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The investment effects of Cohesion Policy at the extensive and intensive margins

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Introduction

Introduction

❑ Background

- **"New" literature**
  - Causal effects (Becker, 2010; Pellegrini et al, 2013; Crescenzi and Giua, 2016; Giua, 2017; Di Cataldo, 2018; Becker et al, 2018)
  - Factors conditioning success and failure (Rodriguez-Pose and Fratesi, 2004; Tsiapa and Sotiriou, 2015; Crescenzi et al, 2017; Fratesi and Wishlade, 2017; Di Cataldo and Monastiriotis, 2018)

- **"New" policy**
  - Place-based policies and smart specialisation (Barca report; Kline, 2010; McCann and Ortega-Argiles, 2011; Foray, 2014; …)
  - New conditionalities (including "ex ante" and "macroeconomic")
  - New financial instruments (loans, guarantees, equity, quasi-equity and "risk-bearing mechanisms")

Introduction

❑ Key issue

- **Traditional focus – growth**
  - Growth and convergence (Leonardi, 2006)
  - Employment (and other socio-economic outcomes – Di Cataldo and Rodriguez-Pose, 2017)
  - Capacities (mainly in qualitative literature – also, modes of implementation etc)

- **An emerging key issue – investment**
  - Mobilisation of private capital (extent of development / deepening)
  - Effectiveness of private capital (intensity / productivity of K)

→ ***NOTE: in line with questions of, and the recent shift towards, "new financial instruments", value for money, fiscal prudence***

Introduction

❑ Some "theory"

- **"Mainstream" view**
  - Crowding-out (public investments may raise the cost of private capital via the interest rate effect of public borrowing)
  - Creaming-off (public investments may deprive the private sector from relevant human resources and skills)
  - Displacement (public investments themselves may be limiting the range of investment opportunities in the private sector)

- **Nuanced arguments**
  - Open economies (no strict constraint on capital)
  - Enabling infrastructures (human, physical – resolve supply-side constraints, create positive demand spillovers)
  - Enabling risk-taking (NIP – cost discovery, new fin instruments)

Considerations for the analysis

Considerations for the analysis

❑ On the extent versus the productivity of capital

- **Complements**
  - Factors 'enabling' investment as the factors that raise the productivity of capital
    - e.g., reducing transport costs raises accessibility and thus also knowledge flows and competition
    - e.g., raising local human capital increases profitable business opportunities and thus new 'good' jobs

- **Substitutes**
  - Factors 'incentivising' private investment as factors that allow for speculative / unsustainable business projects
    - e.g., supporting small-scale industry in remote areas ("subsidising failure")
  - Or/also, diminishing returns and/or selection/endogeneity…

Considerations for the analysis

❑ Past literature

- **Generally, a limited and 'scattered' literature**
  - Some literature on the productivity of public (EU) investment
    - e.g., Rodriguez-Pose and Garcilazo, 2015 on role of QoG
    - e.g., broader lit on 'factors conditioning' (Crescenzi et al, 2017)
  - Limited literature on regional investment functions
    - Whitmore (1981), Paci (1985), Schalk and Untiedt (2002)
    - Escriba and Murgui (2005, …): accumulation rate (I_t/K_{t-1})
    - Accelerator effect, profits, relative costs (wages), technology, cost of capital, demand pressures, accessibility, human capital

Considerations for the analysis

❑ Data

- **Sample coverage**
  - The entire population of NUTS2 regions in the EU27 (excl. Croatia) spanning across the two programming periods of 2000-2006 and 2007-2013 (with data coverage up to 2015)

- **Data sources and variables used**
  - Structural Funds database of the EC (DG Regional Policy)
    - both annualised commitments and annual payments for the full period as well as programming period-specific data with detail on expenditures axes (thematic categories of expenditures)
  - Regional economic data from Eurostat
    - regional GDP, GVA and Gross Fixed Capital Formation (private economy and industry)
    - regional levels of education (levels of qualification of the working age population), R&D spending (public and private), employment, and others

Considerations for the analysis

❑ Empirical approach

- **Regression analysis**
  - Estimation of two models of
    - Capital formation (investment equation)
    - Output growth (production function approach)
  - Estimated via OLS (and, later, SURE)
    - No IV setting given our interest in both equations

- **Decomposition analysis**
  - Detailed Oaxaca-Blinder decomposition of growth equation
  - Split sample into 'treated' (Obj.1, above-avg) and non-treated
  - For investment (capital growth),
    - 'explained' component shows extensive margin
    - 'unexplained' component shows intensive margin

