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The Asymmetric Impacts of Fiscal Consolidation on Poverty and Social Exclusion: Regional Perspective

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Abstract. The presented paper contributes to the current state of discussion about the effects of fiscal policy on economic activity via three key points. It focuses on the effects of fiscal policy on poverty and social exclusion instead of on broad measures of economic performance. The analysis is performed on the regional level of some EU national economies, and it focuses on possible asymmetric impacts according to the level of the economic performance of the regions regarding the national levels. The results show that fiscal restrictions, both expenditure-oriented and income-oriented, have significant negative impacts on both poverty and social exclusion. Especially as far as social exclusion is concerned, the impacts on the already underperforming regions seem to be even more profound. When poverty is considered as a measure of inequality instead of social exclusion, revenue-oriented fiscal restrictions seem relatively more harmful than expenditure-oriented fiscal consolidations as far as the underperforming regions are concerned.

JEL classification: E62, I32, R00

Key words: EU, fiscal consolidation, GMM, NUTS2, poverty, social exclusion

Statements and Declarations

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1 Introduction

As a reaction to the COVID epidemic, European governments chose to close down significant parts of their economies in 2020 and 2021, and in an attempt to mitigate negative economic shocks they resorted to massive fiscal expansions, especially, via the expenditure side of the budgets. As a result, general government debt burdens have increased and are expected to increase over the foreseeable future. In the wake of the previous economic crisis, the Great Recession, European governments agreed to set up various forms of so-called debt brakes, incorporated in laws, which oblige governments to proceed with austerity measures once they start approaching predefined limits of general government debt. Given the current economic development, fiscal restrictions are expected in the coming years.

Regarding austerity policies applied in the wake of the Great Recession, fiscal restrictions may have had rather disastrous impacts on both economic activity and wealth (Jordà, Taylor 2016, Fragetta, Tamborini 2019). Moreover, they may well have missed the main target, which was a decrease in public indebtedness (Fatás, Summers 2018). These issues are presented in more detail in the following section. While there is a large body of both theoretical and empirical sources related to these questions on the level of national economies, there is a lack of empirical evidence as far as regional economies are concerned.

Usually, the focus is placed on economic activity. To broaden the current state of knowledge, the presented paper not only focuses on the effects of fiscal policy on regional economies, which is rare, but especially puts the spotlight on the effects of fiscal policy on poverty and social exclusion. These measures of economic outcomes are often kept out of economic analysis altogether. It is shown in the discussion of the results that the long-term economic development of the regions is to be expected to be at risk when poverty or social exclusion increases. In the following section, it is also briefly discussed that increasing poverty and social exclusion may also lead to political instability (Dijkstra et al. 2020).

The discussion below shows clearly that negative economic effects of fiscal consolidations on the regional level are indeed to be expected so that in qualitative terms the results presented in the empirical part are not surprising (Auerbach, Gorodnichenko 2017). However, what is novel is the distinction between the impacts of the business cycle and discretionary fiscal policy and the role of persistent poverty or social exclusion. It is shown that the negative impacts of fiscal consolidations are found to be more profound in the case of already underperforming regions. This, in turn, means that austerity measures add to the observed discrepancies between regional economies.

More specifically, this study is conducted on a sample of NUTS2 regions of the following countries: Czechia, Estonia, Spain, Italy, Cyprus, Latvia, Luxembourg, Hungary, Malta, and Slovakia. The fact that the sample of countries does not include all or most EU economies is due to insufficient availability of data on poverty and social exclusions at the regional level. The generalized method of moments is employed to investigate the relationship between fiscal policy and the selected poverty indicators.

The paper is structured as follows: Section 2 sheds light on the impacts of fiscal restrictive policy from the point of view of national economies and it also presents some important findings regarding regional economies that are partially reflected in the construction of the empirical model; Section 3 provides information on the data and empirical approach; Section 4 presents the estimates and then places the results in the context of existing studies, especially focused on economic growth; Section 5 summarizes the main findings.

