Macroeconometric Evaluation of Active Labour Market Policies in Germany - A Dynamic Panel Approach Using Regional Data*

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Abstract Most evaluation studies of active labour market policies (ALMP) focus on the microeconometric evaluation approach using individual data. However, as the microeconometric approach usually ignores impacts on the non-participants, it should be seen as a first step to a complete evaluation which has to be followed by an analysis on the macroeconomic level. As a starting point for our analysis we discuss the theoretically expected effects of ALMP. Following that we estimate the impacts of ALMP in Germany for the time period 1999-2001 with regional data of 175 labour office districts. Due to the high persistence of German labour market data the application of a dynamic model is crucial. Furthermore our analysis accounts especially for the inherent simultaneity problem of ALMP. For West Germany we find positive effects of vocational training, whereas for job creation schemes no significant effect can be found. In East Germany we find only for structural adjustment schemes a weak evidence for a positive impact.

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1 Introduction

In view of the immense spending on active labour market policies (ALMP) in Germany (about 43 bn DM in 2001) and their debatable success, the evaluation literature has been growing rapidly in recent years.[1] Most studies focus on the microeconometric approach using individual data. The importance of this approach is straightforward and the framework for such an analysis is well developed.[2] However, as the microeconometric approach usually ignores impacts on the non-participants, it should be seen as a first step to a complete evaluation which has to be followed by a macroeconometric analysis. Instead of looking at the effect on individual performance, we would like to find out if the ALMP represent a net gain to the whole economy. This is likely to be the case only if the total number of jobs is positively affected by ALMP.

Most macroeconometric evaluations of ALMP are based on panel data models, since a single time series for one country or region usually does not provide enough observations. Between these studies, two major strands can be distinguished. First, authors like e.g. Forslund and Krueger (1994) or Calmfors and Skedinger (1995) use variation in programme scale across regional units (jurisdictions) combined with data at the regional level to estimate the effects. Second authors like Jackman, Pissarides, and Savouri (1990), Layard, Nickell, and Jackman (1991) or OECD (1993) use variation in programme scale across different countries even though such an analysis might suffer from the heterogeneous policy measures between the countries. As we want to evaluate the effects of ALMP in Germany for the recent years, our analysis will use a regional data set that enables use to estimate the net effect of ALMP for Germany. Due to the structural differences between West and East Germany we analyse both regions separately.

In 1998 the legal basis for the labour market policy in Germany has been changed to the new Social Code SGB III. Changes have been made not only in the objectives, like a more intensive focus on problem groups of the labour market, but also in the institutional organisation of labour market policy, leading to decentralisation and more flexibility in the regional allocation of resources to different measures. This decentralisation allows an adjustment to the situation on the local labour markets on one hand, and requires, on the other hand, that any evaluation takes regional aspects into stronger considerations than before. The importance of suitable data which allows to take regional heterogeneity into account has to be stressed. Especially in East Germany this is problematic due to permanent adjustments in the regional delimitations of the labour office districts ('Arbeitsamtsbezirke'). In contrast to other evaluation studies, this is not problematic for us because for the time span under consideration, no such changes occurred.

The aim of the study is to add a new perspective to the evaluation of ALMP in Germany. This is done by using regional data to obtain macroeconomic or net effects of these measures. The remainder of this paper is organised as follows. In the next section we discuss the micro- and macroeconometric evaluation approaches. Highlighting the advantages and shortcomings of each approach makes clear their necessity as additional ingredients to a complete evaluation. Section 3 gives an overview of ALMP in Germany and section 4 presents the used data. Following that we discuss briefly the possible effects of ALMP in a macroeconomic framework, before we present the empirical analysis and the results. Finally, the last section concludes and gives an outlook for further research.

[1] See Hagen and Steiner (2000) or Hujer and Caliendo (2001) for extensive overviews regarding micro- and macroeconometric evaluations of ALMP in Germany.

[2] See e.g. Heckman, LaLonde, and Smith (1999) or Smith (2000).

2 Micro- and Macroeconometric Evaluation

The ideal evaluation process consists of three steps. First, the impact of the programme on the participating individual should be estimated. Second, it should be examined if the impacts are large enough to yield net social gains. Finally, it should be answered if this is the best outcome that could have been achieved for the money spent (Fay, 1996). We will discuss the first two-steps, namely the micro- and the macroeconometric evaluation.

The main question of microeconometric evaluations is if the interesting outcome variable for an individual is affected by the participation in an ALMP programme. That being done, the direct gain can be compared with the associated costs and the success of the programme can be judged. However, microeconometric approaches estimate in nearly all cases the effect of treatment on the treated. One important concept in this context is the stable unit treatment value assumption (SUTVA, Rubin, 1980). One implication of SUTVA is that the effect of the intervention on each individual is not affected by the participation decision of any other individual, i.e. the treatment effect for each person is independent of the treatment of other individuals. This assumption guarantees that average treatment effects can be estimated independently of the size and composition of the treatment population. Among other things SUTVA excludes cross effects or general equilibrium effects. Even though its validity facilitates a manageable formal setup, in practical applications it is frequently questionable whether it holds. Looking at the immense amounts spent on ALMP in Germany (for details see section 4) and the large scale of the programmes, spill-over effects on non-participants are very likely.[3] Therefore the microeconometric approach is partial-analytic and should only be seen as one-step to a complete evaluation, or as Heckman (1999) puts it, microdata are no panacea and must be used in conjunction with aggregate time-series data to estimate the full general-equilibrium consequences of policies.

