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. To do so we discuss a theoretical labour market framework augmented by ALMP that enables us to find relevant channels how ALMP might influence the whole economy. This framework serves as a starting point for the following empirical analysis, where we use regional data of 175 German labour office districts and a dynamic panel estimator to evaluate the impacts of ALMP in Germany in the time period 1998-2000. Our analysis accounts especially for the inherent simultaneity problem of ALMP and dynamics on the labour market. Separate estimations for West and East Germany show considerable differences in the effects of ALMP in both regions. Whereas in West Germany vocational training and job creation schemes have positive effects on the labour market situation, the results in East Germany are at best insignificant.

Keywords: Evaluation, Active Labour Market Policy, Dynamic Panel Data Model, Matching, Beveridge Curve.

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Contents

1 Introduction

In view of the immense spending on active labour market policies (ALMP) in Germany (about 43 bn DM in 2000) and their debatable success, the evaluation literature has been growing fast 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 (Heckman, LaLonde, and Smith, 1999). 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 know 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.

Basically, two major strands of literature on how to estimate macroeconomic effects can be distinguished. First, the estimation of structural, general equilibrium models (see e.g. Davidson and Woodbury (1993) or Heckman, Lochner, and Taber (1998)). The advantage of these studies is that they make explicit assumptions about the mechanism generating the general equilibrium effects and also provide a framework that allows the estimation of many evaluation parameters (Smith, 2000). One obvious disadvantage, however, lies in the strong identifying assumptions they require. Second, authors like Forslund and Krueger (1994) use variation in programme scale across regional units (jurisdictions), combined with data at the regional level, to estimate the effects. This can in principle also be done on a national level with cross-country data, even though such an analysis might suffer from the heterogeneous policy measures between the countries.[2]

As we want to evaluate the effects of ALMP in Germany for the recent years, the second strand seems more appropriate and will be described in section 3. 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 organization of labour market policy, leading to decentralization and more flexibility in the regional allocation of resources to different measures. This decentralization allows an adjustment to the situation on the local labour markets on one hand, and requires, on the other hand, that any evaluation gives more consideration than before to regional flexibility.

The importance of suitable data which allows to take regional heterogeneity into account has to be stressed. Especially in 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. This should allow us to obtain more accurate results.

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 organized as follows. In the next section we discuss the micro- and macroeconometric evaluation approaches. Highlighting the advantages and shortcomings

[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. Jackman, Pissarides, and Savouri (1990)

of each approach makes clear their necessity as additional ingredients to a complete evaluation. Section 3 develops a framework for the analysis of the effects of ALMP on the matching efficiency, before we give an overview of ALMP in Germany and discuss the importance of regional analysis in section 4. Following that, we review previous empirical findings of macroeconomic evaluations in Germany before we get to our empirical analysis in section 6. The first part of this section presents briefly the dynamic panel data estimation approach used for our analysis, before our results are presented in the second part. Finally, section 7 concludes and gives an outlook for further research.

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. If one looks 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 estimation of general-equilibrium effects is not straightforward and compared to the number of micro-analysis the existing literature is relatively small. This might be due to several reasons, like the inherent simultaneity problem or the availability of suitable data. The issue of simultaneity arises because spending on ALMP should influence the labour market situation but might also be determined by it, which has to be taken into account. The major obstacle, however, is the absence of an obvious theoretical framework within which to couch the analysis. Leaving the traditional way of 'cheating the Phillips curve', i.e. improving the unemployment-inflation

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

trade-off and thereby reducing the nonaccelerating inflation rate of unemployment (Baily and Tobin, 1977) aside, a model is needed that explains the relevant labour market variables (e.g. regular employment or unemployment) and is also capable of incorporating ALMP.

Thinking about the numerous labour market models in the macroeconomic context, the question arises which model appropriate is for the evaluation issue. The two most used models, which focus on a positive equilibrium unemployment rate, 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 (1986) 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. Search models on the other hand assign the cause of unemployment to a time and cost consuming matching process. 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).

Using a combination of both frameworks, Calmfors (1994) summarizes various channels how ALMP might influence participants and the whole economy. The effects which have received substantial attention in the literature (see e.g. Layard, Nickell, and Jackman (1991) or OECD (1993)) are deadweight losses and substitution effects. 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 subsidized job instead of an unsubsidized 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 minimize 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 generalization of the so called displacement effect. This effect typically refers to displacement in the product market, e.g. if firms with subsidized workers may increase output, but displace (reduce) output among firms who do not have subsidized 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.

To see how problems can arise if one neglects such effects let us discuss an example. As the outcome variable of interest in Germany is usually the employment situation of participating individuals, we consider a wage subsidy programme that aims to increase the employment probability of long-term unemployed, by giving employees a subsidy if they hire an individual out of the target group. The usual microeconometric approach analyses the effects on the labour supply side of the market by looking at the individual's performance. So if the individual gets a job because of the subsidy, the programme were a success. The shortcoming is, however, the possible occurrence of substitution or displacement effects, e.g. if an unsubsidized worker is fired to hire a subsidized worker. Hujer, Caliendo, and Radic (2001) suggest to estimate the success of wage subsidies on the labour demand side of the market by looking at the employment

situation within the firm. Doing so, substitution effects within the firm already 'net out' and give a clearer picture of the net effects. Displacement effects between firms, however, cannot be detected with this approach. Clearly, these effects have to be taken into account if one intends to make statements about the net effect of ALMP.

After making clear the need for a macroeconomic evaluation, we are going to discuss a suitable framework for this type of analysis in the next section. Thereby we are going to concentrate on the effects of ALMP on the matching process of the labour market. This is particularly reasonable if ALMP is aimed to overcome structural problems on the labour market such as imbalances between labour demand and supply. The theoretical analysis will be done in a search model framework, which enables us to find the relevant relationships determining unemployment and employment, as well as the expected effects that ALMP might have. This analysis will then serve as a starting point for the empirical analysis in section 6.

Whilst concentrating on the matching process, we are not going to analyse possible effects on the wages and on the labour supply. This is mainly due to current data limitations and might be tackled in further studies. The effects of ALMP on wages are presented in the context of a search model by Holmlund and Linden (1993) and Calmfors and Lang (1995). The main results are that if ALMP lowers the welfare losses of unemployment, ALMP causes upward pressures on the wages.[4] The effects on the labour supply are represented to a large extent by the movements of the labour force and the effects on the labour force are mostly associated with movements of the wage rate[5], due the competition effect. The basic idea is that an increase in the labour force is likely to reduce wage pressures and therefore rises employment.

3 Effects of ALMP on the Matching Efficiency

An important intention of ALMP programmes is to improve the matching efficiency of the participants. Calmfors (1994) gives three explanations how ALMP can help to improve the matching efficiency. First, ALMP can rise the search intensity of the programme participants by encouraging them to search more actively. Second, ALMP can speed up the matching process by upgrading the skills of the participants and by adjusting the skills to the structure of the labour demand. The latter confirms the traditional intention of ALMP to overcome structural imbalances in the labour market by adjusting the structure of the labour supply to demand (Calmfors and Skedinger, 1995). Third, a programme participation can serve as a substitute for regular work experience which can reduce the employers uncertainty about the employability of the job applicant (Calmfors, 1994).

In order to evaluate the effects of ALMP on the matching process, we will first consider a matching function augmented by ALMP. The matching function serves as an approximation of the trading frictions in the labour market, where the matching process is costly and time consuming (Pissarides, 2000). The matching function determines the new hires into regular employment by the stock of effective job seekers and the stock of vacancies:

$$H = h(V, S), \tag{1}$$

[4] Empirical evidence for the wage rising effects of ALMP is for example given by Calmfors and Forslund (1991) in their empirical investigation for Sweden.

[5] See Calmfors (1994) and Calmfors and Lang (1995) for a detailed analysis.

where H is the number of matches, V the number of vacancies, S is the number of effective job seekers and h is a function that exhibits constant returns of scale.[6] The number of effective job seekers is defined as the weighted sum of open unemployed U and programme participants P, where the weights are given by the search effectiveness of U and P respectively (Holmlund and Linden, 1993). Assuming that the search effectiveness of the open unemployed is unity, whereas it is c for the participants we get:

$$S = U + cP. \tag{2}$$

The search effectiveness c can either lie between $0 \leq c \leq 1$ in the case when a programme participation implies a lower search effectiveness relative to unemployment, or can lie above unity if a programme participation implies a higher search effectiveness relative to open unemployed. In our context we assume that the parameter c summarizes several determinants of the search effectiveness for the ALMP participants. These determinants are given by the search intensity, i.e. how much effort a participant puts into searching actively for a job. Furthermore c captures the employability that is given by the skills or how well the skills are adapted to the requirements of the firm. Monitoring aspects play a role here, too, in the sense that if a firm can better assess the employability of a job aspirant, the hiring process may be accelerated.

