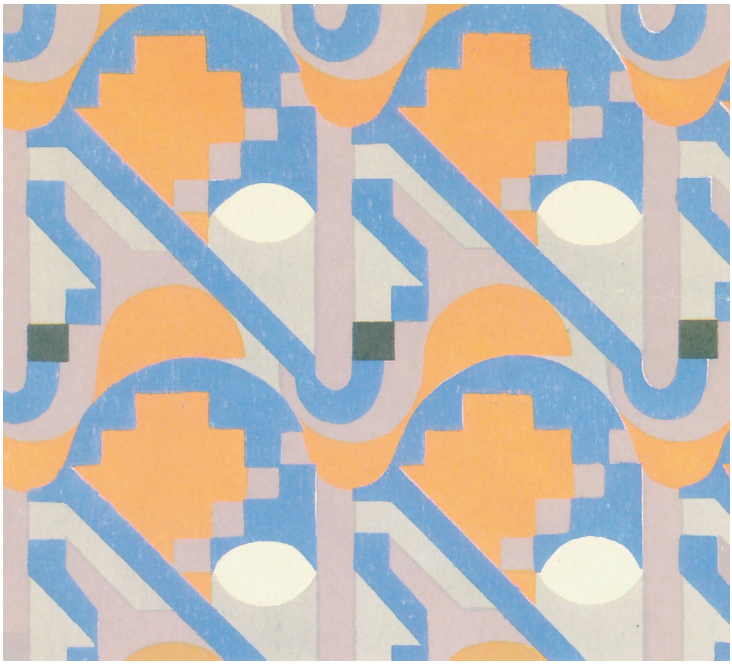
THE REGIONAL CHALLENGES IN THE POST-COVID ERA

edited by
Annalisa Caloffi, Marusca De Castris,
Giovanni Perucca



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The Regional Effects of Public Spending on Active Labor Market Policies: Evidence from Advanced Economies

Jessica Faraci, Davide Furceri°, Fabio Mazzola*, Pietro Pizzuto**

Abstract

This paper examines the regional effects of public spending on Active Labor Market polices (ALMPs). Using an unbalanced sample of 308 regions belonging to 29 OECD Economies for the period 1995-2011, we show that discretionary increases in public spending on active labor market policies at the national level have statistically significant short- and medium-term effect in reducing regional unemployment rate, while raising regional output. These effects tend to be larger during periods of low GDP growth, and when complemented by a larger share of cohesion fund expenditures.

1. Introduction[1]

The impact of COVID-19 on economic activity and employment levels has been unprecedent in terms of speed and severity. At the beginning of 2021, The International Labor Organization (ILO) estimated a striking worldwide loss of 255 million jobs as a result of the COVID-19 pandemic, with the unemployment rate rising by 1.1 percentage points – from 5.4 to 6.5 percent, and 81 million workers pushed out of the labor market (ILO, 2021). Many countries reacted swiftly in increasing support to the health sector and the deployment of vaccines, as well as significant fiscal stimulus (Deb *et al*., 2021), but worries are mounting on the scarring effects the pandemic is generating even at the regional level. The first EU-wide Annual Regional and Local Barometer (EU Annual Regional and Local Barometer, 2020) warns that the COVID-19 crisis is negatively impacting sub-national authorities'

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1. The views expressed in this paper are those of the authors and do not necessarily represent those of the IMF or its member countries.

revenues and health systems with the risk of increasing regional disparities. Evidence from major epidemics and pandemics of the latest two decades supports this claim and suggests that the impact of health crises appears uneven across regions, with those having a poor matching in the labor market (denoted by high unemployment rates), more dependent on tourism and with a larger share of low-skilled workers being disproportionally hit (Aronica, Pizzuto, 2022).

Although regional growth and resilience are strictly affected by regional endogenous characteristics (see Capello, 2009; Martin, Gardiner, 2019; Mazzola, Pizzuto, 2020; for a broad review of studies), it is increasingly recognized that the factors determining regional performance should not be found only in each region's endogenous endowments but are also associated with some pervasive peculiarities of the national economy and its general performances and policies (Camagni, Capello, 2010).[2] In the context of the COVID-19 pandemic, active labor market policies (ALMPs) can play an important role in making regional labor markets more resilient to the current crisis as they can help displaced workers to find jobs more quickly and facilitate the matching of jobseekers with emerging job opportunities. While there is no agreed definition of the concept, the OECD defines ALMPs as aiming: "to bring more people into the effective labor force, to counteract the potentially negative effects of unemployment and related benefits on work incentives by enforcing their conditionality on active job search and participation in measures to improve employability, and to manage employment services and other labor market measures so that they effectively promote and assist the return to work" (OECD, 2003: p.132).

