in the cyclically-adjusted primary budget balance (CAPB) have been used. Scholars highlight that the CAPB approach has some limits. Firstly, it fails to remove the impact of sharp swings in economic activity and assets prices from fiscal data resulting that CAPB is correlated with economic activity but not necessarily linked to policy actions (Devries et al., 2011; Agnello and Sousa, 2012). Second, even if the change in the CAPB accurately reflects discretionary changes in fiscal policy, those can be motivated by a desire to respond to cyclical fluctuations, raising reverse causality concerns (p. 3, Devries et al., 2011). Third, there is uncertainty about the cyclical adjustment procedure, or to be more precisely, there is certain degree of arbitrariness in the selection of the statistical smoothing technique that is used to net out the automatic impact of the cycle on the headline fiscal figures (Darby et al., 2008; Agnello and Sousa, 2012). Last but not the least, the empirical evidence suggests that elasticizes of budgetary components with respect to output can vary over time, the standard methods imply that these elasticizes are treated as constant (Jaeger and Schuknecht, 2007; Agnello and Sousa, 2012).

To deal with all these issues, we will implement the approach introduced by Devries et al. (2011). The authors define the fiscal consolidation as a policymakers' intentions to reduce the budget deficit and not as a response to prospective economic conditions which allows them to construct a narrative approach that identifies episodes of fiscal consolidation based on policy actions motivated by deficit reduction and not looking at fiscal outcomes. Therefore, the data has been constructed by examining accounts and records of what countries were intending to do at the time of publications by recording the budgetary effect of the fiscal consolidation

measures in the year in which they come into effect (the concept of government corresponds to the general government and budgetary impact has been scaled in the percent of GDP). By doing so, this approach eliminates the endogeneity of the response of fiscal policy to the economy, as it captures policymakers' decisions. Also, it allows for a quantification of the size and the composition of fiscal consolidation programs based on the fact that it notes is the fiscal consolidation based on tax hikes and/or spending cuts (p. 7, Agnello and Sousa, 2012). However, the limitation of this approach is the availability of data. For the purposes of our paper, only 13 of the EU countries up to 2009 can be available to use the Devries et al. (2011)'s approach.

Thus, we will use the approach introduced by Devries et al. (2011) to deal challenging issue of fiscal consolidation measure.

The second key variable is regional economic resilience that is also quite difficult to measure. The literature offers several different ways to proxy the variable for its measurement (e.g. Simmie and Martin, 2010; Martin, 2012; Fingleton et al., 2012; Sensier et al., 2016). Each of these methods and approaches has certain limitations (Martin and Sunley, 2015). Considering that in our paper we use panel data model, we find the most appropriate econometric approach that uses quantitative data. More precisely, we use the sensitivity index (RES) as an indicator for regional economic resilience. The sensitivity index has been usually calculated based on employment data or GDP data (Martin, 2012; Finleton et al., 2012). For sensitivity index calculation, the current literature indicates that employment is a more appropriate measure than GDP since employment data are less prone to revision (Sensier et al., 2016). Thus, sensitivity index in this paper gauges the percentage change in employment in the region (E_i) compared with the EU average change in employment (E_{EU}). The formula used for its calculation is presented in following paragraph:

$$RES = \frac{\Delta E_i / E_i}{\Delta E_{EU} / E_{EU}} \qquad (1)$$

In equation (1) ΔE_i stands for employment change in region i in period t compared to period t-1 while E_i is employment in region i in period t. The symbol ΔE_{EU} stands for employment change in the EU in period t compared to period t-1, while E_{EU} represents employment in period t.

The assumption that regional economic resilience is influenced only by the fiscal consolidation is rather restrictive and results could potentially suffer from the omission of other (possibly) significant determinants. Hence, this paper analyses whether the relationship between regional economic resilience and fiscal consolidation holds when additional explanatory variables are included in the model.

Before indicating other important determinants, it should be emphasized that understanding the determinants of regional economic resilience is a complex process, with many factors being simultaneously important. Martin and Sunley (2015) indicate five basic groups of regional economic resilience determinants: (i) industrial and business structure, (ii) labor market conditions, (iii) agency and decision-making, (iv) financial arrangements and (v) governance arrangements. Sedita et al. (2016) recognize related and unrelated varieties, population density, macro-geographical area, industrial districts and degree of exporting as relevant determinants. Finally, Nystrom (2017) underlines five areas of determinants of regional resilience: (i) regional closures, (ii) individuals in the region, (iii) regional industry, (iv) regional economy and (v) regional attractiveness. The inclusion of all potential determinants indicated in the above-mentioned literature in this paper could be ultimate. But it is not straightforward task since the regional data on stated aspects (determinants) are rarely available and/or of poor quality. Therefore, the focus of this paper has been on a limited number of available variables.