To evaluate the impact of an ALMP programme on the search effectiveness one has to consider several factors. First, if a participation in an ALMP programme is associated with full time employment, it is reasonable to assume that the search effectiveness of the participants is lower than unity (Holmlund and Linden, 1993). Since in this case there might be insufficient time for actively searching a regular job we can expect locking-in effects. On the other hand, if the ALMP programme has the intention to adapt the skills of the participants to the labour demand or to improve the active search behaviour, it is reasonable to assume that search effectiveness is greater than unity. Therefore the question if the parameter c lies above or below unity depends heavily upon the type and the characteristics of the programmes under consideration.

However, taking the search effectiveness of the participants as given, leads to the question what the impacts of a programme extension are. To determine the steady state equilibrium unemployment rate we assume an exogenously given rate q at which workers are separated from their regular jobs (Holmlund and Linden, 1993). The steady state equilibrium is then determined by the equality of the hirings into regular employment from the pool of the job seekers and by the separations from regular employment:

$$h(v, u + cp) = q(1 - u - p), \tag{3}$$

where U, V and P are expressed as rates relative to the labour force L, i.e. $u = \frac{U}{L}$, $v = \frac{V}{L}$, and $p = \frac{P}{L}$. Furthermore the normalization enables us to determine employment n as $n = 1 - u - p$. Equation (3) is a so called revised Beveridge curve that implies for a given vacancy rate the equilibrium job seeker rate that is determined by the matching process and the quit rate q.[7] In comparison to the standard Beveridge curve explaining the unemployment rate as a function of the vacancy rate, the extension of the Beveridge curve by ALMP does not

[6] Furthermore it is assumed that: $\frac{\partial H}{\partial V} > 0$ and $\frac{\partial H}{\partial S} > 0$.

[7] The term 'revised Beveridge curve' refers to the job seeker-vacancy relationship (Calmfors, 1993, 1994)).

change their fundamental properties. This can be seen by implicit differentiation of (3) with respect to u and v and rearranging:

$$\frac{du}{dv} = -\frac{h_v(v,s)}{h_s(v,s)+q}, \tag{4}$$

where $h_v(v,s)$ and $h_s(v,s)$ denote the partial derivatives of $h(v,s)$ with respect to v and s. Condition (4) shows that the negative relationship between unemployment and vacancies also holds for the revised Beveridge curve. Hence a higher vacancy rate implies a lower steady state unemployment rate due to the improved conditions on the labour market.

Additionally, the revised Beveridge curve can be used to evaluate the impact of ALMP on the total rate of job seekers. Following Calmfors (1993), we can obtain the effects of a programme expansion on the stock of job seekers by implicit differentiation of (3) with respect to u and p:

$$\frac{du+dp}{dp} = -\frac{h_s(v,s)(c-1)}{h_s(v,s)+q}. \tag{5}$$

As can be seen from (5) an ALMP extension can only lead to an inward shift of the revised Beveridge curve if $c > 1$, i.e. if the programme participants search more effectively than the unemployed. Therefore it can be shown that if the matching between job seekers and vacancies is not instantaneously, ALMP can increase employment by improving the matching efficiency, where the rise in the matching efficiency results from the higher proportion of programme participants with a higher search effectiveness. Note that in the case where c is unity a programme extension would not lead to an increase in regular employment. In this case an ALMP extension would only lead to a bookkeeping effect since the rise in programme participation would be fully compensated by a reduction in unemployment. If the search effectiveness of the programme participants lies below the search effectiveness of the unemployed there would even be a reduction in employment since more workers were turned into a state with a lower probability to become employed.

In addition to this pure effect via the matching efficiency there is an effect on the firms employment decision. Hence we have to consider a mechanism that determines both employment and vacancies. Following Holmlund and Linden (1993) and Calmfors and Lang (1995), the present discounted value of the expected profit of a vacant job J_v is given by

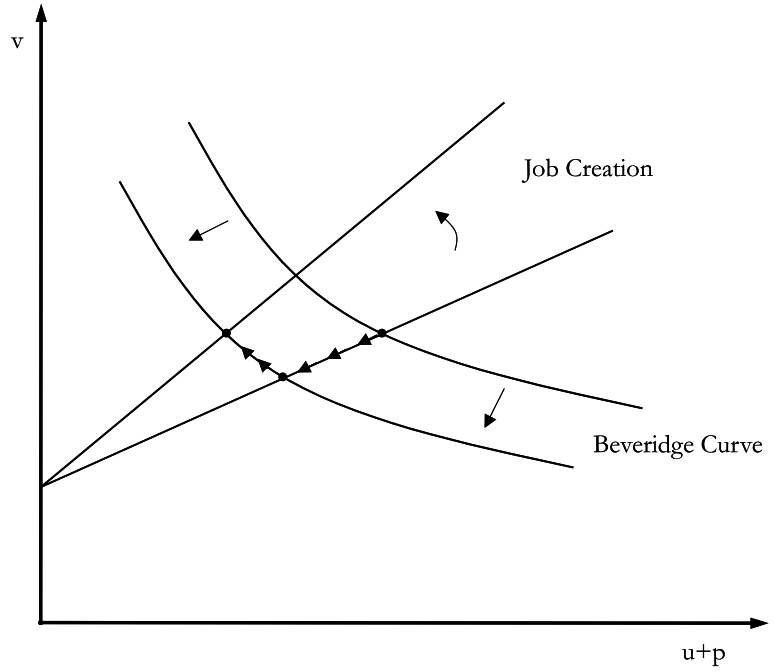
$$rJ_v = -k + \rho(J_o - J_v), \tag{6}$$

where r is the real interest rate, k is the cost of maintaining a vacancy, ρ is the rate at which vacant jobs are filled and J_o is the present discounted value of the expected profits from an occupied job. The rate at which vacant jobs are filled is defined by the matching function, that is $\rho = h(v,s)/v$ (Pissarides, 2000). The value of an occupied job J_o is given by

$$rJ_o = f'(n) - w - q(J_v - J_o), \tag{7}$$

where $f'(n)$ is the marginal product of labour and w is the real wage rate. An occupied job yields a surplus of $f'(n) - w$, and turns into a vacant job at the rate q. Since vacancies are opened as long as they yield positive profits, equilibrium requires $J_v = 0$. Therefore the firm's zero profit condition can be written as:

Figure 1: **Effects of ALMP on the Matching Process**



$$f'(n) = w + \frac{(r+q)k}{\rho}. \tag{8}$$

This equation corresponds to a marginal condition for the demand for labour that determines the total number of existing jobs (Jackman, Pissarides, and Savouri, 1990). The total number of existing jobs consists of the number of occupied jobs (regular employment) and the number of vacant jobs. Equation (8) is similar to a standard labour demand condition where the number of jobs is determined by the equality of the marginal product of labour and the wage rate. Additionally, due to the time and cost consuming matching process, the number of jobs depends on the expected present discounted costs of maintaining a vacancy. Hence, for a given level of employment, equation (8) determines the number of vacancies that are maintained by the firms. Employment is then determined by the Beveridge curve, that is by the number of job seekers and the number of vacancies that are brought together by the matching process and the separations from regular employment. Figure 1 draws the job creation curve and the negative sloped Beveridge curve from equation (3) into the $u + p$, v space. The equilibrium is given by the intersection of the Beveridge curve and the job creation curve.

If ALMP participants have a higher search effectiveness than the unemployed, i.e. $c > 1$, an extension of ALMP would lead to two important effects: First, as described above, the higher search effectiveness lowers the vacancy rate and the rate of job seekers since the flow into regular employment increases. This can be regarded as a shift of the Beveridge Curve to the origin. Second, from the improved matching process follows that a vacant job remains open for a shorter time. Therefore the firms expected present discounted costs of maintaining a vacancy decrease, so the firm will offer more vacancies. This can be represented by an anticlockwise rotation of the

job creation curve. Therefore the initial effect of the ALMP extension is reinforced by a move to the left on the Beveridge curve. Hence, the effect on the job creation increases employment. Furthermore, if ALMP can help to improve the marginal rate of job matching, i.e. make the Beveridge curve flatter, an increase in the vacancies lowers the rate of job seekers additionally (Jackman, Pissarides, and Savouri, 1990).

Moreover, ALMP can be seen especially in the case of training programmes to be able to increase the productivity of the participants. If this increase in the productivity of the participants is sufficient to rise the productivity of the whole economy, the firms are willing to open more vacancies and employment increases. On the other hand this might also lead to substitution effects since the firms only replace the hires from the stock of open unemployed with the hires from the more productive stock of participants. Calmfors (1994) notes furthermore that this effect on the labour demand is not self-evident since it is not clear if the scale or the substitution effect of a rise in the productivity dominates.