The main problem is here that a positive effect on the individual level need not to be positive on the aggregate level. Particularly ALMP is often suspected to have a positive effect on the individual level but a zero or even a negative effect for the whole economy. In this context, deadweight losses and substitution effects have received substantial attention in the literature (see e.g. Layard, Nickell, and Jackman (1991) or OECD (1993)). If the outcome of the programme is not different from what would have happened in its absence, we talk about a deadweight loss. A common example is the hiring from the target group that would have occurred also without the programme. If a worker is taken on by a firm in a subsidised job instead of an unsubsidised worker who would have been hired otherwise, we talk about a substitution effect. The net short-term employment effect in this case is zero. Such effects are likely in the case of subsidies for private-sector work. There is always a risk that the employers hold back ordinary job creation in order to be able to take advantage of the subsidies. In order to minimise this danger, a principle of additionality may be imposed. Another problem might be that ALMP may crowd out regular employment. This can be seen as a generalisation of the so called displacement effect. This effect typically refers to displacement in the product market, e.g. if firms with subsidised workers may increase output, but displace (reduce) output among firms who do not have subsidised workers. Calmfors (1994) also stresses the importance of tax effects in the sense that programmes have to be financed by taxes which distort the choices of both participants and non-participants.

[3] If we look at the typical small-scale U.S. programmes on the other hand, the occurrence of such effects is less likely.

3 Institutional Setup and Instruments of ALMP

Labour market policies in Germany are organised by the Federal Employment Office ('Bundesanstalt für Arbeit'). Up to 1998, the legal basis for the labour market policy in Germany had been the work support act ('Arbeitsförderungsgesetz', AFG), founded in 1969 which was followed by the new Social Code SGB III ('Sozialgesetzbuch'). Changes have been made not only in the objectives, like a more intensive focus on problem groups of the labour market, but also in the institutional organisation of labour market policy, leading to decentralisation and more flexibility in the regional allocation of resources to different measures.[4] Whereas the AFG had been implemented under full employment conditions, the SGB III was created in a rougher economic situation, where labour market policy is affected by narrower budget constraints. Some of the AFG's objectives, like the securance of a high employment ratio and the avoidance of low-quality employment, were dropped and a focus has been given on the (re-)integration of problem groups in the regular labour market (§7,3 SGB III) whilst using the resources in an efficient way ('Grundsatz der Wirtschaftlichkeit und Sparsamkeit'). Furthermore the self-responsibility of each individual is emphasised and the 'reasonableness-clause' ('Zumutbarkeitsklausel') is tightened, which makes it harder for unemployed to turn down job offers.[5]

Table 1 summarises the spending on and the entries into the most important measures, which are vocational training ('Förderung der beruflichen Weiterbildung', VT) on the one hand and subsidised employment, consisting of traditional job creation schemes ('Arbeitsbeschaffungsmaßnahmen', JCS) and structural adjustment schemes ('Strukturanpassungsmaßnahmen', SAS) on the other hand.

In principle, public vocational training under the AFG comprised three types of training measures, namely further training ('Fortbildung'), retraining ('Umschulung') and training to familiarise with a new occupation ('Einarbeitung'). The first two types have been summarised in one item (§§77-96, 153-159, 517 SGB III), whereas the latter is now part of the employment subsidies and will not be discussed here.[6] The Federal Employment Office pays the costs of the training measures and a subsistence allowance ('Unterhaltsgeld') to the participants, which amounts to 60 per cent (67 with one or more children) of the previous net income (equal to unemployment benefit). The main goals are to re-integrate unemployed by improving their skills and turn away the danger of unemployment for employees at risk.

Subsidised employment programmes consist of traditional job creation schemes and structural adjustment schemes. JCS (§§ 260-271 SGB III) should support activities which are of value to the society and additional in nature, which means that without the subsidy they could not be executed. They include limited employment for long-term unemployed to improve their labour market prospects. The FEO usually pays between 30% and 75% of the costs for 12 months and the rest is paid by the implementing institution, which is usually a non-profit organisation (public or private legal entities, mainly municipalities). Priority is given to projects which improve the chances for permanent jobs, that support structural improvement in social or environmental

[4] A good overview of the most relevant reforms can be found in Fitzenberger and Speckesser (2000). Sell (1998) presents an extensive discussion of the new SGB III, regarding especially the self-responsibility of employees for their own labour market success. Fertig and Schmidt (2000) explain and classify the different measures of employment promotion and explicitly distinguish between non-discretionary and discretionary measures. Brinkmann (1999) discusses aspects of decentralisation and regionalisation as well as the now mandatory output evaluations.

[5] Other interesting new features of the SGB III, like the special programme to combat youth unemployment ('JUMP'), individualised support through 'free promotion' as well as the reform law regarding the ALMP instruments ('JOB-AQTIV'), cannot be discussed here. For a comprehensive overview see Fitzenberger and Hujer (2002).

[6] See Hujer, Caliendo, and Radic (2001) for an overview of employment subsidies.

Table 1: **Labour Market Policies and Unemployment in Germany, 1999-2001**

	West-Germany						East-Germany					
	1999		2000		2001		1999		2000		2001	
Spending (in bn DM / % of total)												
Total Spending	83.25	–	78.14	–	80.29	–	52.04	–	47.83	–	48.35	–
Passive Labour Market Policies	53.31	64.03	47.11	60.29	48.72	60.68	27.88	53.58	26.82	56.08	27.10	56.05
Active Labour Market Policies	22.98	27.60	23.92	30.62	24.30	30.26	22.32	42.89	19.12	39.97	19.35	40.01
Vocational training (VT)	7.78	9.34	7.94	10.16	8.19	10.20	5.43	10.43	5.37	11.24	5.47	11.30
Job Creation Schemes (JCS)	2.14	2.58	2.00	2.56	1.69	2.10	5.66	10.88	5.20	10.87	4.13	8.55
Structural Adjustment Schemes (SAS)	0.25	0.30	0.25	0.32	0.25	0.31	1.23	2.36	1.15	2.40	1.45	3.01
SAS-East for Private Firms (SAS-East)	0.14	0.16	0.03	0.04	0.01	0.01	3.43	6.59	1.24	2.60	0.40	0.81
Participants (Entries)												
Vocational Training	264,811		285,921		338,516		166,745		190,751		226,616	
Job Creation Schemes	85,003		78,684		61,890		210,496		181,395		130,147	
Structural Adjustment Schemes	11,183		10,657		11,466		45,836		43,555		42,581	
SAM-East for Private Firms)	5,581		940		333		145,420		45,482		26,939	
Unemployed (in millions)	2.76		2.53		2.48		1.34		1.36		1.37	
Unemployment Rate (in %)	9.9		8.7		8.3		19.0		18.8		18.9	