The effects of ALMPs have been largely assessed through both micro and macro studies. At the micro level, existing studies focus on individual behaviors, and use a range of methods to compare participants to activation programs and control groups, including experimental studies adopting random assignment of participants. The outcome variables in such studies are typically the exit rate for participants from benefits to a job and/or post-program earnings. The empirical evidence is mixed, with training programs, especially those tied to local labor market needs, being more effective than public sector job creation schemes (Martin, 2015 and references cited in therein).

At the macro level, the focus has been to understand if the policy actions are effective in reducing the structural unemployment rate, lift productivity by increasing skill-matching, increase output and strengthen resilience to exogenous shocks. Specifically, several studies (see Martin 2015, for a broad review) have shown that

2. Recent studies have shown how both monetary and fiscal policies may have differential effects at a lower level of spatial aggregation (i.e. regions): See for example Furceri *et al*. (2019) and Pizzuto (2020) for the asymmetric effects of monetary policy, and Agnello *et al*. (2016) and Gbohoui *et al*. (2019) for the regional effects of fiscal policy.

ALMP spending seems to be effective in reducing unemployment and long-term unemployment, especially in the aftermath of negative shocks (Blanchard, Wolfers, 2000; OECD, 2009; Bassanini, Duval, 2006, 2009; Duval, Furceri, 2018).

While the effects of ALMPs have been largely assessed at both micro and macro levels, very little is known on the regional effects of public national spending on ALMPs. This paper tries to fill this gap by investigating the effects of public spending on active labor market policies on the performance of regional economies for a large sample of advanced countries. In detail, we estimate the dynamic response of regional unemployment rate and output, through Impulse Response Functions (IRFs) based on local projections of the effect of the national public spending shocks on ALMPs (Jordà, 2005). For each future period, the evolution of regional outcomes through time is regressed against our measure of shock, an autoregressive component to capture persistence, and a set of control variables. In addition, we augment the baseline specification to evaluate to what extent the impact of such spending shocks is heterogeneous across regions depending on their business cycle position and the share of cohesion fund expenditures to GDP.

We find that discretionary increases in public spending on active labor market policies have statistically significant short- and medium-term effect in reducing unemployment rate, while they raise output gradually. Consistent with the literature on time-varying fiscal multipliers at the national level (e.g., Auerbach, Gorodnichenko, 2012), we find that ALMPs spending have larger expansionary effects during periods of recession. In addition, we find that ALMPs have larger positive effects on the regional economies when complemented with cohesion fund expenditures: a larger share of cohesion funds fosters job creation and increases demand for labor (through investments in infrastructures, research and innovation, digital technologies), thus magnifying the response of regional outcomes to national spending on ALMPs. Overall, our results provide support for the important role that ALMPs can play in mitigating the adverse aggregate and regional impacts of the COVID-19.

The remainder of the paper is organized as follows Section 2 describes the data. Section 3 discusses the empirical strategy. Section 4 presents the results. Finally, Section 5 concludes discussing some policy implications.

2. Data

Our data relate to regional output and unemployment rates for an unbalanced sample of 308 regions belonging to 29 OECD Economies for the period 1995-2011. We complement the OECD data with the European Structural and Investment Funds expenditure data provided by the European Commission. Table 1 presents key descriptive statistics of outcome variables as well as of cohesion fund expenditures.

Table 1 – Descriptive statistics

Variable	*Obs*	*Mean*	*Std. Dev.*	*Min*	*Max*
GDP growth (%)	3,372	2.12	3.68	-33.33	32.12
Unemployment rate change (ppt)	2,966	0.11	1.24	-4.38	8.09
Cohesion fund expenditures (% of GDP)	1,624	0.60	1.04	0.00	8.78

Data for public spending on active labor market policies (ALMPs), available for an unbalanced panel of 29 countries for the period 1995-2011, are taken from the OECD Social Expenditure database. As shown in Table 2 and Figures 1 and 2, ALMPs are quite heterogeneous across countries. Spending reaches higher peaks in Denmark and Sweden, with an average value of about 1.5% of GDP over the period under investigation. Unlike the former, in Sweden there is also higher variability in the distribution of such expenditures over the period considered. This is likely linked to the substantial policy interventions adopted to offset the negative consequences of the long-lasting recession that the country experienced in the 1990s, Conversely, countries that on average have lower ALMPs spending levels, such as Mexico or the United States, show very little variability over time, with average values of about 0.1 and 0.2, respectively.