Employment subsidies work in the same direction since they lower the labour cost at given productivity. Therefore the firm is willing to create more jobs and employment increases. In the case of employment subsidies the substitution effect can lead to a substitution of regular employed workers with subsidized workers in order to lower the labour cost by holding employment constant, too.[8]

4 Active Labour Market Policies in Germany and the Dataset

We will start this section by giving a brief overview of the institutional setup and the instruments of ALMP in Germany, especially regarding the development after the introduction of the SGB III in the year 1998. Following that, we will describe the dataset used in our analysis, before we discuss the importance of regional analysis and the regional variation of the data at hand.

4.1 Institutional Setup and Instruments

Labour market policies in Germany are organized by the Federal Employment Office ('Bundesanstalt für Arbeit'). Up to 1998, the legal basis for the labour market policy in Germany has been the work support act ('Arbeitsförderungsgesetz', AFG), founded in 1969. From that point, the new Social Code SGB III ('Sozialgesetzbuch') took over this role. 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 organization of labour market policy, leading to decentralization and more flexibility in the regional allocation of resources to different measures.

Since the data we analyse ranges from 1998 to 2000, we focus on the SGB III and discuss the AFG very briefly. A good overview of AFG's historical evolution can be found in Staat (1997).[9] The improvement of the labour force structure, i.e. the adjustment of the labour supply to the changing labour demand, has been the primary goal in the early years. It was aimed to attend

[8] Note that in the definition of Layard, Nickell, and Jackman (1991) the displacement effect works in the same direction as the substitution effect but as a crowding out effect between different firms.

[9] The main goals can be found in §§1,2 AFG and have been: (a) securance of a high employment ratio, (b) avoidance of low-quality employment, (c) improvement of the structure of the labour force, (d) promotion of mobility, (e) social goals and (f) promotion of target groups.

the continual growth of the economy, that changed the labour market conditions permanently, with a continuous adjustment of the labour force structure to fulfill the new requirements. In detail, a short supply of jobs with specific (high-level) skills as well as an excess supply of jobs requiring low skills only was to be avoided. These goals had to be revised quite soon. At the end of 1973, the sharp rising unemployment rate in connection with the first oil price shock drove attention to the fight against this development. This becomes clear when we look at the participation structure of the ALMP. In the early 1970s, less than 15 per cent of all participants had been unemployed before participation, whereas in the 1980s this was the case for almost 80 per cent.

After some innovations and amendments, the AFG has been replaced by the SGB III in 1998. 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.

Whereas the AFG has been implemented under full employment conditions, the SGB III has been born 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. The most important goal (§7,3 SGB III) is the (re-)integration of problem groups in the regular labour market whilst using the resources in an efficient way ('Grundsatz der Wirtschaftlichkeit und Sparsamkeit').

As the government sees itself in a promoting role only, the SGB III places particular emphasis on the fact that employees have to act on their own authority regarding their labour market success. This comes together with a tightening of the reasonableness-clause ('Zumutbarkeits-klausel'), which for example makes it harder for unemployed to turn down job offers.

Besides the change of the objectives, there have been organizational 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. According to §§71b, SGB IV, several categories of ALMP must be financed by one single budget item ('Eingliederungstitel'), which is then assigned to the regional employment office. The new feature of the SGB III is now that the employment offices are free to set their priorities on how much weight to assign to each programme. This leaves the decision of the mix of instruments free to the particular regional branch of the Federal Employment Office (Brinkmann, 1999). This decentralization allows an adjustment to the situation on the local labour markets.

Furthermore, 10% of the budget can be used for 'free promotion' ('Freie Förderung', §10, SGB III), allowing a more individualized support. Each employment office has considerable flexibility to act with local focus, e.g. by implementing measures which are custom made for the situation at the local labour market.

Another promising feature is the so-called 'Eingliederungsplan' to avoid long-term unemployment. Under this new plan, the local labour exchange and the unemployed have to establish which active measures or which action from the unemployed will help to avoid a drifting off into (long-term)unemployment within six months after the begin of the unemployment spell.

Other interesting new measures, like the special programme to combat youth unemployment ('JUMP'), measures which are implemented in pathfinder regions and aim to promote the employment of low-qualified individuals or long-term unemployed ('CAST') 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).

Another new point in the SGB III is the mandatory output evaluation. The employment offices are now required to draw up output evaluations ('Eingliederungsbilanzen', §11, SGB III), including most importantly the employment status of each participant some time after completion of a measure. As our discussion made clear, any evaluation of efficiency and effectiveness of labour market policy must give more consideration than before to regional flexibility and take into account the various support strategies developed by the employment offices (Brinkmann, 1999). This is what we are trying to do in section 6.

Table 1: **Spending on Labour Market Policies in Germany, 1998-2000**

	1998		1999		2000	
	in bn DM	% of total	in bn DM	% of total	in bn DM	% of total
Germany						
Total Spending	133.18		135.29		125.96	
Passive Labour Market Policies	85.32	64.07	81.19	60.01	73.93	58.69
Active Labour Market Policies	39.40	29.59	45.30	33.48	43.04	34.17
Vocational training (VT)	12.51	9.39	13.20	9.76	13.31	10.57
Job Creation Schemes (JCS)	7.43	5.58	7.81	5.77	7.20	5.71
Structural Adjustment Schemes (SAS)	1.47	1.10	1.48	1.09	1.40	1.11
SAM-East for private firms (SAS-East)	3.13	2.35	3.57	2.64	1.27	1.01
Free Support (FS)	0.55	0.41	1.09	0.81	1.13	0.89
West Germany						
Total Spending	82.17		83.25		78.14	
Passive Labour Market Policies	56.26	68.47	53.31	64.03	47.11	60.29
Active Labour Market Policies	19.29	23.48	22.98	27.60	23.92	30.62
Vocational training (VT)	7.04	8.57	7.78	9.34	7.94	10.16
Job Creation Schemes (JCS)	1.98	2.40	2.14	2.58	2.00	2.56
Structural Adjustment Schemes (SAS)	0.25	0.30	0.25	0.30	0.25	0.32
SAM-East for Private Firms (SAS-East)	0.07	0.09	0.14	0.16	0.03	0.04
Free Support (FS)	0.22	0.27	0.50	0.60	0.54	0.70
East Germany						
Total Spending	51.01		52.04		47.83	
Passive Labour Market Policies	29.06	56.97	27.88	53.58	26.82	56.08
Active Labour Market Policies	20.11	39.43	22.32	42.89	19.12	39.97
Vocational training (VT)	5.47	10.72	5.43	10.43	5.37	11.24
Job Creation Schemes (JCS)	5.45	10.69	5.66	10.88	5.20	10.87
Structural Adjustment Schemes (SAS)	1.22	2.40	1.23	2.36	1.15	2.40
SAM-East for Private Firms (SAS-East)	3.06	5.99	3.43	6.59	1.24	2.60
Free Support (FS)	0.33	0.64	0.59	1.14	0.58	1.22

Source: Bundesanstalt für Arbeit (2001)

Table 1 shows the spending on labour market policies in Germany from 1998 to 2000. Whereas in 1998 only 29.6% of the total spending have been dedicated to active measures, the share rose to 34.2% in 2000. In West Germany, the share of ALMP's rose from 23.5% to 30.6% whereas it remained relatively stable in East Germany at around 40%. One obvious reason for the limited success in switching resources into active measures, is the constantly high unemployment rate in East Germany (see Table 2). As unemployment benefits are entitlement programmes and most active measures are discretionary in nature, the former increase automatically with a rising unemployment rate, whereas the latter are easier disposable.

The most important measures in 2000 have been vocational training ('Förderung der beruflichen Weiterbildung', VT) with 13.31 bn DM and subsidized employment, consisting of traditional job creation schemes ('Arbeitsbeschaffungsmaßnahmen', JCS) with 7.2 bn DM and structural adjustment schemes ('Strukturanpassungsmaßnahmen', SAS) with 2.67 bn DM.

Table 2: **Unemployment Rate in Germany, 1998-2000**

	1994	1995	1996	1997	1998	1999	2000
Germany	10.6	10.4	11.5	12.7	12.3	11.7	10.7
West Germany	9.2	9.3	10.1	11.0	10.5	9.9	8.7
East Germany	16.0	14.9	16.7	19.5	19.5	19.0	18.8

Source: Bundesanstalt für Arbeit (2001)

In principle, public vocational training under the AFG comprised three types of training measures, namely further training ('Fortbildung'), retraining ('Umschulung') and training to familiarize with a new occupation ('Einarbeitung').[10] The first two types have been summarized in one item (§§77-96, 153-159, 517 SGB III). The latter is now part of the employment subsidies and will not be discussed here.[11] 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.

