



Absolute Poverty and Sound Public Finance in the Eurozone

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Abstract

The respect of fiscal parameters is supposed to be – according to the official position of the European institutions – the best recipe for granting stability and growth. This optimistic view appears to be in contrast with the recent increase in poverty. The aim of this paper is to individuate the existence of a relation between governments’ decisions about fiscal policy and absolute poverty in 19 Eurozone countries from 2005 to 2017. The attempt is to answer the question as to whether the effect on growth generated by fiscal policy measures can account for the objective of poverty alleviation. The results support the conclusion that absolute poverty increases in the presence of a restrictive fiscal policy, while it decreases in the opposite case. During declining macroeconomic conditions, national governments belonging to the Eurozone appear to be unable to reconcile the objective of sound public finance with that of poverty alleviation.

Keywords Poverty · Fiscal policy · Growth · Eurozone · Dynamic panel data

Jel Classification E62 · I30 · I38 · C33

1 Introduction

Inequality in advanced economies is at centre stage of economists’ recent debates. This issue is not simply a matter related to normative values of economic policy and to social justice but rather to the proper functioning of the economic system. High inequality is supposed to

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increase social conflict and to undermine trust in political and economic institutions (OECD 2014). In the Eurozone, such an issue is becoming ever more relevant due to the inability of single countries to tackle inequalities for a number of relevant reasons: 1) the need to respect fiscal parameters; 2) the reduced rate of growth and 3) the need to compete in a globalized market. The subsequent decrease in available resources, at least in the short run, limits the single states' ability to manage the public balance and to reach the objective of a more equal society. However, recent political events both in western and eastern countries suggest that income inequality boosts Euroscepticism, especially among the lower-educated, and that it threatens the construction of a single and integrated geographical area (Kuhn et al. 2016).

The general macroeconomic conditions and the increasingly competitive international scenario bring to the forefront an issue usually considered a matter of underdeveloped and developing countries: the existence of a large number of people living in conditions of material deprivation or in absolute poverty. In the Eurozone in 2015, the number of materially deprived people was 23,090,000, with an increase of more than 14%, equal to 2,849,000 people since 2005, when Eurostat carried out the first survey of the variable.¹

At the same time, in the Eurozone, there is the issue of sound public finance measured by the respect of fiscal rules defined in the Stability and Growth Pact (SGP) and the Fiscal Compact (FC).² The theoretical underpinnings of fiscal rules are the crowding-out effects (Berti et al. 2013), the Ricardian equivalence theorem (Barro 1974) and the instability effects on the expectation of long-run unsound public finance (Giavazzi and Pagano 1990). Because public expenditure is unable to change the long-run equilibrium income, it is better to avoid the real financial instability deriving from the excessive issuing of public debt. The respect of fiscal parameters is supposed to be – according to the official position of the European institutions – the best recipe for granting stability and growth.

However, the priority assigned to sustainable public finance seems to limit the ability of advanced economies to redistribute resources and smooth excessive income differences among individuals within a country (IMF 2014).

The issue of the effects of fiscal policy on poverty and social exclusion is receiving ever-increasing attention among academics, especially in these times of crisis. Ball et al. (2013), using a narrative approach in identifying fiscal restriction (Romer and Romer 2010), support the conclusion that in 17 OECD countries, fiscal consolidation has distributional effects by raising inequality, decreasing wage income shares and increasing long-term unemployment. Agnello and Sousa (2014) similarly find that in 18 OECD countries in the period 1978–2009, a larger income inequality is associated with austerity measures, resulting in an increase in spending cuts rather than tax hikes. In Greece, a relatively stable income inequality is associated with a marked drop in living standards and consumption levels (Kaplanoglou and Rapanos 2018). In some countries of southern Europe – Spain, Italy and Portugal – during the years 2009–2013, income inequality followed a mixed path, while rising to alarming levels in Greece (Matsaganis and Leventi 2014a). EUROMOD simulation models also reveal that young people in particular have paid for the crisis and that tax-benefits systems were not able to compensate for increased poverty and income differences among individuals (Matsaganis and Leventi 2014b). Crettaz (2015), after examining 2008, 2011 and 2012 survey data from EU-SILC, affirms that in a subset of European Union countries – Austria, Germany, Greece,

¹ EU-SILC statistics available at <http://ec.europa.eu/eurostat/web/income-and-living-conditions/data/database>.

² For a detailed reconstruction of Eurozone fiscal policy rules from their birth to nowadays, see European Commission (2018).

France, Italy, Spain and the UK – cuts in social expenditures and labour market deregulations – implemented to counteract the deterioration of public accounts – brought about a new form of poverty: “in work-poverty”. The contribution nearest the approach of this paper is Darvas et al. (2014), who conclude that in times of crisis, co-movements of fiscal consolidation programmes and adverse social conditions are registered. This conclusion only reveals a positive correlation between the two phenomena and therefore it cannot be considered – since it is not supported by empirical estimates – a convincing claim for the existence of a stable relationship between structural adjustment programmes and poverty in the Eurozone.

The aim of this paper is to individuate the existence of a relationship between fiscal policy and absolute poverty in the Eurozone. We attempt to answer the question as to whether the effect on growth generated by structural public balance adjustment can account for the objective of poverty alleviation. The issue of absolute poverty has never been analysed in the whole Eurozone as depending on fiscal policy measures. The endeavour is to provide both a general assessment of the relationship and a broad picture of some unpleasant effects of the Eurozone policy framework.

To reach the paper’s objective, the percentage of the population living in absolute poverty is connected to the change in structural public balance. Absolute poverty is measured by the indicator “material deprivation”, that is, the number of people affected by a lack of basic resources from having a “decent life” in a modern country (see below for a detailed explanation) or who have a very low per-capita real income. Absolute poverty is not affected by specific country conditions – as are the measures of inequality – and is comparable across nations. This measure is apt to compare countries with very different GDP levels, such as the Western and Eastern nations of the Eurozone.