Source: Bundesanstalt für Arbeit (2002)

services or that aim at the integration of extremely hard-to-place individuals. Especially in East Germany, structural adjustment schemes (§§272-279 SGB III) play a prominent role. Their goal is, analogous to JCS, the integration into regular employment, but less severe eligibility criteria apply to participants, so not only unemployed but also individuals threatened by unemployment may participate. The SAS consist of a wage subsidy equal to the average amount of unemployment allowance or assistance (including contributions to the social security system) which is paid on the Federal territory, typically for a maximum period of 36 months. In East Germany, the SAS may be implemented by public institutions and private companies ('SAM Ost für Wirtschaftsunternehmen', SAS-East), whereas in West Germany only the first is possible.[7]

Besides the above mentioned change of the objectives, there have been organisational changes, too, increasing the flexibility of ALMP on a regional and local level. The local employment offices are now allowed to allocate their budgets relatively freely to different measures. This leaves the decision of the mix of instruments free to the particular regional branch of the FEO (Brinkmann, 1999) and therefore allows an adjustment to the situation on the local labour markets. Typically, in situations with great imbalances in the labour market, JCS are preferred to training measures, whereas in areas with low unemployment rates hardly any JCS are started.

Consequently the dominantly used measure in the West (unemployment rate in 2001: 8.3%) is VT, where the expenditures amount to 8.19 bn DM in 2001, corresponding to a share of 10.2% of the total spending. The next important measures are JCS with a share of 2.1% and SAS with 0.31%. In East Germany (Unemployment rate in 2001: 18.9%), the situation is much more balanced. Again, VT is the most important programme (5.47 bn DM, 11.3%), but JCS (4.13 bn DM, 8.55%) follow closely. This gets also clear if we look at the number of participants entering the two types of programmes. Whereas in West Germany in 2001 over 338,000 individuals entered VT, only around 72,000 entered subisidised employment programmes. In East Germany on the other side around 226,000 individuals participated in VT and nearly 200,000 in subsidised employment programmes. After looking at the spending on the different measures and the participating individuals, it is also interesting to look at the average duration of the measures. This should give us important hints on the lag structure for our subsequent analysis. The average duration of the measures under consideration in 1999 lies between 8 and 10 months. JCS have the shortest duration with 8.3 months, followed by VT (8.4 months) and SAS with 9.8 months (Bundesanstalt für Arbeit, 2000).

4 The Dataset

The data of this study refers to labour market regions defined by the administrative areas of the regional offices of the FEO. These are the adequate units of the analysis since, as we have seen, the regional offices take some important decisions concerning the mix of measures of active labour market policy. Furthermore, the allocation of funds is done by indicators calculated for these areas. These indicators are: The local job seeker rate (this is the unemployment rate extended by the rate of people participating in measures of active labour market policy), the growth rate of employment, the rate of long-term unemployed and the rate of people who leave unemployment to start a regular job (Blien, 2002). The data comes from internal administrative processes of the FEO (Pallas-reg system of the Institute for Employment Research) and since it

[7]Since January 1998 SAS-East could also be requested in West-Berlin.

is used for the allocation of funds and for administrative purposes associated with legal claims it is especially reliable.[8] A special difficulty of regional labour market analyses is that the regional units used, i.e. the administrative areas of the local offices, are not constant in time. Especially in East Germany their shape has been changed very often. Therefore it is not always clear whether e.g. a change in the number of unemployed registered in a special office is due to a change in the conditions on the local labour market or whether it is due to a change in the size of the area which refers to this office. For the time span in question 1999 - 2001 no such changes occurred. Therefore difficult procedures of recalculation could be avoided.

Table 2: **Descriptive Statistics**

	West Germany			**East Germany**		
	Mean	Min	Max	Mean	Min	Max
Quarterly regional information on:						
Participants in JCS	356	3	2181	3882	1048	12547
Participants in SAS	62	0	1241	3105	514	9091
Participants in VT	1227	255	8500	3813	1139	8197
Unemployed	17092	3331	88317	36462	10671	74296
Dependent Labour Force	201539	59864	991637	194258	54113	368984
Unemployment Rate (in %)	8.85	2.68	18.07	19.12	12.85	26.89
Job Seeker Rate (in %)	9.79	2.94	19.37	25.32	16.57	34.86
Number of labour office districts			141			34
Number of observations			1692			408
Time range			1999:Q1-2001:Q4			1999:Q1-2001:Q4

Table 2 summarises the used data. We exploit a pooled time-series cross-section data set for the German labour office districts. The time span ranges from the first quarter 1999 to the fourth quarter 2001, leaving us 12 observations for each labour office district. The immense differences between the East and the West German labour market make it necessary to analyse both areas separately, so that we have 141 cross sections in West Germany and 34 in East Germany.[9] It is quite interesting to look at the regional variation in the data. There are huge differences not only between West and East Germany but also within each region. If we look at the regional job seeker rate, we have in West Germany an average of 9.79% in the time span under consideration, whereas in East Germany the average lies around 25.32%. The extreme values concerning the job seeker rate are 2.95% in Freising (South Germany, north of Munich) and 34.9% in Sangershausen (East Germany). Under the institutional structure of one country, very different labour market situations are discernible. Even if only Western Germany is regarded, there are high differences with 18.1% in Wilhelmshaven as the maximum value. These regional disparities provoke very different strategies of ALMP and therefore any evaluation of the efficiency of these measures must give more consideration than before to regional aspects.

5 Macroeconomic Analysis of ALMP

The estimation of macroeconomic effects is not straightforward, and compared to the number of micro analyses the existing literature is relatively small. The major obstacle, however, is that a

[8] Recently administrative checks have shown that a special kind of data with the same origin is biased. Especially one variable which gives the figure of job placements done by the local offices of the BA is affected by this bias. This variable is not used in our study. There are no hints that there are similar problems with other variables.