Let us now turn to subsidized employment programmes, consisting of traditional job creation schemes and structural adjustment schemes. JCS is the more important programme in West and East Germany and the spending in 2000 sum up to 7.2 bn DM. JCS (§§ 260-271 SGB III) are normally only available to non-profit organisations. They should support activities which are of value for the society and additional in nature, that is without the subsidy they could not be executed. They include limited employment for long-term unemployed in projects to improve their labour market prospects. Even though JCS should be co-financed measures, where between 30% and 75% of the costs are subsidies by the FEO and the rest is paid by the implementing institution (public or private legal entities, mainly municipalities), exceptions can be made in the direction of a higher subsidy-quota (up to 100%). The subsidy is normally paid for 12 months but can be extended up to 24 and even 36 months if it is followed by regular

[10] See Hujer and Wellner (2000) for an overview of vocational training under the AFG.
[11] See Hujer, Caliendo, and Radic (2001) for an overview.

employment. Priority is given to projects which improve the chances for permanent jobs, that support structural improvement in social or environmental 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, the spending amounting to 2.4 bn DM in 2000. 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. The subsidy is typically paid for a maximum period of 36 (48) 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.[12]

Looking at the distribution of the spending on the different measures shows considerable differences between West and East Germany. The dominantly used measure in the West is vocational training, where the expenditures amount to 7.94 bn DM, corresponding to a share of 10.16% of the total spending. The next important measures are JCS with a share of 2.56% and SAS with 0.36%. In East Germany, the situation is much more balanced. Again, VT is the most important programme (5.37 bn DM, 11.24%) but JCS (5.2 bn DM, 10.87%) follows closely.

The discrepancy between both parts gets also clear if one looks at Figures B.1 and B.2 in the appendix. They show the number of participants in the three most important programmes for West and East Germany from 4/1997 to 4/2000. In West Germany, on average 200.000 thousand individuals participated in VT in every quarter, 50.000 in JCS and around 8.000 in SAS. The ratio between participants and unemployed has been 1:10. The situation in East Germany is as expected remarkably different. First of all, the participation in the different measures is more balanced. The most important measure is JCS with 143.000 participants on average, followed by SAS with 137.000 and VT with 134.000 and the ratio between participants and unemployed has been 1:3.

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 latter analysis. The average duration for 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).

4.2 The Dataset and the Importance of Regional Analysis

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

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

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 sources of the data on unemployment and labour market policy measures used in this study are the internal administrative processes of the FEO. 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. On the contrary, since the data are used for the allocation of funds and for administrative purposes associated with legal claims it could be expected that they are especially reliable. A detailed description of the data used can be found in the Tables A.1, A.2 and A.3 in the appendix.

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 1998 - 2000 no such changes occurred. Therefore difficult procedures of recalculation could be avoided. The data base of this study is taken from the Pallas-reg system of the Institute for Employment Research. This system includes aggregated data originated by the administrative processes in the FEO and data from other sources. The advantage of these data is that the information is made consistent in the dimensions of time and space. This is not an easy task, since there have been redefinitions of the data with respect to its content. The administrative processes changed during time according to different legal definitions and varying internal procedures of the Federal Employment Services. The data are prepared in a way that they can be used in scientific research.

The regional offices are free to decide between job creation schemes and measures of vocational training. 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. This can easily be seen from a comparison of the Figures B.3 and B.4 in the appendix. Figure B.3 shows the distribution of the job seeker rate in Germany. It is a very severe problem in the East. The lowest rates can be found in the south. Figure B.4 gives the relation between people participating in job creation schemes to those involved in measures of vocational training. The comparison of both maps shows the logic behind the regional distribution of the measures, since training is not very useful in areas where hardly any jobs are available. From the maps the size of the regional units used for the analyses can be seen. The maps show the great variation of the indicators used. The extreme values concerning the job seeker rate are 4.24% in Freising (Southern Germany, to the North of Munich) and 33.0% in Sangershausen (Eastern Germany). Under the institutional structure of one country, very different labour market situations are visible. Even if only Western Germany is regarded there are high differences with 18.32% in Gelsenkirchen as the maximum value. These regional disparities provoke very different strategies of labour market policy. Regional analysis can be used to gain variance (Krugman, 1991) for economic analyses. The estimates can be done by a far greater precision. Compared to data on individual participants of labour market policy schemes, regional data show e.g. indirect effects concerning the substitution of regular employment. The variation of

conditions on the labour market is under the constraint of the same institutional setting. Only between East and West Germany there are some differences in the laws to be applied and there are - of course - major differences with respect to the history of both areas and the productivity of the economy.

5 Previous Empirical Findings

We will now give a brief overview of the empirical findings from macroeconometric evaluations for Germany on a regional level.

Büttner and Prey (1998) use yearly data (1986 to 1993) from 74 planning regions of West Germany to evaluate the effects of training programmes and public sector job creation on the labour market efficiency. They use a disequilibrium approach and their results suggest that training programmes have no effect and job creation programmes have a significant positive effect on the matching efficiency. Prey (1999) extends this work by additionally controlling for the regional age structure and recipients of social assistance and estimating separately for men and women. She finds that VT increases (decreases) the mismatch for women (men), whereas JCS decreases the mismatch for men.

Pannenberg and Schwarze (1998) use the data from 35 local labour office districts to evaluate training programmes in East Germany. They use monthly data from 1992 to 1994 and find that the programmes have negative effects on the regional wages.

Steiner, Wolf, Egeln, Almus, Schrumpf, and Feldotto (1998) examine the effects of vocational training on the labour market mismatch using the data from 35 local labour office districts in East Germany. They observe only very small effects on the matching efficiency which disappear in the long-run.

Schmid, Speckesser, and Hilbert (2000) use yearly data from 142 local labour office districts to estimate the effects of further training, retraining, public sector job creation and wage subsidies on long-term unemployment in the period 1994-1997. They find that job creation programmes reduce only 'short' long-term unemployment (6-24 months), whereas vocational training reduces long-term unemployment ($>$ 24 months).

Hagen and Steiner (2000) evaluate vocational training, job creation schemes and structural adjustment schemes in East and West Germany using the data from local labour office districts. The time period under consideration differs and ranges from 1990-1999. The estimated net-effects are not very promising as all measures increase unemployment in West Germany. Only SAS reduces the unemployment rate slightly in East Germany, whereas JCS and VT increase it, too.

Blien et al. (2002) analyse the effects of ALMP on the development of regional employment in Eastern Germany and find positive impacts. They use detailed data form the employment statistics and the time span of 1993-99. Their regional units are 112 districs ('Landkreise/ kreisfreie Städte'). Their method is an econometric equivalent to conventional shift-share analysis (based on constrained regression), which is extended to include many determining variables.

6 Empirical Analysis and Results

The empirical analysis exploits a pooled time-series cross-section data set for the German labour office districts. The time span ranges from the fourth quarter 1997 to the fourth quarter 2000, leaving us with 13 observations for each labour office district. As discussed in section 4, the immense differences between the East and the West German labour market make it necessary to analyse both areas separately. The number of cross sections for West Germany are 141 and 34 for East Germany.[13]

Our empirical analysis will focus on the revised Beveridge curve presented in our theoretical discussion. We are not going to estimate a standard matching function alone, even though the estimation would be interesting as it answers directly the question whether ALMP raises the matching efficiency, especially the search effectiveness of the programme participants (in contrast to the unemployed). However, an estimation of the matching function does not deliver a complete picture of the effects of ALMP, as it only considers the effects on inflows into employment. By doing so, effects of ALMP on existing jobs are omitted. If for example ALMP helps to rise the new hirings, we do not know if these new hirings only replace already existing jobs leaving employment constant.

As we want to estimate the net effects of ALMP on the whole economy we stick with the revised Beveridge curve. It determines the equilibrium rate of job seekers that is associated with given flows into and out of employment. ALMP can either have impacts on the flow into employment e.g. by changing the matching efficiency or have impacts on the outflows from employment e.g. by affecting the wages. For this reason the Beveridge curve seems to be the right tool for the analysis since it can account for both.

6.1 Specification and Estimation

For the analysis of the effects of ALMP on the job seeker rate, the basic equation we want to estimate is

$$c(L)s_{it} = a_0 + \sum_{j=1}^{3} a_j(L)\psi_{it}^j + a_4(L)v_{it} + a_5(L)X_{it} + \varepsilon_{it}, \tag{9}$$

where the dependent variable is the regional rate of total job seekers s_{it}. $c(L) = 1 - c_1L - c_2L^2 - \cdots - c_qL^q$ and $a_k(L) = a_{k0} + a_{k1}L + a_{k2}L^2 + \cdots + a_{kq}L^q$ are associated polynomials in the lag operator with q as the maximum lag. As already defined in section 3, the rate of total job seekers is given by the sum of unemployed U_{it} and participants in ALMP programmes P_{it} 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. As presented in our theoretical analysis, equation (9) is a revised Beveridge curve that explains the job seeker rate as a function of the vacancies and the ALMP measures as well as other variables.

