CSEF

Centre for Studies in Economics and Finance

WORKING PAPER NO. 293

Asymmetric Effects of National-based Active Labour Market Policies

Carlo Altavilla and Floro Ernesto Caroleo

October 2011

University of Naples Federico II

University of Salerno

Bocconi University, Milan

CSEF - Centre for Studies in Economics and Finance
DEPARTMENT OF ECONOMICS – UNIVERSITY OF NAPLES
80126 NAPLES - ITALY
Tel. and fax +39 081 675372 – e-mail: csef@unisa.it

CSEF
Centre for Studies in Economics and Finance

WORKING PAPER NO. 293

Asymmetric Effects of National-based Active Labour Market Policies

Carlo Altavilla* **and Floro Ernesto Caroleo****

Abstract
Labour market policies settled at national level imply a "one-size-fits-all" labour market strategy. This strategy might not sufficiently take into account region-specific economic structures. We employ a panel factor-augmented vector autoregression (FAVAR) to evaluate whether active labour market programmes (ALMPs) might asymmetrically affect labour markets at regional level in a data-rich environment. The paper focuses on Italian regions. Our results suggest that while in the South employment is mainly driven by social and economic context variables, in the North the employment dynamics is significantly explained by policy interventions. Finally, we suggest two main policy implications. First, the success of active policies depends on the regional labour market conditions. Second, policymakers should adjust labour policy strategy to the regional economic structure

Keywords: Active Labour Market Policies, FAVAR

JEL classification: C33, J64

* Corresponding author: University of Naples "Parthenope", CESifo and CSEF, Via Medina, 40 - 80133 Naples (Italy). E-mail: Altavilla@uniparthenope.it; Phone: (+)39 0815474733, fax (+)39 0815474750.

** University of Naples "Parthenope", Via Medina, 40 - 80133 Naples (Italy). E-mail: caroleo@uniparthenope.it; Phone: (+)39 0815474740, fax (+)39 0815474750.

Table of contents

1 Introduction

This paper explores the role that active labour market policies (henceforth ALMP) set at national level might have on regional labour market performance. The hypothesis underlying our empirical investigation is that, given the dualistic economic structure of the Italian regions, ALMP might produce asymmetric effects on regional labour markets. More specifically, ALMP may asymmetrically influence the matching process as well as the labour market equilibrium conditions at a regional level.

Government expenditure on labour market policies (LMPs) can be divided into two categories, active and passive. Passive policies include payments of unemployment benefits in the form of unemployment insurance or social assistance. ALMPs are, instead, policy interventions targeting certain sub-groups on the labour market, aiming to activate the unemployed to enhance employability.

From a theoretical point of view the effects of ALMPs can be analysed by evaluating their impact on the equilibrium relationship between unemployment and vacancies within a model of job search and matching, i.e. the Beveridge Curve framework. This curve represents a negative relationship between unemployed workers and the number of unfilled jobs (vacancies). More precisely, the Beveridge Curve[1] can be viewed as the result of a process in which workers and firms engage in a costly search, due to informational or locational imperfections, to find each other. The key argument is that the "matching function" (e.g. Petrongolo and Pissarides, 2001) describes the ways the match between unemployed workers and unfilled jobs takes place; the behaviour of workers in searching for a job; the behaviour of employers in screening applicants for a vacancy and the probability that the job contact takes place.

The determinants of the matching function influence the position and the slope of the Beveridge Curve. The slopes depends on the search intensity of job seekers and on labour market mismatches, while the job finding rate, hence the equilibrium condition, also depends on the decision of a job seeker to accept a job and on the employer's acceptance decision (e.g. Shimer, 2005; Yashiv 2006).

However, other key variables influencing the equilibrium condition are those factors resulting in skill, sector and regional mismatches. Several authors (Armstrong and Taylor 2000; Jones and Manning, 1992; Gorter and Van Ours, 1994; Dixon et al. 2010) have applied the Beveridge curve

[1] The theoretical foundations of the Beveridge Curve are substantially twofold: the first, starting from the Hansen model (Hansen, 1970; Holt and David, 1966), derives the matching function from an aggregation over distinct markets in the presence of frictions and of limited mobility of labour. More recently, an alternative approach was developed which arises from a matching function combined with job search (Mortensen and Pissarides, 1994; Pissarides, 2000; Petrongolo and Pissarides, 2001).

framework to regional studies, seeking to verify the extent to which the different regional rates of unemployment could be explained by differences in labour market imperfections, as opposed to differences in effective demand. The main idea is that movements in the Beveridge curve may be partly explained by changes in the cross-region dispersion of employment growth. Indeed, if labour demand is growing in some parts of the country while shrinking in others, a regional mismatch may take place. As a consequence, in order for the unemployed to be matched with available vacancies, they should move across regions. This costly and time-consuming reallocation mechanism delays the job-matching process and increases the probability of high levels of both unemployment and vacancies. And the higher these barriers, the more diverse are the matching equilibrium conditions and hence the slope and position of the curve in the different regions.

The position and slope of the Beveridge curve are also significantly affected by active labour policies (Jackman et al. 1990). More active than passive labour policies cause the Beveridge Curve to shift inward since they reduce labour market mismatches and search frictions. Nevertheless, the final effect of ALMPs on regional labour market tightness could be heterogeneous and uncertain.

Despite many empirical evaluation studies no clear-cut cross-country evidence exists on the determinants of ALMP effectiveness. In general, microeconometric evaluation studies have found that ALMPs have at best a modest impact on participants' labour market prospects. Their success depends on the type and duration of the program, the characteristics of the participants, and the evaluation methodology. Analysing cross-country evidence on the effectiveness of specific programmes on different target groups, Heckman et al. (1999) give a detailed overview of several microeconometric evaluation studies. They conclude that labour market programmes have a minor effect on labour market performance. Furthermore, they find considerable heterogeneity in the impact of such programmes.

Using meta-analysis, Kluve (2010) evaluates the effect of 137 different studies on programme evaluation from 19 countries. His results suggest that it is almost exclusively the programme type that seems to influence the effectiveness of the active measures. While the effectiveness of direct employment programmes in the public sector seems to be very low, wage subsidies and job search assistance are the top performing policies. The effect of training programmes, which represent the most widely used type of active policy, on labour market participants is not very large. These results are in line with that obtained in Card et al. (2009) where it was also found that ALMP programmes do not seem to have differential effects on men versus women.

While microeconometric evaluation studies aim to analyse the likely effects that a particular programme might have on individuals, macroeconomic studies are usually employed to evaluate the effect of the ALMP on aggregate employment or for the economy as whole. There are two alternatives to consider: whether ALMPs positively affect both unemployment and output, or whether the effect is simply distributional, that is, whether work is shifted from the old to the

young or from one region to another (Bellman and Jackman, 1996). In general this literature stresses that, when taking into account not only the direct effects on participants but also the indirect effects on non-participants, negative effects (like displacement, deadweight and substitution effects) may worsen the labour market outcomes[2].

This framework has been used by several studies based on OECD data which explain the cross-country variation in unemployment rates by the cross-country variation in a number of labour market institutions; one of them is the ALMP (Layard et al., 1991; Nickell and Layard, 1997; Blanchard and Wolfers, 2000).

Recently, there has been a growing interest in the analysis of the macroeconomic effect of specific programmes of active labour policies using regional data (Hujer et al., 2006; Fertig et al., 2006; Puhani, 2003). Most of these studies estimate an augmented Beveridge curve and find mixed results regarding the effects of the ALMP on labour market performance.

However, there are few studies focusing on whether regional disparities might influence the effectiveness of the ALMP. Gerfin and Lechner (2002), for example, analyse several active labour market measures adopted in Switzerland during the 1990s. Despite highlighting the considerable differences in youth unemployment rates between the German-speaking cantons and the non-German-speaking cantons as well as the strong regional heterogeneity in the programme's allocation process, the authors mainly focus on partial-equilibrium effects of the ALMP. Using data from administrative unemployment and social security records they find that whereas traditional employment programmes negatively affect labour market performance, a wage subsidy for temporary jobs has a significant positive effect.

Following Warren's seminal paper (1991), several authors such as Fahr and Sunde (2006), and Ilmakunnas and Pesola (2003) apply a stochastic production frontier approach to model the matching process at regional level. Destefanis and Fonseca (2007) adopt a similar approach to evaluate the impact of a labour market reform in Italy (the so-called Treu Reform of 1996) on the unemployment-vacancy relationship across regions. They find the existence of a substantial difference in the matching efficiency between the southern and northern regions.

In Italy, although the institutional setting may differ little between southern and northern regions there are substantial economic differences between the two parts of the country. Nevertheless, evaluation to date has been mainly carried out using the conventional micro-oriented approach to policy evaluation[3].

---

[2] See Altavilla and Caroleo (2006b). For a review of the debate on the evaluation of the effects of the ALMP on labour markets see: Kluve et al. (2006); Kluve (2010); Calmfors, Forslund and Hemstròm (2001); Caliendo et al. (2008), Büttner and Prey (1998).

[3] For a comprehensive survey of the evaluation studies carried out in Italy, see Trivellato et al. (2003) and Trivellato (2009).

The present paper investigates to what extent regional labour markets in Italy might be asymmetrically influenced by labour policy measures that ignore differences in regional economic structures. The method chosen to evaluate ALMPs in Italy is a dynamic multivariate panel model which enables estimation of the net effects of ALMP participation on employment or unemployment in a regional framework.

The remainder of the paper proceeds as follows. Section 2 describes some stylized facts. Section 3 reports the empirical findings and discusses the effects of an ALMP shock on labour market variables. Section 4 focuses on regional policy implications. Section 5 summarizes the paper's main findings and concludes.

2 Stylized facts

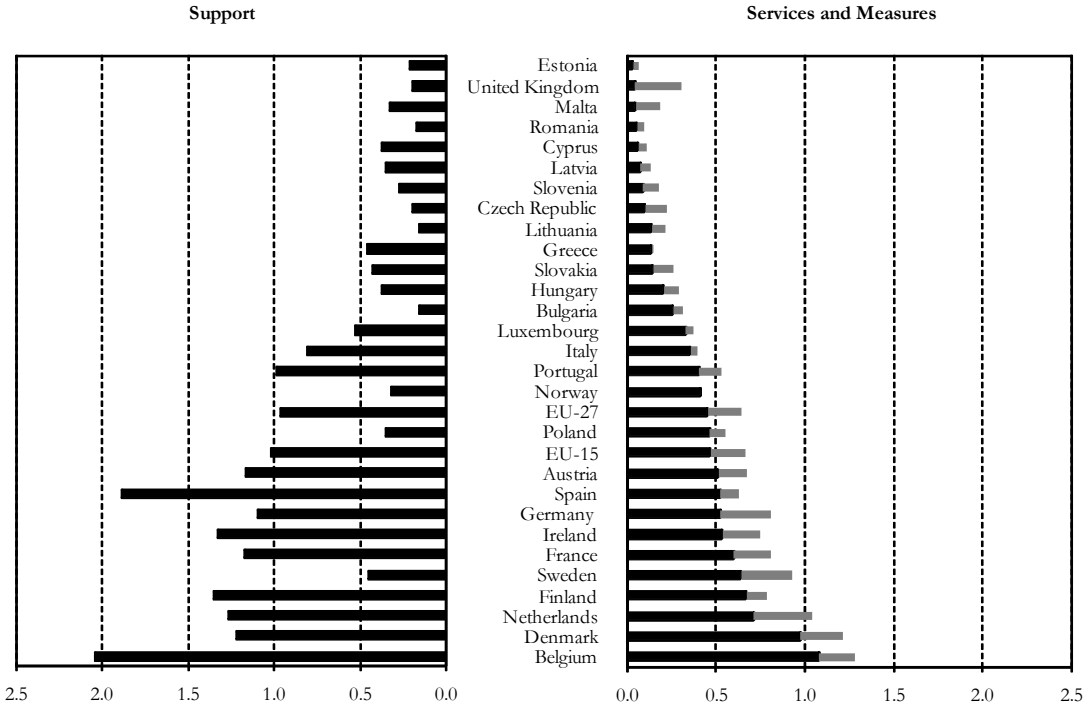
Since the mid 1970s, most OECD countries have progressively shifted resources from passive income support, like unemployment benefits, to activation measures. In general, expenditure on ALMPs increased over the 80s and 90s with a peak in the mid 90s when countries reacted to high unemployment levels that persisted after the recession of the early 90s. Lower unemployment levels during the following decade have been accompanied by a decrease in the share of GDP devoted to ALMPs. In Europe, the increase in ALMP expenditure has been significantly influenced by the establishment of the European Employment Strategy (EES). This strategy has stressed the importance of the interaction between active and passive policies in influencing labour market outcomes[4]. In EU countries, ALMP design varies considerably depending on the specific country characteristics and the period when such programmes are implemented.

Figure 1 depicts the proportion of GDP devote to LMPs following the classification used by Eurostat. Labour market interventions are divided into three main categories: LMP services (grey bars in the right-hand figure), LMP measures (black bars in the right-hand figure) and LMP support (black bars in the left-hand figure). While the first two categories refer to active policies, the last includes the expenditure on passive interventions.

