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# Impact Assessment of European Cohesion Policy: Theoretical and Empirical Issues

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## **RSA WORKSHOP**

### ***EU Cohesion Policy: Focus on the Territorial Dimension***

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## Introduction

European Cohesion Policy as we know it goes back to the reform prior to 1989-94 programming period, following the introduction of the principle of ***‘economic and social cohesion’*** in the Single European Act in 1986.

Now designed to fulfil the objective of achieving a greater social, economic and territorial cohesion (EU Treaty, article number 3) it is financed through the Structural Funds (ERDF, ESF) and the Cohesion Fund.

Most funds allocated to Regional Operational Programmes within National Frameworks agreed with the EU Commission, while significant funds are also allocated to the Cohesion Fund (for countries <90% GDP pp PPS) and also to interregional cooperation or Community Initiatives

## A closely scrutinized policy

European Cohesion Policy is probably the most closely scrutinized of all regional development policies:

- highly visible one
- it concerns multiple countries (all those of the European Union)
- data are available in a relatively easy way (although data limitations are important)
- managed by an institution with limited political power

Hence a «culture» of evaluation which is not present elsewhere

- A system of appraisal, monitoring and evaluation covering all EU-funded regional development interventions (*Bachtler & Wren, 2006*)
- for the 2007-13 programming period already 821 evaluations ERDF co-financed programmes and 721 for ESF co-financed ones (*EU Cohesion Report 2014*)

## Aim of the paper

There exist at least three types of impact evaluations:

1. qualitative impact evaluations operating at the level of the single region or measure or programme;
2. quantitative impact evaluations operating at the same small level
3. evaluations at the level of the whole Cohesion Policy whose methodology is normally a quantitative one

Focus is here on the latter:

- studies whose target variable is either GDP or employment;
- whose coverage is EU-wide, or a subset of countries (for example the EU15 countries already member before 2004)

Aim is to show the issues which make results of this literature not consistent and which prevent to achieve the best theoretically possible analysis

## Brief survey (1)

The scientific literature is replete with plenty of papers which investigate the effects of ECP

- The survey by Gripaos et al. (2008) already counted 84 bibliographical references
- A meta-analysis had already been produced by Dall'Erba & de Groot in 2006

Recently, Pieńkowski & Berkowitz (2015) provide a detailed and synthetic appraisal of what methodologies, territorial scale and results have been obtained in the papers which study econometrically the impact of Cohesion Policy

Table 1: Comparison of econometric models, objectives and variables in the econometric studies

Author	Framework	The issue analysed in the study	Dependent variable	Explanatory variables	Spatial dimension?
Crescenzi, Giua (2015)	Regression discontinuity design, applied separately by Member State	Net impact of EU regional policy at local level	Variation in the number of employees	Initial number of employees, dependency ratio	No
De Dominicis (2014)	Neoclassical growth model, spatially augmented (2 regressions)	Effects of regional inequality on growth in Objective 1 and non-Objective 1 regions	GDP growth per worker	GDP dispersion, initial GDP, population growth	Spatial Durbin model
Fratesi, Perucca (2014)	Barro-like regional growth model, augmented	Impact of territorial capital on effectiveness of Cohesion Policy funds in CEE	GDP growth per capita	Initial GDP, regional specialisation, industrial transition, SF categories, territorial capital variables	Spatial auto-correlation tested
Maynou et al. (2014)	Dynamic panel data model based on neoclassical convergence model	If Structural Funds (SF) and Cohesion Fund (CF) helped achieve convergence of the Eurozone regions	GDP growth per capita	7 regional and 5 MS level variables incl. investment, education, employment; CPF transfers at MS level	Spatio-temporal adjustment
Pellegrini et al. (2013)	Regression discontinuity design	Causal effects of Structural Funds transfers on GDP growth	GDP growth per capita	GDP per head	Results controlled for spatial effects
Rodriguez-Pose, Garcilazo (2013)	Neoclassical growth framework	Impact of quality of regional government and Structural Funds on growth	GDP growth per capita	Initial GDP, quality of government, Structural Funds transfers, infrastructure, education, employment, etc.	Population density as a proxy for agglomeration effects
Rodriguez-Pose, Novak (2013)	Neoclassical growth framework (2 regressions for 2 periods)	'Learning effects' - changes in impact of SF on regional growth	GDP growth per capita	Initial GDP, investment, infrastructure, education, innovation, quality of institutions, Structural Funds transfers, etc.	A proxy indicator included in the regression