The explanatory variables include lagged values of the regional job seeker rate to control for persistence on the labour market. Furthermore we use lagged values of the regional vacancy rate v_{it} (relative to the labour force) as well as current and lagged measures for the regional ALMP activity. Since the job seeker rate contains the ALMP participants, a direct usage

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

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 utilize 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.

$$\psi_{it}^{j} = P_{it}^{j}/(U_{it} + \sum_{k=1}^{3} P_{it}^{k}) \tag{10}$$

for $j = (1, 2, 3)$. Finally the $1 \times K$ vector X_{it} captures other explanatory variables such as the regional population density and the national unemployment and vacancy rate, as well as seasonal dummies to control for cyclical and seasonal factors.

The imposed dynamic specification of equation (9) 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 4 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.

For the residual, we assume a conventional one way error-component structure:

$$\varepsilon_{it} = \mu_i + \xi_{it} \quad \text{with } \mu_i \sim \text{IID}(0, \sigma_\mu^2) \text{ and } \xi_{it} \sim \text{IID}(0, \sigma_\xi^2). \tag{11}$$

Since it is reasonable to expect that the regional explanatory variables are correlated with μ_i, a conventional OLS estimation of equation (9) would not be appropriate. One way to eliminate the individual effect μ_i is the within transformation. This can be performed by the pre-multiplication of equation (9) with a matrix $\mathbf{Q} = \mathbf{I_{NT}} - \mathbf{I_N} \otimes \frac{\mathbf{J_T}}{T}$, where $\mathbf{I_{NT}}$ is a $NT \times NT$ identity matrix and $\mathbf{J_T}$ is a $T \times T$ matrix of unity. N denotes the number of labour office districts and T the number of time periods available for each district. Performing a usual OLS estimation on the transformed equation then gives the within estimator.

In a dynamic specification with the lagged dependent as an explanatory variable, the within transformation does not eliminate all correlation of the explanatory variables with ε_{it}. Since the within transformation produces $y_{it}^{*} = y_{it} - \frac{1}{T}\sum_{t=1}^{T} y_{it}$, the lagged dependent variables y_{it-s}^{*} for $s = (1, 2, \cdots, q)$ will be correlated with ξ_{it} by construction (Baltagi, 2001). Therefore the within estimator will be biased and its consistency will depend on T being large.[14]

For this reason we will mainly focus on the estimation results obtained from the GMM estimator proposed by Arellano and Bond (1991). The Arellano and Bond GMM estimator can be summarized as follows: First, difference equation (9) to get rid of the individual effect

$$c(L)\Delta s_{it} = \sum_{j=1}^{3} a_j(L)\Delta\psi_{it}^{j} + a_4(L)\Delta v_{it} + a_5(L)\Delta X_{it} + (\xi_{it} - \xi_{it-1}), \tag{12}$$

where $\Delta = (1 - L)$. Equation (12) includes as explanatory variable s_{it-1}, which is obviously correlated with $(\xi_{it} - \xi_{it-1})$. Following Arellano and Bond (1991), the optimal GMM or two

[14] For the bias and the consistency of the within estimator in dynamic models see for example Nickell (1981) and Ridder and Wansbeek (1990).

step instrumental variable estimator results from the moment equations $E(\mathbf{Z_i}'\Delta\xi_i) = 0$, where $\mathbf{Z_i}$ is given by:

$$\mathbf{Z_i} = [\text{diag}(s_{i1}, s_{i1}\ s_{i2}, \cdots, s_{i1}\cdots s_{iT-2}), \mathbf{W_i}]. \tag{13}$$

Hence the matrix $\mathbf{Z_i}$ contains the optimal set of instruments for s_{it-1} in the block diagonal matrix $\text{diag}(s_{i1}, s_{i1}\ s_{i2}, \cdots, s_{i1}\cdots s_{iT-2})$. With the assumption that the remaining variables are strictly exogenous, i.e. $E(W_{it}\Delta\xi_{is}) = 0$ for all s, $t = 1, \cdots, T$ the instruments for s_{it-1} are combined with

$$\mathbf{W_i} = [\Delta v_i^0, \cdots \Delta v_{i,}^q, \Delta\psi_i^0, \cdots, \Delta\psi_i^q, \Delta X_i^0, \cdots, \Delta X_i^q], \tag{14}$$

where the uppercase letter indicates the lag of the variable.[15] Define the matrix of regressors as $\mathbf{Y_i} = [\Delta s_i^1, \cdots, \Delta s_i^q, \mathbf{W_i}]$, the GMM estimator for the parameters can then be obtained from

$$\hat{\delta} = \left[\left(\sum_i \mathbf{Y_i}'\mathbf{Z_i}\right)\mathbf{A_N}\left(\sum_i \mathbf{Z_i}'\mathbf{Y_i}\right)\right]^{-1}\left(\sum_i \mathbf{Y_i}'\mathbf{Z_i}\right)\mathbf{A_N}\left(\sum_i \mathbf{Z_i}'s_{i\cdot}\right) \tag{15}$$

The optimal choice for the weighting matrix $\mathbf{A_N}$ is given by $\mathbf{A_N} = (N^{-1}\sum_i \mathbf{Z_i}'\Delta\hat{\xi}_i\Delta\hat{\xi}_i{}'\mathbf{Z_i})^{-1}$ where $\hat{\xi}_i{}'$ are the residuals from a consistent one step estimator. This can be computed by using $\mathbf{A_N} = (N^{-1}\sum_i \mathbf{Z_i}'\mathbf{H}\mathbf{Z_i})^{-1}$ where $\mathbf{H}$ is a $T-2 \times T-2$ matrix with 2's on the main diagonal and -1's on the sub-diagonals and zeros otherwise (Arellano and Bond, 1991).

The consistency of the Arellano and Bond GMM estimator relies heavily upon the fact that there is no second order serial correlation in the residuals. Arellano and Bond (1991) provide an asymptotic normal test statistic that is reported in our results. Furthermore they note that since $\Delta\xi_{it}$ is assumed to be the first difference of serial uncorrelated errors, the first order serial correlation need not to be zero. Additionally, the test statistics for first order serial correlation are reported.

A major problem of the macroeconometric evaluation of ALMP is 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 beside others (Calmfors and Skedinger, 1995). As our discussion in section 4 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 utilization of accommodation ratios in order to measure the ALMP activity weakens the problem of interdependence. 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. Non-parametric estimates in Figure B.5 in the appendix show that there is a dependence between the unemployment rate and the accommodation ratios.

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. Therefore equation (12) would not be identified because of the nonzero correlation of ψ_{it}^j and ψ_{it-1}^j with

[15] For illustration $v_i^0 = [v_{iq}\cdots v_{iT}]$ and $v_i^1 = [v_{iq-1}\cdots v_{iT-1}]$.

$(\xi_{it} - \xi_{it-1})$. In particular if we assume that $E(\psi_{it}^j \xi_{is}) \neq 0$ for $s \leq t$ and all j, the coefficients for $\Delta\psi_{it}^j$ and $\Delta\psi_{it-1}^j$ would suffer from a simultaneity bias. To overcome the simultaneity problem one can build up a matrix of instruments for $\Delta\psi_{it}^j$ and $\Delta\psi_{it-1}^j$ in the same way as Arellano and Bond (1991) suggested for the lagged dependent variable. But if we think of ALMP to be determined by a policy reaction function, there may be more superior instruments available to deliver a more accurate prediction of $\Delta\psi_{it}^j$ and $\Delta\psi_{it-1}^j$. To do so, we classify the expected arguments in the policy reaction function into three types.

First, we consider regional labour market indicators that determine the ALMP decision made by the labour office. Additionally to the long-term unemployed, which are an indicator for the allocation of funds, we also include the youth unemployment rate, as instruments. The latter might be justified, as ALMP is often addressed to this group. Both indicators might be problematic since a correlation with $(\xi_{it} - \xi_{it-1})$ cannot be neglected. But since it is reasonable that there is a delay between a change in the regional indicators and an associated adjustment of the ALMP activity we use the regional indicators lagged two times as instruments.

Second, we follow Calmfors and Skedinger (1995) and assume that political factors influence the ALMP activity. Generally, political parties assigned to the political left are expected to encourage ALMP more than parties that are associated to the political right. To allow for these political factors in the policy reaction function, we include the share of regional parliament seats assigned to the Social Democratic Party and to the Christian Democratic Union. Furthermore we include a dummy variable that indicates if the executive is held by parties of the political left.

Finally, even though the SGB III has lead to decentralization and more flexibility in the regional allocation of resources to different measures, the legislative decisions are made on the national level. Therefore we include the lagged national long-term unemployment rate, too.

