

WHO CARES ABOUT REGIONAL INEQUALITIES? EFFECTS OF FISCAL CONSOLIDATION

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Abstract

The most recent global economic crisis and the concerns about long-term (un)sustainability of public finances has supported the implementation of budgetary consolidation measures. Although there are relatively large number of papers investigating the impact of fiscal consolidation on different aspect of economy this paper represent unique attempt of investigating the effects of fiscal consolidation on regional inequalities.

We test the hypothesis that in the period of fiscal consolidation, when some spending cut and/or tax hikes, less developed regions are not in position to protect themselves against undesired redistributive policies which put them in more disadvantaged position and increase regional inequalities.

In empirical part of the paper we explore the impact of fiscal consolidation on regional inequalities on national levels among 13 EU member countries for period 1995-2009. Two groups of variables are particularly important for this study: measure of regional inequality and fiscal consolidation. Due to fact that recent literature recognizes problems with using cyclically-adjusted primary budget balance (CAPB) as a measure for fiscal consolidation we extend regional empirical literature by using a new database of fiscal consolidation that successfully tackles all this issues.

The results indicate that fiscal consolidation led by tax hikes increases regional inequalities and that fiscal consolidation led by spending cuts doesn't have significant influence on regional inequalities. Finally, the paper highlights that fiscal consolidation is not only the matter of the public debt levels or economic growth, but also important regional issue.

Keywords: Regional inequalities, Fiscal consolidation, European Union

JEL classification: R12, E62, H23

1. Introduction

The financial turmoil that emerged in 2008 led to the implementation of the large fiscal stimulus programs which, combined with cyclical revenue losses, resulted in sharp increases in budget deficits in the large number of countries. The increasing budget deficits with the uncertainty regarding the economic path resulted with the concerns about long-term (un)sustainability of public finances. Thus, policy makers have decided to implement budgetary consolidation measures hoping that this will bring a normalization of the debt growth.

However, fiscal consolidation doesn't have only influence on the public debt levels, but also on the different aspects of economy. This issues have been recognized by researchers that have published large number of papers looking at the potential impact on economic growth (e.g. Castro 2007, 2011, Heim 2010a, 2010b, Afonso and Jalles, 2011). Recently, special attention have been dedicated to the impact of fiscal consolidation on distribution issue. In first place, researches focused at the income distributional effects of fiscal policy. They find evidence that net government spending reduces income inequality (Wolff and Zacharias, 2007) or that lower public expenditure is linked with the increasing income inequality (Bertola, 2010). Only a few studies have looked directly on the influence of the specific action in fiscal policy, fiscal consolidation on income distribution. Smeeding (2000) specifies that fiscal consolidation result with the increase in income inequality and Agnello and Sousa (2012) find that income inequality significantly rises during period of fiscal consolidation, especially if the fiscal policy is driven by spending cuts. At this basis, it is obvious that there are relatively large number of evidence that fiscal consolidation have significant impact on income distribution.

At same time regional dimension of the fiscal consolidation have remained unexplored. Traditionally argument why we care for “regional issue” has two dimensions, theoretical and empirical. Theoretical dimension includes two fundamental explanations: economic efficiency and social equity (Gardiner et al., 2010). Economic efficiency can be disturbed by persistent regional disparities since the underutilization and underperformance of labour and capital in less prosperous regions mean that national wealth is lower than it could otherwise be if those resources were fully and more productively employed. (p 2, Gardiner et al., 2010). Second reason, social equity, has a motivation in the belief that individuals should not be seriously and systematically socially disadvantaged with respect to the basic needs (e.g. job opportunities, housing conditions, access to public services, Gardiner et al., 2010). Finally, regional inequalities tend to increase socio-political instability and have a negative impact on economic growth (e.g. Alesina and Perotti, 1996, Dutt and Mitra, 2008, Kim 2008). Empirical dimension involves the large number of studies that indicate that level of the regional inequalities didn't decrease in the world, especially in the world largest economy, EU (e.g. Boldrin and Canova, 2001.; Canova, 2004; Magrini, 2004; Petrakos and Artelaris 2009, Petrakos, 2009, Doran and Jordan, 2013). At same time it seems to be little consensus on a list of effective policy instruments which may reduce regional inequalities (Kim, 2008). This can be, at least partially, explained by the fact that almost all fiscal policy measures have influence on the regional inequalities and that only right combination of the policy measures can be successful. Considering the theoretical and empirical dimension of the “regional issue” and lack of effective policy instruments the paper offers motivation for analyzing the influence of the fiscal consolidation, as a recently very popular measure among national policy makers, on regional inequalities.