A very heterogeneous picture emerges. Few countries spent more than 1% of GDP on ALMPs in 2008. Moreover, in most countries passive policies absorbed a higher percentage of GDP. The countries with the highest and lowest ALMP expenditure are Belgium and Estonia, respectively. Other countries to record significant proportions of ALMP expenditure include Denmark (1.21%), and Netherlands (1.04%).

[4] See European Commission (2006) for a detailed overview of the existing knowledge of ALMPs in Europe.

Figure 1: Public Expenditure on LMP as a percentage of GDP, 2008



Source: Eurostat, LMP database

The heterogeneity in ALMP spending is even greater when looking at the period 2004-2008 (Table 1). The standard deviations as well as the average ALMP expenditure among countries (the last two rows) decrease over the five years considered in the table. This general pattern is most probably due to the global financial and economic crisis that hit Europe in 2007: during the recession there was a tendency to reduce the ALMP in favour of LMPL support. Indeed, expenses on activation measures decreased for almost all EU countries. Only in Belgium did expenditure on activation measures during the crisis remain substantial, one of the highest among OECD countries. Most countries reacted to the crisis by stepping up passive measures rather than increasing ALMP.

Table 1: Spending on Active Labour Market Policies (Percentage of GDP)

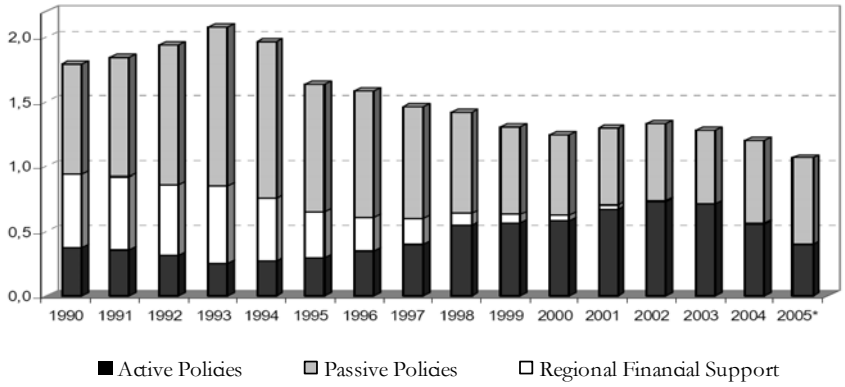
	2004	2005	2006	2007	2008
EU-27	:	0.51	0.50	0.45	0.46
EU-15	0.61	0.52	0.52	0.47	0.47
Belgium	0.87	0.91	0.95	1.02	1.08
Bulgaria	0.47	0.43	0.39	0.31	0.26
Czech Republic	0.13	0.12	0.13	0.12	0.10
Denmark	1.51	1.27	1.21	1.02	0.98
Germany	0.85	0.60	0.59	0.46	0.53
Estonia	0.04	0.05	0.05	0.03	0.04
Ireland	0.51	0.49	0.47	0.48	0.54
Greece	0.14	0.06	0.15	0.15	0.14
Spain	0.55	0.53	0.56	0.56	0.53
France	0.72	0.66	0.68	0.68	0.60
Italy	0.54	0.48	0.41	0.37	0.36
Cyprus	:	:	0.06	0.08	0.07
Latvia	0.08	0.16	0.19	0.11	0.08
Lithuania	0.15	0.15	0.18	0.23	0.14
Luxembourg	0.36	0.40	0.39	0.38	0.33
Hungary	0.20	0.20	0.19	0.23	0.21
Malta	:	:	0.07	0.03	0.05
Netherlands	0.92	0.86	0.78	0.72	0.71
Austria	0.44	0.46	0.54	0.51	0.52
Poland	:	0.36	0.36	0.40	0.47
Portugal	0.53	0.50	0.44	0.37	0.41
Romania	0.10	0.11	0.10	0.08	0.06
Slovenia	:	0.19	0.18	0.11	0.09
Slovakia	0.07	0.17	0.14	0.12	0.15
Finland	0.79	0.73	0.74	0.71	0.67
Sweden	0.97	1.06	1.11	0.87	0.64
United Kingdom	0.06	0.05	0.04	0.05	0.05
Norway	0.65	0.62	0.47	0.45	0.42
Average	0.49	0.45	0.42	0.39	0.37
St. Deviation	0.37	0.32	0.31	0.29	0.28

In Italy, expenditure on ALMP as a percentage of GDP has decreased in recent decades, sinking as low as 0.36% in 2008. As shown in Figure 1, this percentage is lower than that observed for the majority of European countries. During the last fifteen years, the Italian labour policy strategy, following the recommendations of the EES, has changed substantially, especially regarding wage contracts and the ALMPs (Pirrone and Sestito, 2009; Altavilla et al. 2009).

Until the early 1990s, the public authorities implemented extraordinary region-specific policies aiming to support the less developed southern regions. The main active labour measures were

regional-based financial incentives such as tax allowances or reductions in social security contributions for firms employing workers resident in disadvantaged regions. However, these incentives were considered not consistent with the European Union's goal of job creation as they gave southern firms an unfair advantage over their competitors in other regions or other European countries. Consequently, as shown in figure 2, the Italian labour market authorities changed the composition of labour market policy expenditure by substantially down-sizing region-specific programmes.

Figure 2: Labour market policy in Italy



Source: Ministry of Labour

In addition, with some reforms to the labour market (the so-called Treu Reform, Law no. 196/1997, and the so-called Biagi Law no. 30/2003) and to public administration (the so-called Bassanini Law no. 15/1997) the policy strategy changed the institutional setting governing the labour market. On the one hand, short-term contracts (Boeri and Garibaldi, 2007) and temporary work agencies were introduced to give more flexibility within otherwise rigid employment protection legislation. On the other, in line with the progressive decision-making decentralization of public administration, management of most active labour market policies was transferred to local institutions (Regions or Provinces). In particular, Italian regional and provincial authorities now organize public employment services and the regional training system, and determine specific policy measures in favour of disadvantaged groups (Altavilla et al. 2009).

Management of passive expenditure and of the measures supporting hiring and training still remain the main expenditures made at a national level.

A detailed classification of the main expenditures of Italian LMP is reported in Table 2.

Table 2: Share of LMP expenditure by type of action in Italy, 2001-2008

LMP	Category	Type of Action	2001	2002	2003	2004	2005	2006	2007	2008
Services	1	Labour market services	0.05	0.14	0.39	0.54	0.65	0.53	3.30	3.07
										0.00
Measures	2	Training	17.07	17.51	20.91	19.55	17.18	15.78	16.10	14.61
	3	Job rotation and Job sharing	-	-	-	-	-	-	0.20	0.25
	4	Employment incentives	24.98	32.84	28.69	21.13	18.23	18.14	13.30	12.37
	5	Supported employment and rehabilitation	0.47	0.46	0.51	0.54	0.56	0.20	-	-
	6	Direct job creation	3.55	2.67	2.29	0.95	0.86	0.79	0.80	0.58
	7	Start-up incentives	5.31	1.97	3.98	4.56	4.38	3.84	2.70	1.99
		LMP measures (categories 2-7)	53.97	56.12	56.54	46.93	41.52	38.94	33.10	29.71
Supports	8	Out-of-work income maintenance and suppor	41.37	40.56	40.61	50.85	56.76	58.63	55.80	59.59
	9	Early retirement	4.66	3.32	2.85	2.22	1.71	2.43	7.80	7.63
		LMP measures (categories 8-9)	46.03	43.88	43.46	53.07	58.48	61.06	63.70	67.22
Total LMP expenditure			100	100	100	100	100	100	100	100

Source: Eurostat, LMP database

In the empirical analysis, we focus on the period 1996-2007. The choice of sample period was motivated by two considerations. First, given the labour market reforms that took place in Italy in the mid 1990s, our sample period (1996-2007) allows us to evaluate ALMPs within a single policy regime. The Lucas critique (i.e. the statistical relationships that hold under one policy regime may not be relevant under another when variations in the explanatory variables arise from different policies) would otherwise apply and make our macroeconomic policy evaluation meaningless. Second, we have a severe data availability problem before 1995 for ALMPs and some other variables used in the analysis.

During our sample period, expenditures on ALMP that are national-oriented allow us to answer our main research question: does a centralized labour market policy have heterogeneous effects on regional markets depending on the different economic environment? The Italian labour market is still characterised by considerable regional disparities. The well-known dualistic structure of the Italian economy largely reflects substantial differences in labour market indicators. Regional unemployment differentials among Italian regions, for example, have widened since the mid 1980s, especially between the leading northern regions and the less developed South.

Changes in regional disparities as measured by a simple standardised variation index[5] over the period 1995-2007, for the 124 variables used in the empirical analysis, are summarised in Table 3. The table synthesizes the data reported in column VI of the table presented in Appendix 1. For each category (column 2) several variables are grouped according to the order given in table A.1. A value greater than zero means that, on average, during the period 1995-2007 there was an increase

[5] For each year the variation index is calculated as the ratio between the standard deviation and the mean of a given variable.

in regional disparities. Since for most variables the average variation index is positive, we can conclude that, over the period considered in the analysis, the volatility of the economic variables among regions has substantially increased.

Table 3: Variation index for regional disparities

Variables	Category	Mean Variation Index
1-18	Social and economic context	3.0
19-22	Crime	3.0
23-27	Infrastructure	0.7
28-30	Education	1.9
31-34	Health	3.7
35-51	GVA	0.8
53-70	Hours Worked	1.7
71-88	Investment	1.7
89-106	Remuneration	3.7
107-110	Imp./Exp.	3.8
111-119	Financial Market	3.3
120-124	Labour Market	4.1

Note: The table reports the standardised variation index for the 124 variables used in the empirical analysis. Variables are grouped according to the order given in table A1.

Although these disparities have been well-documented in both empirical and theoretical studies, labour market policies have been designed without a regional-specific orientation. We are now interested in analysing whether the consequence of this strategy has been a homogenous use of ALMP across regions.

Table 4 reports the percentage of participant as share of total labour force in both the South and the North for the main policy interventions (classified by type of action).

It clearly emerges that, during the sample period analysed in the paper, northern and southern regions have implemented an almost identical policy mix. In fact, the interventions they have made in order to boost the labour market performance are very similar. The strategy involves extensive use of recruitment incentives (more permanent than temporary) and training (more workplace training than apprenticeship). Other measures like job rotation and job sharing (measure 3), supported employment and rehabilitation (measure 5), and direct job creation (measure 6) have received much less attention.

Table 4: Percentage of labour force involved in different ALMP actions

		South	North
Training			
2.2	Workplace training	1.35	1.56
2.4	Apprenticeship	0.92	0.89
3 Job rotation and job sharing			
3.2	Job sharing	0.003	0.001
4 Employment incentives			
4.1	Recruitment incentives		
4.1.1	Permanent	6.67	5.47
4.1.2	Temporary	0.86	1.07
4.2	Employment maintenance incentives	0.08	0.05
5 Supported employment and rehabilitation			
5.1	Supported employment	0.17	0.22
6 Direct job creation		0.05	0.04

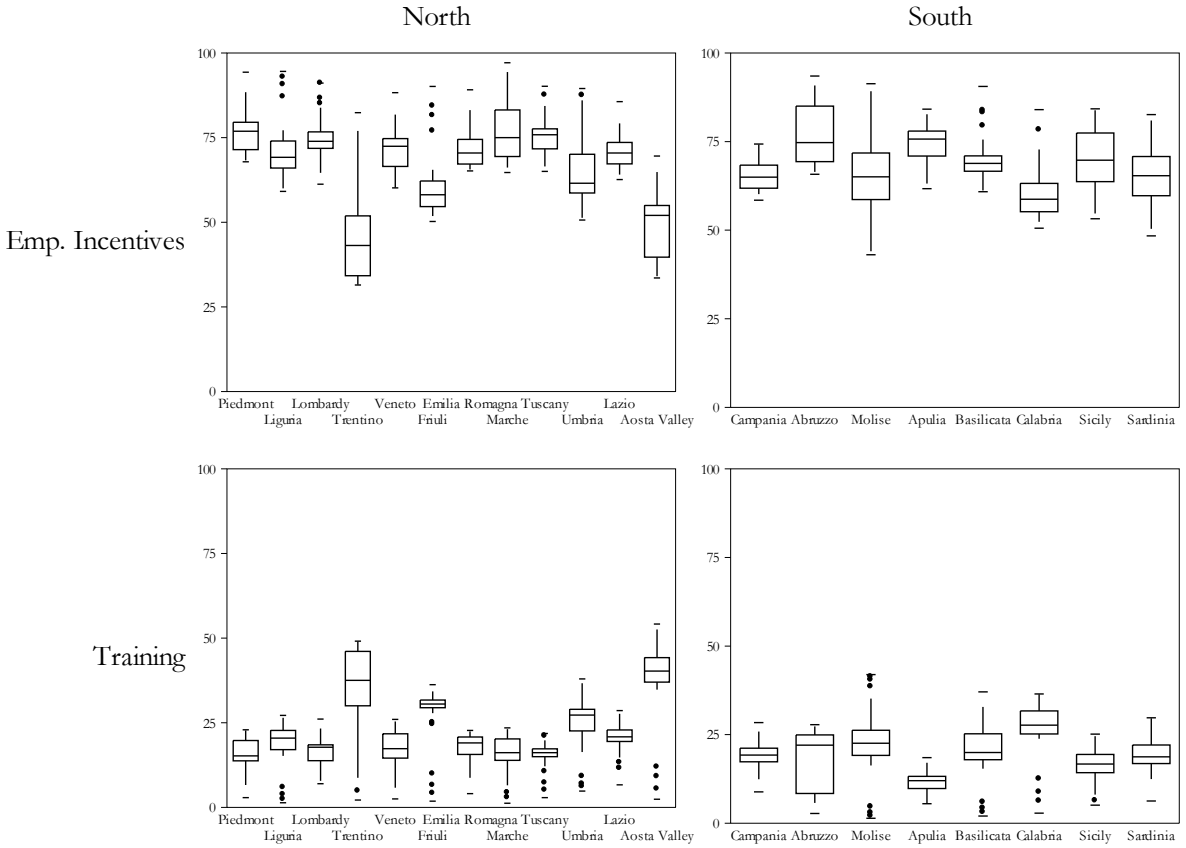
Figure 3 describes for each region the percentage of participants in the two main active policies, i.e. training and employment incentives,[6] as a share of total ALMP participants (relative to the labour force) over the entire sample period. This figure summarizes the sample distribution of the two interventions as share of total ALMP by using box-plots (also known as a box-and-whisker diagram). These graphs detect interquartile ranges (the box), medians (the line inside the box), the maximum and the minimum values (the whisker), and outliers of the two measures in both North and South.