In order to isolate discretionary spending shocks from automatic changes in spending driven by business cycle fluctuations, we follow an approach inspired by Perotti (1999) and Corsetti *et al*. (2012) and also adopted in Duval and Furceri (2018). Specifically, spending shocks are identified as innovations to economic activity as well as to expectations about current economic activity that is as the residuals from the following regression:

$$\Delta s_{it} = \alpha_i + \delta_t + \beta_i \Delta y_{it} + \beta_i \Delta y_{it}^{E} + \varepsilon_{it} \qquad [1]$$

in which Δs_{it} denotes the growth rate of public spending on active labor market policies; Δy_{it} is GDP growth; Δy_{it}^{E} denotes the OECD forecast for GDP growth at time t, made at $t-1$; α_i and δ_t are country and time fixed effects, respectively. Table 2 reports the key descriptive statistics of the spending shocks.

3. Methodology

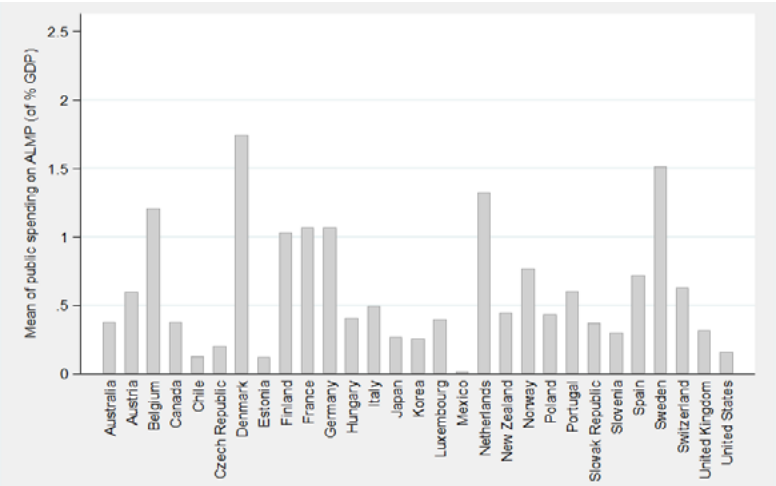
To estimate the impact of public spending on active labor market policies on several regional outcomes over the period 1995-2011, we follow the method proposed by Jordà (2005) and estimate impulse response functions directly from local projections:

Table 2 – Descriptive statistics by Country

Country	ALMPs					Spending shocks				
	Obs	*Mean*	*Std. Dev.*	*Min*	*Max*	*Obs*	*Mean*	*Std. Dev.*	*Min*	*Max*
Australia	17	0.38	0.10	0.29	0.72	17	-0.18	1.30	-2.63	1.67
Austria	17	0.60	0.14	0.38	0.84	17	0.14	0.66	-0.8	1.72
Belgium	17	1.20	0.16	1.02	1.59	17	0.19	0.92	-1.94	2.31
Canada	17	0.37	0.08	0.26	0.55	17	0.03	0.65	-1.40	1.15
Chile	4	0.13	0.02	0.10	0.16	2	0.00	0.22	-1.61	1.61
Czech Republic	17	0.20	0.06	0.10	0.33	15	0.00	1.28	-1.81	2.72
Denmark	17	1.74	0.23	1.34	2.26	17	0.06	0.99	-1.65	2.23
Estonia	9	0.12	0.08	0.05	0.24	3	0.00	4.68	-4.31	4.97
Finland	17	1.03	0.22	0.82	1.56	17	-0.09	0.92	-1.54	1.38
France	17	1.06	0.13	0.85	1.24	17	-0.18	0.73	-1.62	1.67
Germany	17	1.07	0.18	0.74	1.30	17	0.09	0.78	-1.54	1.14
Hungary	16	0.41	0.08	0.32	0.64	13	0.00	1.98	-5.30	2.30
Italy	8	0.49	0.07	0.41	0.63	7	0.00	0.85	-1.01	1.66
Japan	17	0.26	0.06	0.17	0.43	17	-0.02	2.02	-3.60	6.29
Korea	12	0.25	0.16	0.11	0.61	11	0.00	3.84	-5.12	8.32
Luxembourg	13	0.39	0.14	0.14	0.56	12	1.02	1.27	-1.01	3.78
Mexico	14	0.02	0.01	0.01	0.03	13	0.00	3.86	-6.12	7.39
Netherlands	17	1.32	0.16	1.06	1.55	17	0.12	0.73	-0.90	1.88
New Zealand	17	0.44	0.12	0.27	0.67	17	0.05	0.68	-1.48	1.61
Norway	13	0.76	0.20	0.55	1.25	13	-0.32	0.96	-1.83	1.37
Poland	17	0.43	0.12	0.22	0.69	15	0.00	2.36	-3.74	5.47
Portugal	17	0.6	0.08	0.48	0.77	17	-0.52	0.92	-2.17	0.84
Slovak Republic	17	0.37	0.16	0.21	0.75	11	0.00	2.33	-3.10	3.47
Slovenia	8	0.30	0.10	0.18	0.51	3	0.00	3.71	-4.20	2.80
Spain	17	0.71	0.17	0.38	0.94	17	0.11	1.37	-1.88	3.61
Sweden	17	1.51	0.55	0.85	2.44	17	-0.14	1.47	-2.14	2.59
Switzerland	17	0.62	0.10	0.47	0.83	17	-0.13	1.26	-2.58	2.21
United Kingdom	11	0.32	0.07	0.22	0.46	10	-0.18	0.8	-1.63	1.03
United States	17	0.16	0.02	0.13	0.19	17	0.16	1.23	-2.13	2.56
Whole panel	431	0.64	0.48	0.01	2.44	400	0.004	1.56	-6.12	8.32