The rest of the paper is organized as follows. In the next section, we give a brief summary of the previous works on regional inequalities, fiscal consolidation and present the institution for the influence of fiscal consolidation on regional inequalities. In section 3 we present data and empirical methodology. We represent empirical results and conclusion in sections 4 and 5.

2. Literature Review

For understanding regional inequalities it is necessary to stress that the economic theory offers different classes of models which posses different policy implications for dealing with regional inequality.

Arguments in favour of convergence are given by the neoclassical growth with exogenous technological change model (e.g. Solow 1956, 1994). Depending on the assumptions on preferences and demography, this group of models predict unconditional or conditional convergence. Thus, the role of government involvement is relatively limited to infrastructural investments which affect the mobility of goods, labour and other factors (Kim, 2008) On the other hand, divergence is initiated in the theory of endogenous growth (Romer, 1986, 1990) and the “new” theory of international trade triggered by Krugman (1991a) and Krugman (1991b) and Venables (1995) that has motivated so-called models of “new economic geography” (e.g. Krugman, 1991a, 1991b, Fujita and Krugman, 1995, Fujita et al., 1999). The “New economic geography” models based on imperfect competition and increasing returns due to “cumulative causation” forces, self-enforcing nature of increasing returns and inefficient equilibrium market allocations highlight the significantly higher potential for government intervention (p. 9, Kim, 2008). Obviously, these models by emphasizing significance of the fiscal policy actions offer motivation for the investigating the role of fiscal consolidation in the paper.

To deal properly with this issue we should firstly define the fiscal consolidation phenomena. It should be recognized as a policymakers' intentions to reduce the budget deficit and not by a response to prospective economic conditions (Devries et al., 2011). Therefore, except the cases when governments introduce fiscal consolidation measures based on a desire to reduce the budget deficit this phenomena also include the cases when measures have been followed by an adverse shock that distracted countercyclical discretionary stimulus. At same time, fiscal consolidation should not enclosed the cases when the motivation for cutting government spending or raising taxes is restraining domestic demand. In cases when fiscal

consolidation is offset by fiscal actions not primarily motivated by cyclical fluctuations, such as a tax cut motivated by long-run supply-side considerations, the sum of the measures should be computed and, if the overall change in policy yields budgetary savings, consolidation should be noted. (p. 5, Devries et al., 2011)

From this point of view, the often used concept in the literature that identifies the fiscal consolidation by using the statistical concept such as the increase in the cyclically-adjusted primary budget balance (CAPB) can be problematic (Devries et al., 2011, Agnello and Sousa, 2012). 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. Moreover, 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). Also, 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 and Melitz, 2008; Agnello and Sousa, 2012). Last but not the least, the empirical evidence suggests that elasticities of budgetary components with respect to output can vary over time, the standard methods imply that these elasticities are treated as constant (Jaeger and Schuknecht, 2007, Agnello and Sousa, 2012).