[9] Due to data limitations, Berlin is excluded from the analysis.

macroeconometric analysis of ALMP should be based on a theoretical framework that explains the relevant labour market variables (e.g. regular employment or unemployment). Thereby the main problem is not the availability of an appropriate theory but the availability of suitable data in order to implement the theory in an econometric model.

Considering the available theories, the question arises which theoretical framework is appropriate for the analysis of ALMP. Leaving aside the traditional way of 'cheating the Phillips curve', i.e. improving the unemployment-inflation trade-off and thereby reducing the nonaccelerating inflation rate of unemployment (Baily and Tobin, 1977), a model is needed that generates a positive equilibrium unemployment rate and is also capable of incorporating ALMP. For the theoretical analysis of ALMP the two most used models are the Layard and Nickell (1986) framework and the search model framework (see e.g. Pissarides (2000)). Both models differ by their primary reason for equilibrium unemployment. In the Layard and Nickell framework, unemployment is generated through a wage setting process that pushes the wage rate over the equilibrium rate generated by labour demand and labour supply. One possible explanation for these wage distortions is the power of unions in the wage bargaining process or efficiency wages. The Layard and Nickell framework is particularly suitable to consider the effects of ALMP on labour markets where wage distortions are a serious problem.

Search models on the other hand assign the cause of unemployment to a time and cost consuming matching process. The matching process serves as a proxy for the differences in the geographic and skill characteristics between the vacant jobs and the job seekers. Therefore the matching process can be used to summarise mismatch problems and structural imbalances on the labour market. Due to the traditional intention of ALMP to overcome these problems, the matching process should be one important aspect for the analysis of ALMP. Theoretical considerations based on the impacts of ALMP in these two frameworks are given for example by Johnson and Layard (1986), Holmlund and Linden (1993) or Calmfors and Lang (1995). For the analysis of ALMP clearly a combination of both frameworks as presented by Calmfors and Lang (1995) is useful, since mismatch and wage distortions are problems of the labour market especially in Germany. Calmfors (1994) and Calmfors, Forslund, and Hemström (2002) identified within such a theoretical framework various effects of ALMP. In the following we will briefly present the most important ones.

Effects on the Matching Process: ALMP can improve the matching process through several channels. First, ALMP can improve the active search behaviour of the participants. Second, ALMP can speed up the matching process by adjusting the structure of the labour supply to demand. Here we primarily think of retraining programmes that adapt the skills of the unemployed to the requirements of the vacant jobs. Third, the participation in an ALMP programme can serve as a substitute for work experience that reduces the employer's uncertainty about the employability of the job applicant. If ALMP can improve the matching process, the question is what are the effects on regular employment or the wages. First of all an improved matching process means that for a given stock of vacancies there is a greater inflow into employment.[10] Furthermore, the improved matching process reduces the average duration a vacancy remains unfilled. Since this reduces the costs of maintaining a vacancy firms provide more vacancies which is equivalent to an increase in the labour demand. The same effect also improves the firm's position in a wage bargaining process, since the firm can expect to fill a vacancy much

[10] This is equivalent to an inward shift of the Beveridge Curve.

quicker if a worker was laid off. Therefore the improved matching process also leads to a reduction of the wage rate. ALMP programmes are also expected to have negative effects on the matching process, i.e. so called locking-in effects. If a participation in an ALMP programme is associated with full time employment, there might be insufficient time for actively searching a regular job. In this case the search effectiveness of the participants is lower than the search effectiveness of the openly unemployed (Holmlund and Linden, 1993). Since this locking-in effect vanishes at the moment when the programme expires, the question is if the positive effects on the search effectiveness persist after the participation has ended.

Effects on Welfare of the Unemployed: If an ALMP programme rises the re-employment probability or if the compensation level is higher than the unemployment benefits, the ALMP programme rises the expected welfare of the unemployed. This is caused by the fact that an unemployed person faces a positive probability to being placed into a programme and thus faces a rise in the expected income. In the context of a wage bargaining process this is the same as an increase of the fallback income, i.e. the income that is obtained if the bargaining fails and the worker becomes unemployed (Layard, Nickell, and Jackman, 1991). The rise of the fallback income leads to a higher outcome for the wage rate, since the position of the workers in the bargaining process is improved. This effect of ALMP on the wage pressure is indeed not avoidable, since every improvement of the situation of the unemployed is connected with a reduction of the welfare losses.

Effects on the Competition in the Labour Market: ALMP (especially training programmes) are expected to improve the skills of the participants, i.e. to make the participants more competitive. This means not only that there is an improved competition between the unemployed but also an improvement of the competition between the employed and the unemployed, i.e. between the insiders and the outsiders. Additionally, ALMP can affect the competition if it stimulates the participants to search more actively (i.e. to counteract the discouraged worker effect) or it helps to rise the labour force participation. In both cases there is a rise in the effective labour supply, that leads to a reduction of the wage rate.

Effects on the Productivity: ALMP programmes that improve the skills of the participants or serve as a substitute for work experience, can be expected to improve or to maintain the productivity of the participants. Considering a conventional labour demand condition, a rise in the productivity would lead to an increase of employment for a given wage rate. Calmfors (1994) notes that the rise in the productivity is not self evident, because on the other hand there is the opportunity to produce the same output with fewer but more efficient workers. Additionally, Calmfors, Forslund, and Hemström (2002) note that the rise in the productivity of the participants may also have a wage rising effect through a rise in the reservation wage of the participants.

In order to set up the econometric model for the evaluation, we can use the preceding discussion to find the relevant relationships. In particular, theory suggests that there are effects on the matching process, on employment and on the wage rate. Therefore, a straightforward empirical implementation would be the estimation of a matching function (see e.g. Boeri and Burda (1996)) or a wage equation (see e.g. Calmfors and Forslund (1991)). Unfortunately, data limitations do not allow us to estimate such structural relationships. For this reason we follow the strategy of Calmfors and Skedinger (1995) and base our empirical analysis on a reduced form

relationship, explaining the total unemployment rate in the economy. Here we define the total unemployment as the stock of job seekers, i.e. the sum of openly unemployed and the programme participants. This is necessary to avoid estimating the bookkeeping effect, i.e. that a programme expansion leads automatically to a reduction in the stock of the openly unemployed.