The figure suggests that over the sample period analysed in this study, Italian regions have used the same policy strategy. In particular, employment incentives schemes have interested almost 2/3 of the workers that have participated in an active program. Participants in training programs have reached almost 20% of the total. The only exceptions are Aosta Valley and to a lesser extent Trentino Alto Adige, where the differences between training and employment incentives programs is more muted.

6 We only consider these two policies because they account, on average, for more than 85% of the total ALMP participants.

.

Figure 3: Share of ALMP participants by type of action in Italian regions



Note: The figure reports, for each region, the distribution of training and employment incentives as share of total ALMP over the sample period.

In order to further investigate whether Italian regions have homogenously used ALMP we test the statistical significance of the difference with dummy variable regression models.

Precisely, we estimate the following equations:

$$ALMP_{i,t} = \alpha_o + \alpha_1 d + \varepsilon_{i,t} \quad (1)$$

$$Employment\_Incentives_{i,t} = \gamma_o + \gamma_1 d + \varepsilon_{i,t} \quad (2)$$

$$Training_{i,t} = \beta_o + \beta_1 d + \varepsilon_{i,t} \quad (3)$$

Where the dependent variables are the share of participants in ALMP, Training and Employment incentives programs over the labour force for region *i* (*i=1,2,…20*) at time *t*; and, *d* is a dummy variable that takes value one if region *i* is in southern Italy and zero otherwise. The coefficients α_1, β_1 and γ_1 capture the average difference in the dependent variables between northern and southern regions.

The results obtained with OLS are reported in Table 5.

On average, southern regions use more employment incentives than northern regions (0.23). The opposite is true for the training programs (-0.4). Overall, the number of participants in ALMP as percentage of labour force is lower in the South (-0.16).

Looking at the standard errors (*s.e.*) reported in the table we can evaluate whether these differences are statistically significant. The differences in ALMP and in the employment incentives programs are not statistically different from zero. The only significant difference is related to the training schemes. However, this result is completely driven by the value of Aosta Valley. In fact, when excluding Aosta Valley from the regression, the difference becomes not statistically significant: the value of β_1 becomes 0.06 with a standard error of 0.07. In this case, also the fit of the model, as summarized by the R^2, increases from 0.39 to 0.51.

We can conclude that Italian regions have followed a common labour market strategy irrespectively of their economic structure peculiarities. This strategy, settled at national level, has induced region to follow policies that have not sufficiently taken into account the different characteristics of the regional labour markets.

Table 5: Differences between South and North

Variable	*Constant*	*d*	R^2
ALMP	5.23	-0.16	0.56
s.e.	*0.21*	*0.33*	
Employment Incentives	3.21	0.23	0.59
s.e.	*0.13*	*0.20*	
Training	1.45	-0.40	0.39
s.e.	*0.07*	*0.12*	

3 Macro-econometric framework

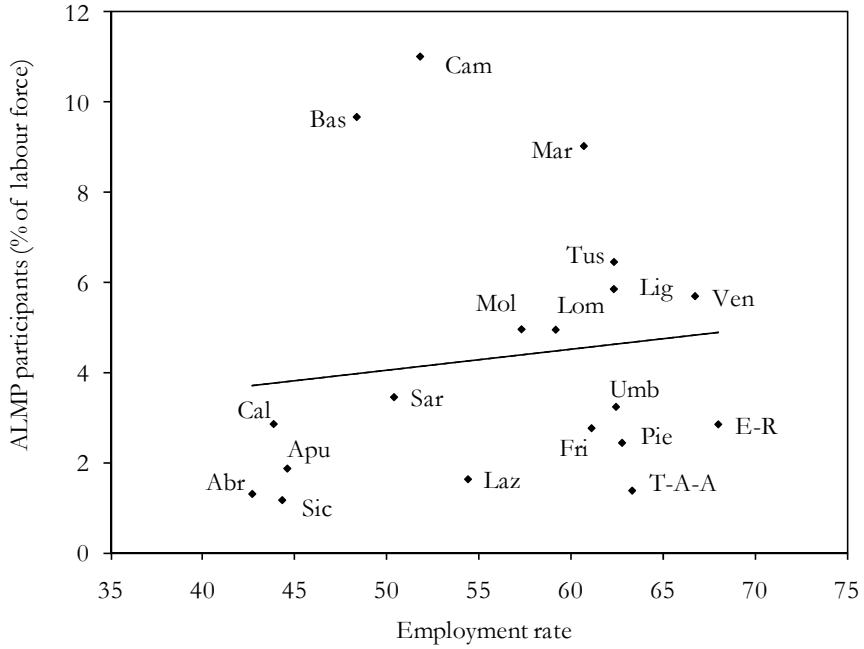
This paper aims to empirically evaluate whether the "one-size-fits-all" labour market strategy adopted by Italian policymakers during the last decade might generate asymmetries in the effect of ALMPs on regional labour market performance. Using a panel-factor augmented-vector autoregression (FAVAR) we estimate whether ALMPs might heterogeneously affect labour market variables at a regional level. The hypothesis underlying our empirical investigation is that, given the different economic structures characterizing the Italian regions, ALMPs might produce asymmetric effects on the performance of regional labour markets.

We use a panel dataset of Italian regions, covering the period 1996:1-2007:4. The data are quarterly and are collected from ISTAT, SVIMEZ, Bank of Italy and CambridgeReg and the

Ministry of Labour[7]. The ALMP measure can either be defined as the expenditure (as a percent of GDP) on ALMP or the number of participants in ALMP programmes. In our empirical analysis we use the participants in programmes of active policies as a percentage of the labour force[8].

From inspection of the relationship between the employment rate and ALMP participants relative to the labour force over the entire sample period (Fig. 4) there emerges a positive relationship between ALMPs and employment rate. Indeed, regions with few participants in ALMPs, such as Puglia, Calabria, Sicily and Sardinia, have lower employment rates. By contrast, regions with a higher employment rate, like Lombardy, Tuscany and Veneto, have a higher share of labour force participating in ALMPs[9].

Figure 4: Employment rate and ALMP participants (1996-2007)



Note: Pie = Piedmont; Lom = Lombardy; T-A-A = Trentino-Alto Adige; Ven = Veneto; Fri = Friuli-Venezia-Giulia; Lig = Liguria; E-R = Emilia Romagna; Tus = Tuscany; Umb = Umbria; Mar = Marche = Lazio; Abr = Abruzzi; Mol = Molise; Cam = Campania; Apu = Apulia; Bas = Basilicata; Cal = Calabria; Sic = Sicily; Sar = Sardinia. The solid line represents the regression line.

The regression line (the solid black line in figure 4) suggests a mild and positive relationship between employment and ALMP participation. Of course, a linear correlation in no way indicates whether increasing the number of ALMP participants might have a causal effect on the

[7] See Appendix 1 for a detailed description of the variables used in the analysis and their sources.
[8] The exact relationship between expenses and participants in ALMPs is derived in Altavilla and Caroleo (2006a) and in Calmfors et al. (2001).
[9] Note that ALMP participation in Campania and Basilicata is high because the denominator of our policy measure (labour force) is relatively low.

employment rate. This is due to the reverse causation or endogeneity problem. Indeed, given that policymakers react to rising unemployment or other labour market problems with increased policy efforts, it becomes very difficult to distinguish the effect of policy measures on the labour market. Basically, expenditures on ALMPs may affect the employment rate, but the level of employment may equally affect spending on ALMPs. This problem represents the main issue a researcher faces when evaluating the effect of ALMPs with a macroeconomic model.

Any empirical approach that intends to capture how an ALMP shock is transmitted to the labour market has to take this "reverse causation" relationship explicitly into account. The macroeconomic literature typically estimates these impacts using vector autoregressions (VAR). This framework estimates the effects of labour policy instrument shocks without, a priori, dismissing any of the potential correlations and causal relationships among the variables included in a model. However, VAR models usually contain a very small number of variables relative to the information set monitored by labour market authorities. The rationale for only utilizing a small subset of the available information in VARs is that these models lose degrees of freedom as more variables are added – the so-called 'curse of dimensionality'. Therefore, our analysis builds on the factor augmented vector autoregressive (FAVAR) approach suggested by Bernanke et al. (2005). This approach uses factor extraction techniques to summarise the relevant information from a large set of time series[10]. Thus, the advantage of the FAVAR approach is that all potentially relevant information for policymakers can be taken into consideration.

3.1 A panel FAVAR model

The econometric model we use to evaluate the effect of ALMPs on labour market performance is a panel factor-augmented vector autoregressive model (FAVAR). As stressed above, the choice of the model is motivated by two main reasons. First, FAVAR allows us to solve the endogeneity problem and then correctly identify the effect of an ALMP shock on labour market variables by imposing a set of exclusion restrictions. Second, FAVAR is a flexible model that identifies dynamic relationships among variables in a data-rich environment. Working with more than 120 time series would otherwise not be feasible.

Given the significant difference between Italian regional economies we analyse two areas separately: we consider eight regions[11] for Southern Italy and twelve[12] for Centre-Northern Italy, and specify two different models accordingly. These two models share the same set of explanatory variables and are estimated over the same sample period.

[10] The recent literature on factor models has solved the curse of dimensionality, allowing very large panels of data to be decomposed into a small number of common factors (Stock and Watson, 1998, 2002).
[11] The southern regions are Campania, Abruzzo, Molise, Apulia, Basilicata, Calabria, Sicily and Sardinia.
[12] The twelve regions are Piedmont, Aosta Valley, Liguria, Lombardy, Trentino-Alto-Adige, Veneto, Friuli-Venezia-Giulia, Emilia Romagna, Marche, Tuscany, Umbria and Lazio.

We assume that k economic variables form a vector Y which describes the labour market policy transmission channel. More precisely, we assume that the vector Y_{it} ($i=1,\ldots n$ and $t=1,\ldots,T$ where n indicates the number of regions considered in the model and T the sample period considered in the analysis) contains the employment rate (E_{it}), the participation rate ($Part_{it}$), and the ratio between the number of participants in the ALMP and the working-age population ($ALMP_{it}$). Following the standard approach, we could estimate the relationship among these variables by specifying a multivariate time series model such as a VAR. However, by analysing the dynamics governing the variables contained in Y_{it} we might not fully capture all relevant information. More specifically, in our case, we consider 120 additional time series[13] for each region, collected in a vector X_{it}. These series are initially transformed to induce stationarity. Assuming that all additional information depends on m unobservable factors summarized in the vector F we can specify a FAVAR model that summarizes the joint evolution of Y_{it} and F_{it}:

$$\begin{bmatrix} F_{it} \\ Y_{it} \end{bmatrix} = A(L) \begin{bmatrix} F_{it-1} \\ Y_{it-1} \end{bmatrix} + \varepsilon_{it} \tag{4}$$

where $A(L) = I - A_1 L - \ldots - A_p L^p$ is a lag polynomial matrix of order p. For each region, the $(m+k)' 1$ vector of error terms e_{it} is mean 0 with covariance matrix V.

The above model cannot be directly estimated because of the non-observable factors. For each region, we assume that there exist some unobservable fundamental forces that affect the dynamics of the time-series belonging to the vector X_{it} that can be summarized by m factors in the following observation equation:

$$X_{it} = \Lambda F_{it} + e_{it} \tag{5}$$

where Λ represent the $(m' k)' n$ matrices of factor loadings while e_{it} is a mean-zero error vector representing the idiosyncratic component of X_{it}. Equation (5) is the factor representation of the data. Therefore the model consists of a transition equation (4) and an observation equation (5) similar to that proposed in Bernanke et al. (2005) and can be estimated by employing the two-step principal components procedure suggested in Stock and Watson (1998, 2002).

[13] All variables considered in the factor analysis and their transformations are reported in Appendix 1. When computing the common factors we do not consider the last two variables, the employment and participation rate, which are included in Y_{it}.