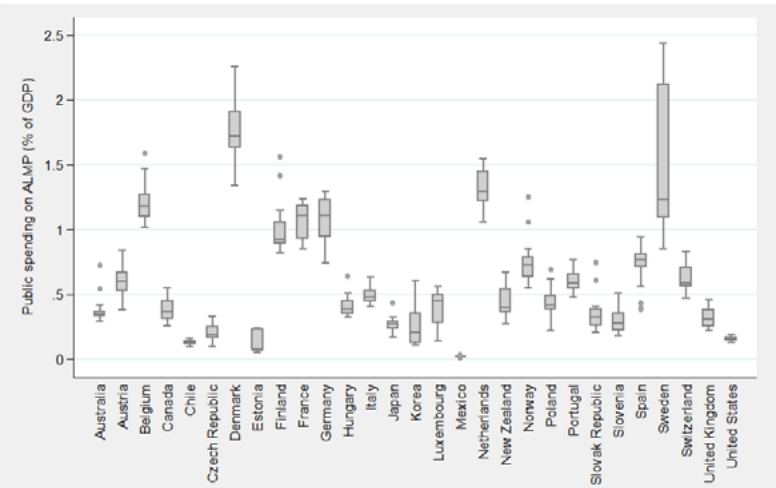
Note: Data for public spending on active labor market policies are taken from the OECD Social Expenditure database; spending shocks are identified as innovations to economic activity as well as to expectations about current economic activity that is as the residuals from regression (1).

Figure 1 – Average differences in ALMP (% of GDP)



Note: The chart shows the average value of public spending on ALMP (as % of GDP) over the period 1995-2011.

Figure 2 – Variability of public spending on ALMP (% of GDP)



Note: The graph shows the variability of public spending on ALMP (% of GDP) for each of the 29 countries in the period 1995-2011. The lowest point on the box-plot (i.e. the boundary of the lower whisker) is the minimum value of the data set and the highest point (i.e. the boundary of the upper whisker) is the maximum value of the data set (excluding any outliers) for each country. The box is drawn from Q1 to Q3 with a horizontal line drawn in the middle to denote the median. Outliers that differ significantly from the rest of the data are plotted as individual points beyond the whiskers.

$$y_{r,i,t+k} - y_{r,i,t-1} = \alpha_r^k + \delta_t^k + \beta^k spend_{i,t} + \theta^k X_{r,i,t} + \varepsilon_{r,i,t+k} \quad [2]$$

where $y_{r,i,t+k}$ is the dependent variable of interest for region r in country *i* in year *t* (namely, the log of GDP or the unemployment rate);α_i are regional fixed effects included to control for unobservable regional specific factors which may affect regional outcomes; δ_t are time fixed effects, included to control for global shocks, as for example changes in the global business cycle; $spend_{i,t}$ denotes the spending shocks purged by any predictable component related to the current economic activity and its expectations – that is, the residuals of equation (1); $X_{i,t}$ is a vector of controls that includes three lags of the dependent variable and the spending shock.