2 Regional Development and Effects of Fiscal Policy

On the level of national economies, there is substantial evidence published in the aftermath of the Great Recession which shows that fiscal restrictions during economic downturns have strong negative impacts on economic activity.

Canzoneri et al. (2016) show that financial frictions, price rigidity, and the severity of recession increase fiscal multipliers. On the sample of OECD countries, Riera-Crichton et al. (2015) estimate that spending multipliers may reach well over one in periods of extreme recessions. In this context, Bilbao-Ubillos, Fernandez-Sainz (2014) show, as many others did, that the original reasoning behind the push of fiscal consolidations in the EU had counted on much lower fiscal multipliers. Deleidi et al. (2020) and Gabriel et al. (2020) confirm in the sample of selected EU countries, that public investment multipliers may have long-term effects on economic activity and that the Great Recession gave rise to an increase in them. The long-term negative effects of austerity measures in the aftermath of the Great Recession on GDP growth in the EU and OECD are also presented by Jordà, Taylor (2016) and Fragetta, Tamborini (2019). Fiscal consolidations in the EU were, in general, revenue-oriented: Van der Wielen (2020) estimates that they had a medium-term negative impact on output and that the associated multiplier was greater than one.

The fact that economic development may be severely hampered by fiscal consolidation can result in so-called self-defeating consolidations (DeLong, Summers 2012). Fatás, Summers (2018)Fatás and Summers (2018) show that self-defeating consolidations may well have been the reality in the case of EU countries. On the sample of OECD and EU countries, the same result is implied by Auerbach, Gorodnichenko (2017). The context of fiscal consolidations in the EU is quite peculiar, as argued by Tamborini, Tomaselli (2020). They show that the policy was driven predominantly by compliance with established fiscal rules with little concern about actual market conditions.

A fundamental contribution to the analysis presented in this paper comes from Coady, Gupta (2012) who, on a large sample of world economies, show that fiscal consolidations bring about rising income inequality. The reason is that fiscal consolidations are accompanied by decreasing wage share, which, given the relatively higher share of low-income households in the overall wage share, leads to higher income inequality. The other important driver is that increasing unemployment typically first hits those with low skills and lower incomes.

Fiscal consolidations are therefore expected to have negative impacts on regional poverty and social exclusion. The empirical analysis below shows how big the impact is, and it also sets it apart from the impact of the business cycle and hysteresis in the sense of the persistence of poverty and social exclusion.

Most empirical analyses concerned with the economic development of regional economies are focused on long-term issues, especially the question of convergence/divergence of economic development. Castells-Quintana et al. (2015) link the observed increasing inequality at the level of EU regions to economic growth promoted by openness, technological change, and tertiary specialization. Gómez Tello et al. (2020) note that regional disparities in the EU are on the rise in the sense that quite a significant portion of regions are closer to the average but the smaller group of the richest regions move further and fast above the average. Concerning the previously cited paper, the main reason might be summarized as technological change.

Crescenzi, Rodríguez-Pose (2012) identify innovation capacity, the capacity to attract migrants, and some population characteristics as the key factors behind regional economic growth. Innovation capacity and technology are found to be important determinants of resilience on the regional level in the aftermath of the Great Recession in the papers by Bristow, Healy (2018) and Cappelli et al. (2021).

An important contribution regarding the purpose of this paper comes from Hauptmeier et al. (2020), who show that the effects of monetary policy are highly asymmetric. Poorer EU regions register stronger negative and more persistent impacts of restrictive monetary policy. The question of asymmetric regional impacts in the context of fiscal policy is posed by Piacentini et al. (2016) and Lucidi (2021), who focus on Italy. Piacentini et al. (2016) show that fiscal consolidation adopted in the wake of the financial crisis had more significant negative impacts on the poorer southern regions of the Italian economy than on the northern regions. The analysis of Lucidi (2021) supports their results.