6 Econometric Methods

The above described reduced form approach enables us to estimate the total net effect of ALMP, i.e the effect through all channels discussed (Calmfors, Forslund, and Hemström, 2002). The basic equation we want to estimate is

$$c(L)s_{it} = a_0 + \sum_{j=1}^{3} a_j(L)\psi_{it}^j + \sum_{k=1}^{K} b_k(L)x_{it}^k + u_{it}, \tag{1}$$

where s_{it} is the regional rate of total job seekers relative to the labour force, ψ_{it}^j (for $j = 1, 2, 3$) is a measure for the ALMP programmes and x_{it}^k (for $k = (1, \cdots, K)$) is a set of K other explanatory variables. As usual in the panel context, all variables are indexed by $t = (1, \cdots, T)$ as a time index and $i = (1, \cdots, N)$ is an index for the regions. $c(L) = 1 - c_1L - c_2L^2 - \cdots - c_pL^p$, $a_j(L) = a_{j0} + a_{j1}L + a_{j2}L^2 + \cdots + a_{jq}L^q$ and $b_k(L) = b_{k0} + b_{k1}L + b_{k2}L^2 + \cdots + b_{kq}L^q$ are associated polynomials in the lag operator with p and q as the maximum lag, where q need not be the same for all explanatory variables. The rate of total job seekers is given by the sum of unemployed and participants in ALMP programmes relative to the labour force. The ALMP programmes we analyse are divided into job creation schemes P_{it}^1, structural adjustment schemes P_{it}^2 and training programmes P_{it}^3. Since the job seeker rate contains the ALMP participants, a direct usage of the participation rates (i.e. programme participants relative to the labour force) would bias our results. To avoid this, we follow Calmfors and Skedinger (1995) and utilise so called accommodation ratios to express the regional ALMP activity. The accommodation ratios are defined as the stock of participants in a specific type of programme relative to the total rate of job seekers, i.e. $\psi_{it}^j = P_{it}^j/(U_{it} + \sum_{k=1}^{3} P_{it}^k)$ for $j = (1, 2, 3)$. For the further analysis, the ALMP accommodation ratios will be summarised as $\Psi_{it} = [\psi_{it}^1, \psi_{it}^2, \psi_{it}^3]$. Finally $X_{it} = [x_{it}^1, \cdots, x_{it}^K]$ includes national variables like the national unemployment and vacancy rate, and seasonal dummies to control for seasonal factors.

The imposed dynamic specification of equation (1) not only enables us to control for the high persistence of quarterly labour market data but also to analyse the time lag between a change of the ALMP activity and the associated impact on the regional job seeker rate. This is particularly advisable if we bear possible locking-in effects of ALMP programmes in mind. Our description of the German situation in section 3 has shown that the average duration of the programmes lies between 8 to 10 months. Therefore a lag of 4 quarters for the accommodation ratios is advisable. In particular, we will impose four lags for the job seeker rate and for the ALMP measures.

Equation (1) can be seen as a reduced form relationship that explains the job seeker rate as a function of the ALMP measures and other variables.[11] For the residual, we assume a one way error-component structure

[11] Using the job seeker rate as dependent variable allows us to draw conclusions for the regular rate of employment which is defined as $n = 1 - s$. The use of the job seeker rate would be problematic if ALMP programmes would attract people from out of the labour force into the labour force. In this case there would be a movement in the job seeker rate that should not be interpreted as a programme effect. But since nearly all programme participants are placed from the stock of unemployed this problem is negligible.

$$u_{it} = \mu_i + v_{it}, \tag{2}$$

where μ_i is a regional specific effect and v_{it} is a residual varying over regions and time.

In order to estimate the parameters of equation (1) we have to consider that it is reasonable to assume, that our explanatory variables are correlated with the regional specific effect. Especially for the lagged dependent variable this problem is obvious. To overcome this problem we apply the first-differenced GMM estimator suggested by Arellano and Bond (1991) and the system GMM estimator suggested by Blundell and Bond (1998). Both estimators utilise linear moment conditions that rely on the equations in first differences. For the lagged job seeker rate we set up the following linear moment conditions,

$$E(s_{it-g}\Delta u_{it}) = 0; \text{ for } t = 6, \cdots, T \text{ and } 2 \leq g \leq t-1, \tag{3}$$

where the start at $t = 6$ is due to the inclusion of four lags.

A major problem of the macroeconometric evaluation of ALMP is the interdependence between ALMP and the unemployment rate. With the intention of ALMP to counteract unemployment, it is most natural to think of the decision on how much money is spent on ALMP being determined by the unemployment rate. Generally, the level of ALMP activity is assumed to be determined by a policy reaction function where the unemployment rate is only one argument besides others (Calmfors and Skedinger, 1995). As our discussion in section 3 has shown, this is also true for Germany, as the allocation of funds to the local labour offices is done according to several indicators, including e.g. the job seeker rate and long-term unemployed.

As Calmfors and Skedinger (1995) note, one can hope that the utilisation of accommodation ratios in order to measure the ALMP activity weakens the problem of interdependence, because it is a priori not clear if an increase of the unemployment rate leads to a more or less proportional increase in the programme participation. Since the unemployment rate is a major part of the job seeker rate, it is reasonable to assume that the job seeker rate and the accommodation ratios are determined simultaneously. Following this discussion, we assume that the ALMP accommodation ratios are endogenous, i.e. $E(\Psi_{ig} v_{it}) \neq 0$ for $g \geq t$. These considerations enable us to build the following linear moment conditions analogously to the lagged dependent variable:

$$E(\Psi_{it-g}\Delta u_{it}) = 0; \text{ for } t = 6, \cdots, T \text{ and } 2 \leq g \leq t-1. \tag{4}$$

For the explanatory variables in X_{it} we assume that they are strictly exogenous, and therefore simply use the ΔX_{it} to instrument themselves, i.e. we impose the following K moment conditions:

$$E(\Delta X_{it}\Delta u_{it}) = 0. \tag{5}$$

The first-differenced GMM estimator is then calculated from the moment conditions (3), (4) and (5).