The first step consists in estimating $\boldsymbol{m}$ unobservable factors $\widehat{F}_{it}$ as the principal components[14] of all macroeconomic time series X_{it}. Following Bernanke et al. (2005), in order to identify the factors against any rotations we impose the following factor restriction[15]: $\widehat{F}_{it} = \sqrt{T}\widehat{Z}$, where $\widehat{Z}$ correspond to the eigenvectors of the $\boldsymbol{m}$ largest eigenvalues of XX'.

In the second step, the FAVAR model described in equation (4) is estimated by standard methods, with F_{it} replaced by $\widehat{F}_{it}$ and an additional identifying assumption imposed. More precisely, model (4) is a reduced form VAR model, which contains a block recursive restriction that the unobservable factors do not respond to the ALMP shocks contemporaneously. A Choleski decomposition of the reduced form covariance matrix V is used to orthogonalize the reduced form innovations and to identify the structural model. We order the ALMP last and treat its innovations as labour policy "shocks". This ordering imposes the identifying assumption that employment and participation rate do not respond to labour policy innovations within the quarter[16]. Note that this recursive order solves the endogeneity problem outlined above. The timing of the model can be summarized as follows: a shock to labour policy instruments in period *t* affects the employment rate at time *t+1*. In fact, at time *t* the employment rate is predetermined, and hence cannot be influenced by any policy instrument. For example, an increase in active labour policy increases labour force participation, thereby facilitating an increase in the employment rate.

In principle, once we have recovered $\widehat{F}_{it}$, the panel FAVAR model can be estimated either under the null of homogeneity, using a fixed effects estimator, or under the alternative of heterogeneity of slope coefficients, i.e. using the mean group estimator of Pesaran and Smith (1995).

The mean group estimator allows coefficients and error variances to vary across regions and estimates (4) separately for each region. By contrast, a pooled (or fixed effects) estimator assumes that coefficients and error variances are homogeneous across regions, allowing only for region-specific fixed effects.

As discussed in Pesaran and Smith (1995), results are likely to vary significantly with respect to the estimation method, *i.e.* from the least restrictive, but potentially not efficient, mean group estimator, to the fixed effect estimator that only allows intercepts to vary across regions. We estimated the models with both techniques and compute a Haussman type test of the difference

[14] The principal components are orthogonal linear combinations of the data that explain the maximal variances of the data contained in X_{it}.

[15] In fact, given the rotational indeterminacy problem, unless identification assumptions are imposed on the factor loadings, it will always be possible to find some rotation of the factors which explains the same amount of total variation in the data but implies a different set of factor loadings.

[16] We examine the robustness of the main results by adopting alternative identification schemes. Our results remain substantially unchanged.

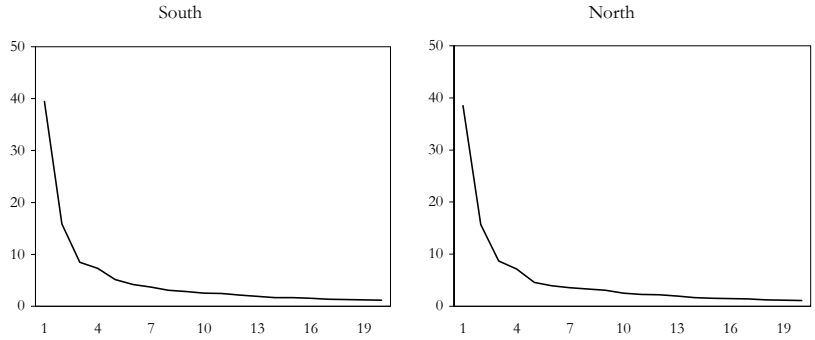
between the two estimators. Under the null of homogeneity the test statistic is distributed as a χ^2 with $k+1$ degrees of freedom where k stands for the number of explanatory variables. Applying this test, we cannot reject the null of homogeneity in all estimated models. Specifically, we do not reject homogeneity in the model for the South (the statistics equals 3.17 with p-value 0.17) or for the North (the statistics equals 1.21 with p-value 0.75). We then estimate all models by assuming slope homogeneity.

3.1 Empirical Results

This section presents the results of the two-step estimation procedure. We first concentrate on principal component analysis and then on the simulation of the FAVAR model.

Figure 5 shows the outcome of principal component analysis by way of a *scree plot* which maps the largest twenty eigenvalues of the data matrix. There appears to be a natural break at the fourth value, with the remaining eigenvalues flattening out.

Figure 5: Scree plot of eigenvalues from principal component analysis



As shown in Table 6 the first four principal components explain on average 32%, 12%, 7% and 6% of the total variance in our economic series, making a cumulative proportion of 58%.

Table 6: Principal component analysis

	1st PC	2nd PC	3rd PC	4th PC
South				
Eigenvalue	39.45	15.85	8.49	7.29
Variance Explained (%)	32.33%	12.99%	6.96%	5.98%
Cumulative Var. Exp. (%)	32.33%	45.32%	52.28%	58.25%
North				
Eigenvalue	38.52	15.71	8.65	7.16
Variance Explained (%)	31.57%	12.88%	7.09%	5.87%
Cumulative Var. Exp. (%)	31.57%	44.45%	51.54%	57.40%

Given the number of the time series included in the analysis, we consider this proportion sufficiently high. By contrast, the fifth and sixth components account for only 3% and 2%, respectively. We also employ the Bai and Ng (2002) procedure for determining the number of static factors and find that *PC1* and *IC1* criteria substantially support our choice of limiting our analysis to four principal components.

Table 7 shows the percentage of variance in a given variable explained by all the factors, i.e. the communality[17]. The communality for a variable is the sum of squared factor loadings for that variable (row), and thus is the percent of variance in a given variable explained by all the factors.

Table 7: Extracted communalities

Variables	Category	South	North
1-18	Social and economic context	0.71	0.62
19-22	Crime	0.12	0.13
23-27	Infrastructure	0.32	0.33
28-30	Education	0.09	0.02
31-34	Health	0.80	0.69
35-51	GVA	0.55	0.54
53-70	Hours Worked	0.53	0.47
71-88	Investment	0.77	0.75
89-106	Remuneration	0.43	0.45
107-110	Imp./Exp.	0.84	0.88
111-119	Financial Market	0.82	0.81
120-124	Labour Market	0.85	0.88

The table suggests that for both areas of the country the four extracted factors explain a high percentage of the variance of the variables summarizing the social and economic structure (variables 1 to 18), investment (variables 71 to 88), financial market (variables 111 to 119) and labour market (variables 120 to 124). The variance of other variables, mostly those related to crime and infrastructure, is less explained by the factors which are extracted, resulting in coefficients lower than 0.5.

To explore what kind of interpretation could be assigned to the first four principal components, we employ an orthogonal rotation of the estimated eigenvectors using the varimax method. Varimax rotation seeks to maximize the variances of the squared normalized factor loadings across variables for each factor. This is equivalent to maximizing the variances in the columns of the matrix of the squared normalized factor loadings.

[17] In complete principal component analysis, with no factors dropped, the communality is equal to 1.0, or 100% of the variance of the given variable. As our model does not extract all the variance, the proportion of variance of a particular variable that is due to common factors is called the communality. The proportion of variance that is unique to each variable is then the respective variable's total variance minus the communality.

Table 8 depicts the rotated components. Categories again refer to the ordering of the series as reported in Appendix 1. The average principal component 'loadings' are shown in the columns from 3 to 6. Figure A.2 in Appendix 2 reports a detailed graph where variables are not grouped. The first rotated principal component is a linear combination that places heavy weights on regional economic series related to the social and economic context in both estimated models. The second rotated eigenvector clearly picks out the indicators associated with investment and hours worked for both south and north.

Table 8: Loadings on selected principal components

South

Variables	Category	1st PC	2nd PC	3rd PC	4th PC
1-18	Social and economic context	0.7	-0.1	0.0	0.2
19-22	Crime	0.16	-0.04	0.10	0.00
23-27	Infrastructure	0.28	0.03	0.06	-0.12
28-30	Education	0.07	0.03	-0.04	-0.07
31-34	Health	0.79	-0.12	0.02	0.37
35-51	GVA	0.57	-0.03	0.09	0.23
53-70	Hours Worked	0.33	0.23	0.23	0.15
71-88	Investment	-0.06	0.72	0.05	-0.05
89-106	Remuneration	0.17	0.00	0.35	0.12
107-110	Imp./Exp.	0.26	-0.04	-0.06	0.82
111-119	Financial Market	0.51	-0.03	0.05	0.72
120-124	Labour Market	0.43	-0.01	0.04	0.79

North

Variables	Category	1st PC	2nd PC	3rd PC	4th PC
1-18	Social and economic context	0.7	0.0	0.2	0.0
19-22	Crime	0.23	0.05	0.08	-0.10
23-27	Infrastructure	0.37	-0.01	0.04	0.15
28-30	Education	0.06	0.03	0.00	0.06
31-34	Health	0.61	-0.19	0.46	0.13
35-51	GVA	0.49	-0.06	0.30	0.15
53-70	Hours Worked	0.23	0.25	0.16	0.30
71-88	Investment	-0.09	0.69	-0.04	0.09
89-106	Remuneration	0.17	0.06	0.20	0.38
107-110	Imp./Exp.	0.20	-0.05	0.88	-0.05
111-119	Financial Market	0.36	-0.07	0.80	0.07
120-124	Labour Market	0.36	-0.09	0.84	-0.01

Note: Numbers in the first column refer to the ordering of the variables as reported in Appendix 1. Hence 1-18 social and economic context; 19-22 crime; 23-27 infrastructure; 28-30 education; 31-34 health; 35-51 GVA; 53-70 hours worked; 71-88 investment; 89-106 remuneration; 107-110 import/export; 111-119 financial market; 120-124 labour market

Interestingly, the third and fourth principal components for the south are very similar to the fourth and third components for the north. More precisely, the third component for the South and the fourth component for the North seem to be linked with remuneration. On the contrary, labour market variables and financial market indicators load highly on the third component for the North and the fourth component for the South.

We can now describe how these factors could be used in a standard VAR for evaluating the effect of ALMPs on labour market performance. Once we have estimated the FAVAR we can compute the dynamic effects of *ALMP* shocks on labour market variables, examining in particular the similarity of employment responses in each area. This is accomplished by using impulse response functions with a structural decomposition of the variance covariance matrix explained above. A 32-quarter horizon is considered. The estimated responses to a 1% increase in *ALMP* are reported in Figure 6. Each response is provided with the associated asymptotic confidence bands.

Impulse responses look reasonably well behaved and give rise to the usual hump-shaped dynamics. The figure shows that all response functions are statistically significant. Moreover, the impulse responses for the northern regions are substantially larger than those for the south. Most importantly, the results suggest that the employment rate in the selected regions responds to identical labour policy shocks with different speeds and movements, as well as with different magnitudes of the effects.

Table 9 outlines some key characteristics of the estimated response functions. In particular, it gives information about the maximum impact and the average responses of the employment and participation rate to *ALMP* structural shocks. The table also considers the time that a shock takes to exert its maximum effect on employment and its cumulative effect. Despite some qualitative similarities, the existence of different responses across regions is suggested. In both areas, an ALMP shock produces an increase in the employment rate. However, the magnitudes of the effect are quite dissimilar. Whilst in the South the employment rate increases by more than 20 base points, an ALMP shock in the North raises the employment rate by 38 base points.

The time-profile of the response functions is also significantly different. After an initial delay, the response function displays a hump-shaped pattern that reaches its maximum increase after roughly two years in the North and one year in the South. Asymmetries are also detected in the response of the participation rate. Again, the largest responses are observed in the North: in particular, the response of participation in northern regions reaches a maximum of 26 base points after eight quarters, while the reaction of the southern Italian regions is smaller and more rapid: 13 base points after four quarters.