The existing literature on the economic development of regions pays very little attention to the effects of economic policy in terms of monetary and fiscal policy. Therefore, the first goal of the paper is to show quantitatively what the impacts of fiscal policy on regional development in terms of social exclusion and poverty are. The second goal of this paper is to show that the impacts of fiscal policy on poverty and social exclusion depend on their initial levels. The substantiation comes from the analysis of regional impacts of monetary policy and indirectly from the many analyses concerned with long-term growth patterns at the regional level.

Seeing these asymmetries is also crucial from the point of view of a broader socioeconomic analysis. Dijkstra et al. (2020) and Winkler (2019) show that the observed persistent underperformance of some regions promotes social discontent with the expected inclination towards political instability. Using the household survey conducted by the Austrian Central Bank, Belabed, Hake (2018) show that higher income inequality is associated with higher distrust in national government institutions on a sample of countries from Central, Eastern, and Southeastern Europe.

3 Data and Econometrical Analysis

The econometrical model is set up to explain the behavior of the at-risk-of-poverty rate and the percentage of people at risk of poverty or social exclusion in the EU NUTS2 regions. The yearly data comes from the Eurostat and Ameco databases (Eurostat 2022a, Ameco 2022). The sample runs from 2005 to 2019. The adjusted sample, shown in Tables 2 and 3, goes from 2007 to 2019. The adjustment comes from first-differenced data and lags included in the empirical model. The at-risk-of-poverty rate and the percentage of people at risk of poverty or social exclusion come from the Eurostat database and are defined as follows (Eurostat 2022b):

- The at risk-of-poverty rate (below designated as poverty) is defined as a share of people with an equivalised disposable income below the at risk-of-poverty threshold, which is set at 60 % of the national median equivalised disposable income. The equivalised disposable income is the total disposable income of a household divided by the number of household members converted into equivalised units, which means weighting each member by their age.
- The percentage of people at risk of poverty or social exclusion (below designated as exclusion) is a broader measure. It includes all people at risk of poverty and also those who are socially materially deprived or who live in a household with very low work intensity. A person designated as socially deprived means that they cannot afford at least three of the following items: to pay rent/mortgage/utilities, to keep the home adequately warm, to face unexpected expenditures, to eat meat or proteins regularly, to go on holiday, a television set, a washing machine, a car, a telephone. A household with very low work intensity is such whose members of working age worked less than 20 % of their total potential during the previous 12 months.

Since both measures are expected to show a great deal of persistence over time because they are influenced by wealth, which, as a typical stock variable, is persistent, the model should take account of this feature.

The key question is to what extent these two measures are influenced by the business cycle, on the one hand, and discretionary fiscal policy, on the other. The business cycle is captured by year-on-year relative changes in gross domestic product in purchasing power standard per inhabitant (below designated as output). Therefore, it is not expressed by output gap since output gap is by definition stationary and, as explained further below, the model is estimated in first differences. The measure of the business cycle includes, among others, the effects of monetary policy and automatic stabilizers. Discretionary fiscal policy is captured by cyclically adjusted net lending without interest payments, cyclically adjusted total revenue, and cyclically adjusted total expenditure without interest payments. These variables are referred to as net lending, revenues, and expenditures, respectively. All three variables are related to the sector of the general government and are expressed as a percentage of gross domestic product. These data are from the Ameco database. The differences in these variables enable us to capture the effects of discretionary fiscal policy. Positive values of differenced series of net lending and total revenue and negative values of differenced series of total expenditure represent fiscal restriction.

Lessmann, Seidel (2017) and Crescenzi, Rodríguez-Pose (2012) present some large analyses of regional growth and inequality, which for the purpose of this paper, was a useful source of information as to what variables might be taken into account as control variables. However, the focus in this paper is different. It is not concerned with long-term economic development, and many control variables used in the cited papers would be of little or no relevance also because they changed quite negligibly given the sample in question.