Specifically, the local projection approach consists of running a sequence of predictive regressions – one for each time horizon – of a variable of interest on a structural shock (in our case, regional outcomes and ALMPs spending shocks, respectively). The impulse response function is then obtained from the sequence of regression coefficients of the structural shock. Thus, equation (1) is estimated for each horizon (year) $k = 0, \ldots, 5$. Impulse response functions are computed using the estimated coefficients β^k, and the associated confidence bands are obtained using the estimated standard errors of the coefficients β^k based on robust standard errors clustered at the regional level.

This baseline specification is then extended to allow the response to vary with business cycle position and the share of cohesion fund expenditures as follows:

$$y_{r,i,t+k} - y_{r,i,t+1} = \alpha_r^k + \delta_t^k + F(z_{rit})[\beta_L^k spend_{i,t}] + (1 - F(z_{rit})[\beta_H^k spend_{i,t}] + \theta_L^k X_{ri,t} + \varepsilon_{ri,t+k} \quad [3]$$

With
$$F(z_{rit}) = \frac{exp^{-\gamma z_{rit}}}{(1 + exp^{-\gamma z_{rit}})}, \gamma = 1.5 \quad [4]$$

in which, z_{rit} is a regional-level variable (i.e. economic growth or share of cohesion fund expenditures), normalized to have zero mean and unit variance, while the parameter γ controls the smoothness of the transitions from one regime to another with larger values being associated to immediate switches, and smaller ones implying a smoother transition (Auerbach, Gorodnichenko, 2012). We set γ=1.5.[3] The weights assigned to each regime vary between 0 and 1 according to the weighting function *F*(.), so that $F(z_{it})$ can be interpreted as the probability of being in a given state. The coefficients β_i^k and β_H^k capture the regional impact of public spending on ALMPs at each horizon *k* in cases of lower output growth (or, alternatively, lower share of cohesion funds expenditures) – that is, when $F(z_{it}) \approx 1$ and *z* goes to minus infinity – and in cases of higher output growth (or, alternatively, higher share of cohesion funds expenditures) – that is, when $(1 - F(z_{it})) \approx 1$ and *z* goes to plus infinity.

3. Results are robust to different values of gamma.

4. Results

4.1. Baseline

Figure 3 shows the estimated dynamic response of real per capita regional GDP and unemployment rate to an unexpected increase in public spending on active labor market policies over the five-year period following the event. The shadow area denotes the 90 percent confidence interval around the point estimates. Discretionary increases in public spending on active labor market policies are found to have statistically significant short- and medium-term effect in reducing unemployment, while they raise output gradually. Particularly, a 10 percent increase in spending, generates a decrease in unemployment by about 0.1 percentage point one year after the shock and by about 0.4 percentage point after 5 years. The output effects, instead, materialize only in the medium-term with a peak effect on the level of output of about 0.4 percent after 5 years the shock (see also Table 3).

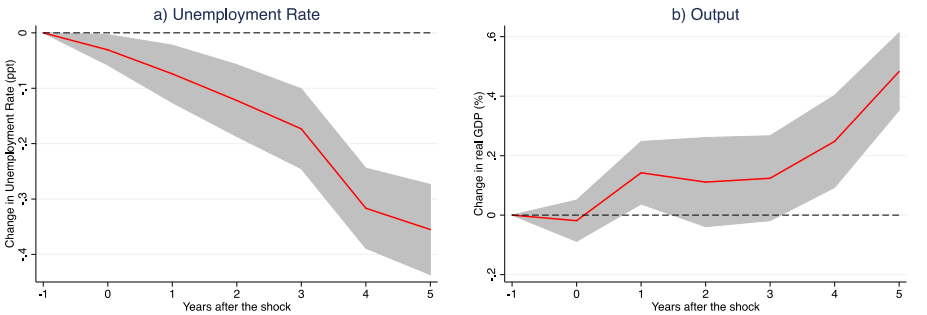
4.2. Robustness checks

We have carried out several robustness checks of these findings. The first is to include regional-specific time trends. The second is to include simultaneously in the regression several country-level control variables (proxies for the level of economic development and fiscal policy, as well as measures of trade and financial globalization) since national features may affect regional economic performances and may be correlated with shocks to ALMP spending. The results are reported in Figure 4 and are very similar to, and not statistically different from, the baseline.