As presented in Ahn and Schmidt (1995), the linear first-differenced GMM estimator does not utilise all available moment conditions. Furthermore, Monte Carlo results from Blundell and Bond (1998) and Blundell, Bond, and Windmeijer (2000) have shown that in certain cases the first-differenced GMM estimator tends to be biased. As it was shown by Blundell and Bond (1998) and Blundell, Bond, and Windmeijer (2000), a poor performance of the first-differenced

GMM estimator can result from a highly persistent pattern in the dependent variable, or if the variance of the regional effect μ_i exceeds the variance of the residual v_{it}. Unfortunately, both cases seem to be an issue for our analysis.

To overcome the drawbacks of the first-differenced GMM estimator, we additionally implement the system GMM estimator suggested by Blundell and Bond (1998). The system GMM estimator uses additional moment conditions for the equations in levels that result from restrictions on the initial conditions. These conditions relate to the assumption that the first differences of the dependent variable is uncorrelated with the regional effect. Applied to our case this implies that we can build the following moment conditions for the job seeker rate

$$E(u_{it}\Delta s_{it-g}) = 0; \text{ for } t = 6, \cdots, T \text{ and } g = 1, \cdots, 4 \ , \tag{6}$$

where we allow for the inclusion of four lags in equation (1).[12] Note that if $E(u_{it}\Delta\Psi_{it}) \neq 0$, obviously Δs_{it} would be correlated with μ_i. Therefore we also need to assume that the Ψ_{it} process is uncorrelated with the regional effect in first differences. In this case the following moment conditions are valid:

$$E(u_{it}\Delta\Psi_{it-g}) = 0; \text{ for } t = 6, \cdots, T \text{ and } g = 1, \cdots, 4, \tag{7}$$

where g starts at 1 because we assume that Ψ_{it} is an endogenous regressor. For the remaining variables which are not determined by a regional specific component, we just impose the following k moment conditions, i.e these variables are used to instrument themselves:

$$E(u_{it}X_{it}) = 0. \tag{8}$$

For the calculation of the system estimator we use the full set of moment conditions (3), (4), (5), (6), (7) and (8).

In contrast to the first-differenced GMM estimator, there is no one-step estimator that is asymptotically equivalent to the two-step estimator. The consistency of both GMM estimators relies heavily upon the fact that there is no serial correlation in the residuals. Arellano and Bond (1991) provide an asymptotic normal test statistic for first- and second-order serial correlation that is reported in our results. A serious problem found in various Monte Carlo studies are the downward biased asymptotic standard errors of the two-step estimates.[13] This is because the standard expression for the asymptotic variance ignores the presence of the estimated parameters in the weight matrix (Bond and Windmeijer, 2002). In order to overcome this problem, we apply the finite sample correction proposed by Windmeijer (2000). Monte Carlo results have shown that the corrected variance of the two-step estimator often provides more reliable inference with size proportions similar to those of the one-step variance (Bond and Windmeijer, 2002).

7 Empirical Results

The estimation of the effects of ALMP on the job seeker rate (JSR) in both regions is done with the same model with the exception that for West Germany the structural adjustment schemes are due to their minor importance not included. The other ALMP measures, namely job creation schemes and vocational training are included for both regions.

[12] Note that due to the presence of the moment condition (3) the moment conditions for $g > 4$ would be redundant. Additionally the following moment conditions are valid in our situation: $E(u_{i5}\Delta s_{i5-g}) = 0$ for $g = 1, 2, 3$.

[13] See for example Arellano and Bond (1991).

For West Germany we have restricted the number of moment conditions for both GMM estimators. This is advisable because the time dimension $T = 12$ is relatively large compared to the number of cross sections $N = 141$. Since the moment conditions (3) and (4) use the whole history (e.g. $s_{it-2}, \cdots, s_{i1}$) as instruments the number of overidentifying restrictions becomes rather large. As discussed in Bond (2002) and Arellano and Bond (1998) the inclusion of too many instruments may result in overfitting biases. To avoid this problem we do not use the whole history as instruments in the moment conditions (3) and (4). For the first-differenced GMM estimator we have truncated the history after $t-8$ and for the system GMM estimator we have truncated it after $t-6$.[14] Note that even if we use the reduced set of instruments for the system GMM estimator the number of moment conditions exceeds the number of cross sections. The specification of the moment conditions (e.g. see Blundell, Bond, and Windmeijer (2000)) for the GMM estimators implies, that the two-step weight matrix is estimated only from N observations. In our case, the weight matrix for the system GMM estimator is estimated with less observations than instruments, anyway.[15] Although the system estimator suffers from this problem there is no evidence of an overfitting bias, so the results for the system GMM estimator look most reliable. For East Germany this problem is more severe since we have only 34 cross sections at hand. Due to the reduced number of cross sections and the unchanged time dimension the GMM estimators are not applicable for East Germany. Therefore we will only present the results from a least squares dummy variable (LSDV) estimator.

Table 3 reports the estimation results from the first-difference GMM (DIF GMM), the system GMM (SYS GMM) for West Germany and the LSDV estimator for East Germany. The results form the GMM estimators are the two-step estimates with corrected standard errors as proposed by Windmeijer (2000).

Results for West Germany: Considering the results from the DIF GMM and the SYS GMM estimators for West Germany, we do not find an evidence for second order serial correlation for any estimator.[16] In contrast, the test for first order serial correlation rejects the null hypothesis for both estimators. The Sargan test of overidentifying restrictions cannot reject the set of instruments for both estimators. The difference between both Sargan tests is 8.2 with 66 degrees of freedom, i.e. the additional set of instruments cannot be rejected. Turning to the coefficients for the lagged dependent variable, the results from the SYS GMM are associated with a more persistent pattern of the job seeker rate compared to the DIF GMM estimates. The coefficients for the job seeker rate sum up to 0.02 for the first-differenced GMM and to 0.95 for the system GMM estimator. The substantial difference between the first-differenced and the system GMM estimator indicates that the inclusion of the additional moment conditions for the level equations seems to be essential for the identification of the parameters of interest. In order to analyse the effects of the ALMP measures we rely on the cumulated lag coefficients and the long run multiplier. The cumulated lag coefficients describe the total impact of an ALMP extension in t on the job seeker rate in $t+g$.