The change in structural public balance is the structural public balance adjustment. This adjustment represents the changes in the public budget (increase of deficit if negative or additional surplus if positive) expressed as a percentage of the output potential. The decomposition of the public budget—as the basic literature refers to it—among actual, cyclical and structural components is aimed at separating cyclical influences on the budget balances from those that are non-cyclical. This variable is not observable but rather must be estimated and is subject to measurement errors. As it will be further explained below, scholars are still debating about how to calculate this variable. The main issue is related to the measure of the output potential, which is said to be influenced by the dimension of structural adjustment itself. However, the indicator used in this paper is the component of the public balance that national and supranational institutions take into account to reach their objective of sound public finance (Mourre et al. 2013). Due to its endogenous features, this indicator is able to capture both the direct effect on poverty and the further effect induced via changes in the output potential (Tereanu et al. 2014). Whatever the weakness of this indicator, it is the instrument European policy authorities adopt for public budgetary surveillance.

The main argument of the paper relies on the effect on growth of structural adjustment. Fiscal policy has a same sign effect on poverty through its effect on output and employment and therefore on the number of those belonging to the lowest end of the income distribution. As a matter of fact, the indicator of absolute poverty employed can be considered as a proxy of the per capita income growth rate of the poorest people living in the countries considered. Of course, the quality of fiscal adjustment matters since changes in different budget items can sort different effects (Giambattista and Pennings 2017, states that change in transfers have greater effects than changes in public purchases). However, growth is here considered as the precondition for reduction in the number of absolute poor.

The sample contains 19 countries currently belonging to the Eurozone from 2005 to 2017 for a total of 247 observations. The starting date of the sample is constrained by the availability of the indicator of absolute poverty, which Eurostat started to calculate since the year 2005. Furthermore, no similar indicators are available on other databases for advanced countries.³ These countries all have shared similar constraints designed to respect the fiscal parameters of the currency union. The empirical estimates use panel data dynamic techniques suitable for cases of a number of cross sections greater than the time dimension: the Arellano-Bond GMM estimator. This estimator provides reliable estimates in the presence of both path dependence and endogeneity issues. Other variables considered in the literature as affecting poverty directly and through the need to compete in a globalized market are considered as control variables: trade openness, financial globalization, the amount of private credit, the number of tertiary educated people and the degree of flexibility of the labour market.

The results support the conclusion that material deprivation increases in the presence of restrictive fiscal policy and decreases in the opposite case. During declining macroeconomic conditions, national governments belonging to the Eurozone appear to be unable to reach the objective of sound public finance while at the same time tackling absolute poverty.

To further deepen the analysis the relation between an indicator of relative poverty – the number of people living below the threshold of the 60% median equivalized disposable income - and structural adjustment is investigated for a longer time span (1995–2017) for 12 Eurozone countries sharing similar standard of living. Then the sample is divided between the pre (1995–2008) and the post (2009–2017) crisis period. This time – due to the different features of the sample $N = 12$ and $T = 23$ - a dynamic error correction form of panel data estimator is employed – the Pooled mean Group (PMG) estimator. The features of the empirical technique employed allows detecting a long run and positive relationship between the two variables of interest confirming that structural adjustments increase poverty, even if it is measured in relative terms.

The remainder of the paper is as follows: section 2 provides a review of the theoretical debate on the objective of sound public finance and its relationship with growth; section 3, which presents the empirical analysis, is divided into sub-sections: 3.1. offers a first glance at the dynamic of the two main variables considered; 3.2 describes the methodology adopted for the main estimates and 3.3 the results; 3.4 presents the empirical analysis on the longer sample of 12 Eurozone countries with the relative poverty indicator. Finally, section 4 draws some conclusions and derives some policy implications for the future of the Eurozone.

2 The Rationale for the Objective of Sound Public Finance: The Case of the Eurozone

Sustainable public finance is at the centre stage of the European policy framework, as it is considered a precondition for long-term stable growth. The need for sound public finance is linked to the long-term macroeconomic impact of unsustainable expenses and to the supposed

³ OECD calculates the poverty rate as the ratio of the number of people whose income falls below the poverty line taken as half the median household income of the total population <https://data.oecd.org/inequality/poverty-rate.htm>. This measure considers as reference the median equivalized disposable income whose level is highly influenced by specific country conditions. It is a measure of relative poverty – available for advanced countries on the OECD database from 2004 - rather than an objective measure of absolute poverty and is limitedly comparable across nations.

existence of a threshold above which the outstanding government debt is associated with reducing rates of growth (Reinhart and Rogoff 2010). The higher the debt, the higher the amount of interest to be paid. Moreover, government spending, following the seminal contribution of Barro (1974), does not produce long-term growth; the expansionary effects of fiscal policy are compensated by expected tax increases – and subsequent consumption reduction – necessary to repaying debt in the future. If this phenomenon applies to expansionary fiscal policies, it also applies to restrictive ones, where the positive effects of future tax decreases compensate for the negative outcomes of fiscal policy.

Further extensions of Barro (1974) are contained in the so-called Keynesian effects of non-Keynesian fiscal policies (Giavazzi and Pagano 1990); if consumers have rational expectations and are not liquidity-constrained, they tend to smooth consumption through time, following the expected flow of disposable income. In the same way, entrepreneurs expect tax reductions, increase their savings and promote capital accumulation and investments. If, therefore, during periods of fiscal retrenchment, an increase in consumption and investment is observed, it is proof that individuals and firms have revised their permanent income upward and that the cause of this revision is the consolidation of public finances. The effects of fiscal consolidations are assured by a kind of “super-Barro effect” (Canale et al. 2008), according to which fiscal contraction has a more-than-proportional effect on permanent income (Alesina and Ardagna 2010; Alesina and Ardagna 2012).