The special attention in the paper is dedicated to the institutional framework of the country. More precisely, we focus on decentralization issues. To do so, we introduce two variables: fiscal decentralization and political decentralization. For the fiscal decentralization, we use subnational (state and local government) expenditures as a percentage of total public expenditures (GEXP) and subnational public revenue (state and local) as a percentage of total public revenues (GREV). As a proxy for political decentralization, we use Regional Authority Index (RAI). It is a measure of the authority of regional governments measured along ten dimensions: institutional depth, policy scope, fiscal autonomy, borrowing autonomy,

representation, law making, executive control, fiscal control, borrowing control, and constitutional reform (Hooghe et al., 2016).

Other control variables are being used in the paper and chosen in line with relevant development literature (e.g. Li and Westlund, 2013, Pedrana, 2013) We use the gross domestic product per capita at current market prices (GDP) and the PPS per inhabitant (GDPpppc) as proxies for the stage of development. Moreover, we use the labor force participation rate (Labor) or economic activity rate - population from 15 to 64 years as proxies for the labor force participation. Finally, we use the percentage of people with tertiary education in population between 25 and 64 years (EDU) as proxy of the level of education.

Data for GDP and education have been collected from QoG EU Regional dataset (Charron et al., 2016), while data for labor force participation and for fiscal decentralization are collected from Eurostat database. Data for political aspects of decentralization (RAI) have been collected from dataset established by Hooghe et al. (2016).

3.3. Econometrics analysis and results

The first model is formed to test the direct influence of government sector on regional economic resilience and is given by:

$$RES_{it} = \mu + \gamma RES_{i,t-1} + \beta_1 GOVERNMENT + \beta_2 GDPpc_{it} + \beta_3 EDU_{it} + \beta_4 LABOR_{it} + \alpha_i + \varepsilon_{it} \quad (2)$$

where RES represent regional economic resilience, GOVERNMENT stands for different aspects of government sector, i.e. total government expenditure (GEXP) and revenue (GREV) as a percentage of GDP, PPS per capita (GDPpc) measures initial level of development, EDU measures the percentage of people with tertiary education in population between 25 and 64 years, LABOR measures labor force participation (population from 15 to 64 years), i stands for NUTS 2 regions and t is the one-year period, μ is the intercept, γ is the parameter of lagged dependent variable and $\beta_1,...,\beta_4$ are the parameters of exogenous variables. It is assumed that ε_{it} are IID(0,σ_ε^2). α_i is unobservable individual-specific effect that is time invariant and it accounts for any individuals. The model presented in equation (2) postures several advantages. According to Pablo-Romero and Molina (2013) panel data methodology allows larger number of explanatory variables, larger sample of countries, longer time periods under analysis and greater depth in the relationships between variables. Furthermore, Seetaram and Petit (2012) specify that one of the most important advantages is that panel data modelling allows for the control of heterogeneity in the sample.

The model in equation (2) was tested for several different scenarios. In all scenarios, all previous mentioned control variables are included (level of GDP -GDPpc, labor force participation -LABOR, education -EDU). Differences between the four scenarios are in measuring government sector and period coverage. In scenario 1 (2) government sector is represent by government expenditure (revenue) and we test does higher government expenditure (revenue) as a percentage of GDP decreases regional economic resilience. In scenario 3 (4) we test does higher government expenditure (revenue) decreases regional economic resilience in periods when fiscal consolidation has been implemented.

Table 1. Estimation Results for model of regional resilience
(Arellano and Bond GMM System Estimator)

Variable	Scenario 1	Scenario 2	Scenario 3	Scenario 4
Const.	-550.9375***	-696.607***	-1106.465***	-1055.271***
Lagged RES	-.0245959***	-.0256984***	-.0356818***	-.0369242***
GEXP	-.5388723***		2.331823***	
GREV		3.382322***		3.165607***
GDPpc	.3068291**	.7122969***	.57735**	.905235***
LABOR	7.959331***	7.330582***	13.638***	12.5796***
EDU	-.9656198***	-1.680847***	-.9924893*	2.407067***
Number of observations	2921	2921	1847	1847

*, **, *** indicates significance at 10%, 5% and 1% level, respectively. Source: Calculation by authors

Taking into consideration the empirical results presented in Table 1, it is firstly possible to notice that all independent variables have significant impact on regional resilience as all variables are statistically significant with significance level of at least 10%. Higher level of initial GDPpppc and labor force participation increase the value of the sensitivity index. Considering that higher value of the sensitivity index stands for lower level of regional economic resilience, higher level of development and labor force participation have negative impact on regional economic resilience. However, higher share of human capital (EDU) has negative effect on the sensitivity index and therefore positive impact on regional economic resilience.