Considerations for the analysis

❑ Empirical approach – regression analysis

- **Regional investment equation (growth of capital)**
  - Investment rate (ratio to GVA) as a proxy for capital growth
  - Part-following the 'accumulation rate' tradition (no K-stock data)

$$\frac{I_t}{Y_t} = f(pressure\ of\ demand; technology; human\ capital)$$

PoD: past empl growth; Tech: R&D % of GDP; HC: education rates

- **Regional growth equation (productivity of capital)**
  - Production function, augmented for human capital etc

$$\Delta y = \alpha + \beta_1 \Delta E + \beta_2 \frac{I}{Y} + \gamma_1 T + \gamma_2 S + \delta_1 C + \delta_2 (C * \frac{I}{Y})$$

E: empl; T: R&D; S: education; C: cohesion payments (%GDP)

  - Interest is with coefficient δ_2 (with/without setting δ_1=0)

Considerations for the analysis

❑ Empirical approach – decomposition analysis

- **Regression specification**
  - Same output growth model, excluding the Cohesion variable
  - → *Currently experimenting with alternative model specifications*

- **Sample split**
  - Treated: all regions eligible for 'convergence' or transitory funds under the 2006-13 programming regulations
  - → *Currently experimenting with alternative 'discontinuities'*

- **Approach**
  - Oaxaca-Blinder with 'omega' option (twofold decomposition based on pooled model excluding *groupvar –cohesion funds*)
  - → *Currently extending to other decomposition options*

Empirical results

Empirical results

❑ Regression analysis – extensive margin

Dependent variable	(1)
Lag empl growth	1.097***
	(0.126)
R&D (total, %GDP)	0.0595***
	(0.0123)
Education secondary	-0.0177***
	(0.00191)
Education tertiary	0.000832
	(0.00264)
CF (%GDP)	
CF(t-1) (%GDP)	
CF(t-2) (%GDP)	
Log-difference CF (%GDP)	
Constant	9.073***
	(0.131)
Time effects	Year
Space effects	RE
Observations	2,351
Number of regions	241
R-squared (within)	0.404

- ✓ **Positive effects at the extensive margin**
- ✓ **No matter how measured**

Empirical results

❑ Regression analysis – intensive margin: regression results

VARIABLES	(1)	(2)	(3)
Employment growth	0.0470**	0.0471**	0.0474**
	(0.0197)	(0.0197)	(0.0197)
Capital growth	0.0579***	0.0575***	0.0607***
	(0.0180)	(0.0179)	(0.0200)
R&D (%GDP)	-3.33e-06	-3.23e-06	-3.10e-06
	(6.61e-06)	(6.60e-06)	(6.62e-06)
Education (med)	2.10e-05	6.09e-05	7.07e-05
	(0.000440)	(0.000439)	(0.000440)
Education (high)	-0.000402	-0.000338	-0.000320
	(0.000513)	(0.000513)	(0.000516)
CF (%GDP)	0.358**		
	(0.156)		
CF t-1 (%GDP)		0.481***	0.503***
		(0.169)	(0.180)
CF t-1 (x) Capital growth			-0.168
			(0.476)
Constant	0.0329	0.0278	0.0264
	(0.0317)	(0.0317)	(0.0320)
Observations	2,004	2,004	2,004
R-squared	0.918	0.918	0.918
Number of regions	241	241	241