Two control variables used as instruments are employed: the dependency ratio and the share of higher levels of education attained in the population. The dependency ratio is defined as a ratio of those of aged up to 14 and over 65 to those of age between 15 and 64. The share of higher levels of attained education is a ratio of those who attained levels

Table 1: Summary of NUTS2 Regions Included in Stage 1 (Table 3) and Stage 2 (Table 4) of the Analysis

Country	NUTS 2	Included	Country	NUTS 2	Included
Czechia	CZ01	1	Italy	ITH1	1
Czechia	CZ02	1, 2	Italy	ITH2	1
Czechia	CZ03	1, 2	Italy	ITH3	1
Czechia	CZ04	1, 2	Italy	ITH4	1
Czechia	CZ05	1, 2	Italy	ITH5	1
Czechia	CZ06	1, 2	Italy	ITI1	1, 2
Czechia	CZ07	1, 2	Italy	ITI2	1, 2
Czechia	CZ08	1, 2	Italy	ITI3	1
Estonia	EE00	1	Italy	ITI4	1
Spain	ES11	1, 2	Italy	ITF1	1, 2
Spain	ES12	1, 2	Italy	ITF2	1, 2
Spain	ES13	1, 2	Italy	ITF3	1, 2
Spain	ES21	1	Italy	ITF4	1, 2
Spain	ES22	1	Italy	ITF5	1, 2
Spain	ES23	1	Italy	ITF6	1, 2
Spain	ES24	1	Italy	ITG1	1, 2
Spain	ES30	1	Italy	ITG2	1, 2
Spain	ES41	1, 2	Cyprus	CY00	1
Spain	ES42	1, 2	Latvia	LV00	1
Spain	ES43	1, 2	Luxembourg	LU00	1
Spain	ES51	1	Hungary	HU21	1, 2
Spain	ES52	1, 2	Hungary	HU22	1, 2
Spain	ES53	1	Hungary	HU23	1, 2
Spain	ES61	1, 2	Hungary	HU31	1, 2
Spain	ES62	1, 2	Hungary	HU32	1, 2
Spain	ES63	1, 2	Hungary	HU33	1, 2
Spain	ES64	1, 2	Malta	MT00	1
Spain	ES70	1, 2	Slovakia	SK01	1
Italy	ITC1	1	Slovakia	SK02	1, 2
Italy	ITC2	1	Slovakia	SK03	1, 2
Italy	ITC3	1	Slovakia	SK04	1, 2
Italy	ITC4	1			

Notes: Region coding corresponds to the practice of Eurostat, included in 1 and/or 2 means included in the first and/or the second stage of the analysis.

of education higher than lower secondary aged between 25 and 64 to the total population of the same age.

The dependency ratio is extremely important from the point of view of discretionary fiscal policy. Fiscal restriction oftentimes relies on increasing indirect taxes and cutting social welfare. Regions with a higher share of the retired population and a higher share of children are thus expected to be hit relatively more than those with a higher share of the economically active population where the percentage of households with relatively higher income must be greater.

The higher share of higher levels of attained education means that the risk of losing a job during a period of fiscal restriction is expected to be lower than in regions with lower levels of attained education. The variable is called the education ratio.

All of the EU NUTS2 regions were considered; however, many countries do not supply the data on at-risk-of-poverty rates or social exclusion on the regional level at all or have started only recently. The panel includes 63 regions in total. The regions included are presented in Table 1.

Table 2 presents the statistical characteristics of the data series. The series may be considered as non-stationary in levels and stationary in first differences. The Breitung unit

Table 2: Statistical Properties of the Data

Series/Statistics	Mean	Standard deviation	Normality	Unit root – series in levels	Unit root – series in 1st differences
Poverty	17.38	8.82	136.33***	0.38	-10.94***
Exclusion	24.52	10.45	88.46***	2.31	-9.85***
Output	10.03	0.37	37.09***	0.32	-3.81***
Net lending	0.06	2.60	107.21***	1.17	-3.87***
Expenditures	41.85	2.82	28.47***	-1.58*	-8.04***
Revenues	41.91	3.95	65.53***	-1.12	-3.87***
Education ratio	66.22	17.04	58.13***	-0.36	-10.08**
Dependency ratio	49.56	5.72	3.54	13.29	-2.15**