Thus approach introduced by Devries et al. (2011) that has been constructed on similar approaches by Ramey and Shapiro (1998), Ramey (2011), and Romer and Romer (2010) has been implemented recently. This narrative approach identifies episodes of fiscal consolidation based on policy actions motivated by deficit reduction and not looking at fiscal outcomes. As a result the data has been constructed by examining accounts and records of what countries were intending to do at the time of publications (such as the IMF Recent Economic Developments reports, the IMF Staff Reports, or the OECD Economic Surveys) 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, Devries et al. 2011) There are several advantages of this method comparing to CAPB method. At first place it 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)

Finally, what is the intuition behind the relationship between fiscal consolidation and regional inequalities. Starting point for our intuition is interpretation of the paper by Tiebout (1956) according to which more developed regions can use different policy instrument at national level to protect themselves against, from their perspective, undesired redistributive policies. This can be especially problematic when regional inequalities are rising and when situation may require intervention from the national level of government in order to provide a higher level of equalization of resources across different regions. For example it can be manifested on the progressivity of the tax system or in the composition of public expenditures. Obviously, if the more developed regions can shape fiscal policy at national level to protect themselves it may result with lower levels of help for less developed regions. Also when regional inequalities are rising more developed regions can seek for higher level of decentralization so that they can protect their income from undesired redistributive policies on national level. Although the literature recognizes that almost all fiscal policy measures have influence on regional inequalities (Kim, 2008) the effects of the abovementioned intuition has been analyzed, up to authors knowledge, only for the link between decentralization and regional inequalities (e.g. Ezcurra and Pascual, 2008; Rodríguez-Pose and Ezcurra, 2010, Lessmann, 2012; Ezcurra and Rodríguez-Pose, 2013). At same time, the influence of the fiscal consolidation on the regional inequalities stays unexplored.

3. Methodology And Data

Before explaining the methodology, we will first describe the data set. Data has been collected for 13 EU member countries (List of countries is available in Appendix 1) from

Eurostat database, World Development indicators and from new dataset of fiscal consolidation constructed by Devries et al (2011) for period 1995-2009. Two groups of variables are particularly important for this study: measure of regional inequality and fiscal consolidation.

Regional inequalities has been measured by the indicator calculated from regional GDP figures based on the European System of Accounts (ESA95). It represents sum of the absolute differences between regional (NUTS II) and national GDP per inhabitant, weighted with the share of population and expressed in percent of the national GDP per inhabitant. This measure in line with standards introduced by Portnov and Felsenstein (2010) which are used to test sensitivity of commonly used (income) inequality measures to changes in the ranking, size and number of regions into which a country is divided for country i in year t .

As it has been already stressed the data from narrative approach by Devries et al. (2011) has several advantages comparing to CAPB method. Thus for the measuring fiscal consolidation this approach introduced by Devries et al. (2011) has been implemented in the paper.

The assumption that regional inequalities have been influenced only by fiscal consolidation is restrictive and empirical findings can suffer from omission of other important determinants.

In order to address this issue, we have tried to include other determinants that literature has recognized as a important by considering relevant papers such as Barrios and Strobl (2009), Rodríguez – Pose and Ezcurra (2010), Lessman (2012) and Ezcurra and Rodríguez-Pose (2013) and at same taking into consideration our data limitations¹.

The first explanatory variable involves the influence of the trade openness on regional inequalities and it has been in first place established by the new economic geography (Daumal, 2010) Although the models of the new economic geography indicate that different outcomes depend on the theoretical assumptions employed in each case, they all confirm the relevance of the trade openness for regional inequalities (e.g. Krugman and Livas Elizondo, 1996; Paluzie, 2001, Crozet and Koenig-Soubeyran's, 2004, Brulhart et al., 2004, Brulhart, 2009, Rodríguez-Pose, 2012). Empirical studies, on single country and cross-country level, also confirm importance of trade openness, but without presenting uniform direction and dimension of this relationship (e.g. Daumal, 2010. Brulhart, 2009, Rodríguez-Pose, 2012). One of the reasons reason why the theoretical and empirical relationship between greater openness and regional inequalities remains ambiguous can be explained by the fact that openness as such may not have same discernible effects on regional inequalities due to different macroeconomic policies, level of development or type of economic institutions (Milanovic, 2005). The lack of uniform empirical results can also have foundation in the use of imprecise measure for trade openness. Alcalá and Ciccone (2004) and Barrios and Strobl (2009) have criticized the use of ratio of total trade (import+export) to GDP in order to measure trade openness and propose instead alternative indices: the real openness index, which is the sum of imports plus exports expressed in common currency (here the euro) relative to the GDP expressed in PPP terms. Thus, we use the indicator expressed as total imports and exports in current US\$ divided by GDP in PPP current US\$