Table 2: Cohesion Policy data used in the econometric studies

Author	Cohesion Policy data used in analysis	Time period	Territorial units*
Crescenzi, Giua (2015)	Structural Funds (SF) Objective 1 eligibility (Yes - No)	1988-1989	LAU-2 (municipalities) in 4 MS: DE, ES, IT, UK
De Dominicis (2014)	SF Objective 1 eligibility (Yes - No)	1991-2004	188 NUTS2
Fratesi, Perucca (2014)	ERDF and Cohesion Fund (CF)	2004-2006	108 NUTS3 in CEE
Maynou et al. (2014)	ERDF, CF, EAGGF, FIFG transfers, as% of GDP, at country level	1995-2006	17 MS (Euro area)
Pellegrini et al. (2013)	SF Objective 1 eligibility (Yes - No)	1995-2006	190 NUTS2
Rodriguez-Pose, Garcilazo (2013)	Structural and Cohesion funds payments	1996-2007	169 NUTS2
Rodriguez-Pose, Novak (2013)	SF payments to Objectives 1,2,5b and 6	1994-2006	133 NUTS2
Tomova et al. (2013)	ESIF payments (ERDF, CF, EAGGF, FIFG, Cohesion Fund), at country level	1980-2013	28 MS
Becker (2012a)	Structural Funds (actually: ERDF?) and CF commitments	1989-2006	251 NUTS2
Becker (2012b)	Structural Funds (actually: ERDF?) and CF commitments	1994-2006	2078 NUTS3
Le Gallo et al (2011)	Not clear what Structural Funds data have been used	1989-1999	145 NUTS2
Becker (2010)	Eligibility for Objective 1 transfers (Yes - No)	1989-2006	1498 NUTS2 and NUTS3
Moll Hagen (2010)	Structural (actually: ERDF?) and CF commitments	2000-2006	126 NUTS2
Dall'erba Le Gallo (2008)	Structural Funds transfers (no details given)	1989-1999	145 NUTS2

Table 3: Main results and conclusions from the econometric studies

Author	Main results of the study	Conclusions for EU Cohesion Policy
Crescenzi, Giua (2015)	Positive impact of Objective 1 interventions in Italy, Spain and UK; negative in Germany.	The results support the role of Cohesion Policy and suggest its reform towards giving it a stronger 'place-based' dimension.
De Dominicis (2014)	Inequality has a positive impact on GDP growth in less developed regions and no significant impact in the other regions.	Concentration of Structural Funds in a limited number of regions may enhance growth in the early stages of developments.
Fratesi, Perucca (2014)	Cohesion policy is not very effective <i>per se</i> , but is more effective in regions more endowed with territorial capital.	Investing Cohesion Policy funds in regions more endowed with territorial capital pays more than investing them in weaker regions.
Maynou et al. (2014)	Significant positive effect of SCF on GDP growth at country level, but no significant effects of SCF on convergence.	No conclusions for Cohesion Policy.
Pellegrini et al. (2013)	Positive and statistically significant effect of ERDF Objective 1 interventions on regional growth (0.6-0.9% additional annual growth).	Growth effects of Cohesion Policy are rather modest.
Rodriguez-Pose, Garcilazo (2013)	High impact of quality of government on regional growth in poorer EU regions; smaller impact of Cohesion Policy funds.	Above certain intensity level, Cohesion Policy transfers need to be accompanied by measures aimed at improving local governance and institutions.
Rodriguez-Pose, Novak (2013)	Positive impact of 2000-2006 Structural Funds on regional growth, but no impact in 1994-1999.	Effectiveness of Cohesion Policy has improved in 2000-2006 in comparison to 1994-1999.
Tomova et al. (2013)	Cohesion Policy funds contributed to improving socio-development at country level. Higher impact when combined with sound fiscal and macroeconomic policies.	Making Cohesion Policy funds conditional on sound fiscal and macroeconomic policies likely to improve effectiveness of these funds.
Becker (2012b)	Growth effects of Cohesion Policy transfers decrease with increasing transfer intensity. Optimal transfer intensity: up to 0.4% of GDP. Max. desirable intensity: up to 1.3% of GDP.	Cohesion Policy transfers should have been relocated from the regions receiving the highest transfer intensity to regions receiving less funds.
Becker (2012a)	'Objective 1 treatment' has significantly higher growth impact in regions with good human capital and quality of government.	To maximise growth impact, Objective 1 transfers should be reallocated to regions with the best good human capital and quality of government.

Source: Pienkowski and Berkowitz (2015)

## Brief survey (2)

There have historically been studies denying the impact of the policy (e.g. *Boldrin & Canova, 2001*), others which support that there is a positive correlation (e.g. *Dall'erba, 2005*; *Leonardi, 2006*) and others whose results are mixed and depend on certain conditions (e.g. *Esposti & Bussoletti, 2008*).

Why are the results so different?