Figure 6: Responses of employment and participation rate to a 1% increase in ALMP

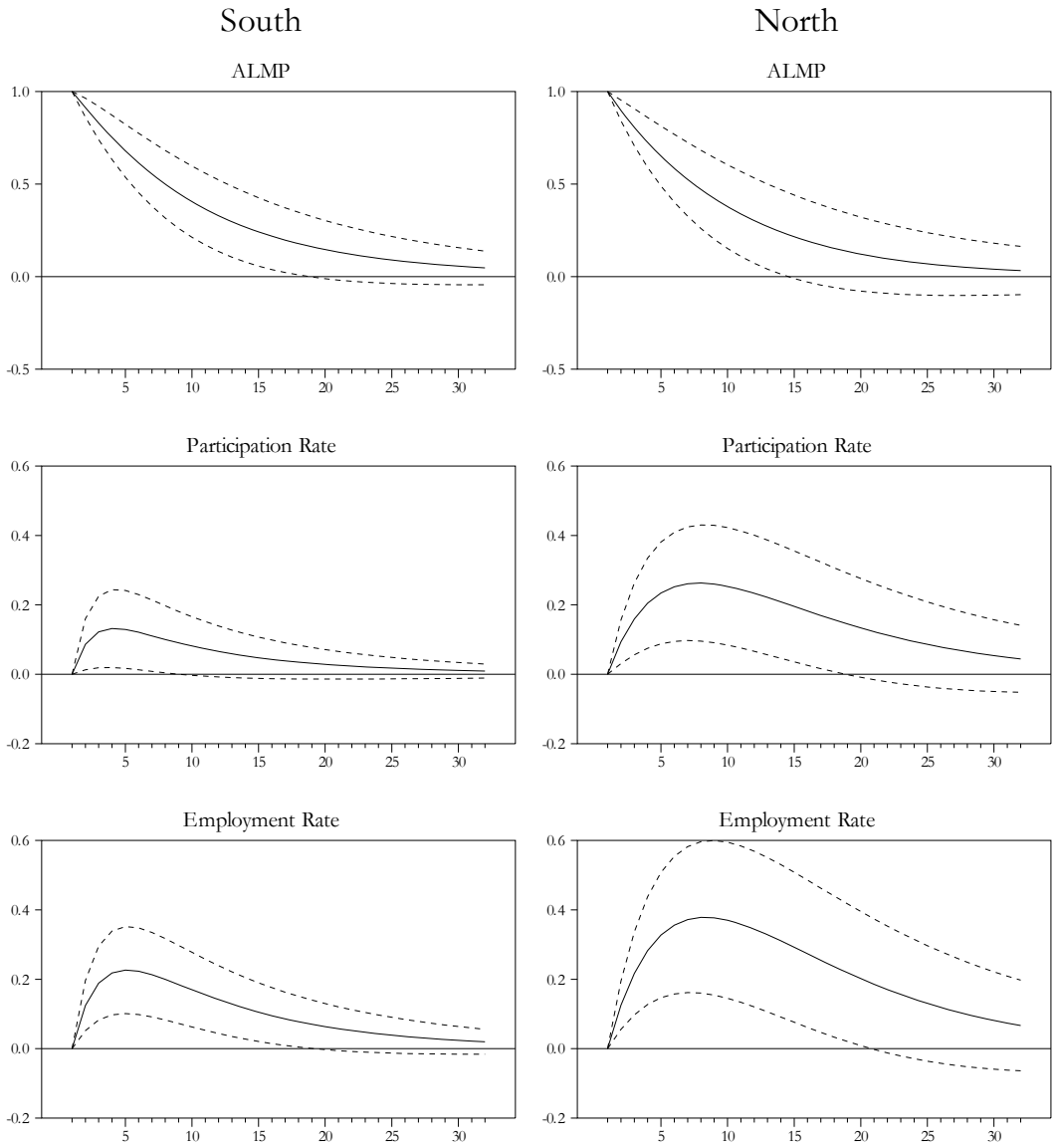


Table 9: Estimated response function features

	South		North	
	Participation Rate	*Employment Rate*	*Participation Rate*	*Employment Rate*
Average Effect	0.051	0.1	0.15	0.22
Cumulative Effect	1.641	3.216	4.809	7.049
Maximum Effect	0.132	0.227	0.263	0.378
Time to maximum	4	4	8	8

These results might be interpreted as a measure of how effective ALMPs are in supporting job reallocation and boosting reemployment among dismissed workers in the two areas of the country.

Given the timing of our model, an exogenous ALMP shock is transmitted to employment through participation rate. As for most European countries (Decressin and Fatás, 1995), we find evidence that a policy shock has a strong effect on the participation rate in both South and North. The larger effect on participation rate in the northern regions means that in this part of the country an ALMP shock calls upon many more people outside the labour force to participate than in the south. In other words, although the size of shock is identical, the reaction to the shock is stronger in the north where more people enter the labour force. In the south, a smaller percentage of non-participants enter the labour force to fill new jobs.

The final effect on employment also depends on the level of job reallocation produced by the ALMP shock. As shown by the cumulative effect of the shock reported in table 9, this reallocation process results in a new equilibrium employment level above the initial value of the shock. However, the reallocation process associated with the ALMP shock in the North generates a larger amount of additional jobs than the same shock in the South. This means that in the North, the amount of search effort and, in turn, successful job reallocation significantly depends on the levels of ALMP which in turn speed up the transition into new jobs. The different magnitudes of the effect can also be explained by the differences in both the number of vacancies and that of unemployed in the two areas. Whilst the northern regions have a large number of vacancies and fewer unemployed, the South has fewer vacancies and a large number of unemployed. It follows that an identical increase in ALMP has a greater effect on the northern employment rate.

Impulse response analysis also provides an answer to another important policy question: Are similar adjustment patterns observed for ALMP shocks in specific regions within Italy? The different adjustment speeds of employment rates to ALMP shocks reflect persistent differences between North and South. We do find substantial differences between Italian regions in terms of adjustment patterns to an ALMP shock. Table 9 and figure 6 show that the adjustment to a positive ALMP shock in the South is absorbed faster, and that the shock's maximum effect is reached after one year. In the North it seems to take longer and then the cumulative effect on employment is higher. This evidence supports the view that the reallocation rate of unemployed workers and migration flows on the northern labour market are indeed much higher than in other parts of Italy.

The responses of 11 selected variables to a 1% increase in ALMP at relevant horizons (Table 10) are largely in line with our a priori predictions. An increase in ALMP tends to reduce both the unemployment rate and the long-term unemployment. Moreover, GDP and investments positively react to the ALMP shock, in both areas.

Table 10: Response of selected variables to a 1% shock in ALMP

South

	ESI	GDP	VCR	SSER	GVA	HW	IN	TR	FDIA	UR	LUR
4	0.01	0.08	0.01	-0.01	0.07	0.05	0.03	0.03	0.002	-0.04	-0.03
8	0.02	0.11	0.03	-0.01	0.10	0.06	0.06	0.04	0.001	-0.04	-0.04
12	0.02	0.11	0.03	-0.01	0.10	0.06	0.06	0.04	-0.002	-0.03	-0.03
24	0.01	0.05	0.01	-0.01	0.05	0.02	0.03	0.02	-0.004	-0.01	-0.01

North

	ESI	GDP	VCR	SSER	GVA	HW	IN	TR	FDIA	UR	LUR
4	0.02	0.11	0.03	0.07	0.05	0.12	0.03	0.02	-0.001	-0.04	-0.05
8	0.02	0.11	0.03	0.09	0.07	0.13	0.06	0.02	-0.012	-0.05	-0.06
12	0.01	0.05	0.01	0.07	0.06	0.09	0.06	0.01	-0.021	-0.05	-0.05
24	0.00	0.00	0.00	0.02	0.03	0.01	0.03	0.00	-0.025	-0.02	-0.02

Note: ESI = Firm start-up Index; GDP = gross domestic product; VCR = Legality condition Index; SSER = Secondary School Enrolment Rate; GVA = gross value added; HW = Total Hours Worked; IN = Total Investment; TR = Total Remuneration; FDIA = Foreign Direct Investment Attraction Index; UR = Unemployment Rate; LUR = Long-term Unemployment Rate.

Our analysis now concentrates on the forecast error variance decomposition. The main strength of this type of analysis is its ability to capture the weight of different variable innovations on a given variable forecast error variance decomposition. In other words, it yields information on the percentage of variation in the forecast error of a variable explained by its own innovation and the proportion explained by innovations in other variables at different horizons.

Table 11 depicts the forecast error variance decomposition of the variables in the FAVAR models estimated above up to a six-year horizon. The table gives useful information on the relative ability of *ALMP* to affect employment dynamics at different horizons. According to the variance decomposition at short horizons, ALMP innovations do not play a major role in the quarterly fluctuations of the employment rate. The dynamics of employment are largely dominated by its own shocks, and they indicate that short-run fluctuations in the employment rate display no association with active labour market programmes or with the dynamics of the participation rate. For long horizons, we find that both ALMPs and the participation rate have a certain influence in determining employment dynamics. This influence varies across regions: while in southern regions only 7% of employment movements are driven by ALMP shocks, in the North this percentage more than doubles (almost 16%).

Table 11 also illustrates the percentage of variance explained by the estimated common factors. In the South, the first estimated component, which is related to the social and economic context, does significantly affect movements in the employment rate: after six years, it explains almost 19% of the employment change. In the northern regions, by contrast, employment dynamics seems to be partially explained by the dynamics of the fourth principal component (related to wage and hours worked): in particular, movements in the fourth PC after six years account for almost 20% of employment variation.

Table 11: Forecast-error variance decomposition

South

	1st PC	*2nd PC*	*3rd PC*	*4th PC*	*E*	*Part*	*ALMP*
Employment							
4	0.04	0.80	0.07	1.68	94.39	0.52	2.49
8	7.09	1.68	0.11	3.56	78.60	1.92	7.04
12	15.38	1.76	0.15	3.86	69.83	2.09	6.94
24	18.93	1.76	0.17	3.84	66.31	2.09	6.90
Participation							
4	0.02	0.14	0.17	3.01	43.22	52.27	1.18
8	0.02	0.14	0.22	3.90	42.24	50.66	2.83
12	0.12	0.14	0.23	4.22	41.74	49.95	3.60
24	1.13	0.17	0.28	4.33	41.11	49.04	3.93
ALMP							
4	0.47	0.28	0.50	1.20	1.94	0.21	95.41
8	2.48	0.64	0.79	1.53	1.44	0.43	92.70
12	3.92	1.14	1.04	1.49	1.41	0.51	90.50
24	4.08	1.28	1.12	1.48	1.40	0.53	90.10

North

	1st PC	*2nd PC*	*3rd PC*	*4th PC*	*E*	*Part*	*ALMP*
Employment							
4	0.07	0.38	0.06	9.57	84.99	0.54	4.38
8	0.21	0.32	0.13	13.49	73.53	0.55	11.78
12	0.67	0.46	0.21	15.35	66.59	1.49	15.23
24	1.22	1.08	0.36	19.00	58.57	3.98	15.79
Participation							
4	0.42	0.39	0.68	6.91	57.54	29.74	4.32
8	0.42	0.33	0.57	12.58	49.48	25.40	11.22
12	0.53	0.50	0.51	15.36	45.01	23.95	14.14
24	0.77	1.48	0.45	19.62	40.10	22.98	14.61
ALMP							
4	1.16	0.85	0.05	0.25	0.06	7.22	90.42
8	3.03	1.21	0.23	0.49	0.05	16.33	78.66
12	3.95	1.68	0.50	0.53	0.12	21.34	71.89
24	4.15	1.90	0.91	0.58	0.34	23.71	68.41

We may conclude that there are different explanations for employment dynamics in the two areas. In the South neither *ALMP* nor the participation rate seems to account for changes in the employment rate: employment is driven by its own shocks in the short term and by social and economic context variables at longer time horizons. By contrast, in the northern regions, the employment dynamics is significantly explained by remuneration and hours worked.

Finally, we report the fraction of employment rate, participation rate and ALMP explained by the eleven selected variables introduced above in table 12. In both models, the variable that exerts the largest influence on employment rate is the unemployment rate. Interestingly, while in the South the dynamics of ALMP is significantly driven by GDP and GVA movements (almost 10%), in the North changes in active labour market policies are explained by changes in the unemployment rate (about 13%).

Table 12: Forecast-error variance decomposition – other variables

South

Employment	ESI	GDP	VCR	SSER	GVA	HW	IN	TR	FDIA	UR	LUR
4	0.309	0.687	1.612	0.046	0.683	0.334	0.033	0.106	0.083	31.249	21.716
8	0.438	1.780	1.964	0.212	1.885	0.377	0.196	0.330	0.085	29.793	20.800
12	0.448	2.682	1.992	0.467	2.902	0.376	0.395	0.534	0.123	28.989	20.216
24	0.486	3.755	1.958	1.012	4.168	0.497	0.666	0.782	0.279	28.460	19.919

Participation	ESI	GDP	VCR	SSER	GVA	HW	IN	TR	FDIA	UR	LUR
4	0.561	0.186	1.026	0.123	0.182	0.049	0.115	0.048	0.001	6.729	5.888
8	0.574	0.613	1.009	0.124	0.591	0.052	0.208	0.048	0.002	6.630	5.912
12	0.571	0.958	1.026	0.153	0.935	0.072	0.217	0.058	0.005	6.576	5.923
24	0.629	1.347	1.053	0.271	1.358	0.142	0.222	0.089	0.029	6.541	5.935

ALMP	ESI	GDP	VCR	SSER	GVA	HW	IN	TR	FDIA	UR	LUR
4	1.149	2.626	0.105	0.236	2.159	0.250	1.353	0.591	0.251	0.225	1.065
8	0.856	5.097	0.319	1.142	4.432	0.894	2.269	0.493	0.625	0.294	2.242
12	1.079	7.188	0.526	2.304	6.452	1.699	2.946	0.657	1.056	0.365	2.774
24	2.440	9.967	0.802	4.385	9.381	2.831	3.760	1.055	2.142	0.426	3.115

North

Employment	ESI	GDP	VCR	SSER	GVA	HW	IN	TR	FDIA	UR	LUR
4	0.015	0.484	0.025	0.225	0.503	0.064	0.188	0.085	0.032	31.605	11.887
8	0.031	0.614	0.074	0.387	0.644	0.095	0.990	0.188	0.042	27.711	9.998
12	0.082	0.762	0.128	0.437	0.802	0.455	1.990	0.235	0.044	24.599	8.929
24	0.231	0.966	0.216	0.446	1.036	1.523	3.273	0.227	0.056	22.283	8.019

Participation	ESI	GDP	VCR	SSER	GVA	HW	IN	TR	FDIA	UR	LUR
4	0.045	0.163	0.001	0.137	0.230	0.341	0.231	0.139	0.182	0.478	2.046
8	0.056	0.132	0.016	0.306	0.188	0.408	0.255	0.234	0.461	0.716	2.176
12	0.104	0.123	0.043	0.347	0.189	0.500	0.463	0.284	0.627	0.669	1.990
24	0.228	0.148	0.100	0.369	0.245	1.231	0.963	0.278	0.837	0.806	1.882

ALMP	ESI	GDP	VCR	SSER	GVA	HW	IN	TR	FDIA	UR	LUR
4	0.681	0.069	1.772	3.394	0.163	1.501	0.558	0.074	0.115	4.304	1.042
8	0.913	0.195	1.822	2.364	0.393	3.703	1.390	0.124	0.135	8.760	1.487
12	1.079	0.273	1.852	2.263	0.525	5.370	1.803	0.214	0.127	11.109	1.686
24	1.262	0.322	1.889	2.765	0.624	6.216	2.001	0.370	0.126	12.834	1.870

Note: ESI = Firm start-up Index; GDP = gross domestic product; VCR = Legality condition Index; SSER = Secondary School Enrolment Rate; GVA = gross value added; HW = Total Hours Worked; IN = Total Investment; TR = Total Remuneration; FDIA = Foreign Direct Investment Attraction Index; UR = Unemployment Rate; LUR = Long-term Unemployment Rate.