The case of the Monetary Union is the only one adopting fiscal rules at a supranational level, at it is seen as an instrument of external discipline as a substitute or complement to domestic discipline.⁴ As a matter of fact, there are a number of externalities specifically linked to the presence of a common currency: a) incentive to run deficits with a fixed-exchange rate, b) the existence of a financial cost of debt default due to bank holdings of government debt, and c) the presence of economic costs of a debt default due to the risk of pressure on the ECB to inflate away. Increasing the public deficit to be financed by additional debt is likely to produce asymmetrical macroeconomic effects among EMU countries. In the absence of a shared policy mechanism, it is desirable to have common rules to avoid inflation contagion and sudden stops in capital flows. Increasing reliance on rules allows improving predictability, addressing political failures, increasing credibility and enforcing coordination among different countries. In addition, public spending is often subject to the consensus mechanism rather than to effectiveness and efficiency criteria.

However, the 2007 financial crisis and the subsequent sovereign bond crisis highlighted that the attempt to reach the thresholds, in the presence of general declining macroeconomic conditions, seems to produce self-fulfilling mechanisms of decreasing growth and deteriorating public accounts. In the absence of effective monetary policy measures, fiscal retrenchment is more apt to have negative effects on growth (Christiano et al. 2011; DeLong and Summers 2012; Krugman 2013) and to undermine even the process of the consolidation of public finances (De Grauwe and Ji 2013).

⁴ As it is well known, the Maastricht Treaty signed in 1992 and the Stability and Growth Pact state that public deficits and debt ratios to GDP should stand at 3% and 60% of GDP, respectively. To achieve these objectives on March 2nd, 2012, European Union countries (excluding the UK and the Czech Republic) signed the Fiscal Compact, which commits them to a particularly onerous path of reduction of public spending. In particular, the structural deficit – that is, the one that does not depend on the cycle – should not exceed 0.5% of GDP, and those countries with a debt/GDP ratio exceeding 60% should pursue a path of reduction at an annual value of 1/20 of the GDP.

This view is now accepted by the IMF (2010) and OECD (Hermansen et al. 2016), which, after revising its initial position, affirmed that the reduction in the public deficit has negative and higher-than-expected effects on growth (IMF 2010; Blanchard and Leigh 2013). The positive and large multipliers can all be traceable, in times of crisis, to the existence of underutilized productive capacity and of a flat supply curve which the market's automatic forces cannot remedy. The Keynesian multiplier is positive and is larger in the presence of a) a financial constraint (Galí et al. 2007), limiting borrowing in the future; b) wage and price rigidities (Woodford 2011) that, whatever their origin, reduce internal and external competitiveness; c) reduced openness to the global economy (Corsetti et al. 2013), since fiscal retrenchments – as the open-economy Keynesian multiplier states – hit internal demand and not imports; and d) a fixed exchange rate regime, as in the case of the Eurozone (Ilzetzi et al. 2013). The absence of a currency realignment mechanism increases the inability to quickly offset the reduction of internal demand via exports.

Some economists have also begun to revise their positions on the sole short-term effect of fiscal policy. It is worth noting the contribution of Fatás and Summers (2018), who upturn the so-called “super-Barro” effect: fiscal retrenchments in times of crisis are very likely to have a long-term negative impact on output, causing a downward revision of potential output.

However, despite these findings, the Eurozone appears to not have changed its policy framework. With the aim of restoring compliance to rules and to avoid spill-over effects, 1) the European Stability Mechanism (ESM) was created. It is a permanent mechanism with an unlimited lending capacity, allowing peripheral countries to receive financial assistance under the strict condition of implementing Stability and Convergence Programmes; 2) many countries introduced the so-called “fiscal compact” in their constitutional law, thus reducing space for fiscal policy measures; and 3) the European Central Bank reduced the interest rate on main refinancing operations until reaching the level of 0.00 points in March 2016 (the marginal lending facility to 0.25 points and the deposit facility to –0.40 points). The downward spiral triggered by low interest rates and fiscal retrenchments revealed the inability of the ECB to raise inflation. As a matter of fact, low interest rates reduce the wealth effect of government debt, and, to be effective in increasing inflation, this should be – as the standard intertemporal models inspired by Barro's (1974) contribution also state – accompanied by a future decrease in taxes (Leeper 2016). However, in peripheral countries, the decrease in interest rates, following policy commitments, must be accompanied by an increase in taxes. Moreover, due to the permanent effect on output of fiscal retrenchments (Blanchard and Leigh 2013; Fatás and Summers 2018), this is likely to produce a further future increase in taxes and a decrease in growth.

3 Empirical Analysis

The aim of the paper is to detect to what extent governments' structural public balance adjustment implemented inside the Eurozone policy framework affect absolute poverty as measured by the indicator material deprivation. The sample contains nineteen Eurozone countries: Austria, Belgium, Cyprus, Estonia, Finland, France, Germany, Greece, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Portugal, the Slovak Republic, Slovenia and Spain. These countries are all members of the Eurozone at present, although they joined the currency union in different years.⁵ The

⁵ Austria, Belgium, Finland, France, Germany, Italy, Ireland, Luxembourg, the Netherlands, Portugal and Spain are the original members of the Euro Area formed in 1999. Other member-states later joined the single currency in different years. In particular, Greece entered the Eurozone in 2001, Slovenia in 2007, Malta and Cyprus in 2008, Slovakia in 2009, Estonia in 2011, Latvia in 2014 and, lastly, Lithuania in 2015.

objective is to explore this link to individuate its dimension and manifestations, regardless of the composition and nature of fiscal consolidation programmes, in the belief that it is a by-product of its effect on growth. Even though the sample contains a time span in which some countries did not yet belong to the Eurozone, they all share similar constraints and have been requested to respect the fiscal parameters of the currency union, which they entered in subsequent years.