The second variable to be considered is a decentralization. Since the decentralization has become global trend over the last decays, the interest on the effect of decentralization processes increased considerably, mostly for the link between decentralization and economic growth (e.g. Davoodi and Zou, 1998; Thießen, 2003; Iimi, 2005; Rodríguez-Pose and Ezcurra, 2011). In view of the fact that the recent wave of decentralization has been driven by the rationale that decentralized governments have superior economic efficiency (Rodríguez – Pose and Ezcurra, 2010) it has brought special attention on the role of decentralization for regional inequalities (e.g. Ezcurra and Pascual, 2008; Rodríguez-Pose and Ezcurra, 2010, Lessmann, 2012; Ezcurra and Rodríguez-Pose, 2013). The starting position in theoretical literature points Oates theorem on fiscal decentralization according to which differences in

¹ Due to the lack of comparable and reliable data on variables than will empirically include all aspects of the recent NEG models and the second reaching beyond the purely market access driven framework across the 28 countries

preferences about public goods across regions will require decentralized provision of such goods in order to improve regional economic performance. It should be also stressed that several authors offered different perspective indicating that decentralization might cause coordination problems, excessive regulation, higher administrative costs or poor quality (Tanzi, 1996) or increase corruption and cronyism undermining potential efficiency gain (Lessmann and Markwardt, 2010). Also there are some doubts about what kind of decentralization matter for regional inequalities (e.g. Ezcurra and Rodriguez – Pose, 2013) Despite theoretical doubts, empirical studies offer empirical evidence for significant influence of the decentralization on regional inequalities (e.g. Rodriguez – Pose and Ezcurra, 2010, Lessmann, 2012, and Ezcurra and Rodriguez – Pose 2013). Thus, in order to control for the possible influence of decentralization we use the indicator expressed as the sum of the shares of local and state revenues as a percentage of national GDP.

The last control variable emphasizes the relevance of the level of development in explaining regional disparities. This interest goes back to the pioneer work of Williamson (1965) in which author indicates that regional inequality increase first and then systematically decreases in the following stages of development. The theoretical explanation can follow two basic group of models (Ezcurra and Rodriguez – Pose 2013). In first one, in the early stage of development a economic activity tends to be located in small number of regions due to centripetal agglomeration forces (Baldwin and Martin, 2004). After some level of concentration, centrifugal agglomeration forces prevails suggesting that developed economies benefits of the spatial dispersion of economic activity. (Thisse, 2000). The neoclassical growth model due to existence of decreasing returns to capital offers similar conclusion (Barro and Sala-I-Martin, 1995). Considering abovementioned, our model includes in the list of control variables the national GDP per capita.

There is also a need to control for other factors which may affect the relationship between regional inequality and fiscal consolidation². However, due to lack of comparable and reliable data for the countries covered in the analysis, they cannot be included and tested. We therefore have to assume that these variables are not systematically correlated with any of the other regressors, implying that there is no omitted variable problem in leaving out this conditioning interaction.