Notes: Poverty (At risk of poverty rate, in %), Exclusion (Percentage of those at risk of poverty and social exclusion, in %), Output (GDP in PPS per inhabitant, logarithm), Net lending (cyclically adjusted net lending of the general government as a percentage of GDP, in %), Expenditures (cyclically adjusted total expenditure of the general government as a percentage of GDP, in %), Revenues (cyclically adjusted total revenue of the general government as a percentage of GDP, in %), Education ratio (share of education levels of 3 and higher of those aged between 25 and 64 in the population aged between 25 and 64, in %), the Dependency ratio (ratio of those aged up to 14 and over 65 to those aged between 15 and 64, in %). Source of the data: Eurostat and Ameco. Normality is tested by the Jarque-Bera test under the null of normal distribution, the unit root is tested by the Breitung test under the null of a unit root.

root test was employed. It assumes a common unit root process across the cross-sections. The Breitung test is less computationally complex than, for example, the Levin-Lin-Chu test, which, given the data limitations with respect to time, makes it more convenient for the purpose of the analysis. The null hypothesis of the Breitung test is that the data contains a unit root process.

The general structure of the empirical model is as follows:

$$y_{i,t} = c_i + \alpha y_{i,t-1} + \delta x_{i,} + \epsilon_{i,t} \tag{1}$$

where c represents constants, y contains the at-risk-of-poverty rate or the percentage of people at risk of poverty or social exclusion, x contains the measure of the business cycle and one of the three measures of discretionary fiscal policy.

Practically in all economic relationships the problem of endogeneity should be suspected. Endogeneity arises due to measurement errors, omitted variables, and interdependencies between the dependent and explanatory variables. Since the true economic model is never known in economics, the problem of omission is always present. As far as simultaneity is concerned, it cannot be ruled out that changes in poverty have effects on the conduct of fiscal policy and, thus, the business cycle. Under such conditions, it would be incorrect to base the estimation on the OLS estimator. Any transformation based on fixed or random effects approaches does not solve the problem as it would entail a positive correlation between the transformed error term and transformed lagged dependent variable. The problem of endogeneity is oftentimes solved by applying instrumental variables. Therefore, this type of model is typically dealt with in the first differences:

$$\Delta y_{i,t} = \alpha \Delta y_{i,t-1} + \delta \Delta x_{i,t} + \Delta \epsilon_{i,t} \tag{2}$$

which have already been shown to be stationary, see Table 2. The estimation of transformation (2) typically rests on a generalized method of moments, GMM, which employs instrumental variables. The Arellano-Bond estimator is used. Dynamic one lag of the measure of the business cycle, the dependency ratio, and the education ratio are used as instruments. Since the number of instrumental variables exceeds the number of estimated parameters, the model is overidentified. This enables testing of the validity of instruments by applying the Sargan-Hansen J-test with the null hypothesis that the instruments are valid.

Table 3: All regions

	Poverty	Poverty	Poverty	Exclusion	Exclusion	Exclusion
Dependent (-1)	0.29***	0.32***	0.28***	0.58***	0.63***	0.63***
Output	0.00	0.01*	-0.01***	-0.08***	-0.07***	-0.09***
Net lending	0.12***	XXX	XXX	0.25***	XXX	XXX
Expenditures	XXX	-0.16***	XXX	XXX	-0.29***	XXX
Revenues	XXX	XXX	0.17***	XXX	XXX	0.30***
J-stat (p-value)	64.02 (0.37)	59.13 (0.51)	61.99 (0.44)	61.92 (0.44)	63.26 (0.40)	62.21 (0.47)
AR(1)	-2.55**	-2.45**	-2.48**	-3.45***	-3.58***	-3.44***
AR(2)	0.71	0.70	0.70	0.69	0.73	0.68
no. of cross-section: 63, adjusted time sample: 2007:2019						