Data about material deprivation are collected from Eurostat EU-SILC statistics <http://ec.europa.eu/eurostat/web/income-and-living-conditions/data/database>, while data on structural balance are available on the World Economic Outlook database, October 2017, published by the IMF (<http://www.imf.org/external/pubs/ft/weo/2017/02/weodata/index.aspx>). Eurostat calculates a very similar variable, the cyclical adjusted balance (CAB), available in the AMECO database. Both statistical offices rely on the estimates of the production function, frequently updated on the basis of new available information. However, data from the European statistical office are available from AMECO online only from the year 2009 and therefore are not suitable for our analysis.

3.1 Absolute Poverty and Discretionary Fiscal Policy: A First Glance

Absolute poverty is measured by material deprivation (MD). This is the number of people materially deprived, expressed as a share of the total population. Poverty has multidimensional aspects, each capturing different features of social hardship. There is much debate surrounding the definition of poverty, and different measurements of poverty have been considered to capture its alternative dimensions (Atkinson 1987). Despite the different perspectives adopted, there is a general agreement that poverty can be defined as the lack of resources necessary to conduct an acceptable way of living in a society (Townsend 1971; Townsend 1985; Sen 1979; Townsend 1985). There are therefore two main aspects to take into account: the lack of resources and the society in which to apply the measurement, or an objective dimension and a relative dimension. To measure poverty, Eurostat refers to two main categories of indicators: a first one capturing monetary poverty and a second one capturing physical poverty. Monetary poverty is measured by the indicator ‘people at risk of poverty after social transfers’. Monetary poverty is the share of the total population with an equalised disposable income below the at-risk-of-poverty threshold of 60%⁶ of the national median equalised disposable income after social transfers. Physical poverty is measured by material deprivation, or the percentage of the population that cannot afford at least four of the following nine items: 1) to pay their rent, mortgage or utility bills; 2) to keep their home adequately warm; 3) to face unexpected expenses; 4) to eat meat or proteins regularly; 5) to go on holiday; 6) a television set; 7) a washing machine; 8) a car and 9) a telephone (Eurostat 2016). Both indicators consider the “society” in which they are calculated since they refer to geographically and historically defined assets. However, while the first indicator is country-specific, the second has the advantage of being comparable across nations belonging to the same economic area. In addition, “people at risk of poverty after social transfers” is a measure of inequality, as the number of poor people is calculated in respect to a threshold (Kenworthy, 2011, Darvas et al. 2014), while the “Material deprivation” indicator is a measure of absolute poverty, as it is calculated based on the availability of specific physical assets (Crettaz 2015).⁷

⁶ Eurostat also calculates the same indicator fixing the threshold at 40%. However, the 60% is the most frequently used benchmark to measure monetary poverty and inequality.

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The difference between the two indicators is particularly relevant when considering EU expansion and the diversity of living condition across Eurozone countries (Fusco et al. 2011; Nolan and Whelan 2010). Material deprivation represents a measure of extreme poverty based on a minimum level of essential goods that people should have access to. Material deprivation can be considered a measure of the real per capita GDP of those at the lowest end of income distribution. Material deprivation is comparable across countries belonging to the Eurozone, and its management and correction can be considered a step towards the construction of a social and economic integrated monetary union.

The main dependent variable is the structural public balance adjustment, which is the year-by-year change in structural public balance. The structural public balance (SB) is that part of the government's budget deprived from its cyclical component, expressed as a share output potential. The IMF and the EC use for their calculation a "top-down" approach, which is a two-step methodology, computing the cyclical component of the budget first and then subtracting it from the actual budget balance (Mourre et al. 2013; Hagemann 1999). The results are expressed in the percentage of the output potential. According to the literature, there is also a "bottom-up" approach consisting in approximating the structural balance to the residual of the estimates of actual balance on the change in current income, meaning that the actual balance is purged of the business cycle. (Agnello et al. 2013). The calculation of the output potential is the result of estimates of the production function, considering changes in total factor productivity and availability of production factors (Anderton et al. 2014)⁷. Despite its limitation of not being an observable value, the structural balance accounts for the eventual effects on output potential of a change in the availability of the factors of production induced by change in aggregate demand. Therefore, "short-run growth revisions should not be viewed as solely cyclical but rather [as] also including a permanent structural component due to