4.3. Non-linear effects

The average response of output and unemployment rate to public spending on ALMPs may mask significant heterogeneity across regions depending on the position of the regions across the business cycle and the share of cohesion funds expenditures to GDP that may magnify (or crowd out) the effects of such public spending. To shed light on these issues, we re-estimate our model using equation (3). Figure 5 shows that positive shocks to spending on active labor market policies tend to have bigger effects in bad economic times. In recessionary periods, a 10 percent increase in spending increases output by about 0.5 percent in the medium term (after 5 years) – the effect is statistically significant at 5 percent – while does not have a statistically significant medium-term effect during booms. Similarly, the effects on the unemployment rate, though statistically significant

Figure 3 – Impact of public spending on ALMP on regional outcomes



Note: The charts show the impulse response functions and the associated 90 percent confidence bands as shadow area; t=0 is the year of the public spending shock. Estimates based on equation (1) using a sample of 308 regions over the period 1995-2011.

Table 3 – Impact of public spending on ALMP on regional outcomes

	k=0	*k=1*	*k=2*	*k=3*	*k=4*	*k=5*
Output	-0.001	0.163***	0.132	0.119	0.196**	0.429***
	(0.042)	(0.061)	(0.085)	(0.083)	(0.094)	(0.078)
Unemployment rate	-0.036**	-0.086***	-0.142***	-0.191***	-0.332***	-0.366***
	(0.017)	(0.031)	(0.039)	(0.043)	(0.044)	(0.050)

Note: Estimates are obtained using a sample of 308 regions over the period 1995-2011, and based on $y_{r,i,t+k} - y_{r,i,t-1} = \alpha_r^k + \delta_t^k + \beta^k spend_{i,t} + \theta^k X_{r,i,t} + \varepsilon_{r,i,t+k}$. Standard errors in parentheses are clustered at the regional level. Regional and time fixed effects included but not reported. *** p<0.01, ** p<0.05, * p<0.1.

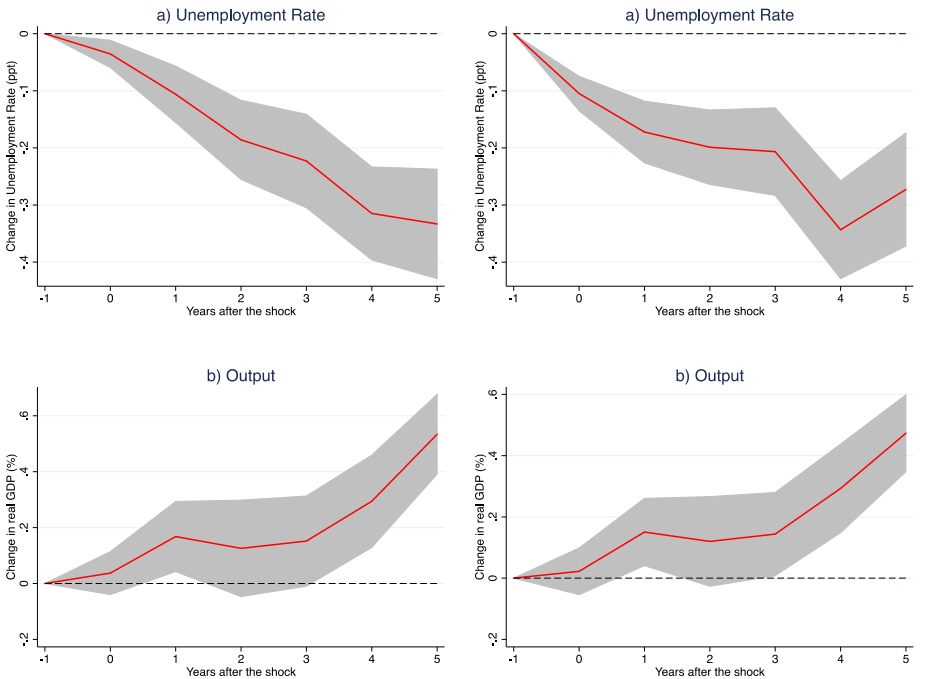
in both phases of the business cycle, are larger (i.e. greater reduction) during periods of slack than in expansionary periods.

This finding is consistent with the growing literature that points to larger fiscal multiplier effects during recessions (Auerbach, Gorodnichenko, 2012; Blanchard, Leigh, 2013; Jordà, Taylor, 2016; Abiad *et al*., 2016; Duval, Furceri, 2018). Indeed, labor market reforms that often involve short-term fiscal stimulus, like ALMPs, have a greater payoff when economic conditions are weak.