It only partly depends on the methodologies used

The fact that different periods are used is also not enough to justify this variation (although it seems to be consolidated knowledge that the detected impact is larger for the most recent programming periods (*Pinho et al., 2015*; *Rodríguez-Pose & Novak, 2013*))

It primarily depends on the complexity of the policy, and providing a single assessment to such a multi-faceted policy is a hard task

# Issues related to the characteristics of Cohesion Policy



## Geographical scale and spillovers

Policy is mostly deployed at the regional scale, but not necessarily and not in all cases

Nor it can be assumed that its impact should be assessed at the level of the individual regions (aggregate impact of cohesion policy on territorial cohesion or on European growth)

Eligibility aspects: Nuts2 & Nuts0 & Lau2

Analyses at Nuts2 level: most meaningful or most available data?

Are the effects confined within Nuts2?

Is spatial econometrics enough? (*Thissen et al. 2013*)

What degree of spatial heterogeneity? (*Ramajo et al. 2008*)

## A multi-faceted policy (1)

Cohesion Policy is a multifaceted policy which includes a large number of different aspects and objectives

Cohesion Policy is normally applied in isolation but interacts with a large number of other policies, coming from the member countries and the individual regions

Other bodies often have different and conflicting objectives (countries, regions, and the EU itself)

Backwash and spread effects, which are common to all policy initiatives, are also present for European Cohesion Policy

## A multi-faceted policy (2)

Cohesion Policy is very large and very differentiated inside:

No single objective, but a plurality of objectives

Objectives are not even stable in time:

A pattern of evolution can be detected from more cohesion (i.e. basically lower disparities) to more competitiveness (i.e. more growth for all the regions of Europe)

Objectives are not all economic:

Incorrect to assess the economic impact for funds spent on socio-political objectives (e.g. quality of life, the protection of the environment, the inclusion of disadvantaged people)

## A multi-faceted policy (3)

ECP impact is the sum of different impacts of different axes:

Some of these axes have normally a larger impact on economic variables, while others are expected to impact on other socio-economic aspects

The delays for the policies to be effective are not the same for all axes

First demonstration of this goes back to Rodríguez-Pose & Fratesi (2004)

Unfortunately, detailed data not available until the SWECO 2010 project

## Economic geography effects

The possibility for obtaining a reliable assessment of the impact of Cohesion Policy limited by the nature of economic geography, the existence of multiple equilibria and self-reinforcing mechanisms

- An economy cannot move out of a stable equilibrium in a NEG model unless the shock is sizeable enough (*Ottaviano, 2003*): Are Structural Funds investments large enough?
- Structural Fund investments have traditionally been devoted to infrastructure (until the most recent programming periods) but infrastructure provision can lead to more agglomeration
- Moreover, infrastructure can only cross some territories (*Vickerman, 1991*) and measuring accessibility is a difficult task (*Vickerman et al. 1999*); different impact of transport infrastructure improving connections within regions or between regions (*Martin, 1999*)

Few attempts to employ NEG (*GMR Geographic Macro and Regional model Varga 2015*)

## Other theoretical aspects

Important to understand the causal chain going from the policy to its impact, as in the theory based evaluation

There is a plurality of channels through which CP could impact on regional growth, e.g.

- the most traditional and easiest one is the set-up of demand side multiplicative effects
- other channels are more dynamic in nature, such as the stimulus to innovation
- CP could also act through the creation of public capital
- creation of private capital whose accumulation can be stimulated by investment incentives or by the improvement of attraction factors
- softer channels could act, for example CP invests large sums in measures related to individual human capital

Never mutually exclusive

## Eligibility

Eligibility to policy is not uncorrelated to the outcomes

- Complex mechanism for the regional allocation of funds (*Dotti, 2012*).
- Economic disadvantage is not fully coincident with the spatial distribution of structural funds, and the concentration of the former is larger than the one of the latter (*Crescenzi, 2009*)
- incentives for regions not to overcome the threshold of 75% (even if all regions are funded starting from the 2007-13 programming period)
- Statistical effect of enlargement (phasing in and phasing out)

## Additionality

National governments have to match the EU investments with own resources, which should ensure that CP investments are additional to local funds and not substitute to them

The incentive to divert national resources to other places or other initiatives is very strong (case of the Italian Mezzogiorno, *Polverari, 2013*)

Between 1997 and 2010 EU Structural Funds seem to have mostly had a substitution effect on national public finances. Displacement effects were also found to be clearly present in some sectors (*Del Bo & Sirtori, forthcoming*)

Biased allocation of Cohesion Fund

European competitiveness policy



# Issues related to data and methodologies

## Which data has to be used as impact output?

Assisted regions are basically selected on the basis of regional GDP pp, but the objectives of CP are much more complex (being economic social and territorial cohesion)

Many dependent variables in the literature

- Sigma or Beta convergence, or both (e.g. Leonardi, 2006)
- transition matrixes and markov chains

Most studies use GDP or GDP per capita (in real terms or PPP) but also employment creation (*Giua, 2014*) or the patterns of location of industries (e.g. *Midelfart-Knarvik & Overman, 2002*) and productivity (e.g. *Esposti & Bussoletti, 2008*)

All these variables fail to consider the fact that CP is mostly about long-run development and competitiveness  
--> short term economic performance per se is not the only useful indicator

## The time dimension

The time dimension is crucial when assessing Cohesion Policy, more than for other policies

After how long CP policy is expected to have an impact on its target? Any policy, in fact, has a certain lag, but this lag should be larger for policies whose effects are structural

Difficult is to identify a unique lag which should apply to all policy aspects, since the policy is so composite.