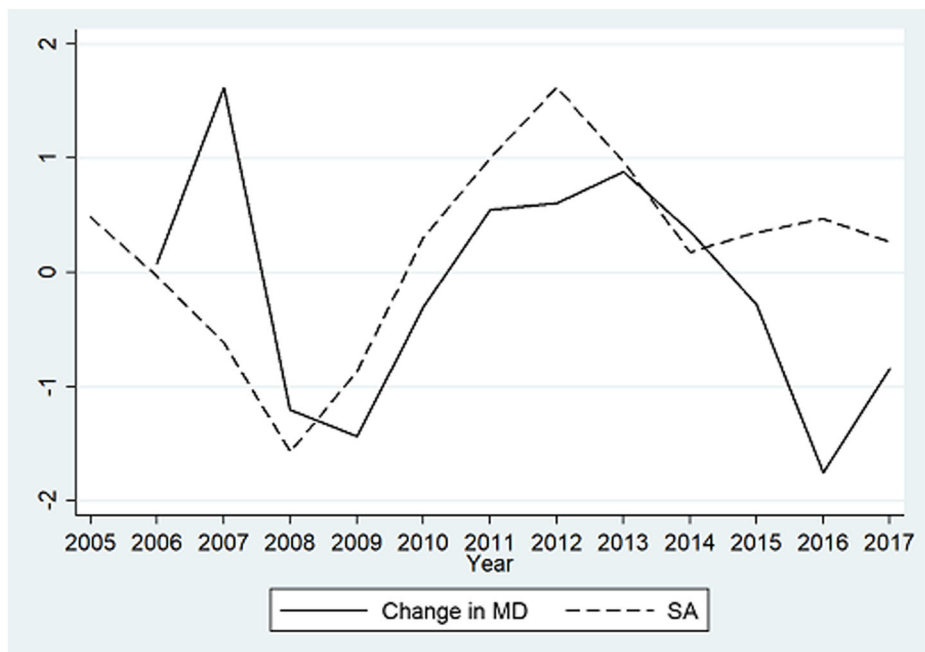


Fig. 1 Change in material deprivation and structural adjustment: panel yearly means

changes in potential output” (Tereanu et al. 2014 p. 4). This result implies that, for example, a restrictive measure reduces the potential output, amplifying the dimension in absolute values of the structural balance and at same time worsening public accounts. The “top-down” approach, together with the estimates on output potential based on the production function, is the methodology the IMF and the EC use for budgetary surveillance; it is the government public balance component the European institution suggests to reduce or allow to increase to reach the objective of sound public finance and is therefore the main component of the adjustment programmes implemented in the selected Eurozone countries.

Structural adjustment was computed as the difference between two consecutive structural balances $SA_{t,i} = SB_{t,i} - SB_{t-1,i}$, where $SA_{t,i}$ is the structural adjustment occurring between the final year t and the initial $t-1$ in the i -th country, calculated as the difference between present $SB_{t,i}$ and past $SB_{t-1,i}$ structural public balance. A positive value of $SA_{t,i}$ means the implementation of restrictive discretionary fiscal policy measures, while a negative value indicates expansive discretionary fiscal policy measures.

A first look at the supposed relation is observable through Fig. 1 and Fig. 2, which offer the panel average yearly connection and the country-specific dynamics of the two indicators, respectively.

In particular, fig. 1 shows the by-year panel mean of the change in material deprivation and structural adjustment. From 2006 and until 2007, expansionary discretionary policy measures are associated with an increase in poverty. The structural adjustment declines from 2007 to 2008, and the same is true for the change in the absolute poverty indicator. From the year 2009, when the financial crisis in the Eurozone became a sovereign bond crisis, the structural adjustments turned from negative (expansionary discretionary measures) to positive (restrictive

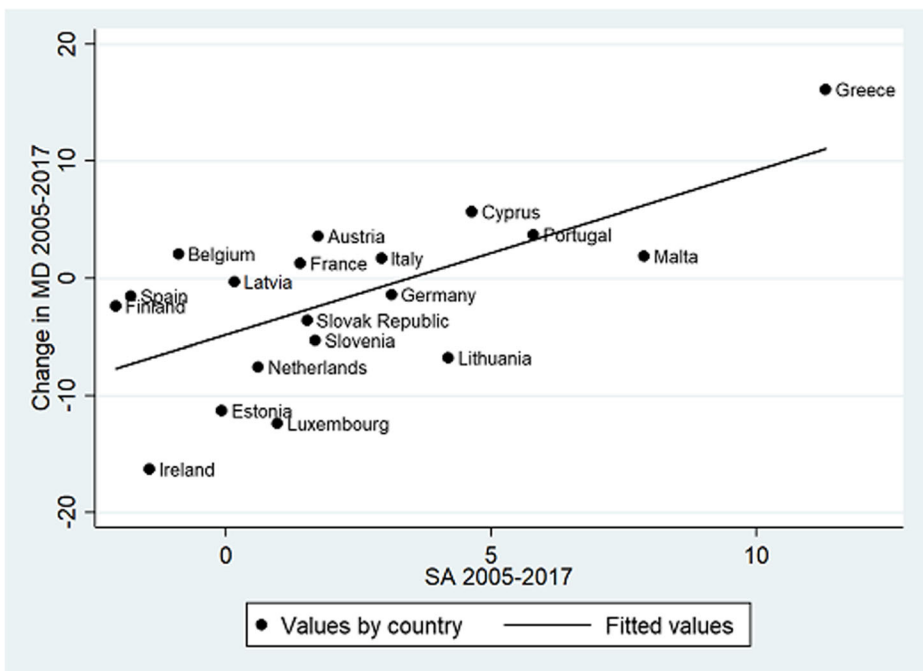


Fig. 2 Change in material deprivation and structural adjustment from 2005 to 2017 in single EZ countries

discretionary measures). In the same years, an increase in the yearly mean value of change in material deprivation is registered. In the year 2012, there is again an inversion of the path that seems to be persistent for the change in material deprivation until 2016. From 2016 to 2017 a slight increase in the change in the number of absolute poor is observable, despite the country mean structural adjustment is decreasing.

In Fig. 2, the country-specific conditions are considered; the by-country structural adjustment occurring during is connected to the change in the percentage of people materially deprived for the whole period. The graph provides an upward-sloped connection since the fitted line suggests that, on average, an increase in material deprivation is associated with restrictive fiscal policy measures and vice-versa.

However, the position on the graph of some countries also suggests that country-specific macroeconomic conditions are relevant to defining the dimension of the connection between the two variables. Both pictures, taken together, suggest that a further investigation of the hypothesized relationship is in order.