We then examine the heterogeneity in response in relation with cohesion fund (CF) expenditures. As known, regional policy is designed to promote convergence, increase regional competitiveness, reinforce the attractiveness of lagging regions, with the ultimate goal to strengthen the economic and social cohesion

Figure 4 – Impact of public spending on ALMP on regional outcomes – robustness checks

i) Regional-Specific Time Trends *ii) Additional Controls*

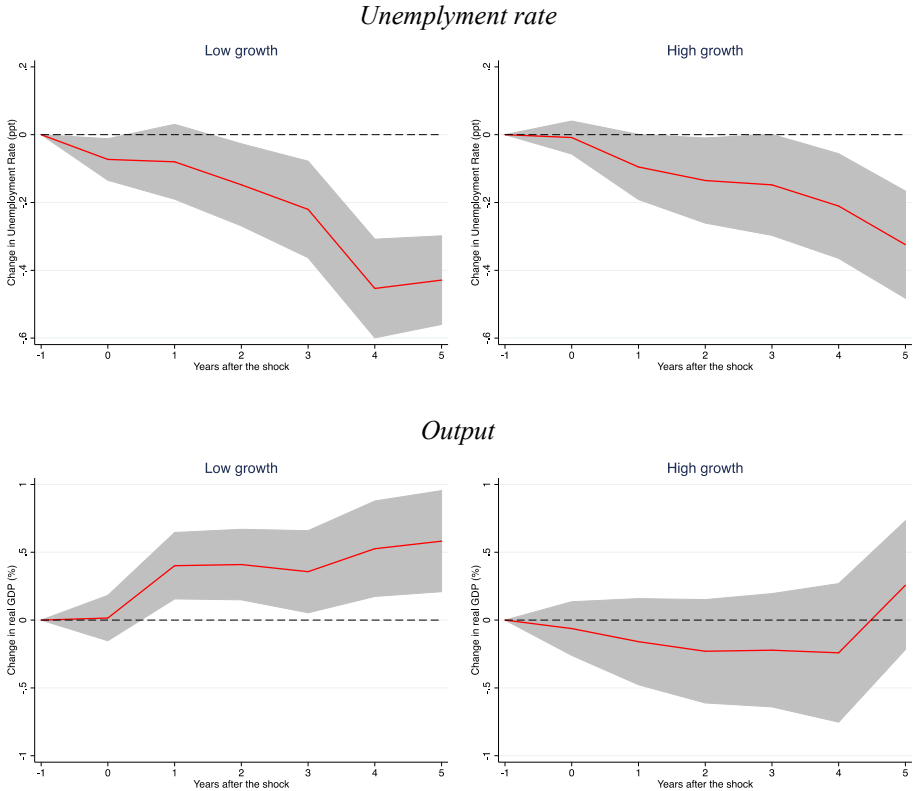


Note: The charts show the impulse response functions and the associated 90 percent confidence bands as shadow area; t=0 is the year of the public spending shock. Estimates based on equation (1) using a sample of 308 regions over the period 1995-2011

of the European Union. The empirical evidence on its role (i.e. through European development funds) in reducing regional disparities is mixed, though most of the studies tends to suggest that development funds had helped the regional convergence process (Aiello, Pupo, 2012; Ederveen *et al*., 2003; Cappelen *et al*., 2003; Furceri *et al*., 2022 we show that economic downturns are associated with a significant and long-lasting reduction in regional inequalities. Expansionary fiscal policy as well as higher share of the European development (cohesion).[4] At

4. Boldrin and Canova (2001) and Dall'Erba and Le Gallo (2008) support the opposite idea finding non-significant effects.

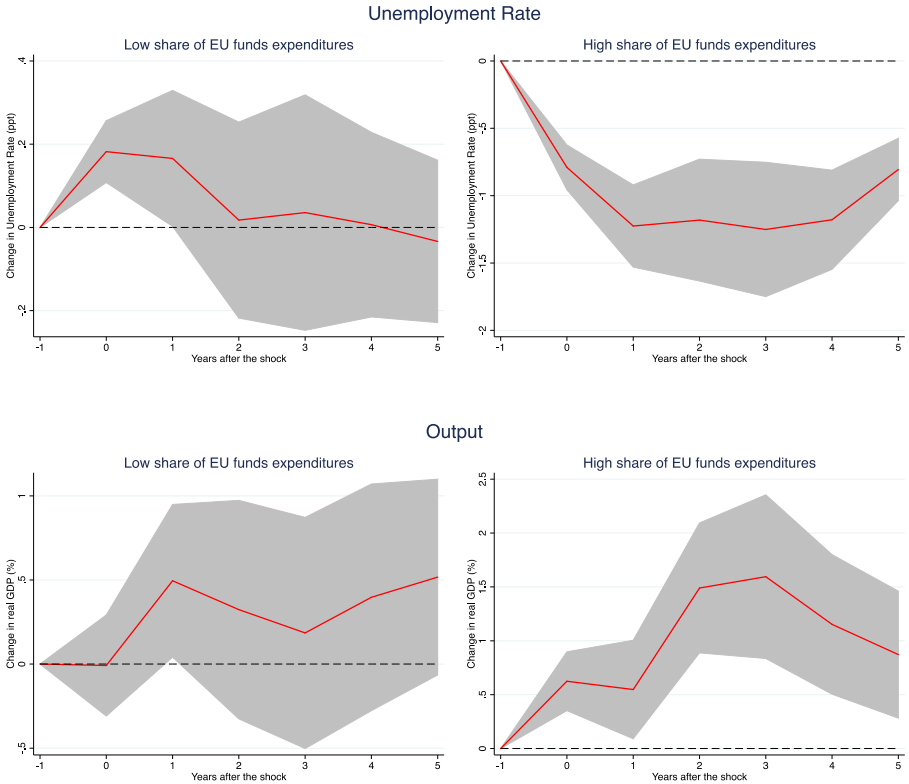
Figure 5 – Impact of public spending on ALMP on regional outcomes – low vs high growth periods