In order to evaluate whether different policies might have a heterogeneous impact on regional economies we simulate the same model (equation 4 and 5) changing only the variable representing the policy instrument. All other variables remain the same. More precisely, we substitute the total participants in ALMP with participants in training and employment incentives programs. All policy variables are expressed as percentage of labour force.

Table 13 presents the results. Both policies have a greater impact on northern labour market. A 1% increase in training leads to a rise of 30 basis points in southern employment after 3 years. In the North, this result is reached after only one year, while after three years the effect is almost the double (0.61%).

The results are very similar when looking at the reaction of the participation rate: the induced increase in training produces a 0.63% and 0.28% growth in the North and the South, respectively. This difference in the reaction is not reduced when evaluating the effect of employment incentives. A policy shock that increases (by 1%) employment incentives also exerts a greater effect on

northern employment (0.34) and participation (0.29) compared to the reaction of the same variable in the South (0.24 and 0.12 respectively).

Overall, consistently with the aggregate measure of ALMP we have used in the benchmark model, also when considering specific policies, such as training and employment incentives, the reaction of northern labour markets is stronger and faster than the one in southern regions.

Table 13: Responses of employment and participation rate to a 1% increase in Training and Employment Incentives programs

		South		North	
Shock to	Years after shock	Employment Rate	Participation Rate	Employment Rate	Participation Rate
Training					
	1	0.12	0.04	0.30	0.36
	2	0.25	0.17	0.51	0.57
	3	0.31	0.28	0.61	0.63
Employment Incentives					
	1	0.09	0.02	0.16	0.14
	2	0.18	0.07	0.28	0.25
	3	0.24	0.12	0.34	0.29

4 Policy implications

Why might centralized ALMPs heterogeneously affect the regional labour market? Overall, the results obtained in the empirical analysis suggest two main policy implications.

First, the success of active policies depends on the regional labour market conditions. More precisely, ALMPs are less effective in regions with poor labour market outcomes. We find evidence that the impact of ALMPs is increasing with the regional employment rate. Similar results were obtained in recent papers by McVicar and Podivinsky (2010) and Blien et al. (2010).

There is much debate, but surprisingly little evidence, on the question of whether Active Labour Market Programmes (ALMPs) have differential effects depending on regional labour market characteristics. On the one hand, we might expect ALMPs to have greater impacts in "tight" labour markets because more and perhaps better job vacancies exist. On the other hand, ALMPs might have larger impacts in very depressed labour markets because the added value of such programmes is higher. Recent studies of East Germany, a natural benchmark for the Italian Mezzogiorno[18], provide a rather pessimistic assessment of the overall effectiveness of ALMPs in less developed regions. Lechner and Wunsch (2009), for example, found that training programmes and two other employment programmes implemented in East Germany failed to increase the employment

[18] Both Italy and Germany have major regional divides, with southern Italy and the eastern portion of Germany recording higher unemployment rates than the rest of the country.

chances and earnings of their participants. Wunsch and Lechner (2008) also conclude that in the very depressed labour market of East Germany, the effectiveness of ALMP is very low.

Consistently, our results strongly suggest that regional structure and labour market conditions significantly reduce the effectiveness of the ALMP in southern Italian regions: the heterogeneous effects found at regional level suggest that these measures are only effective in regions characterised by efficient labour markets. The idea is that since active programmes aim to assist the unemployed to get back into work, their effectiveness crucially depends on the supply of job vacancies (Martin, 1998). Therefore, it comes as no surprise that, in our analysis, active measures in regions generating few vacancies (the southern regions) have been found relatively ineffective.

In other words, the large disparities among Italian regions mirror a different functioning of regional labour markets. In the regions where there are many applicants for few vacancies and the markets face structural problems, employment incentives may not be effective in activating employment dynamics and production and are likely to become subsidies to the underemployed. By contrast, when there are few applicants for many vacancies, the matching function can be improved by boosting labour contracts and training. As a consequence, a "one-size-fits-all" labour market strategy that does not take such disparities into account produces asymmetric effects on regional economies.

Second, policymakers should adjust labour policy strategy to the regional economic structure. In other words, when designing a labour market strategy, the economic context should be taken into account.

Our analysis strongly suggests that contextual factors might play a crucial role in determining the appropriate programmes to be implemented. ALMP appears to differently influence employment in the North and South of Italy and produce a longer-lasting effect in northern regions. There are various explanations for labour market dynamics in the two areas. In the South, employment and participation rate are largely driven by their own shocks as well as by shocks in the socio-economic structure. By contrast, in the northern regions, employment and participation dynamics are significantly explained by active labour market programmes and by the variables related to the business cycle (such as hours worked and remuneration). Consistently with what suggested in Blien et al. (2010), we find that integrating an unemployed person into the labour market is much easier in regions where the unemployment rate is low.

Therefore, our empirical findings highlight the importance of considering the regional economic structure when implementing ALMP.

Overall, the results are in line with the adoption of a "New Regionalism" approach (Cook, 2008; and Cook et al. 2008) which stresses the crucial role played by regional and local economic development in designing institutional changes and policy strategies.

Active labour market policies could be more effective and efficient if their implementation is based on decentralised operational responsibility. In fact, as demonstrated above, when policies are centralized, regions tend to use a similar policy mix. Decentralisation might instead lead to a stronger adjustment of the policy mix to local economic structures.

5 Conclusions

Our study evaluated whether active labour market policies made at the national level generate asymmetric effects when regions have different economic structures. Using empirical analysis, we studied the possible asymmetries that the implementation of ALMPs might produce in regional labour market performance.

The macroeconometric model employed to estimate the effect of ALMP on labour market variables is a panel FAVAR that exploits the relevant information from a data-rich environment. We first estimated the common factors of employment by principal components. Factor analysis suggests that for both areas of the country four factors explain a high percentage of the variance. These factors summarize variables related to the social and economic structure, investment, the financial market and the labour market.

We then simulated the model to measure the dynamic impact of ALMPs on regional labour markets. The results suggest that the impulse responses for the northern regions are substantially larger than those for the South and, more interesting, the employment rate in the selected regions responds to identical labour policy shocks with different speeds and movements, as well as with different magnitudes of the effects. ALMPs appeared to influence employment and participation rate differently and produce a longer-lasting effect in northern regions. An exogenous ALMP shock is transmitted to employment through participation rate. Although the size of shock is identical, the percentage of non-participants entering the labour force that filled new jobs in the North is larger. The final effect on employment, which depends on the level of job reallocation produced by the policy shock, results in a new equilibrium employment level above the initial value of the shock. However, the reallocation process in the South generates a smaller amount of additional jobs than in the North. This means that in the North, the amount of search effort and, in turn, successful job reallocation significantly depends on the levels of ALMP which in turn speed up transition into new jobs.

Finally, the forecast error variance decomposition yielded information on how various structural shocks affect the behaviour of each variable at different time horizons. This analysis showed that the short-term dynamics of employment are largely dominated by their own shocks, and no association with active labour market programmes or with the dynamics of the participation rate can be displayed. For long time horizons, we find that both ALMP and participation rate have a

certain influence in determining employment dynamics but this influence varies across regions. Employment movements driven by ALMP shocks are more than double in northern regions. Moreover, as regards the influence of different factors on the dynamics of the employment rate, we found that in the South the first factor, which is related to the social and economic context, significantly affects long-term movements in the employment rate. In the northern regions, by contrast, employment dynamics seems to be partially explained by the dynamics of the fourth factor (related to hours worked and remuneration).

We conclude that there are different explanations for labour market dynamics in the two areas. In the South, labour market indicators are largely driven by shock in the economic structure. By contrast, in the northern regions, employment and participation dynamics are significantly explained by active labour market programmes.

Overall, our results highlighted that the large disparities among Italian regions mirror a different functioning of regional labour markets (each region might have a Beveridge curve that differs in terms of position and slope). As a consequence, a "one-size-fits-all" labour market strategy that does not take such disparities into account produces asymmetric effects on regional economies.

Finally, we suggest two main policy implications. First, the success of active policies depends on the regional labour market conditions. As a consequence, policymakers should be very careful in promoting ALMPs in very depressed labour markets. In fact, depending on the characteristics of regional labour markets the effectiveness of these programs might significantly vary. Second, policymakers should adjust labour policy strategy to the regional economic structure. It follows that when designing a labour market strategy, the economic context should be heavily taken into account.

References

Altavilla C. and Caroleo F.E. (2006a) Evaluating the Dynamic Effects of Active Labour Policies in Italy, *Labour*, 20 (2), 349-382.

Altavilla C. and Caroleo F.E. (2006b) Evaluating Asymmetries in Active Labour Policies: The Case of Italy, in F. E. Caroleo and S. Destefanis (eds.) *The European Labour Market: Regional Dimensions*, Physica Verlag, Heidelberg.

Altavilla C., F.E. Caroleo, P. Di Monte and S. Veneziano (2009), Le peculiarità della normativa nazionale sulle politiche del lavoro nelle regioni del Mezzogiorno in Trivellato (ed.), *Il lavoro che cambia: Regolazione, welfare e politiche attive del lavoro*, CNEL, Rome.

Amendola A., Caroleo F.E. and Garofalo M. (1997) Labour market and Decentralized Decision-making: An Institutional Approach, Labour, 3, 1997.

Armstrong H. and Taylor J. (2000) *Regional Economics and Policy*, Third edition.

Bai J. and Ng S. (2002) Determining the Number of Factors in Approximate Factor Models, *Econometrica*, vol. 70, pp. 191-222

Bellman L. and Jackman R. (1996), Aggregate Impact Analysis, chapter 5 in Schmid G., O'Reilly J. and Schömann K. (eds), *International Handbook of Labour Market Policy and Evaluation*, Edward Elgar.

Bernanke, B.S., Boivin J., and Eliasz P.S. (2005) Measuring the Effects of Monetary Policy: A Factor-augmented Vector Autoregressive (FAVAR) Approach, *Quarterly Journal of Economics*, Vol. 120, No. 1, pp. 387–422.

Blanchard O., Wolfers J. (2000), The Role of Shocks and Institutions in the rise of European Unemployment: The Aggregate Evidence, *The Economic Journal*, 110, pp. C1-33.

Blien, Uwe, Franziska Hirschenauer and Phan thi Hong Van (2010) Classification of regional labour markets for purposes of labour market policy, *Papers in Regional Science*, vol. 89(4), pages 859-880.

Boeri T. and P. Garibaldi (2007), Two-Tier Reforms of Employment Protection: a Honeymoon Effect?, *The Economic Journal*, Vol. 117 no. 521, 357–385.

Büttner, T. and Prey, H. (1998) Does Active Labour-Market Policy Affect Structural Unemployment? An Empirical Investigation for West German Regions, 1986-1993, *Zeitschrift für Wirtschafts- und Sozialwissenschaften*, 118, pp. 389–413.

Caliendo M., Hujer R. and Thomsen S.L. (2008) Identifying effect heterogeneity to improve the efficiency of job creation schemes in Germany, *Applied Economics*, 40:9, pp. 1101-1122.

Calmfors L., Forslund A., and Hemstròm M. (2001) Does Active Labour Market Policies Work? Lessons from the Swedish Experiences, *Swedish Economic Policy Review*, vol. 8, pp 61-124.

Card David, Kluve Jochen, and Andrea Weber (2009), The effectiveness of Active Labor Market Programs – A Meta Analysis, *IZA Discussion Paper* No.4002

Cook, B. (2008) Regional and local employment policies: the rise of New Regionalism, Working Paper 08-04, Centre of Full Employment and Equity, University of Newcastle.

Cook B., W. Mitchell, V. Quirk and M. Watts (2008) *Creating effective local labour markets: a new framework for regional employment policy*, Centre of Full Employment and Equity, University of Newcastle and Jobs Australia, November.

Decressin, J. and Fatas, A. (1995) Regional labor market dynamics in Europe, *European Economic Review*, Elsevier, vol. 39(9), pp. 1627-1655,

Destefanis S., and Fonseca R. (2007) Matching Efficiency and Labour Market Reform in Italy: A Macroeconometric Assessment, *Labour*, vol. 21(1), pp. 57-84.