To deepen the analysis of other variables capturing the general policy framework of the Eurozone, the need to compete in the globalized markets together with other variables affecting poverty (Dabla-Norris et al. 2015; Oberdabernig 2013) are considered: 1) the labour market flexibility index, as calculated by The Heritage Foundation. This index is a quantitative measure that considers various aspects of the legal and regulatory framework of a country's labour market, including regulations concerning minimum wages, laws inhibiting layoffs, severance requirements, and measurable regulatory restraints on hiring and hours worked, including the labour force participation rate as an indicative measure of employment opportunities in the labour market. This index ranges from 0 to 100 and captures both the so-called flexibility of the labour market and the general macroeconomic conditions of each single country. This index is calculated by The Heritage Foundation and is available at <http://www.heritage.org/index/>. 2) The number of people with an upper secondary, post-secondary non-tertiary and tertiary education (levels 3–8), as a percentage of people aged 15–64. Education plays a central role in assuring access to the labour market and in gaining a higher income. While the effect on inequality is controversial (Knight and Sabot 1983), the effect on the number of absolute poor people should be an opposite sign. 3) The amount of private credit, always as a share of GDP, as an indicator of the presence of financially constrained households and banking system efficiency. The mainstream literature affirms that access to credit increases an individual's opportunity to anticipate future income via, for example, the implementation of an entrepreneurial activity today. However, the excess of private debt, with stagnating or falling real wages increases inequality and poverty (Stockhammer 2012). 4) The inflation rate measured by the Harmonised Index of Consumer Prices, which is, according to standard theory, supposed to positively affect poverty, while, when moderate, negatively correlated with poverty according to Keynesian theory. 5) Financial openness as an indicator measuring the degree of globalization; this is the sum of financial assets and financial liabilities as a share of GDP. The effect on poverty of this variable is not univocally determined in the literature since it can be considered both an instrument to sustain growth and convergence among countries (Blanchard and Giavazzi 2002) and a signal of a larger exposure to speculative bubbles and external shocks (Pattillo et al., 2004, Calvo 1998). Lastly, 6) Trade openness is the sum of export plus imports as a share of GDP, as a measure of external competitiveness in the goods market. It can occur that higher exports are obtained at the expense of wage reduction or that an increase in imports of cheaper, foreign goods causes a reduction in internal demand and, hence, unemployment. In this case a higher degree of trade openness is associated with a

larger number of materially deprived people. However the increase of exports may have positive effects on aggregate demand and therefore on internal growth.

3.2 Methodology

To evaluate the impact of structural adjustments on absolute poverty, the following model was constructed and estimated:

$$MD_{i,t} = \alpha_i + \beta_1 MD_{i,t-1} + \beta_2 SA_{i,t} + \beta_3 X'_{i,t} + \varepsilon_{i,t} \quad (1)$$

Where $MD_{i,t}$ is the percentage of the total population materially deprived in country i at time t , $MD_{i,t-1}$ is the lagged dependent variable introduced to take into account specific country conditions; $SA_{i,t}$ is the structural public balance adjustment; $X'_{i,t}$ is a matrix containing the control variables (labour freedom, LAB_FREE, tertiary education TER_EDU, Credit CREDIT, the consumer price index HICP, financial openness FIN_OP, and Trade openness TRADE_OP), α_i is the constant term and ε_i is the error term. The i -th country ranges from 1 to 19, and t goes from 1 to 13 or from 2005 to 2017.

Equation (1) is estimated, implementing the GMM dynamic panel methodology, whose specification accounts for autocorrelation between the dependent and explanatory variables (Arellano and Bover 1995). This dynamic panel data technique is well suited in the case of $i > t$, i.e., in cases of a number of observed individuals (19 countries) larger than the observations over time (13 years). This methodology removes the fixed country-specific effect α_i and uses moment conditions in which the lagged differences of the dependent variables are used as instruments in the level equation. However, in small samples, the use of numerous instruments may overfit the instrumented variables and may bias the coefficient estimates (Roodman 2009). What is suggested is not a clear-cut rule but rather a rule of thumb: to use a number of instruments less than or equal to the number of groups.

To avoid biases in the standard errors and to account for the presence of heteroscedasticity occurring in particular with this route, the robust option is implemented. Since the estimator must be free of autocorrelations in the idiosyncratic errors, the Arellano–Bond test for first- and second-order autocorrelation (Arellano and Bond 1991) in the first-differenced errors is performed after the estimation; finally, the Sargan-J test (Sargan 1975; Hansen 1982) is implemented to check for the validity of the over-identifying restrictions. To check the robustness of the relationship between material deprivation and structural adjustment, eq. (1) was estimated first by considering only the main independent variable and by then adding the control variables one at a time.

3.3 Results

As a preliminary analysis, the presence of cross-sectional dependence has been checked on the empirical model, including the whole set of variables. In a dynamic panel data context with a short time period, the eventual existence of unobservable common factors may deliver inconsistent results (Sarafidis et al. 2009). The Pesaran (2004) CD test, whose properties are valid in a dynamic context and with a number of individuals larger than time (De Hoyos and Sarafidis 2006), accepts the null hypothesis of cross-sectional independence (1.437, Pr = 0.1507).