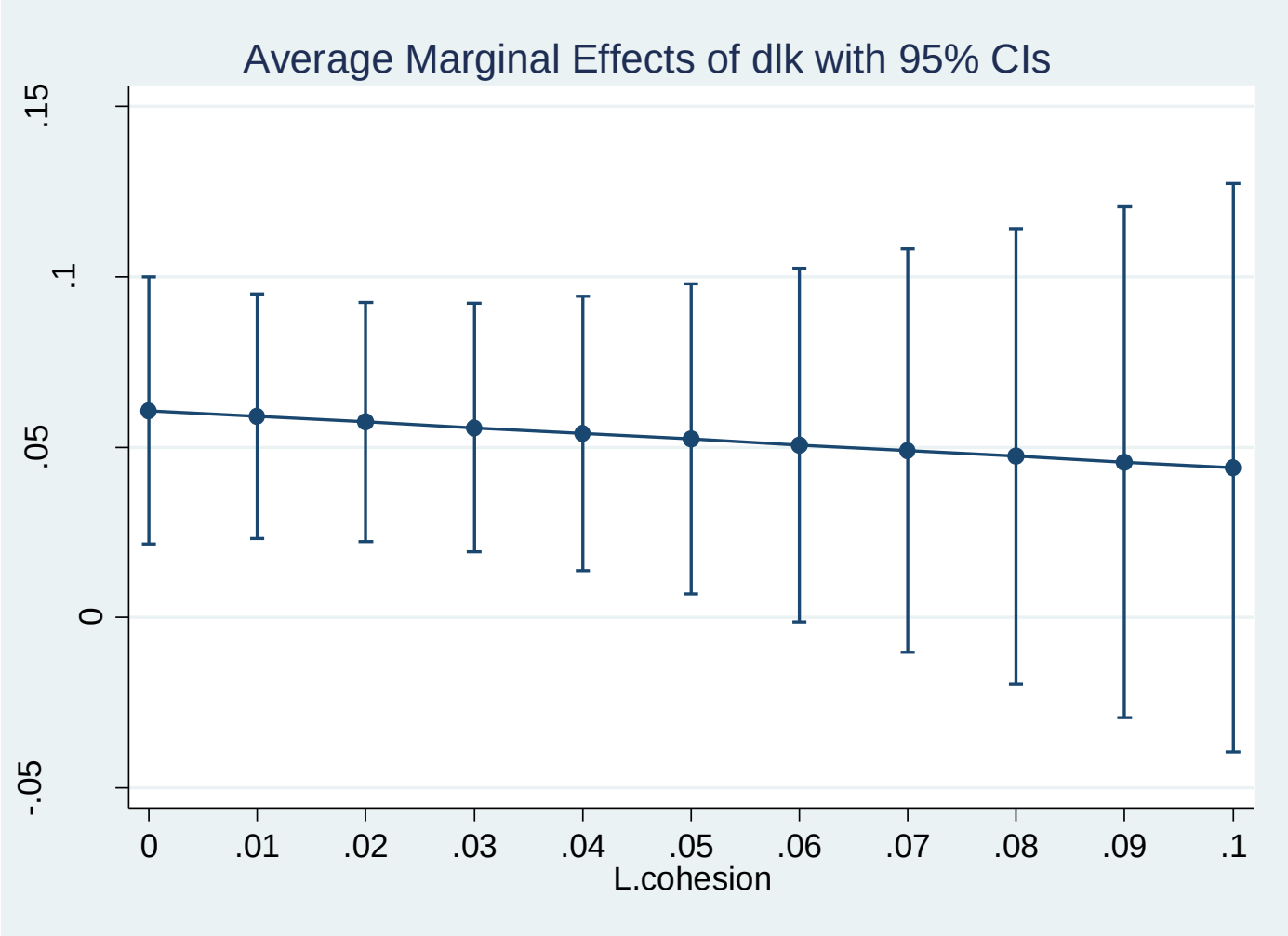
✓**Positive effect on growth**

✓**Stronger with some hysteresis**

✓**But no beneficial effect at the intensive margin**

Empirical results

❑ Regression analysis – intensive margin: marginal effects



Empirical results

❑ Decomposition analysis

	Extensive margin ('explained')	Intensive margin ('unexplained')
Percent contribution of		
Employment growth	-2.81%	-0.10%
Capital growth	104.85%	-2.00%
R&D (per capita)	-11.88%	10.74%
Education (med)	26.57%	114.74%
Education (high)	-16.73%	-23.37%
Total (relative to difference)	72.01%	27.99%
Estimated growth rates		
'Treated'	4.6%	
'Control'	1.8%	
Difference	2.9	

'Treated' regions have less R&D; but R&D there matters more!

While tertiary education is not only lower, but also *less productive* there!

This is almost entirely explained by differences in investment (here, capital growth)

While the intensive margin presents no advantage (if anything, a damping effect)

Convergence (treated) regions have a growth advantage

(Weak) employment growth is a hindrance; but growth is not more/less job-intensive in 'treated' regions

Secondary education is more important for 'treated' regions, at both the extensive and (especially) the intensive margin

Observed characteristics explain more of the difference than their corresponding elasticities

Discussion and conclusions

Discussion and conclusions

❑ Main findings

- **Impact at the extensive margin**
  - Significant and consistent positive effect
  - No ‘crowding-out’; instead, strong ‘mobilisation’ effect
  - Both through regression analysis and in decomposition

- **Impact at the intensive margin**
  - Little/no evidence of a ‘productivity’ advantage for capital
  - Neither of cohesion spending as such (from the regressions) nor of assignment into treatment (from the decompositions)

Discussion and conclusions

❑ Implications and further steps

- **Implications**
  - Policy success with regard to mobilisation
  - But a key issue emerges as to how to raise the productivity of capital through Cohesion Policy
  - Although not a disadvantage at present, the shift to 'new instruments' makes the productivity issue of heightened importance

- **Limitations**
  - Analysis is still rather preliminary: further work needed, with regard to specification and controls for selection/treatment

Investment effects of CP at the extensive and intensive margins

Thank you!

For questions and comments please contact v.monastiriotis@lse.ac.uk