The impact of European Cohesion Policy.

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Investigating and quantifying the system-wide impact of the European Structural Funds 2014-20 constitutes a complex task that requires a nuanced approach. Employing a large-scale spatial general equilibrium model calibrated for 89 regions across the European Union (EU) and the United Kingdom (UK), our research delves into the multifaceted realm of cohesion policy assessment. Cohesion policy, aimed at reducing regional disparities and promoting economic growth, has been scrutinized in the literature through various tools, including econometric analysis, partial and general equilibrium modeling, and counterfactual impact assessments.

The existing body of literature, as exemplified by Fratesi and Wishlade (2017), reveals conflicting evidence when attempting to quantify the impact of cohesion policy. The challenges inherent in this task are manifold. With diverse policy objectives and the intentional generation of spillovers and enhanced regional connectivity, properly accounting for each policy instrument becomes a formidable challenge. Partial equilibrium and reduced-form tools, along with case studies, offer insights into specific facets, such as the impact of a single category of investment or the influence of factors like institutional quality (Rodríguez-Pose and Garcilazo, 2015), regional absorptive capacity (Becker et al., 2013), and capital endowments (Fratesi and Perucca, 2014) on the relationship between policy and economic growth. However, numerical/computable general equilibrium models stand out as powerful tools in this landscape. These models, accounting for the structural linkages of the economy, have the capacity to capture not only direct and indirect effects but also system-wide impacts of policies. The incorporation of interregional trade linkages equips these models to grasp trade and competitiveness spillovers, along with other spillovers stemming from the mobility of production factors (Figus et al., 2018; Johnson, 2014). General equilibrium modeling proves instrumental in differentiating the channels through which various interventions within the cohesion policy package generate effects, offering a more nuanced understanding of each policy measure's contribution to the overall impact.

While model-based simulations generally support a significant economic impact of the European cohesion policy, the complexity of the analysis has led to limitations in the contributions found in the literature. Many studies rely on models calibrated to single-country data, restricting the comprehensive understanding of cohesion policy's regional/spatial dimensions. Notable exceptions include the work of Blouri and Ehrlich (2020) and Korzhenevych and Bröcker (2020).

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Blouri and Ehrlich (2020), employing a slightly different approach than computable general equilibrium models, assess the optimal design of EU regional transfers. Their model incorporates spatial dimensions and location-specific preferences, albeit focusing on a subset of regional EU transfers. On the other hand, Korzhenevych and Broker (2020) uses a spatial forward-looking model to evaluate European regional policy investment support for 25 EU regions. This application disaggregates the policy programme into two broad groups of investments, implying either an increase in private or public investment, thus failing to take into account the multifaceted nature of the programme. Moreover, private and public investments behave similarly and have the same marginal returns. Nevertheless, in this paper, consumers and investors act with perfect foresight, which is a significant improvement over previous impact assessments based on spatial general equilibrium models with imperfect foresight, since the lack of intertemporal substitution could be considered as a serious shortcoming when analysing the potential impact of a multi-annual development policy as pointed out in Partridge and Rickman (2010). Key assumptions about agents' expectations have strong implications for consumption smoothing and investment decisions in response 3 to policy shocks. This is even more important when the policy has direct supply-side effects (as the cohesion policy) with longer-term implications as shown by Allan et al. (2021), who found that imperfect foresight investment models produce more negative, longer-lasting and unstable adjustment paths

Our contribution to this landscape involves the development of a spatial intertemporal dynamic general equilibrium model covering 89 NUTS 1 regions of the EU and the UK. This model is tailored to analyze the macroeconomic impact of investments financed by the European Regional Development Fund (ERDF) and the Cohesion Fund (CF) over the period 2014-2020. The temporal nature of the cohesion policy, operating within a multi-annual financial framework with designated start and end dates for programs, underscores the importance of assumptions about agents' expectations. In our analysis, we explore the role of agents' expectations by comparing results under the assumption of forward-looking agents with perfect foresight against an alternative version where agents form expectations based solely on the current and past state of the economy, making them myopic. This exploration of expectations is particularly relevant when dealing with policies, such as cohesion policy, that have direct supply-side effects with longer-term implications.

The model includes sector-to-sector input-output linkages both within and across regions. Calibration involves data on bilateral final and intermediate goods trade flows for the 89 regions and a composite exogenous rest-of-the-world region. Through simulating model responses to cohesion investments, we aim to assess both short-run and long-run effects. The interregional framework developed via input trade facilitates the transmission of shocks across borders, allowing us to capture the inter-regional spillover effects resulting from the implementation of the cohesion policy package. For example, a positive supply-side shock in one region leads to an increase in home output, thereby improving the home's terms of trade and stimulating exports abroad through enhanced competitiveness. Consequently, as home prices fall in the perturbed region, these effects ripple downstream through the production chain, benefiting importing regions that can now purchase inputs at a more competitive price. The trade transmission channel also plays a pivotal role under demand-side shocks, though in this case, the terms of trade effect reverses.

Recognizing the importance of the nature of the shock for the trade transmission mechanism, we decompose the full policy package into three distinct shocks, each aligned with cohesion policy objectives. The full policy shock consists of a combination of stimulus to government current expenditure, government capital expenditure, and private investment subsidies. While the government current expenditure shock involves only a demand-side response, the two investment shocks have direct supply-side effects with different marginal returns. Public capital enters the model as an unpaid factor subject to congestion, while private investment contributes to the stock of corporate capital, impacting the production function and chosen by optimizing firms.

Proceeding to the quantitative analysis, we attempt a systematic and comprehensive impact assessment of cohesion policy in a large-scale intertemporal spatial general equilibrium modelling framework. We initially simulate the full cohesion policy package, and subsequently, we account for the separate responses of each policy channel. The two variants of the model are then compared in relation to their impact in the short run and in the long run

We show the results of the counterfactual analysis under two variants of the model. A model that includes forward-looking agents capable of forming expectations about future economic outcomes and a version in which agents are backward-looking and form expectations based only on current and past economic states. We find significant differences between the two settings, demonstrating the usefulness of devoting computational resources to the construction of large-scale spatial models with perfect foresight agents. The system-wide impact under perfect-foresight agents is typically lower than that predicted by the model with myopic agents. Moreover, the differences between the two types of models are particularly large in regions that are net beneficiaries rather than net contributors.

We disentangle a number of appropriate channels in relation to the diversity of expenditure associated with cohesion policy. The analysis indicates that supply-side shocks have larger multipliers than purely demand-side shocks, such as shocks to government current expenditure. Additionally, we found that programmes that stimulate private and public investments have larger and more long-lasting effects than demand-side shock. In this case, the model exhibits a rapid adjustment towards the post-policy equilibrium, which limits the legacy effects of the interventions. We have identified a few regions where the economic impact can be explained largely by spillovers (i.e., GDP benefits arising from investments made elsewhere). These spillovers are not uniform and tend to benefit regions closer to the target regions.

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