Table 1 presents the results of the hypothesized dynamic relation between structural adjustment and material deprivation, implemented with the robust option necessary to correct for heteroscedasticity. Model I in the first column considers only the relevant relation proposed, while models II to VII account for the additional introduction of control variables. The structural adjustment always has a positive and significant impact on poverty, increasing as additional control variables are introduced (the coefficient ranges from $\beta_2 = 0.269$ in model I to $\beta_2 = 0.290$ in model VII, with a peak of $\beta_2 = 0.326$ in model IV). Since both MD and SA are percentages, it can be stated, according to the estimates, that structural adjustment has a same sign effect on the absolute poverty for approximately or for more than 27%. When looking at control variables, two out of six appear to influence material deprivation in all the models where they are introduced: the consumer price index and trade openness. An increase in the HICP, used as a proxy of the inflation rate, decreases material deprivation, while deflation increases absolute poverty. The coefficient is $\beta_3 = -0.126$ in model V, $\beta_3 = -0.134$ in model VI and $\beta_3 = -0.133$ in model VII: this may be due to the very low or negative changes in the consumer price index in the years considered registering a general decline of the economic activity. Trade openness and material deprivation are connected with a positive relation $\beta_3 = -0.126$ showing that an increase of exports could have been gained at expenses of a reduction of wages and/or greater imports decrease internal demand and growth.

After having implemented the estimates, the Arellano and Bond (1991) test for zero autocorrelation of first-differenced errors has been implemented in the model, including the

Table 1 Material deprivation and structural adjustment in 19 Eurozone Countries (2005–2017)

Variables	I	II	III	IV	V	VI	VII
LMD	0.595*** (0.097)	0.593*** (0.099)	0.523*** (0.072)	0.543*** (0.069)	0.530*** (0.070)	0.531*** (0.069)	0.556*** (0.067)
SA	0.269*** (0.079)	0.270*** (0.079)	0.329*** (0.122)	0.326*** (0.122)	0.298** (0.115)	0.304** (0.118)	0.290*** (0.110)
LAB_FREE		0.004 (0.028)	0.002 (0.029)	0.006 (0.029)	-0.000 (0.029)	-0.005 (0.028)	-0.012 (0.029)
TER_EDU			-0.143 (0.153)	-0.151 (0.147)	-0.070 (0.132)	-0.067 (0.133)	-0.080 (0.132)
CREDIT				-0.014 (0.010)	-0.011 (0.013)	-0.002 (0.020)	0.000 (0.020)
HICP					-0.126*** (0.047)	-0.134*** (0.050)	-0.133*** (0.046)
FIN_OP						-0.001 (0.000)	-0.001 (0.000)
TRADE_OP							0.126* (0.090)
Intercept	3.095*** (0.581)	-2.861** (1.405)	7.252 (4.601)	7.159 (4.563)	17.534** (7.457)	18.579** (7.802)	17.393** (6.952)
Nr. Instr.	12	13	14	15	16	17	18

Note:***, **, and * reject the null at 1%, 5% and 10% respectively: Standard errors are presented below the estimated coefficients

SA is the structural adjustment; LAB_FREE is an indicator of freedom in the labour market; TER_EDU is the number of people with a tertiary level of education; CREDIT is the amount of private credit, as a share of GDP, HICP is the consumer price index; FIN_OP is the sum of financial assets and financial liabilities as an index of financial globalization and TRADE_OP the sum of export plus imports as a share of GDP as a measure of external competitiveness. Model I does not contain control variables. Models from II to VII accounts for control variables

whole set of variables. This test accepts the null-hypothesis of second order no-autocorrelation (first order $z = -1.390$, second order $z = -0.017$). As a further check, the robust option has been removed, and the Sargan-J test (Sargan 1975; Hansen 1982) has been implemented to investigate the validity of the over-identifying restrictions. This test shows that $\chi^2 = 3.338$, accepting the null hypothesis that the over-identifying restrictions are valid.

3.4 A Further Deepening

The limited availability of the indicator material deprivation prevents the evaluation of the effects of fiscal policy on absolute poverty on a longer period. However, it is interesting to deepen the analysis including the years after the Maastricht treaty and before the introduction of the common currency, during which it was necessary to shape government budget balance in order to meet the fiscal criteria. To reach this objective we substituted material deprivation with “monetary poverty”, which as stated above measures the share of the total population with an equivalised disposable income below the at-risk-of-poverty threshold of 60% of the national median equivalised disposable income after social transfers and is available on Eurostat database from 1995. This indicator has in common with “material deprivation” the threshold approach: poor are considered those who do not reach a minimum level of income. However, in monetary poverty the threshold is fixed at the median income rather than at the availability of specific physical assets. Therefore, it is more similar to an index of inequality rather than to a measure of absolute poverty. Furthermore, it is hardly comparable among nations with different standard of living. These features of the indicator “monetary poverty” guided the selection of the sample and the choice of the technique to conduct further estimates: this new sample contains 12 Eurozone countries – the 11 original members plus Greece (see note 5) and ranges from the 1995 to 2017. In this case $T = 23$ and $N = 12$ and a long run dynamic panel technique fits better the case of our analysis. In particular, the pooled mean group (PMG) estimator is applied: it is considered to be consistent for estimating dynamic heterogeneous panels (the sample of 12 European countries), as the long-run dynamics are supposed to be equal across groups, while in the short run, the process of adjustment may vary across panel members (Pesaran et al. 1997; Pesaran et al. 1999; Blackburne and Frank 2007). It also accounts for endogeneity and cross-sectional dependence issues due to the presence of an unobservable common shock such as the financial crisis. Since it relies on cointegration, the PMG methodology detects the possible existence of a stable relationship, even in the presence of a reduced number of explanatory variables.

