Assessing Cohesion Policy effects on EU regional well-being: a dose-response function to the transfers' intensities

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Over the last decades an increasing number of empirical studies have explored the effectiveness of European Cohesion Policy, although a very feeble attention has been devoted to assess its impact on multidimensional well-being.

European Union supports the economic and social development of regions through Cohesion Policy with the ultimate goal of improving citizens' well-being especially in the least developed areas (Barca 2009): as reported in the Treaty of Lisbon (2010, art.174), "the Union shall develop and pursue its actions leading to the strengthening of its economic, social and territorial cohesion. In particular, the Union shall aim at reducing disparities between the levels of development of the various regions and the backwardness of the least favoured regions ". The new policy concept, defined around a place-based development approach, strengthen the objective of reducing persistent *inefficiency* (underutilisation of resources resulting in income below potential in both the short and long run) and persistent *social exclusion* (primarily, an excessive number of people below a given standard in terms of income and other features of well-being) in European regions.

The effectiveness of Cohesion Policy remains, however, one of the most significant and highly debated aspects of EU policy. Except for very few empirical works, the major part of evidence has GDP growth as outcome variable. Even if GDP is a suitable indicator of production, easily comparable across territories, it is only a proxy of overall well-being, as a growing literature has showed in recent years: it does not account for dimensions of social and economic progress that are not strictly related to the production activity. Consequently, convergence in GDP growth is not a necessary nor a sufficient condition for the improvement of citizens' well-being and it should not be used as the unique target of the European regional policy (Barca and McCann 2011).

The "Beyond GDP" movement promoted by the European Commission and other international institutions, as well as academic and independent researches and the well-known report of the Stiglitz, Sen, Fitoussi Commission (Stiglitz *et al.*, 2009), highlighted the importance of focusing not only on production outcomes, but also on a number of dimensions which are crucial for people's quality of life (health, education, culture and free-time, environment, personal security, social relation, to quote some) when the issue is "measuring economic performance and social progress". Unfortunately, measuring

well-being is not yet a settled matter: it is a difficult task both on the theoretical (what are the really relevant dimensions in order to properly capture the quality of life?) as well as on the empirical ground (what is the most correct method for synthetizing the different quality of life domains? Are appropriate datasets available at national and subnational levels?). As a consequence, assessing the impact of Cohesion Policy in terms of improvement of EU people's well-being may be an even more challenging task than that carried on so far. Moreover, in recent years, the tighter budget of European Union and the debt crises of many member states give raise to another hotly debated issue relying on the transfers' intensities and the "right dose" of the policy that maximise its effectiveness (Becker et al. 2012).

Taking these issues in mind, this paper adopts a multidimensional approach to the identification of the causal relationship between EU Cohesion Policy funding (programming period 2000-2006) to the NUTS 2 of the European Union with 15 member states, by using as outcome variable a composite indicator of well-being concerning a wider range of progress dimensions than production growth.

The aim of the paper is threefold. First, to define a composite measure of well-being for the European NUTS 2 by means of the Principal Component Analysis (hereafter PCA), by combining nine dimensions of social and economic progress (Income and its distribution, Jobs, Housing, Education, Health, Environment, Safety, Civic engagement and Access to services). PCA is a multivariate statistical method for extracting synthetic measures from a set of variables by transforming them into a smaller set of uncorrelated variables, the principal components, capturing most of the variability of the original data and avoiding the unpleasant effects of a subjective weighting scheme.

Second, to use the above mentioned well-being indicator as the outcome variable to assess the impacts of the European Cohesion Policy, applying two non-experimental methods for comparing the performance of different groups of observations: the Regression Discontinuity Design (RDD) and the Regression Kink Design (RKD). The aim is to investigate if the eligibility status to a specific policy objective (Objective 1 in this case) could foster the growth of the European regional well-being respect to the not eligible regions.

Third, to identify the functional form of the relationship between EU-NUTS 2 regional transfer intensity and the growth rate of the previously defined well-being indicator, by way of dose-response function estimation. This allows us to investigate if there is evidence of a maximum desirable treatment intensity and/or a minimum necessary level of regional transfers to induce growth effects. The regional transfers' intensity, following the above-mentioned contribution of Becker, is defined as the amount of EU transfers in percentage of a target region's beginning-of-period GDP. Following Hirano and Imbens (2004) we assume a normal distribution for the treatment intensity given the covariates. We perform the Kolmogorov-Smirnov test to verify this assumption and we find out that the log-transformed treatment intensity variable does not violate the normality assumption with a significance

level of 5%. Our vector of observables (X_i) includes the following variables: per-capita GDP level (in PPS) prior to the respective programming period (in logarithmic); its squared and cubic values; the average population; Population 25-64 years old with up-secondary, post-secondary non-tertiary and tertiary education (ISCED level 3-8); Human Resources employed in Science and Technology in percentage of active population (QoG data – Charron et al. 2016). Moreover, in order to assess the performance of the GPS, we organize the regions into five groups of treatment intensity; we then evaluate the values of the GPS in correspondence of the median of each treatment interval. Afterwards, we test if the conditional mean of the pre-treatment variables given the generalized propensity score is not different between units who belong to a particular treatment interval and units who belong to all other treatment intervals and we find that the balancing property is satisfied at a level lower than 0.01.

To the best of our knowledge, none of the existing researches has linked well-being indicators to the policy evaluation and its transfers' intensities.

The results arising from RDD and RKD do not highlight any statistical significant jump or kink in the growth of regional well-being between Objective 1 and non-Objective 1 regions. This is not surprising in relation to the particular features of our data that can be summarized into four key points: limited availability of the data, short time span of the analysis, influence of institutional factors, limited attention to specific fields of intervention of Cohesion policy and lack of direct policy targeted on promoting well-being growth.

These findings suggest that, even if the effectiveness of EU Cohesion Policy in terms of regional well-being is still a black- box, there is evidence of the existence of a significant effect of the policy in terms of well-being growth. Our analysis suggests that a minimum level of transfers could be a spark for triggering well-being growth. On the other end, it seems that higher level of policy transfers do not foster well-being growth markedly, notwithstanding they promote higher production levels. This suggests that there is room for further research investigating the nature and the determinants of this causal relationship under different assumptions and programming frames.

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