Dixon R., Lim G.C. and Freebairn J. (2010) Regional Beveridge Curves: A Latent Variable Approach, *Melbourne Institute Working Paper Series*, no.15.

European Commission (2006), *Effective European active labour market policies*, in Employment in Europe 2006, Office for official publications of the European Communities, Luxembourg.

Fahr R. and Uwe Sunde (2006) Regional dependencies in job creation: an efficiency analysis for Western Germany, *Applied Economics*, vol. 38(10), pp. 1193-1206.

Fertig, M., Schmidt C. M. and Schneider H. (2006) Active Labor Market Policy in Germany - Is there a Successful Policy Strategy?, *Regional Science and Urban Economics*, 36, pp. 399–430.

Gerfin, M. and Lechner, M. (2002), A Microeconometric Evaluation of the Active Labour Market Policy in Switzerland, *The Economic Journal*, Vol. 112, No. 482 pp. 854-893.

Gorter C. and Van Ours J. (1994) Matching unemployment and vacancies in regional labour markets: an empirical analysis for the Netherlands, *Papers in Regional Science* 73, pp. 153-167.

Hansen, B. (1970) Excess demand, unemployment, vacancies and wages, *Quarterly Journal of Economics* No. 84, pp. 1–23.

Heckman, James J., Robert J. Lalonde and Jeffrey A. Smith. (1999) "The Economics and Econometrics of Active Labor Market Programs." In Orley Ashenfelter and David Card (eds.), *Handbook of Labor Economics*, Volume 3A. Amsterdam and New York: Elsevier, pp. 1865-2095.

Holt, C. and M. David, (1966) The concept of vacancies in a dynamic theory of the labor market, in *Measurement and Interpretation of Job Vacancies*, ed. NBER. New York: Columbia University Press.

Hujer R., Blien U., Caliendo M., Ziess C. (2006) Macroeconometric Evaluation of Active Labour Market Policies in Germany – A Dynamic Panel Approach Using Regional Data, in F. E. Caroleo and S. Destefanis (eds.) *The European Labour Market: Regional Dimensions*, Physica Verlag, Heidelberg.

Ilmakunnas, P., and Pesola H. (2003) Regional Labour Market Matching Functions and Efficiency Analysis, *Labour*, 17(3), 413–437.

Jackman, R., Layard, R. and Savouri, S. (1990) Mismatch: a framework for thought. *CEP discussion paper* No. 01

Jones D. and Manning D. (1992) Long term unemployment, hysteresis and the unemployment–vacancy relationship: a regional analysis, *Regional Studies* 26, 17-29.

Kluve Jochen (2010) The effectiveness of European active labor market programs, Labour Economics (forthcoming,)

Kluve J., D. Card, M. Fertig, M. Gora, L. Jacobi, P. Jensen, R. Leetmaa, L. Nima, E. Patacchini, S. Schaffner, C.M. Schmidt, B. van der Klaauw, A. Weber (2006) Active Labor Market Policy in Europe: Performance and Perspectives, Springer, erscheint in Kürze.

Layard R., Nickell S., Jackman R. (1991), *Unemployment: Macroeconomic Performance and the Labour Market*, Oxford University Press, Oxford.

Lechner M. and C. Wunsch (2009), Active labour market policy in East Germany: Waiting for the Economy to Take Off, *The Economics of Transition*, vol. 17(4), pp. 661-702

Martin J.P. (1998) What Works Among Active Labour Market Policies: Evidence from OECD Countries' Experiences," RBA Annual Conference Volume, in: Guy Debelle & Jeff Borland (ed.), Unemployment and the Australian Labour Market Reserve Bank of Australia

McVicar, D. and Podivinsky, J.M. (2010) Are active labour market programs least effective where they are most needed? The case of the British New Deal for Young People. In, EALE/SOLE 3rd International Conference, London, GB 17 - 19 Jun 2010.

Mortensen D. and Pissarides C. (1994) Job Creation and Job Destruction in the Theory of Unemployment, *Review of Economic Studies*. 61: 397– 415.

Mosley H. and K-U Müller (2007) Benchmarking Employment Services in Germany in: J. de Koning (ed.), *Evaluating active labour market policies: measures, public-private partnerships and benchmarking*, Edward Elgar, Cheltenham.

Nickell S. and Layard R. (1997) Labour Market Institutions and Economic Performance in Ashenfelter O., Card D., *Handbook of Labor Economics,* North Holland, London.

Pesaran, H.M. and Smith R. (1995) Estimating Long-Run Relationships from Dynamic Heterogeneous Panels, *Journal of Econometrics*, 109, pp. 79-113.

Petrongolo, B. and Pissarides, C. (2001) Looking into the black box: a survey of the matching function. *Journal of Economic Literature* 39, 390–431.

Pissarides, C. (2000) *Equilibrium Unemployment Theory*, 2nd edn. Cambridge, MA: MIT Press.

Puhani, P. A. (2003) Active Labour Market Policy and Labour Market Flows - Evidence from Polish Regional Data, *International Journal of Manpower*, 24, pp. 897–915.

Shimer, R. (2005) The Cyclical Behavior of Equilibrium Unemployment, Vacancies, and Wages: Evidence and Theory, *American Economic Review* 95 (1), 25-49.

Stock, J. H. and Watson M. W. (2002) Macroeconomic Forecasting Using Diffusion Indexes, *Journal of Business and Economic Statistics*, Vol. 20, No. 2, pp. 147–162.

Stock, J. H. and Watson M. W. (1998) Diffusion Indexes, *NBER working paper*. No. 6702

Trivellato, U. (2009), *Analisi e proposte in tema di valutazione degli effetti di politiche del lavoro*, Commissione di Indagine sul Lavoro, Rapporto n. 10, CNEL, Roma.

Trivellato, Ugo; Rettore, Enrico; Martini, Alberto, (2003) La valutazione delle politiche del lavoro in presenza di selezione: migliorare la teoria, i metodi o i dati?, *Politica economica*, (3), pp. 301-341.

Warren, R. S. (1991) The Estimation of Frictional Unemployment: A Stochastic Frontier Approach, *Review of Economics and Statistics*, 73(2), 373–377.

Wunsch, C. and Lechner, M. (2008). What did all the money do? On the general ineffectiveness of recent West German labour market programmes, *Kyklos*, 61(1), pp. 134–174.

Yashiv, E. (2006) Labor Search and matching in macroeconomics. European Economic Review, vol.50 (4), pp .909-36.

Appendix 1: Variables used in the empirical analysis

Transformation Code: 1 – no transformation; 2 – first difference; 3 – logarithm; 4 – first difference of logarithm; **Sample:** 1995-2007; **Frequency:** A - Annual; Q – Quarterly; **VI**: Average of the Variation Index over the period 1995-2007.

Table A.1: Variables used in factor analysis

	Short name	Description	Frequency	Tran	F/S	VI	Source
Social and economic context							
1	PCF	Percentage of Cooperative Firms	A	1	S	-2.1	Istat
2	ESI	Firm start-up Index	A	4	S	6.6	Istat
3	FBR	Firm Birth Rate	A	1	S	-8.1	Istat
4	HIAI	Household Internet Access Index	A	4	S	19.1	Istat
5	SURP	Solid urban waste recycled of total solid urban waste (%)	A	1	S	8.8	Istat
6	CAPI	Index of Cultural Activity Participation (number of visitors per institution)	A	4	S	3.4	Istat
7	CAPI2	Index of Cultural Activity Participation (number of visitors per km^2)	A	4	S	3.0	Istat
8	RDP	Research and Development employees per 1000 inhabitants	A	1	S	-0.6	Istat
9	NV	Number of volunteers (%)	A	1	S	-0.8	Istat
10	TA	Tourism Intensity Index	A	4	S	-0.2	Istat
11	ADR	Age Dependency ratio	A	4	S	-0.3	Istat
12	ER	Elderly Ratio	A	4	S	12.0	Istat
13	RP	Number of Resident Permits	A	4	S	1.2	Istat
14	RF	Number of Foreigners Resident	A	4	S	11.3	Istat
15	GRA	Growth Rate in Agriculture	A	1	S	-2.6	Istat
16	HE	Household Expenditure (Levels - 1995m Euro)	A	4	S	1.6	CambridgeReg
17	VAT	Value Added Tax	A	4	S	1.3	Svimez
18	GDP	GDP (Levels - 1995m Euro)	A	4	S	1.1	CambridgeReg
Crime							
19	RPCI	Recorded Property Crime Index	A	4	S	1.7	Istat
20	RVCI	Recorded Violent Crime Index	A	4	S	5.6	Istat
21	CPPI	Crime Public Perception Index	A	4	S	-0.9	Istat
22	VCR	Legality condition Index	A	4	S	5.6	Istat
Infrastructure							
23	FRTI	Freight-Rail Transportation Index	A	4	S	0.3	Istat
24	FTTW	Freight-Truck Transportation Weight	A	4	S	2.2	Istat
25	FTTI	Freight-Truck Transportation Index	A	4	S	2.7	Istat
26	RCI	Rail Commuters Index	A	4	S	-0.4	Istat
27	PTC	Public transport commuters (%)	A	1	S	-1.2	Istat
Households and education							
28	SSER	Secondary School Enrolment Rate	A	1	S	-1.9	Istat

29	SLSP	School-leavers at second year of secondary school of total secondary schools (%)	A	1	S	5.0	Istat
30	SLFP	School-leavers at first year of secondary school of total secondary schools (%)	A	1	S	2.5	Istat
Health							
31	SR	Smoker Rate	A	1	S	1.0	Istat
32	PCPHE	Public Healthcare Expenses per capita	A	4	S	4.8	Istat
33	PHE	Public Healthcare Expenses (%)	A	1	S	3.1	Istat
34	PCHE	Per capita Healthcare Expenses	A	4	S	6.0	Istat
Gross Value Added							
35	GVA	Total GVA (Levels - 1995m euro)	A	4	S	1.2	CambridgeReg
36	GVAA	GVA Agriculture, Forestry and Fishing (Levels - 1995m euro)	A	4	S	0.0	CambridgeReg
37	GVAEM	GVA Energy and Manufacturing (Levels - 1995m euro)	A	4	S	0.0	CambridgeReg
38	GVAME	GVA Mining and Energy Supply (Levels - 1995m euro)	A	4	S	0.8	CambridgeReg
39	GVAFBT	GVA Food, Beverages and Tobacco (Levels - 1995m euro)	A	4	S	0.8	CambridgeReg
40	GVATC	GVA Textiles and Clothing (Levels - 1995m euro)	A	4	S	-0.2	CambridgeReg
41	GVAFC	GVA Fuels, Chemicals, Rubber and Plastic Products (Levels - 1995m euro)	A	4	S	0.3	CambridgeReg
42	GVAE	GVA Electronics (Levels - 1995m euro)	A	4	S	1.2	CambridgeReg
43	GVATE	GVA Transport Equipment (Levels - 1995m euro)	A	4	S	-2.0	CambridgeReg
44	GVAOM	GVA Other Manufacturing (Levels - 1995m euro)	A	4	S	-0.5	CambridgeReg
45	GVAC	GVA Construction (Levels - 1995m euro)	A	4	S	1.1	CambridgeReg
46	GVAMS	GVA Market Services (Levels - 1995m euro)	A	4	S	1.7	CambridgeReg
47	GVAWR	GVA Wholesale and Retail (Levels - 1995m euro)	A	4	S	0.2	CambridgeReg
48	GVAHR	GVA Hotels and Restaurants (Levels - 1995m euro)	A	4	S	1.8	CambridgeReg
49	GVATC	GVA Transport and Communications (Levels - 1995m euro)	A	4	S	1.1	CambridgeReg
50	GVAFS	GVA Financial Services (Levels - 1995m euro)	A	4	S	1.9	CambridgeReg
51	GVAOMS	GVA Other Market Services (Levels - 1995m euro)	A	4	S	2.9	CambridgeReg
52	GVANMS	GVA Non-Market Services (Levels - 1995m euro)	A	4	S	1.7	CambridgeReg
Hours Worked							
53	HW	Total Hours Worked: (Hours Per Employee Per Week - Lfs Measure)	A	4	S	2.4	CambridgeReg
54	HWA	Total Hours Worked: Agriculture, Forestry And Fishing	A	4	S	2.3	CambridgeReg
55	HWEM	Total Hours Worked: Energy And Manufacturing	A	4	S	0.2	CambridgeReg
56	HWME	Total Hours Worked: Mining And Energy Supply	A	4	S	1.9	CambridgeReg
57	HWFBT	Total Hours Worked: Food, Beverages And Tobacco	A	4	S	1.7	CambridgeReg