Note: The charts show the impulse response functions and the associated 90 percent confidence bands as shadow area; t = 0 is the year of the public spending shock. Estimates based on equation (3) using a sample of 308 regions over the period 1995-2011.

the same time, it is also recognized that cohesion policy works differently in very different local economic and social contexts (Crescenzi, Giua, 2020) but very little is known on the interaction effect between "spatially targeted" (like Cohesion Policy) and "spatially blind" policies (like ALMPs). Indeed, the effect of macroeconomic policies, may be magnified (or crowded out) by that produced by cohesion policy. To shed light also on this issue, we re-estimate our model using equation (3) with the variable z being the share of cohesion fund expenditures to GDP. Figure 6 shows that positive shocks to spending on active labor market policies are more effective in increasing output and reducing the unemployment rate when complemented by higher CF expenditures. In particular, we find that a

Figure 6 – Impact of public spending on ALMP on regional outcomes – low vs high share of cohesion fund expenditures



Note: The chart shows the impulse response functions and the associated 90 percent confidence bands as shadow area; t=0 is the year of the public spending shock. Estimates based on equation (3) using a sample of 168 regions over the period 2000-2011.

10 percent increase in spending increases output by about 1.0 percent in the medium-term (after 5 years) in case of higher cohesion fund expenditures and reduces the unemployment rate by about 1.0 percentage point. Conversely, the effects are statistically not different from zero when the share of cohesion fund expenditures is lower. These results suggest strong complementarity between ALMPs and Cohesion Policy. A potential explanation of this result is that complementing the investments in up-skilling and re-skilling of unemployed and displaced workers with the likely job creation and increasing demand for labor that can be stimulated by the expenditures related to the European funds (through investments in

infrastructures, research and innovation, digital technologies), magnifies the original response of regional outcomes to national spending on ALMPs.

5. Conclusions

In response to the COVID-19 crisis, governments are putting into place medium to long-term strategies to boost the jobs recovery and strengthen the resilience of their labor markets. While it is too early to assess the adequacy of public spending on unemployment benefits and ALMPs in response to the current crisis, such policies can have heterogeneous effects across regions even belonging to the same country. In this paper, we focus on the regional effects of public spending on active labor market policies (ALMPs) and we show that discretionary increases in public spending on ALMPs at the national level have statistically significant short- and medium-term effect in reducing regional unemployment rate, while they raise regional output gradually. Such positive effects tend to be larger during downturns, and when complemented by a larger share of cohesion fund expenditures. Our results thus provide support for the important role that ALMPs can play in mitigating the adverse aggregate and regional impacts of the COVID-19 and also on the potential complementarity between and "spatially blind" (Active Labor Market) and "spatially targeted" (Cohesion) policies.

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Gli effetti regionali della spesa pubblica sulle politiche attive del lavoro: evidenze dalle economie avanzate

Sommario

Questo contributo studia gli effetti regionali della spesa pubblica sulle politiche attive del lavoro (ALMPs). Usando un campione non bilanciato di 308 regioni, appartenenti a 29 economie OCSE nel periodo 1995-2011, mostriamo che un aumento della spesa pubblica per le politiche attive del lavoro a livello nazionale ha un effetto significativo di breve e medio periodo nel ridurre il tasso di disoccupazione regionale, aumentando l'output della regione. Questi effetti tendono ad amplificarsi durante i periodi di bassa crescita del PIL, e quando si accompagnano a più elevate quote di spesa del Fondo di Coesione.