Like most of economics relationship, we assumed that regional inequalities are dynamic relationship which means that its current value depends on its past values. Thus we introduce equation which includes dynamic behavior of dependent variable characterized by the presence of lagged dependent variable among the regressors:

$$RIit = \alpha_i + \beta_1 RIit-1 + \beta_2 FCit + \beta_3 GDPcpit + \beta_4 TOit + \beta_5 DECit + \epsilon_{it} \quad (1)$$

- **RIit** represents the level of within-country regional inequality in country *i* in year *t*, measured by the sum of the absolute differences between regional (NUTS II level) and national GDP per inhabitant, weighted with the share of population and expressed in percent of the national GDP per inhabitant. The dispersion of regional GDP is zero when the GDP per inhabitant in all regions of a country is identical, and it rises if there is an increase in the distance between a region's GDP per inhabitant and the country mean.
- **FCit** stands for the proxy that should capture the fiscal consolidation by examining accounts and records of what countries were intending to do at the time of publications and by recording the budgetary effect of the fiscal consolidation measures in the year in which they come into effect for country *i* in year *t*.
- **GDPcpit** denotes GDP per capita, PPP (constant 2011 international \$) for country *i* in year *t*.

² For example regional industrial specialization (Kenen, 1969, Barrios and Strobl, 2009) or institutions (Farole et al., 2011, Rodríguez-Pose, 2013, Muštra and Škrabić, 2014) may affect relationship between regional inequality and fiscal consolidation.

- **TOit** represents the total imports and exports in current US\$ divided by GDP in PPP current US\$ for country *i* in year *t*.

DECit stands for the proxy that should capture decentralization measured by the indicator expressed as the sum of the shares of local and state revenues as a percentage of national GDP for country *i* in year *t*.

eit is constant term and it is assumed that *eit* are $IID(0, \sigma_e^2)$; identically and independently distributed error terms. Also it is assumed that country specific part of error term α_i are $IID(0, \sigma_\alpha^2)$; identically and independently distributed error terms.

In that case the recently used fixed effect estimator³ is biased and inconsistent because with inclusion of lagged dependent variable $RDit-1$ in model, it becomes correlated with α_i . Even though fixed effect estimator becomes consistent when *T* gets large, bias doesn't vanish as number individuals increases (Nickel, 1981). Therefore, in our case fixed effect estimator is not appropriate. Additionally random effect estimator is also biased and inappropriate for estimation of equation (2)⁴.

So for our research it is appropriate to perform some estimator for dynamic panel model. Considering the papers by Arellano and Bond (1991), Arellano and Bover (1995) and Blundell and Bond (1998) we use Blundell and Bond estimator. Number of instruments used in the models doesn't produce significant bias and it doesn't reduced significantly quality of Sargan test⁵. The validity of the instruments used in model is also tested using the Sargan test. So, result of Sargan shows that instruments are valid and that in specified model there is not problem of endogeneity.

4. Empirical Results And Discussion

The empirical research starts by testing the influence of fiscal consolidation for regional inequalities in selected EU countries but not only the size of the fiscal consolidation program (in percentage of GDP), but also and its composition. In particular, is there a difference if fiscal adjustments are led by spending cuts or by tax hikes.

For that purpose we estimate three versions of model given by equation (1) with difference that variable **FCit** represents not only total fiscal consolidation (**FC_Total**) (Model 1) but also it represent in Model 2 fiscal adjustments led by spending cuts (**FC_Spend**) and in Model 3 fiscal adjustments led by tax hikes (**FC_Tax**) for country *i* and year *t*.

All aforementioned econometric details have been integrated in our analysis with the results present in Table 1.

Before introducing main findings we should indicate that the coefficients on control variables are all statistical significant. Deviation of coefficients on control variables from expected signs is present only in Model 2 but explanation for that case can be easily provided. More precisely, statistically significant positive effect of decentralization for regional inequalities could be consequences of fact that we use proxy that in first place captures fiscal dimension of the decentralization (measured as the sum of the shares of local and state revenues as a percentage of national GDP for country *i* in year *t*) and not the other dimensions of decentralization that are important for the regional inequalities (e.g. Lessmann, 2012).

Finally, by focusing on the impact of fiscal consolidation on regional inequalities in our three models (MODEL 1, Model 2 and Model 3), we can indicate particularly interesting and relevant results.