Notes: Variables: Poverty (At risk-of-poverty rate), Exclusion (Percentage of those at risk of poverty and social exclusion), Output (GDP in PPS per capita), Net lending (cyclically adjusted net lending of the general government as a percentage of GDP), Expenditures (cyclically adjusted total expenditure of the general government as a percentage of GDP), Revenues (cyclically adjusted total revenue of the general government as a percentage of GDP). Instruments: dynamic one lag of output, education ratio, and dependency ratio. The J statistic refers to the test of the validity of over-identifying restrictions with the null of the restrictions being valid; p-values show that the null is not rejected in any case. AR(1) and AR(2) refer to the m-statistic of the autocorrelation test in residuals with the null of no autocorrelation. *, **, *** means rejection of the null at a level of significance of 10%, 5%, and 1%, respectively.

A two-step White weighting matrix that is robust to panel-specific autocorrelation and heteroscedasticity is employed. Autocorrelation in the residuals is tested using the Arellano-Bond test for the presence of autoregression in the residuals. Given the fact that the model is estimated in first differences, the Arellano-Bond test for AR(1) shows possible autoregression in the first differences of the residuals. This is generally confirmed and is also expected. The more important is the test for AR(2) autoregression, which indicates whether or not there is autoregression in the levels of the residuals.

The empirical investigation is carried out in two stages. The first stage consists of running the estimation over the whole sample to detect the effects of fiscal policy and also to compare them with those of the business cycle and persistency. The second stage consists of running the estimation only for those regions whose starting position with respect to the economic output was below the country value. More specifically, the second stage considers those regions whose ratio of GDP in PPS per capita to GDP in PPS per capita of the country to which they belong is below 1. A lower cut-off value of the ratio would result in a sample that is too small.

4 Results and Discussion

Table 3 shows the estimates for the whole sample of 63 EU NUTS2 regions. The first lag of the dependent variable, poverty or exclusion, is found to be highly significant and the magnitude of the estimated coefficients points towards the high persistency of the two characteristics. This is much more pronounced in the case of exclusion where the estimated coefficients of lagged dependent variable reach 0.58 or 0.63 compared to 0.29, 0.28 and 0.32 when the measure of poverty is concerned. To put it in a broader context, Chen et al. (2018) show that income inequality in the EU increased especially between 2013 and 2014 and expose that there was a great deal of persistence as far as the overall figure is concerned. This also holds for the at-risk-of-poverty ratio. However, when looking at its structure from the perspective of age groups, there was a dramatic increase in the at risk of poverty ratio between 2008 and 2015 for the age group 18-24. It also increased in the groups of people aged between 25 and 64 years, however, it slightly decreased for those 65 years and older. The estimates given in this paper show that persistence is much higher in the case of the percentage of people at risk of poverty or social exclusion.

The role of the business cycle should be considered insignificant in the case of the at-risk-of-poverty ratio, as the estimates are both/either insignificant and/or very close to zero (0.00, 0.01, -0.01). On the other hand, increases in GDP in PPS per capita tend to decrease the percentage of people at risk of poverty or social exclusion. In quantitative terms, the effect is rather small (-0.08, -0.07, -0.09).

The role of discretionary fiscal policy is statistically significant. Positive changes in cyclically adjusted net lending and revenues increase both the at-risk-of-poverty ratio (0.12 and 0.17) and the percentage of people at risk of poverty or social exclusion (0.25 and 0.30), while positive changes in cyclically adjusted expenditures reduce it (-0.16 and -0.29). The magnitudes of the estimated coefficients show that the impact of fiscal policy is much higher in the case of the percentage of people at risk of poverty or social exclusion.

The results confirm the large body of evidence that shows that the fiscal consolidations that took place in the EU after the Great Recession had a negative effect on the economic development of national economies. Some studies show that the negative effects were long-lasting in nature. This is confirmed by this analysis carried out at the regional level and also shows that the negative effects translated into increased poverty and social exclusion.