The equations to be estimated assume the long and the short-run form. The long-run equation follows the ADRL process using current and past values of the explanatory variables and is described by:

$$MP_{i,t} = \alpha_i + \lambda_i MP_{i,t-1} + \beta_{i,0} SA_{i,t} + \beta_{i,1,j} SA_{i,t-1} + \varepsilon_{i,t} \tag{2}$$

where MP measures the share of population in conditions of monetary poverty or the share of population leaving below the threshold of 60% median income, while SA is structural adjustment. The error correction equation describing the short-run speed of adjustment is:

$$\Delta MP_{i,t} = \phi_{i,j} (MP_{i,t-1} - \vartheta_i - \vartheta_{1,j} SA_{i,t}) - \beta_{i,1} \Delta SA_{i,t} + \mu_{i,t} \tag{3}$$

It is easy to verify that ϑ_i and $\vartheta_{1,j}$ are the long-run coefficients calculated as a weighted average of the coefficient of the independent variables. Parameter $\vartheta_{i,t}$ for the long and $\beta_{i,t}$ for the short

run are the parameters to be estimated in the model. The validity of the model depends on the value of the parameter φ_i : is the error correction speed of adjustment. It has to be significant and $0 < \varphi_i < 1$ must hold. Table 2 describes the results obtained on the whole sample and for the pre (1995–2008) and post (2009–2017) crisis period.

For the whole sample, the empirical model supports the conclusion that structural adjustment has a same sign effect on monetary poverty. The speed of adjustment is $0 < \varphi_i < 1$ and highly significant (-0.153), confirming the validity of the methodology adopted. In the long-run the impact of SA on monetary poverty is 0.615 stating that over the whole period one percentage change in SA affects poverty for more than 0.61 percentage points. When looking at the process of adjustment in the short run ΔSA , it can be said since the coefficient appears to have a lower significance with a value of -0.049 . This is probably due to the specific features of each country, which implemented restrictive/expansive fiscal measures in different periods. Similar conclusions can be reached examining the two subsamples considered: in both cases $0 < \varphi_i < 1$ holds ($\varphi_i = -0.471$ for 1995–2008, while $\varphi_i = -0.442$ for 2009–2017). As it is foreseeable the effect of structural adjustment on absolute poverty is higher in the second half of the sample (0.117 for the first period and 0.431 for the period after the crisis). In regard to short run effect of the independent variable, the same reflections of the whole sample can be made as in none of the two case ΔSA is significant.

Despite the indicator adopted in this section cannot be considered a measure of absolute poverty results appear to reinforce the direct relation between structural adjustment and the number of people living in awkward conditions even when a longer period is examined. The split of the sample into pre and post crisis period confirms the conclusions and highlights the occurrence of larger effects in the second time span. Deserve to be underlined that the EC methodology adopted assigns particular relevance and validity to the univariate estimation.

4 Conclusions

Sound public finance is at the core of the European policy framework. This phenomenon is due to the widespread consensus about the ineffectiveness of fiscal measures in changing growth and unemployment. Expansionary fiscal policies produce only financial instability and negative spill-over effects on the entire currency union. These strong beliefs define the fixed rules that transform fiscal policy from an instrument into an objective. The events following

Table 2 Monetary poverty and structural adjustment in 12 Eurozone Countries: PMG estimator (1995–2017)

Variables	1995–2017	1995–2008	2009–2017
<i>Long Run</i> : SA	0.615** (0.155)	0.117*** (2.21e-08)	0.431*** (0.068)
ϕ_i : speed of adjustment	-0.153*** (0.043)	-0.471** (0.194)	-0.442*** (0.108)
<i>Short Run</i> : ΔSA	-0.045 (0.029)	0.025 (0.081)	0.041 (0.065)
Intercept	2.398*** (0.717)	7.437*** (3.687)	6.970*** (1.533)

Note:***, **, and * reject the null at 1%, 5% and 10% respectively Standard errors are presented below the estimated coefficients

the crisis exerted further pressure with respect to parameters, setting aside the social consequences of the fiscal measures implemented.

In this paper, the relation between structural public balance adjustment and absolute poverty in 19 Eurozone countries during the time span 2005–2017 has been investigated. Absolute poverty is becoming more and more relevant in advanced economies, and due to its non-country specific nature, it allows for a more accurate comparison among countries with very different GDP levels, which also belong to the same economic area. Structural public balance adjustments represent the tool that individual countries must use to contain their deficit and debt within the threshold.

The empirical estimates presented in this paper allow us to support the conclusion that structural public balance adjustments have a direct relation with absolute poverty and that restrictive fiscal measures increase material deprivation, while expansive measures decrease it. In line with the recent debate on the efficacy of fiscal policy, this is the result of the effects of government expenditure on growth that the eventual presence of redistributive measures has not been able to counteract. The introduction in the estimates of other variables affecting poverty consolidates the results and indicates, as additional causes, the rate of inflation and trade openness. Further estimates conducted on a reduced sample of 12 EMU countries for a longer period (1995–2017) and for the two subsamples of pre (1995–2008) and post (2009–2017) crisis period using as dependent variable indicator of monetary poverty confirm the existence of a direct relation between structural adjustments and the share of population living in awkward social conditions.

However, inside the European policy framework, national policies are constrained in their ability to implement autonomously fiscal policies. In the absence of a sustained rate of growth, the interaction among fiscal policy stance, government bonds yields and capital flows limits any kind of single states intervention in the fear of interest rates increase (Canale et al. 2018). Therefore, whatever their aims, national governments are very limitedly able to reconcile the objective of poverty alleviation with that of sound public finance. The increase of poverty is perceived as a kind of unavoidable consequence of fiscal profligacy.

However, as the recent literature about fiscal policy suggests, in the present situation retrenchments seems to have negative effects on growth, to further depress internal demand and to make even more difficult to repay debts in the future; lower interest rates seem to be not the pure result of fiscal restrictions and surely not enough to grant a long-run stable growth. Furthermore, the increase of poverty weakens the political consent and undermines the future existence of the monetary union. The presence of national constraints suggests, therefore, for the future existence of the Eurozone, to push towards centralized fiscal policy instruments. In this context, a quantum leap towards a political union would be required.

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