[14] The presence of the additional moment conditions for the level equations makes it advisable to truncate the history at an earlier point in time compared to the first-differenced GMM estimator.

[15] In this case the weight matrix is calculated with a generalised inverse (see Arellano and Bond (1998) for details).

[16] Since the calculation of the second-order test statistics failed for the corrected standard errors we use the test statistic obtained from the conventional standard errors.

Table 3: **Estimation Results**[a]

		West Germany				**East Germany**	
		DIF GMM		*SYS GMM*		*LSDV*	
		Estimator		Estimator		Estimator	
Variable		Param.	t-value[b]	Param.	t-value[b]	Param.	t-value
	$CONST.$	-	-	0.3240	5.550	0.2725	3.820
Job Seeker Rate	JSR_{t-1}	0.4618	5.307	0.8678	17.330	0.6563	8.982
	JSR_{t-2}	-0.2517	-4.217	-0.1059	-1.391	-0.2031	-2.042
	JSR_{t-3}	-0.0159	-0.541	0.1023	2.996	0.1112	1.331
	JSR_{t-4}	-0.1702	-0.613	0.0931	0.796	0.4431	5.339
Participants in Job	JCS_t	-0.5682	-5.301	-0.8159	-5.680	-0.0117	-0.348
Creation Schemes	JCS_{t-1}	0.5786	4.984	0.8163	5.042	0.0161	0.394
	JCS_{t-2}	0.1082	0.936	-0.0120	-0.131	0.0010	0.032
	JCS_{t-3}	0.1277	1.545	0.0926	1.418	0.0156	0.593
	JCS_{t-4}	-0.1374	-1.276	-0.0800	-1.217	-0.0175	-1.060
Participants in Struct.	SAS_t	-	-	-	-	-0.1063	-2.703
Adjustment Schemes	SAS_{t-1}	-	-	-	-	0.0918	1.771
	SAS_{t-2}	-	-	-	-	0.0037	0.082
	SAS_{t-3}	-	-	-	-	-0.0227	-0.637
	SAS_{t-4}	-	-	-	-	-0.0184	-0.531
Participants in	VT_t	-0.2408	-3.801	-0.2035	-4.874	-0.0625	-1.458
Vocational Training	VT_{t-1}	0.1683	5.377	0.2226	6.084	0.0494	1.015
	VT_{t-2}	-0.0782	-3.198	-0.0681	-3.105	-0.0737	-1.608
	VT_{t-3}	0.0049	0.260	0.0265	1.232	-0.0522	-1.210
	VT_{t-4}	-0.0647	-2.144	-0.0394	-1.814	0.0313	0.845
National Unemployed	NUR_{t-1}	-0.0475	-0.055	-2.1393	-4.937	-3.0282	-3.253
Rate	NUR_{t-2}	0.7782	1.319	-0.2681	-1.027	0.2606	0.320
National Vacancies	NVR_{t-1}	3.0178	0.863	-1.7298	-1.295	0.9597	0.463
Rate	NVR_{t-2}	-3.4925	-3.094	-5.7844	-3.741	-2.5526	-1.236
Seasonal Dummy 1	SD_1	0.0045	0.648	-0.0099	-5.140	0.0083	2.269
Seasonal Dummy 2	SD_2	-0.0087	-1.042	0.0005	0.065	0.0163	1.292
Seasonal Dummy 3	SD_3	-0.0142	-1.397	-0.0017	-0.546	0.0035	0.721
Long Run Multiplier JCS		0.1114	0.748	0.0237	0.023	0.0693	0.506
Long Run Multiplier SAS		-	-	-	-	-0.4407	-1.601
Long Run Multiplier VT		-0.2156	-3.534	-1.4452	-2.592	0.2144	0.788
Wald test of joint significance		(21)	3617.29	(21)	39629.64	(26)	177368.99
Sargan test		(115)	124.06	(181)	132.25	-	-
First-order serial correlation		(141)	-2.23	(141)	-2.12	(34)	3.77
Second-order serial correlation		(141)	-0.74	(141)	0.06	(34)	2.39
No. of observations (N, T)			141, 12		141, 12		34, 12

[a] Degrees of freedom for the test statistics are in parenthesis.
Asymptotic standard errors and test statistics are asymptotically robust to heteroscedasticity.
DIF GMM are the two-step estimates from the first-differenced GMM estimator.
SYS GMM are the two-step estimates from the system GMM estimator.
[b] Corrected standard errors as suggested by Windmeijer (2000).

The long run multiplier is the impact after $t + \infty$, i.e. refers to the total effect of an ALMP extension. The cumulated lag coefficients for West Germany are plotted in Figure 1 up to $t + 6$ quarters and the long run multiplier can be found in Table 3. For job creation schemes we find a significant negative effect at the beginning that vanishes after the first quarter. Only the results from the system estimator bear evidence of a significant negative effect until $t + 6$. Looking at the long-run effects, we do not find any significant effect for JCS. Therefore, although there is a negative impact at the beginning, JCS are not able to reduce the job seeker rate in the long run. Turning to vocational training programmes we find a more promising picture. For both estimators we find throughout a significant negative effect. Furthermore the long-run effects are significantly negative. Hence we conclude that vocational training programmes in West Germany have a permanent negative effect on the job seeker rate.