Although this paper focuses on poverty and exclusion, which is a different concept from that of income inequality, Staicu (2017), among others, reports a positive relationship between inequality and poverty in a large sample of world economies. These findings are important for the following contextualization of the results of this study.

Anderson et al. (2017) present a large meta-regression analysis concerning the relationship between government spending, or fiscal policy in more general terms, and inequality. The sign of the relationship between government spending and inequality depends on the exact adopted fiscal measures, so that there is no definitive answer from their perspective. However, an important piece of information resulting from their analysis is that they find evidence of publication bias in the sense that the negative relationship between government spending and inequality seems to have been under-reported.

A very important question related to inequality is its connection to economic growth. Balcilar et al. (2021) reach a rather frequently occuring result concerning this issue in the sense that they estimate that up to a certain level income inequality may have a positive impact on economic growth, while beyond this level it has a negative impact on future development. Woo (2020) shows that a positive effect of lower income inequality on long-term economic growth may be more than offset by a negative effect caused by redistributive fiscal policy employed to reach lower levels of income inequality. He shows that the final results depend on the initial levels of income inequality and the magnitude of fiscal intervention. However, neither of these papers properly takes into account the theoretical and empirical results of Halter et al. (2014), who explain these often contradictory effects of income inequality on economic growth found in the empirical literature. Halter et al. (2014) summarize the reasons why a higher level of inequality may have both positive and negative impacts on economic growth. The positive and rather short-run impacts stem from the fact that higher inequality may promote a higher rate of savings and thus investments. On the other hand, negative and long-run effects of higher inequality reflect the fact that it hampers the evolution of human capital, it may lead to the adoption of expensive fiscal policies, and it may also contribute to political instability; see the second section of the paper for references regarding the last point.

It may therefore be deduced that protracted restrictive fiscal policy that leads to higher levels of poverty and exclusion, which usually goes hand in hand with higher income inequality, has some long-term detrimental effects on economic growth. This leads us back to Deleidi et al. (2020), Jordà, Taylor (2016), and Fragetta, Tamborini (2019), who without the links to poverty and income inequality showed that the fiscal consolidation adopted in the EU had had long-term negative effects on economic development.

The second stage of the analysis is presented in Table 4. Only those regions whose starting position in terms of GDP in PPS per capita at a national level was less than one are included. The output confirms the results of the first stage with respect to the persistence of both the at-risk-of-poverty ratio (0.29, 0.34, 0.25) and the percentage of people at risk of poverty or social exclusion (0.47, 0.56, 0.53) and the relatively small role of the business cycle. The persistency is again much more pronounced when exclusion is considered instead of poverty. The difference with respect to the role of the business cycle is that now the impact of the business cycle is found to be statistically significant in all cases, but it still its effect is negligible when the measure of poverty is used (-0.01, -0.02, -0.01) compared to the estimates with exclusion (-0.12, -0.09, -0.12).

Table 4: Underperforming Regions

	Poverty	Poverty	Poverty	Exclusion	Exclusion	Exclusion
Dependent (-1)	0.29***	0.34***	0.25***	0.47***	0.56***	0.53***
Output	-0.01**	-0.02*	-0.01***	-0.12***	-0.09***	-0.12***
Net lending	0.12***	XXX	XXX	0.33***	XXX	XXX
Expenditures	XXX	-0.13***	XXX	XXX	-0.39***	XXX
Revenues	XXX	XXX	0.22***	XXX	XXX	0.39***
J-stat (p-value)	38.37 (0.36)	33.54 (0.59)	39.29 (0.37)	36.52 (0.40)	37.44 (0.45)	38.64 (0.35)
AR(1)	-2.22**	-2.22**	-2.17**	-2.93***	-2.63**	-2.91***
AR(2)	0.56	0.60	0.52	0.70	0.65	0.68
no. of cross-section: 38, adjusted time sample: 2007:2019						