With these assumptions on the policy reaction function we build up a matrix $\mathbf{V_i}$ that contains the instruments for the contemporary and the first lagged ALMP accommodation ratios. $\mathbf{W_i}$ is then given by:

$$\mathbf{W_i} = [\Delta v_i^0, \cdots \Delta v_i^q, \mathbf{V_i}, \Delta\psi_i^2, \cdots, \Delta\psi_i^q, \Delta X_i^0, \cdots, \Delta X_i^q]. \tag{16}$$

Additionally, we also test an alternative specification where we assume that the vacancies are predetermined, i.e. $E(v_{it}\xi_{is}) \neq 0$ for $s < t$ and zero otherwise. With this assumption, the set up of the matrix of instruments must account for the correlation between v_{it} and ξ_{it-1} in equation (13). If we think of the vacancies as determined by the firms zero profit condition, one can argue that the job seeker rate influences the hiring costs. This can be explained by the improved matching process, caused by a higher job seeker rate that lowers the average time a vacancy remains open. Furthermore, if we assume that the reaction of the firms is not instantaneously, the vacancies are determined by the lagged job seeker rate. Following Arellano and Bond (1991), the matrix of instruments with predetermined vacancies has the following form

$$\mathbf{Z_i} = [\text{diag}(s_{i1}\ v_{i1}\ v_{i2}, s_{i1}\ s_{i2}\ v_{i1}\ v_{i2}\ v_{i3}, \cdots, s_{i1} \cdots s_{iT-2}\ v_{i1}\ \cdots\ v_{iT-1}), \mathbf{W_i}], \tag{17}$$

where $\mathbf{W_i}$ reduces to $\mathbf{W_i} = [\mathbf{V_i}, \Delta\psi_i^2, \cdots, \Delta\psi_i^q, \Delta X_i^0, \cdots, \Delta X_i^q]$.

In order to consider the sensitivity of the different instrumentation strategies, we will present the estimation results for all presented set of instruments in the appendix.

Due to the specification with four lags for the ALMP measures, the interpretation of the results is not straightforward. Furthermore, a contemporary effect of ALMP that affects the contemporary job seeker rate has additionally an impact on the future job seeker rate due to the autoregressive specification. For these reasons we will calculate the lag coefficients for the ALMP measures. The lag coefficients enable us to observe the effect of an ALMP extension in e.g. $t-4$ on Δs_{it} directly. These direct effects can be obtained by rewriting (12) as:

$$\Delta s_{it} = \sum_{j=1}^{3} \frac{a_j(L)}{c(L)} \Delta \psi_{it}^{j} + \frac{a_4(L)}{c(L)} \Delta v_{it} + \frac{a_5(L)}{c(L)} \Delta X_{it} + \frac{(\xi_{it} - \xi_{it-1})}{c(L)}. \tag{18}$$

The lag coefficients on the accommodation ratio j are then the individual terms in the infinite lag polynomial $b_j(L) = b_0 + b_1 L + b_2 L^2 \cdots = \frac{a_j(L)}{c(L)}$. To find a solution for these lag coefficients, one can use $b_j(L)c(L) = a_j(L)$ and equate the coefficients (Greene, 2000).

Since the lag coefficients are a nonlinear function of the terms in the polynomials $c(L)$ and $a_j(L)$, we use the delta method to calculate the standard errors. This method implies that the variance covariance matrix for the coefficients in $b_j(L)$ can be calculated from

$$\mathbf{\Sigma_{b_j}} = \mathbf{G} \mathbf{\Sigma_{c,a}} \mathbf{G}', \tag{19}$$

where $\mathbf{G}$ is a matrix of partial derivatives of the lag coefficients with respect to the estimated parameters and $\mathbf{\Sigma_{c,a}}$ is the covariance matrix for the estimated parameters (Greene, 2000).

The lag coefficients describe the impact on the change of the job seeker rate in $t+s$ originated from an ALMP extension in t. Additionally it would be interesting to consider the whole effect resulting from an ALMP extension, i.e. the total change of the job seeker rate after s quarters. This effect can simply be calculated by the sum of the lag coefficients, $b_0 + b_1 + b_2 + \cdots + b_s$. These cumulated lag coefficients enable us to assess the short- and medium-term effects on the job seeker rate resulting from an ALMP extension in t.

6.2 Results

Let us now turn to the results which are estimated separately for West and East Germany. To test the sensitivity of our results we present three instrumentation approaches for the Arellano and Bond estimator in first differences as well as a within estimation in levels.[16] The different sets of instruments, have been discussed already in the previous sub-section and are summarized in Table A.4 in the appendix, where we refer to them as IV A, IV B and IV C. IV A implies the instrumentation of the lagged job seeker rate. IV B additionally regards the simultaneity problem by instrumenting the contemporary and first lagged ALMP measures with regional variables (youth- (AL20) and long-term (LAL) unemployment rate), policy variables (Dummy for left-wing regional government (LRLD), share of regional parliament seats assigned to the Social Democratic Party (LSPD) and the Christian Democratic Union (LCDU)) and national factors (national long-term unemployment rate (BLAL)). Finally, IV C accounts in addition for predetermined vacancies. The results of the different instrumentation strategies enable us to

[16] All estimations were done with the DPD98 programme for Gauss written by Arellano and Bond.

consider sensitivity issues and allows us to choose a specification which will be used for further analysis, that is, estimating the short- and medium-term effects of ALMP on the job seeker rate, by computing the lag coefficients.

Results for West Germany Table A.5 in the appendix shows the two-step estimates for the three different sets of instruments. They differ only in a few cases to a change in the signs of the coefficients and most of these changes are given for the coefficients of the structural adjustment schemes SAS which are for West Germany of minor importance anyway. Comparing the results from IV A, IV B and IV C shows, that the standard errors for the latter instrumentation approach provide the lowest standard errors in most cases. The associated Wald test statistics of joint significance exceed the critical values for all three sets of instruments, the same holds true for the Sargan test statistic of overidentifying restrictions. Furthermore the second order serial correlation test statistic does not reject the null hypotheses for all estimations. Summarizing these test statistics, the IV C approach looks most favourable, so we decide to base our analysis on them. It is particularly interesting, that the instrumentation of the ALMP accommodation ratios and the regional vacancy rate leads to lower standard errors for the coefficients of the ALMP measures. The same holds true for the coefficients of regional and national vacancy rates. A comparison of the results from a within regression in levels and IV C is presented in Table 3. It can be seen that the results remain robust regarding the sign of the coefficients. There are only three cases where we observe different signs in the coefficients. For these cases, however, the results are not significant for the within estimator, but for the IV C estimator. Additionally the results show that the standard errors for the within estimator are generally larger than the standard errors for the Arellano and Bond estimator.

After having discussed sensitivity issues, we will now look at the parameters. We find evidence for the negative relationship between job seeker rate and vacancies, i.e. the existence of a revised Beveridge curve. Moreover the negative significant coefficients in both estimations for the national vacancies, suggest a strong interdependence between the regional and the national labour market. Put together this points in the direction that the job seeker rate reacts in the short-run to changes of the labour demand conditions. Additionally we find for West Germany highly significant coefficients on the lagged job seeker rate that support the evidence for the highly persistent unemployment rate in West Germany.

Turning to the coefficients of the ALMP accommodation ratios, we find no clear cut picture for their effects. Looking at Table 3, we observe that there is no consistent structure in the signs of the coefficients for all three programmes. The lag structures vary and do not allow a clear statement. Since we are interested in the isolated effect of an once-and-for-all increase of an ALMP measure on the job seeker rate, lag coefficients are the appropriate tool. Their estimation has been described in the previous section. We chose to calculate the effects for up to $t + 6$ quarters, as we had only 8 quarters for the estimation at hand.