Results for East Germany: Turning to the results for East Germany it has to be noted that the LSDV estimator is not consistent in the case of a dynamic panel data model. The consistency depends on T being large relative to N due to the incidental parameter problem. Therefore the results for East Germany should be handled with care, although the incidental parameter problem should not be too severe in the case of $N = 34$ and $T = 12$. In order to assess the effects of the ALMP measures, we will again inspect the cumulated lag coefficients and the long run multiplier. Figure 2 shows the cumulated lag coefficients for job creation schemes, structural adjustment schemes and vocational training programmes for East Germany. For JCS we do not find any significant effect on the job seeker rate. The cumulated lag coefficients and the long run multiplier are throughout positive but insignificant. Considering structural adjustment schemes, we find an insignificant effect that becomes significant after 4 quarters, however the long run multiplier is only hardly significant at a 10%-level. Finally we find for VT an insignificant positive effect that remains insignificant in the long-run, too. That means that also vocational training are not able to affect the job seeker rate in East Germany.

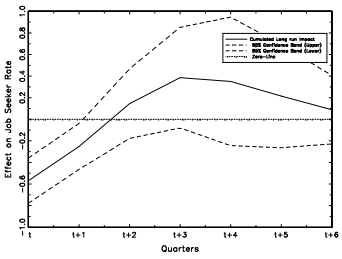
8 Conclusions

We were interested in estimating the net effects of ALMP in Germany. As microeconometric evaluations usually ignore impacts on the non-participants, we used a macroeconometric approach to analyse the effects of job creation schemes, structural adjustment schemes and vocational training on the employment situation in Germany for the time span from 1999 to 2001.

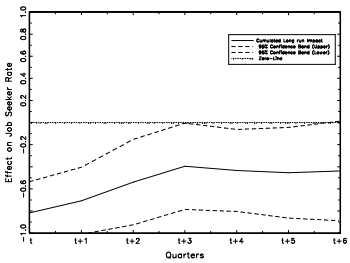
As a starting point of our analysis, we discussed various channels through which ALMP might influence the whole economy in a theoretical framework. Following that, we stressed the importance of suitable data for evaluation purposes which allow to take regional heterogeneity into account. This matters especially for the time period under consideration because the introduction of the New Social Code SGB III in 1998 decentralised the institutional organisation of labour market policy in Germany, allowing more flexibility in the regional allocation of resources to different measures. Due to this fact, any evaluation has to give more consideration to regional aspects than before. To do so we used a regional data set for 175 labour office districts in West and East Germany. The availability of quarterly data allowed us to take dynamics and persistency on the labour market into account. The fact that there are major differences between the East and the West German labour markets made a separate estimation for both areas necessary. We based our empirical specification on a reduced form relationship to evaluate

Figure 1: Cumulated Lag Coefficients West Germany

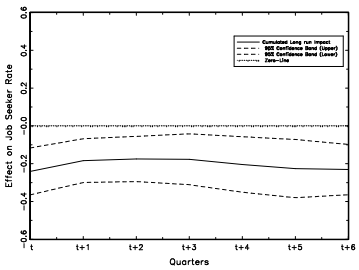
Job Creation Schemes (DIF GMM)



Job Creation Schemes (SYS GMM)



Vocational Training (DIF GMM)



Vocational Training (SYS GMM)

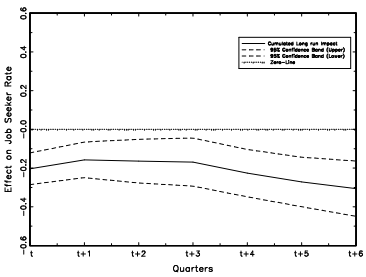
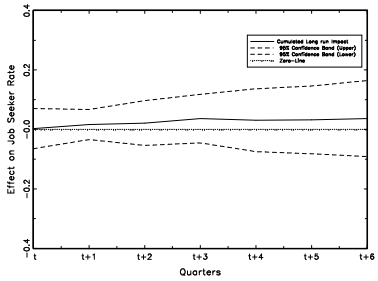
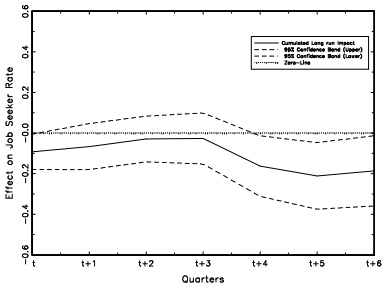


Figure 2: Cumulated Lag Coefficients East Germany

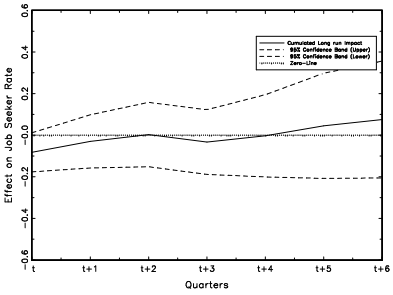
Job Creation Schemes



Structural Adjustment Schemes



Vocational Training



the impact of ALMP on the total rate of job seekers, i.e. the openly unemployed and the programme participants. To control for the problems arising from a dynamic panel data model, we applied the GMM estimation procedures suggested by Arellano and Bond (1991) and Blundell and Bond (1998). Furthermore we used the two-step standard error correction proposed by Windmeijer (2000) to make reliable inference about the two-step estimates. Within those methods for dynamic panel data models we also accounted for the inherent simultaneity problem of ALMP.

Our results indicate for West Germany that vocational training has a significantly negative effect, that is vocational training is able to reduce the job seeker rate. Job creation schemes do not seem to have any significant effect. Due to the small number of cross sections in East Germany, the application of the GMM estimators was not feasible. Therefore the results should be handled with care. For job creation schemes and vocational training we do not find any significant effects, whereas for structural adjustment schemes there is a weak evidence for a positive impact on the labour market situation.

A major task for future work is to analyse the several effects of ALMP with a structural model. Since a reduced form approach can only measure the net effect of ALMP, the different channels through which ALMP might effect the economy cannot be detected. The major problem here is the lack of suitable data that would allow to consider the effects of ALMP on the matching efficiency or on the wages. Basically, the ideal macroeconomic evaluation requires three things: First of all, a well developed macroeconomic theory which is, secondly, applicable in an econometric framework and finally does not fail due to data limitations.

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