Regarding the relationship between the government sector share and regional resilience, the results in scenario 1 show that government expenditure (GEXP) has negative effect on the sensitivity index (RES). In other words, higher level of government expenditure decreases sensitivity of regional economy and therefore increases regional economic resilience. However, in case that we analyze this relationship only in periods of fiscal consolidation than the results are completely different. More precisely, higher level of government expenditure during fiscal consolidation periods has a negative effect on regional economic resilience.

In the next step, we test direct influence of the fiscal consolidation under different institutional framework by following:

$$RES_{it} = \mu + \gamma RES_{i,t-1} + \beta_1 DECfiscal + \beta_2 FC + \beta_3 GDPpc_{it} + \beta_4 EDU_{it} + \beta_5 LABOR_{it} + \beta_6 RAIcountry_t + \alpha_i + \varepsilon_{it} \quad (3)$$

where RES represent regional economic resilience, DECfiscal stands for fiscal decentralization (measured as a percentage of state and local government expenditures in total public expenditures), FC measures different aspects of fiscal consolidation (measured as a percentage of the GDP – FCtotal, but also as fiscal adjustments led by tax hikes (FCtax) and led by spending cuts (FCspend), EDU percentage of people with tertiary education in population between 25 and 64 years, LABOR measures labor force participation (population from 15 to 64 years) and RAIcountry represents proxy for political decentralization that measures the regional authority on country level, i stands for NUTS 2 level and t is one-year period. μ is an intercept, γ is a parameter of lagged dependent variable and $\beta_1,\ldots,\beta_6$ are the parameters of exogenous variables. It is assumed that ε_{it} are IID$(0,\sigma_\varepsilon^2)$. α_i is unobservable individual-specific effect that is time invariant and it accounts for any individuals.

The model in equation (3) was tested in several different scenarios. In all scenarios 5-7 control variables from scenarios 1-4 are included (level of GDPpppc -GDPpc, labor force participation -LABOR, education -EDU). The new variables are for decentralization and fiscal consolidation. Thus, decentralization is presented by proxies for fiscal (percentage of state and local government expenditures in total public expenditures (DECfiscal), and political decentralization (RAIcountry). Fiscal consolidation is presented by total fiscal consolidation (FCtotal) in scenario 5, but also with fiscal adjustments led by tax hikes (FCtax) in scenario 6 and by fiscal adjustments led by spending cuts (FCspend) in Scenario 7.

Table 2: Estimation Results for model of regional resilience
(Arellano and Bond GMM System Estimator)

Variable	Scenario 4	Scenario 5	Scenario 6
Const.	-123.8384***	-117.6741***	-122.4525***
Lagged RES	-.0889991***	-.0827532***	-.0864431***
GEXP	27.41116*	30.59933**	33.59417**
GREV	.5163353	.2833551	.2578491
GDPpc	.8518647***		
LABOR		1.775029***	
EDU			-.9583947***
Number of observations	-.0003882***	-.0003976***	-.0003512***

*, **, *** indicates significance at 10%, 5% and 1% level, respectively.

Source: Calculation by authors

The results in Table 2 indicate that fiscal consolidation increases regional sensitivity index and therefore it has a negative impact on regional economic resilience (scenario 5). This has been especially case if the fiscal consolidation led by tax hikes (scenario 6). However, in case that fiscal consolidation is led by spending cuts that fiscal consolidation increases regional economic resilience (scenario 7). At same time, results in all scenarios indicate that fiscal decentralization (measured as local and state expenditure as percentage of total public expenditures) increases regional sensitivity index and therefore has negative impact on regional economic resilience. At same time, it seems that political decentralization does not have significant effects on regional economic resilience.

4. Conclusion

The literature of regional economics offers different approaches for analyzing regional economic fluctuations (Partdrige and Rickman, 2005; Fingleton et al., 2012; 2015). One of the goal of this field is to understand why some regional economies manage to renew themselves, whereas others remain locked in decline (Martin and Sunley, 2015; Gong and Hassink, 2017). After the Great Recession, special attention by scholars has been dedicated to the concept of the regional resilience (Martin, 2012; Bristow and Healy, 2014; Martin and Sunley, 2015; Modica and Reggiani, 2015). In this paper, we focused on the effects of fiscal consolidation on regional economic resilience.

The main result of the paper is that fiscal consolidation and regional economic resilience are negatively correlated. Moreover, we observe that the negative effect of taxation is higher than the positive effect of public spending. However, the effect of the level of government expenditure on regional economic resilience depends on the economic cycle. Intuitively, this happens because higher share of government expenditure means higher dependency on public sector and thus, when government adopt a fiscal consolidation, it is not possible to be compensated by private sector in the short period.

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