Different time lags provide different results (*Rodríguez-Pose & Fratesi 2007*)

Recent panel estimations use averages over a few years, in order to investigate long-run effects and have more stability (*Mohl & Hagen, 2010*). This is good but forgets:

- the fact that CP has continuously evolved in time
- any possible improvement in the working of the policy is also not considered in this way (all the reforms and new rules)

## Disturbance factors and threshold effects

Presence of disturbance factors

Regression analyses include control variables to avoid the omitted variable bias, but this does not necessarily ensures that all concurrent effects are considered.

***ECP should be assessed in confront with other policies***

but no Structural Fund analysis really includes variables to account for them.

Only structural factors are included (linked to the socio-economic structure of the region and conjunctural factors linked to the specific situation of the country)

Quality of government Charron, Dijkstra, & Lapuente, 2014  
Rodriguez-pose & Garcilazo (2015)

Characteristics of the receiving regions

- Human capital endowment of regions (Becker et al. 2013)
- Territorial capital (Fratesi and Perucca, 2014&2015)

## Econometric aspects (1)

### 1] Models

Multi-equation models advantage of taking into account more different aspects at the same time, but are more complex to implement

National models (Quest (*J. Varga & in 't Veld, 2011*); Hermin (*Bradley & Untiedt, 2012; Bradley, 2006*))

Regional models (GMR model (*A. Varga, 2015*); RHOMOLO model (*Brandsma & Kancs, 2015*))

Models are best used for ex-ante impact assessment rather than ex-post

Larger impact of models with respect to reduced form estimations

## Econometric aspects (2)

2] reduced form estimations

Easier to produce and more transparent. They have a theoretical model underline, but are based on data, with a significantly lower need for assumptions

Panel models (*Bouayad-Agha, Turpin, & Védrine, 2013; Esposti & Bussoletti, 2008; Mohl & Hagen, 2010*), cross sections, non-parametric estimations (*Gómez-García et al. 2012*), regression discontinuity approaches (*Becker et al. 2010; Pellegrini et al., 2013*)

The choice of a panel or of a cross section is in most cases data driven, even if the panel is superior in terms of the possibility to correct endogeneity which, according to Hagen & Mohl (2009) can be due to reverse causality, unobserved variables, omitted variables, measurement errors and the Nickell bias.

## The search for counterfactuals

Regression discontinuity designs have been applied to the impact of Cohesion Policy to estimate the impact over a threshold, by looking at the difference that a threshold produces (e.g. the 75% of GDP of Objective 1 - Convergence - objective).

Regression discontinuity design at spatial level, by looking at small comparable spatial units in the different sides of a border between assisted and non-assisted regions (Giua, 2014).

These methods are able to test whether CP has been effective, but can say less on how large are these effects farer from the threshold.

Recently, the first attempts to test for heterogeneous effects (Becker et al., 2013)

# Conclusions



## Conclusions (1)

There is a large number of difficulties

- some are standard to policy assessments

- others are due to the specific characteristics of Cohesion Policy

Most papers try and get a conclusion on whether CP has

been effective: while in the past many papers were concluding that it was basically ineffective, more recently the effectiveness has generally been detected

HOWEVER:

Theoretically (unless the result is that CP has been fully ineffective the

Boldrin & Canova (2001) result), not much interest in seeing that a policy involving 50 billion Euro per year is

***somehow*** effective:

It would be a very surprising result that all this money would produce no effect (if nothing else casually at least some of this money should produce an impact by increasing demand in weakest areas)

## Conclusions (2)

From a policy perspective: knowing that some effectiveness exists is encouraging but not really useful:

Is cancelling CP really politically feasible? It's the only real and significant redistributive mechanism in the EU.

Measuring to what extent CP is effective is not really useful either.

It may provide help for the Commission to advocate more funds, or for redistributions within the Union's budget, but nothing more.

The purpose of these CP impact assessments, therefore, should not be measuring effectiveness but rather **find ways to improve the policy efficiency**

results are differentiated when different axes are considered  
impact of CP is differentiated depending on the way in which it is applied and on the context to which it is applied

## Conclusions (3)

Time also for econometric researchers to strongly embark on the analysis of ***how to improve effectiveness and efficiency***,

and they can do it by investigating not whether CP has been effective, but when, where and how it has been more as such.

# Thank you for your attention and your comments

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