Notes: Variables: Poverty (At risk-of-poverty rate), Exclusion (Percentage of those at risk of poverty and social exclusion), Output (GDP in PPS per capita), Net lending (cyclically adjusted net lending of the general government as a percentage of GDP), Expenditures (cyclically adjusted total expenditure of the general government as a percentage of GDP), Revenues (cyclically adjusted total revenue of the general government as a percentage of GDP). Instruments: dynamic one lag of output, education ratio, and dependency ratio. The J statistic refers to the test of the validity of over-identifying restrictions with the null of the restrictions being valid; p-values show that the null is not rejected in any case. AR(1) and AR(2) refer to the m-statistic of the autocorrelation test in residuals with the null of no autocorrelation. *, **, *** means rejection of the null at a level of significance of 10%, 5%, and 1%, respectively.

The effects of fiscal policy captured by the changes in cyclically adjusted net lending and expenditures are higher in the case of the percentage of people at risk of poverty or social exclusion (0.33 and -0.39) than the estimates on the whole sample (0.25 and -0.29) shown in Table 3. When cyclically adjusted revenues are used as a measure of discretionary fiscal policy, the effects seem higher in both cases: the at-risk-of-poverty ratio (0.22, Table 4, as compared to 0.17, Table 3) and the percentage of people at risk of poverty or social exclusion (0.39, Table 4, as compared to 0.30, Table 3).

The results are qualitatively in line with the findings presented in the case of the Italian regions mentioned in the second section of the paper (Piacentini et al. 2016, Lucidi 2021). However, at the same time, they should be viewed with a degree of caution given the fact that the sample is rather small and for the very same reasons, it is not possible to further verify the results by changing the cut-off value, which would define the subsamples of regions with worse starting conditions.

5 Conclusions

The estimates point to a significant persistence of both the at-risk-of-poverty ratio and the percentage of people at risk of poverty or social exclusion, and to the insignificant or very weak role that the business cycle plays in their dynamics. On the other hand, the analysis confirms some highly significant impacts discretionary fiscal policy has on the dynamics of both the at-risk-of-poverty ratio and the percentage of people at risk of poverty or social exclusion. It is shown that the impact of fiscal discretionary policy is higher in the case of the percentage of people at risk of poverty or social exclusion. In addition, the impact is higher in the already underperforming regions when this indicator is considered.

The effects of revenue-oriented and expenditure-oriented fiscal policies seem quite comparable when the whole sample of regions is taken into account, meaning those regions with GDP in PPS per capita above the national level, as well those below it. Also, the result does not change whether the at-risk-of-poverty ratio or the percentage of people at risk of poverty or social exclusion is taken as a measure of inequality.

This result changes slightly when only regions whose GDP in PPS per capita is below the national level are taken into account. In this case, the effects of revenue-oriented fiscal policy seem stronger compared to expenditure-oriented fiscal policy when the at-risk-of-poverty ratio is used as the measure of inequality.

Taking account of the confirmed high persistence in the dynamics of both the at-risk-of-poverty ratio and the percentage of people at risk of poverty or social exclusion and the significant impacts of both revenue and the expenditure-oriented fiscal policy, it is

clear that restrictive fiscal policy has the potential to set already underperforming regions in particular on a path of long-term divergent dynamics.

When these results are placed in the context of growth theory, specifically the relationship between income inequality and economic growth, it can be deduced that restrictive fiscal policy that gives rise to higher levels of poverty undermines future economic development. Various papers have reached similar results, focusing on national economies and the impacts of consolidation policies adopted in the EU after the direct impacts of the financial crisis. In this sense, this paper contributes to these findings as it shows possible reasons for why it happened.

The underperforming regions are on average found away from metropolitan areas. Plans of fiscal restrictions, if deemed necessary, need to be constructed with regard to the disruptive impacts they have, especially on the underperforming regions, so that the long-term economic and social harms are kept to a minimum.

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