Table 1. The results of one step Blundell Bond dynamic panel estimator

Variable	Model 1	Model 2	Model 3
Const.	6.380286***	6.650567***	6.327571***

³ Fixed effect estimator is Least Squared Dummy variable estimator.

⁴ For more about bias of Random effect estimator please see Baltagi (2008)

⁵ Bowsher (2002) showed that merely keeping the instrument count below *N* does not safeguard Sargan test (test for the validity of instrumental variables).

Lagged RI	.7746542***	.7642432***	.775718***
FC_total	.0829731		
FC_Spend		-.0521533	
FC_Tax			.1612488*
<i>GDPcap</i>	-0.0000732***	-.0000683***	-0.0000728***
TO	.1101758**	.0854265*	.1091481**
DEC	-.1455225**	0.377292*	-.1412186**
Number of observations	45	45	45
Sargan test (p-value)	.5422	.4613	.5674
*, **, ***- indicate significance at 10%, 5% and 1% level			
<i>Source: Calculation by authors</i>			

In model 1, where we test the importance of the total fiscal consolidation on regional inequalities, the total fiscal consolidation increases regional inequalities but without relevant level of significance. In model 2 the effects of fiscal adjustments led by spending cuts decreases inequalities, but again without relevant level of significance.

At same time, coefficient on fiscal consolidation led by tax hikes (Model 3) is significant and positive which implies that higher taxes in the process of fiscal consolidation lead to the higher levels of regional inequalities. It seems that more developed regions feel less negative influence of the process of fiscal consolidation (in case that fiscal consolidation is led by tax hikes) than less developed regions. Explanation for this results can be two-sided. It can suggest that more developed regions have more resistant economy that can better adapt to the, from their perspective, negative challenges of the fiscal policy. At same time it can be a signal how fiscal policy is shaped, or to be more precisely, how more developed regions can modified fiscal policy instruments at national level to protect themselves against, from their perspective, undesired redistributive policy.

The empirical results provide new perspective for the literature that indicates that fiscal consolidation have relatively stronger negative effect for individuals with lower income (Ahrend et al. 2011; and Rawdanowicz et al, 2013). Moreover, if we take into consideration that share of the people with lower income is higher in less developed regions, it seems that fiscal consolidation should also have negative effect on regional level and increase the regional inequalities.

More precisely, Rawdanowicz et al (2013) indicate that large share of general government spending and revenues has a direct influence on household real disposable incomes. Ahrend et al (2011) in their paper on the sharing of macroeconomic risk in society have found evidence that strong fiscal consolidations have reduced the income share of the two lowest quintiles of the income distribution. Taking into consideration that changing the structure and the size of the government spending is more relevant for individuals with lower income and that share of people with lower income is higher in less developed regions, it is easy to recognize how spending cuts will not help reducing regional inequalities.

On other hand, increasing tax revenues should hurt more people with higher incomes, especially if the structure of tax hikes doesn't change dominant structure of public revenues. (Rawdanowicz et al (2013) indicate that personal and corporate income taxes and social security contributions represents some 60% of total revenues on average and consumption taxes about a third of total revenues).

However, our results indicate tax hikes hurts relatively more less developed regions and increase regional inequalities. Obviously, this indicate that less developed regions are less protected in case that fiscal consolidation is led by tax hikes, or in other words, that more developed regions can easily modified fiscal consolidation led by tax hikes at national level to protect themselves.

Last but not the least additional value of the results in the paper make the prospect for further research much clearer. Namely, empirical findings for this paper should be tested not only for developed countries but also for developing countries where higher income groups or regions can even easier shape fiscal consolidation to protect themselves against undesired

redistributive policies. Also it should be the significant signal that fiscal consolidation is not only the matter of the public debt levels or economic growth, but also important regional issue.

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Appendix 1.

List of the countries included in research

1. Austria
2. Belgium
3. Denmark
4. Finland
5. France
6. Germany
7. Ireland
8. Italy
9. Netherlands
10. Portugal
11. Spain
12. Sweden
13. United Kingdom