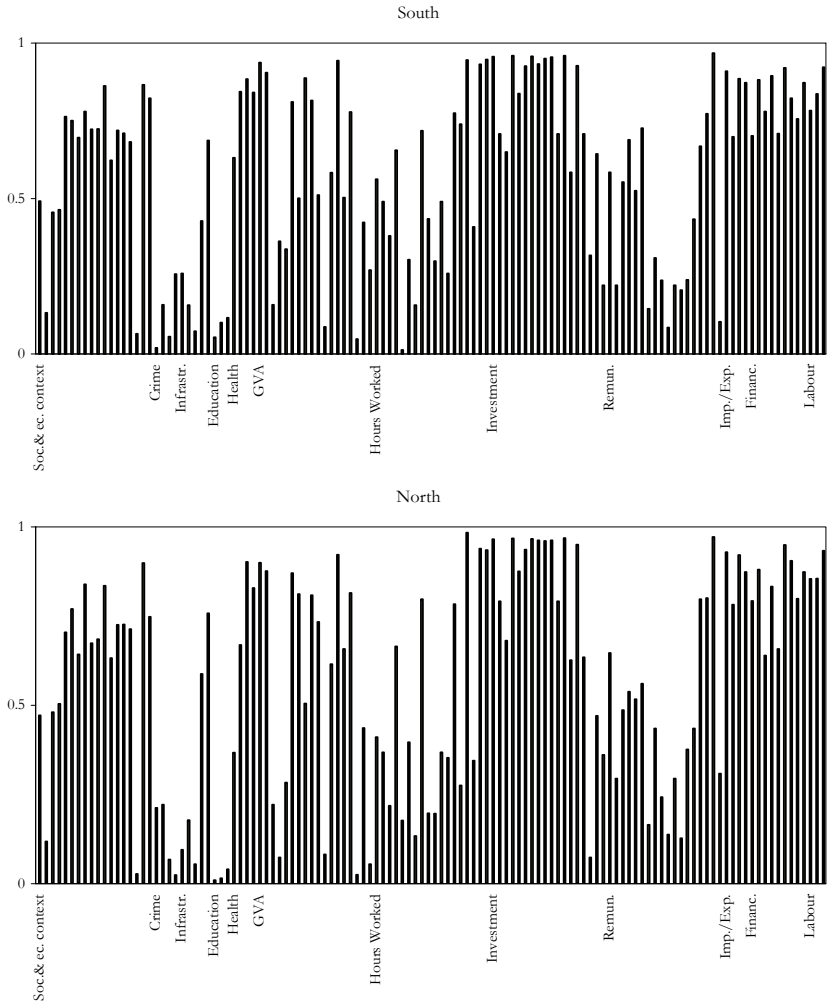
58	HWTC	Total Hours Worked: Textiles And Clothing	A	4	S	1.8	CambridgeReg
59	HWFC	Total Hours Worked: Fuels, Chemicals, Rubber And Plastic Products	A	4	S	1.7	CambridgeReg
60	HWE	Total Hours Worked: Electronics	A	4	S	1.7	CambridgeReg
61	HWTE	Total Hours Worked: Transport Equipment	A	4	S	1.7	CambridgeReg
62	HWOM	Total Hours Worked: Other Manufacturing	A	4	S	1.9	CambridgeReg
63	HWC	Total Hours Worked: Construction	A	4	S	1.5	CambridgeReg
64	HWMS	Total Hours Worked: Market Services	A	4	S	2.4	CambridgeReg
65	HWWR	Total Hours Worked: Wholesale And Retail	A	4	S	1.7	CambridgeReg
66	HWHR	Total Hours Worked: Hotels And Restaurants	A	4	S	1.7	CambridgeReg
67	HWTC	Total Hours Worked: Transport And Communications	A	4	S	1.7	CambridgeReg
68	HWFS	Total Hours Worked: Financial Services	A	4	S	1.7	CambridgeReg
69	HWOMS	Total Hours Worked: Other Market Services	A	4	S	1.7	CambridgeReg
70	HWNMS	Total Hours Worked: Non-Market Services	A	4	S	1.5	CambridgeReg
Investment							
71	IN	Total Investment (Levels - 1995m Euro)	A	4	S	1.6	CambridgeReg
72	INA	Total Investment Agriculture, Forestry And Fishing	A	4	S	1.7	CambridgeReg
73	INAEM	Total Investment Energy And Manufacturing	A	4	S	0.7	CambridgeReg
74	INME	Total Investment Mining And Energy Supply	A	4	S	-0.5	CambridgeReg
75	INFB	Total Investment Food, Beverages And Tobacco	A	4	S	4.0	CambridgeReg
76	INTC	Total Investment Textiles And Clothing	A	4	S	-0.1	CambridgeReg
77	INFC	Total Investment Fuels, Chemicals, Rubber And Plastic Products	A	4	S	0.4	CambridgeReg
78	INE	Total Investment Electronics	A	4	S	1.5	CambridgeReg
79	INTE	Total Investment Transport Equipment	A	4	S	2.2	CambridgeReg
80	INOM	Total Investment Other Manufacturing	A	4	S	0.1	CambridgeReg
81	INC	Total Investment Construction	A	4	S	5.2	CambridgeReg
82	INMS	Total Investment Market Services	A	4	S	1.6	CambridgeReg
83	INWR	Total Investment Wholesale And Retail	A	4	S	4.5	CambridgeReg
84	INHR	Total Investment Hotels And Restaurants	A	4	S	3.0	CambridgeReg
85	INTC	Total Investment Transport And Communications	A	4	S	3.6	CambridgeReg
86	INFS	Total Investment Financial Services	A	4	S	-2.3	CambridgeReg
87	INOMS	Total Investment Other Market Services	A	4	S	0.4	CambridgeReg
88	INNMS	Total Investment Non-Market Services	A	4	S	2.5	CambridgeReg
Remuneration							
89	TR	Total Remuneration (Levels - M Euro)	A	4	S	4.1	CambridgeReg
90	TRA	Total Remuneration Agriculture, Forestry And Fishing	A	4	S	2.0	CambridgeReg
91	TREM	Total Remuneration Energy And Manufacturing	A	4	S	2.9	CambridgeReg
92	TRME	Total Remuneration Mining And Energy Supply	A	4	S	2.4	CambridgeReg
93	TRFB	Total Remuneration Food, Beverages And Tobacco	A	4	S	3.6	CambridgeReg
94	TRTC	Total Remuneration Textiles And Clothing	A	4	S	3.0	CambridgeReg
95	TRFC	Total Remuneration Fuels, Chemicals, Rubber And Plastic Products	A	4	S	3.1	CambridgeReg
96	TRE	Total Remuneration Electronics	A	4	S	3.0	CambridgeReg
97	TRTE	Total Remuneration Transport Equipment	A	4	S	2.5	CambridgeReg

98	TROM	Total Remuneration Other Manufacturing	A	4	S	2.9	CambridgeReg
99	TRC	Total Remuneration Construction	A	4	S	3.2	CambridgeReg
100	TRMS	Total Remuneration Market Services	A	4	S	4.9	CambridgeReg
101	TRWR	Total Remuneration Wholesale And Retail	A	4	S	4.8	CambridgeReg
102	TRHR	Total Remuneration Hotels And Restaurants	A	4	S	4.9	CambridgeReg
103	TRTC	Total Remuneration Transport And Communications	A	4	S	3.5	CambridgeReg
104	TRFS	Total Remuneration Financial Services	A	4	S	3.2	CambridgeReg
105	TROMS	Total Remuneration Other Market Services	A	4	S	7.6	CambridgeReg
106	TRNMS	Total Remuneration Non-Market Services	A	4	S	4.7	CambridgeReg
Import/Export							
107	FDIA	Foreign Direct Investment Attraction Index	A	4	S	41.0	Istat
108	EHPC	Export of high/increasing productivity products (% of total export)	A	1	S	0.6	Istat
109	IEE	Intra-EU Exports	Q	4	S	4.9	ISTAT
110	EEE	Extra-EU Exports	Q	4	S	4.8	ISTAT
Financial Market							
111	CTC	Ratio of Credit to Total Credit	Q	1	F	2.5	Bank of Italy
112	DTC	Ratio of Deposits to Total Credit	Q	1	F	2.9	Bank of Italy
113	UCTC	Ratio of Unpaid Credit to Total Credit	Q	1	F	3.2	Bank of Italy
114	NB	Ratio of Number of banks to Working-age Population	Q	1	S	4.9	Bank of Italy
115	GC	Ratio of Granted Credit to Total Credit	Q	1	F	3.0	Bank of Italy
116	CCTC	Ratio of Claimed Credit to Total Credit	Q	1	F	2.5	Bank of Italy
117	IL	Interest rate on Loans	Q	1	F	2.9	Bank of Italy
118	ID	Interest rate on Deposits	Q	1	F	3.2	Bank of Italy
119	FI	Financial Intermediation Index	A	4	S	4.7	SVIMEZ
Labour Market							
120	UR	Unemployment Rate	Q	1	S	0.8	ISTAT
121	LUR	Long-term Unemployment Rate	Q	1	S	2.8	ISTAT
122	LF	Labour force	Q	4	S	3.8	ISTAT
123	ER	Employment Rate	Q	1	S	0.8	ISTAT
124	PR	Participation Rate	Q	1	S	21.2	ISTAT

Appendix 2: Detailed results on factor analysis

In this appendix for each variable we report detailed results for communalities and factor loading. Tables 5 and 6 in the main text are obtained by averaging the values presented in these figures over the categories reported on the horizontal axis.

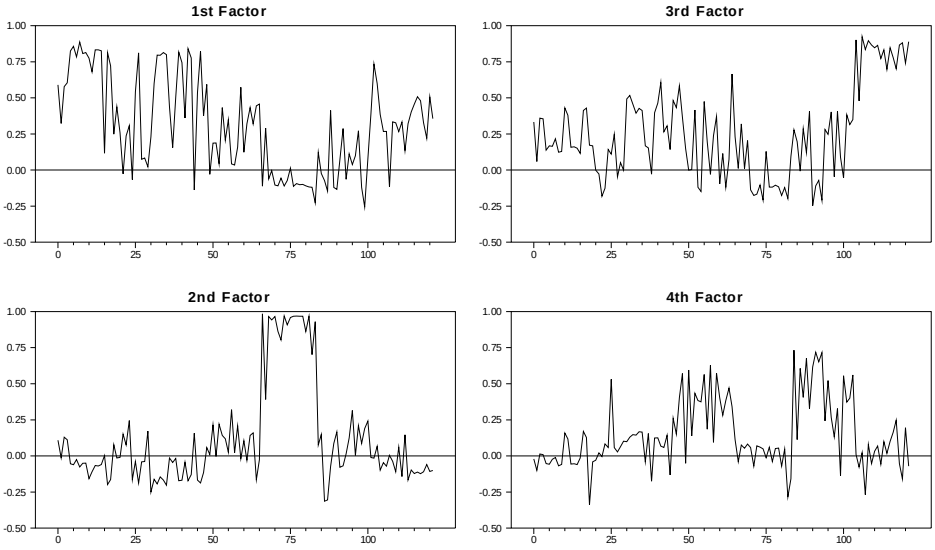
Figure A.1: Extracted Communalities



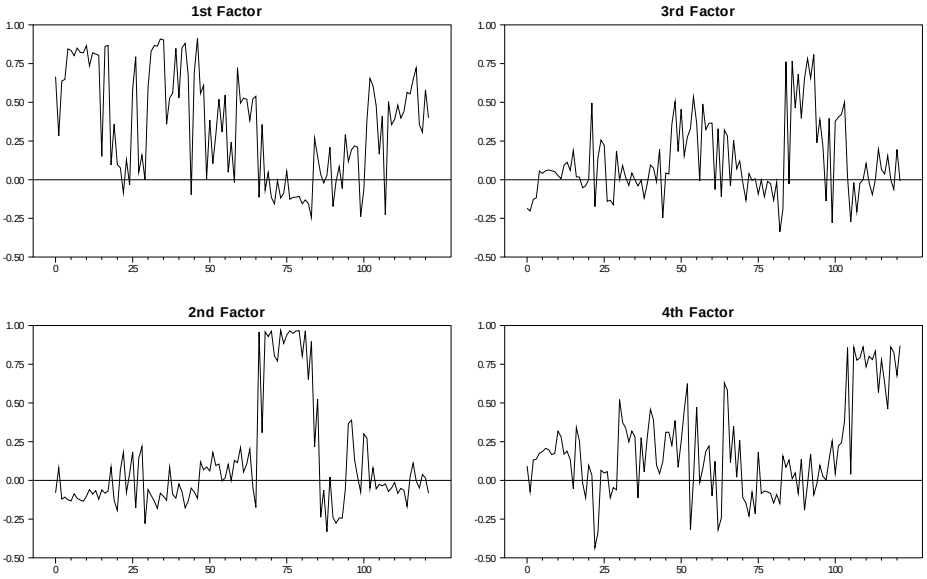
Note: Categories on the horizontal axis refer to the ordering of the variables as reported in Appendix 1. Then, 1-18 social and economic context; 19-22 crime; 23-27 infrastructure; 28-30 education; 31-34 health; 35-51 GVA; 53-70 hours worked; 71-88 investment; 89-106 remuneration; 107-110 import/export; 111-119 financial market; 120-124 labour market

Figure A.2: Loadings on selected principal components

South



North



Note: Numbers on the horizontal axis refer to the ordering of the variables as reported in Appendix 1. Then, 1-18 social and economic context; 19-22 crime; 23-27 infrastructure; 28-30 education; 31-34 health; 35-51 GVA; 53-70 hours worked; 71-88 investment; 89-106 remuneration; 107-110 import/export; 111-119 financial market; 120-124 labour market