Table 3: **Estimation Results for West and East Germany***

		West Germany				East Germany			
		Within-Estimator		Arellano Bond-Estimator - IV $C^{(a)}$		Within-Estimator		Arellano Bond-Estimator - IV $C^{(b)}$	
Variable		Param.	t-Value	Param.	t-value	Param.	t-Value	Param.	t-value
Job Seeker Rate	JSR_{t-1}	0.43458	6.395	0.37923	28.460	0.39715	5.116	0.15517	1.682
	JSR_{t-2}	-0.27999	-2.917	-0.26026	-43.286	-0.16957	-1.497	-0.22607	-2.390
	JSR_{t-3}	0.04870	1.179	-0.01950	-10.020	-0.09270	-0.781	-0.15339	-1.661
	JSR_{t-4}	-0.13147	-0.619	-0.19601	-17.222	0.26995	4.659	0.30117	4.807
Participants in	JCS_t	-0.25930	-3.573	-0.57561	-24.329	-0.01158	-0.548	-0.00023	-0.009
Job Creation Schemes	JCS_{t-1}	0.17193	2.177	0.44409	16.818	0.06490	3.580	0.06728	2.159
	JCS_{t-2}	0.04528	0.426	-0.09876	-6.471	0.01844	1.151	0.02860	1.671
	JCS_{t-3}	-0.05498	-1.076	0.05231	3.601	0.02568	1.680	0.03990	2.070
	JCS_{t-4}	-0.24882	-2.837	-0.30724	-28.214	-0.05114	-2.412	-0.04494	-2.142
Participants in	VT_t	-0.06716	-2.619	-0.12285	-15.771	-0.07377	-1.753	-0.03144	-0.474
Vocational Training	VT_{t-1}	0.06813	3.966	0.13211	17.264	0.09285	2.268	0.14801	2.391
	VT_{t-2}	-0.00663	-0.277	-0.01271	-2.089	-0.09094	-2.942	-0.07441	-2.266
	VT_{t-3}	-0.01070	-0.730	-0.00480	-0.627	-0.01491	-0.440	-0.01350	-0.368
	VT_{t-4}	-0.07218	-4.634	-0.08818	-19.577	0.02401	0.787	0.02411	0.662
Participants in Struct.	SAS_t	-0.43705	-2.937	-0.24361	-6.836	0.06881	1.931	0.10254	1.894
Adjustment Schemes	SAS_{t-1}	0.55174	4.978	0.38803	9.061	0.09728	2.059	0.07285	1.393
	SAS_{t-2}	-0.12567	-0.710	-0.10350	-3.296	-0.01478	-0.329	0.02144	0.630
	SAS_{t-3}	0.04674	0.260	0.31850	9.969	-0.02864	-0.775	-0.03162	-0.920
	SAS_{t-4}	-0.43311	-2.126	-0.52644	-14.107	-0.05253	-1.611	-0.07962	-2.408
Vacancies	VAC_{t-1}	-0.04229	-0.725	-0.09537	-8.978	0.08250	0.435	0.11492	0.542
	VAC_{t-2}	-0.07128	-1.552	-0.08879	-6.536	0.24603	1.145	0.21790	0.981
	VAC_{t-3}	0.05500	1.022	0.03536	4.449	-0.05526	-0.226	0.00462	0.018
	VAC_{t-4}	-0.27879	-3.640	-0.26954	-17.167	-0.03928	-0.198	0.10006	0.471
Reg. Pop. Density	$REGPOP_t$	0.00547	1.043	0.02823	7.507	0.02130	0.865	-0.00490	-0.138
Employed	$EMPL_{t-1}$	0.03589	2.143	0.01653	3.652	-0.10084	-1.579	-0.16836	-2.730
National Unemployed	$UNEMPL_{t-1}$	-0.84262	-1.365	-1.26487	-11.214	-0.47868	-0.323	1.62019	0.990
	$UNEMPL_{t-2}$	0.56805	1.984	0.63664	14.772	0.84904	2.287	0.50669	0.972
National Vacancies	$NAVAC_{t-1}$	-6.67064	-11.030	-7.56823	-41.632	-0.92903	-0.428	-1.05131	-0.516
	$NAVAC_{t-2}$	-1.81959	-0.622	-4.31981	-11.563	-5.14853	-1.260	-1.34862	-0.312
Seasonal Dummies	SD_1	-0.01586	-6.492	-0.01985	-32.680	-0.00467	-0.526	0.00097	0.116
	SD_2	-0.00169	-0.456	-0.00474	-10.756	-0.01990	-2.515	-0.02661	-2.945
	SD_3	-0.00108	-0.165	-0.00382	-6.186	-0.01249	-1.853	-0.00721	-0.875
Wald test of joint significance		16871.87 (32)		1061616.76 (32)		99875.47 (32)		92921.20 (32)	
Sargan test		-		125.08 (120)		-		248.70 (120)	
First-order serial correlation		-2.15 (141)		-1.70 (141)		-3.56 (34)		-2.07 (34)	
Second-order serial correlation		5.17 (141)		0.59 (141)		0.23 (34)		0.29 (34)	
N,T		141,9		141,8		34,9		34,8	

*Degrees of freedom for the test statistics are in parenthesis.
(a) Two-step estimates
(b) One-step estimates

The lag coefficients for each quarter $t, t+1, ..., t+6$ as well as the cumulated lag coefficients (CLC) can be found in Table A.7 in the appendix. The latter are also depicted in Figure 2. Aside from the CLC we also plotted a 95%-confidence interval to test the significance of the results. For interpretation purposes it is worth noting, that a negative CLC implies a positive effect of ALMP, that is if a programme is able to bring down the job seeker rate it is favourable. In this sense, a negative CLC implies an inward shift of the Beveridge curve, i.e. a given level of vacancies is associated with a lower job seeker rate.

Let us start with the results for West Germany on the left side of Figure 2. The first picture shows the effects of job creation schemes on the job seeker rate. It can be seen that the results show a throughout negative influence of JCS on JSR. We can assume that a 1% rise in JCS leads to a drop of the JSR of -0.213% after two quarters. This can be referred to as the short-term effect. In the medium-term (after six quarters) the result is even better, the CLC sums up to -0.492. The confidence bands are relatively narrow, so the effects seem to be robust. This is not the case for structural adjustment schemes which are depicted below in the second picture. The confidence bands are wide and include in 3 out of 6 quarters the zero line. Therefore, a significant effect could not be found. However, as already noted the results for SAS should be treated with caution. Turning to vocational training gives us a slightly different picture. Even though the CLC remain close to zero in the short-term for the first three quarters, a significant negative effect on the JSR can be found after the fourth quarter. In the medium-term we find a significant effect of -0.107.

Therefore, we can conclude for West Germany that structural adjustment schemes do not have any significant effects on the job seeker rate and job creation schemes have negative significant effects. The latter holds true for vocational training, too, but with a smaller magnitude.

Results for East Germany As we only use 34 labour office districts for East Germany, the two-step estimates seem not to be reliable since we used more instruments than cross-section units. Therefore the results in Table 3 are the Arellano and Bond one step estimates with robust test statistics.[17] We have seen in our discussion of the results for West Germany that the different sets of instruments have only marginal effects on the sign of the parameters. Table A.6 in the appendix shows that this pattern can also be observed for East Germany. The Wald statistic is significant and the second order serial correlation test statistic does not reject the null hypothesis for all estimations. The Sargan test statistic of overidentifying restrictions cannot reject the set of instruments. In contrast to the Arellano and Bond estimates for West Germany, the standard errors increase the more instruments we use. In order to compare the results for both regions we will also use the results form the IV C estimation.

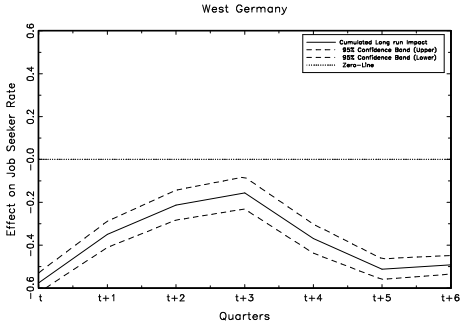
Analogously to West Germany we estimated a within regression of equation (9), too. The results in Table 3 show that there are only a few differences in the signs between the within and the IV C estimator. In all these cases the estimated coefficients are not significant for both regressions.

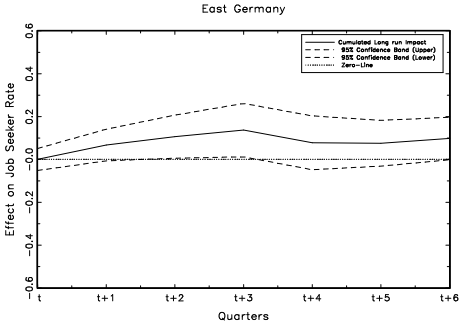
It is most interesting to note that the negative relationship between the job seeker rate and the vacancies cannot be found for East Germany. All coefficients of the lagged vacancy rate are positive and insignificant. This might be an evidence for the strong mismatch problem in

[17] The one step and two step estimator are asymptotically equivalent if the ξit are IID$(0, \sigma_\xi^2)$

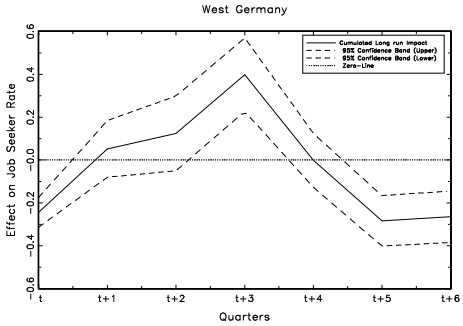
Figure 2: **Cumulated Lag Coefficients for West and East Germany**

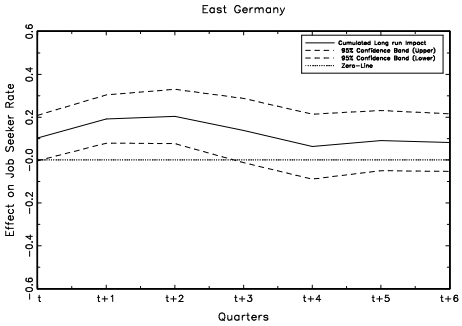
Job Creation Schemes



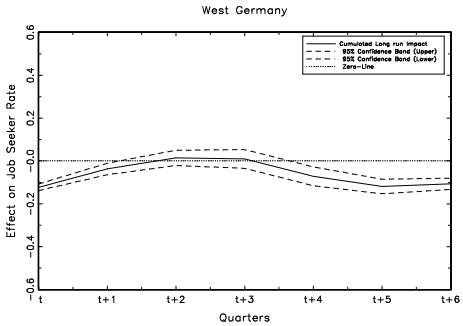


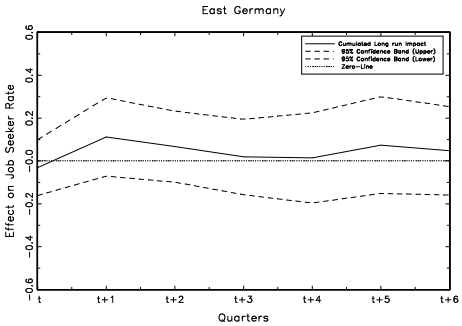
Structural Adjustment Schemes





Vocational Training





East Germany, i.e. the coexistence of open vacancies and unemployment. The coefficients of the national vacancy rate are as negative as in West Germany, but they are insignificant. Therefore it seems that an improvement of the labour demand conditions does not have an immediate effect on the labour supply side, e.g. by bringing down the job seeker rate. This is a major difference in comparison to West Germany and might be an evidence for the fact that a major factor of the unemployment problems lies on the labour supply side.

The coefficients of the ALMP accommodation ratios show once more no clear pattern that would allow us to analyse the effects of ALMP on the job seeker rate. Therefore we turn again to the lag coefficients. They are depicted on the right hand side of Figure 2. Compared to West Germany we find a completely different picture. The job creation schemes, which had a negative significant effect on the job seeker rate in the West, are now at best insignificant, as the lower confidence band is close to zero for more or less all quarters. The short-term and the medium-term effect, however, are significantly positive at 0.106 and 0.098. For structural adjustment schemes the results are not promising, either. The short-term effect on the JSR after 2 quarters is significantly positive at 0.203. It has to be noted, however, that the confidence bands are very wide and include the zero line for the following quarters. Therefore we could not detect any significant effects in the medium-term. For vocational training the bands are even wider and do not allow the detection of any positive or negative significant effects.

To sum up, we could not find any negative significant effects of the different programmes on the job seeker rate in East Germany. The results were at best insignificant, event though they were significantly positive in the short- and medium-term for job creation schemes and in the short-run for structural adjustment schemes.

7 Conclusion

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 1998 to 2000. As a starting point of our analysis, we introduced a search model framework to discuss various channels how ALMP might influence the whole economy. Following that, we stressed the importance of suitable data for evaluation purposes which allows 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 decentralized the institutional organization 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 than before to regional aspects. 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 persistence 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 base our empirical specification on a revised Beveridge curve as it can be used to evaluate 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 an Arellano and Bond estimation procedure. Our empirical analysis accounted especially for the inherent simultaneity problem, by instrumenting the ALMP measures. We also checked the sensitivity of three instrumentation approaches and found only marginal differences between them.

Our results indicate very different effects of ALMP in West and East Germany. For the West we can conclude that structural adjustment schemes do not have any significant effects on the job seeker rate, whereas vocational training and job creation schemes have negative significant effects, that is the latter are both able to reduce the job seeker rate. Thereby it seems that job creation schemes have a greater impact. In contrast to that we could not find any negative significant effects of the different programmes in East Germany. The results were at best insignificant, even though they were significantly positive in the short- and medium-term for job creation schemes and in the short-run for structural adjustment schemes. Our results might be taken as a hint that ALMP are not able to overcome the essential mismatch problem in East Germany.

One has to note, that the results are preliminary. Even though we had a rich cross-section data set at hand, the time-series dimension has been relatively short. Therefore one major task for future work is to base the analysis on a longer time span. Another issue concerns the endogeneity problem that might not be completely solved by the instruments used. This seems to be another task for future research. Furthermore even if we have been able to take several effects of ALMP into account, not all possible channels could be considered. One problem is the lack of suitable data, e.g. to consider effects on wages on a regional level. 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.

A Tables

Table A.1: **Descriptive Statistics for Germany**

Variable	Mean	Std	Min	Max
Number of labour office districs: 175				
No. of observations: 2275				
Time Range: 1997:4 - 2000:4				
Quarterly Average Measures				
Participants in JCS	1122	1849	7	12547
Participants in SAS	834	1828	0	10137
Participants in VT	1868	1454	0	9458
Unemployment	21748	14371	3331	95602
Young Unemployed	558	344	92	2769
Long-Term Unemployed	7725	5498	636	34753
Employed (total)	150122	86565	39427	785049
Vacancies	2541	2200	222	29772
Dependent Labour Force	194517	109973	53808	970211
Population	450022	246421	114200	2071829
Regional Information				
Area (in hectare)	203502	134599	16406	813574
Political Information				
Seats in Regional Parliament SPD	0.39	0.11	0.12	0.59
Seats in Regional Parliament CDU	0.45	0.10	0.21	0.64
Left Regional Government Dummy	0.47	0.50	0.00	1.00
Additional National Data				
National Unemployed	4102125	283208	3688358	4755320
National Long-Term Unemployed	1441242	78754	1312811	1609304
National Vacancies	453766	67196	306082	562266
National Labour Force	41465	311	41009	42032

Table A.2: **Descriptive Statistics for West Germany**

Variable	Mean	Std	Min	Max
Number of labour office districs: 141				
No. of observations: 1833				
Time Range: 1997:4 - 2000:4				
Quarterly Average Measures				
Participants in JCS	376	362	7	2181
Participants in SAS	57	109	0	1246
Participants in VT	1369	894	0	8500
Unemployed	18211	12103	3331	95602
Young Unemployed	481	267	92	2372
Long-Term Unemployed	6680	5051	636	34753
Employed (total)	151005	92420	45826	785049
Vacancies	2681	2383	297	29772
Dependent Labour Force	195072	117213	58409	970211
Population	459608	262924	158303	2071829
Regional Information				
Area (in hectare)	176204	95609	16406	478275
Political Information				
Seats in Regional Parliament SPD	0.41	0.10	0.25	0.53
Seats in Regional Parliament CDU	0.45	0.08	0.37	0.60
Left Regional Government Dummy	0.49	0.50	0.00	1.00

Table A.3: **Descriptive Statistics for East Germany**

Variable	Mean	Std	Min	Max
Number of labour office districs: 34				
No. of observations: 442				
Time Range: 1997:4 - 2000:4				
Quarterly Average Measures				
Participants in JCS	4215	2280	839	12547
Participants in SAS	4053	2072	704	10137
Participants in VT	3938	1501	1139	9458
Unemployment	36415	13744	10671	11620
Young Unemployed	879	434	123	2769
Long-Term Unemployed	12056	5153	3585	25843
Employed (total)	146462	56045	39427	281577
Vacancies	1963	972	222	6096
Dependent Labour Force	192213	72677	53808	368984
Population	410267	154837	114200	792820
Regional Information				
Area (in hectare)	316708	198754	56906	813574
Political Information				
Seats in Regional Parliament SPD	0.31	0.14	0.12	0.59
Seats in Regional Parliament CDU	0.45	0.17	0.21	0.64
Left Regional Government Dummy	0.38	0.49	0.00	1.00

Table A.4: **Instrumentation Approaches**

Strategy	Set of Instruments
IV A	
JSR_{t-1}	diag$(s_{i1}, s_{i1}\ s_{i2}, \cdots, s_{i1} \cdots s_{it-2})$
$ALMP_t$, $ALMP_{t-1}$	-
OS_t	-
IV B	
JSR_{t-1}	diag$(s_{i1}, s_{i1}\ s_{i2}, \cdots, s_{i1} \cdots s_{it-2})$
$ALMP_t$, $ALMP_{t-1}$	$AL20_{t-2}$, LAL_{t-2}, $LRLD_{t-1}$, $LSPD_{t-1}$, $LCDU_{t-1}$, $BLAL_{t-1}$
OS_t	-
IV C	
JSR_{t-1}	diag$(s_{i1}, s_{i1}\ s_{i2}, \cdots, s_{i1} \cdots s_{it-2})$
$ALMP_t$, $ALMP_{t-1}$	$AL20_{t-2}$, LAL_{t-2}, $LRLD_{t-1}$, $LSPD_{t-1}$, $LCDU_{t-1}$, $BLAL_{t-1}$
OS_t	diag$(v_{i1}\ v_{i2}, v_{i1}\ v_{i2}\ v_{i3}, \cdots, v_{i1} \cdots v_{it-1})$

Table A.5: **Sensitivity of the Results Regarding the Instrumentation Approach - West Germany***

Variable		Arellano Bond-Estimates - IV A Param.	t-value	Arellano Bond-Estimates - IV B Param.	t-value	Arellano Bond-Estimates - IV C Param.	t-value
Job Seeker Rate	JSR_{t-1}	0.09185	5.642	0.40707	12.229	0.37923	28.460
	JSR_{t-2}	-0.30729	-32.462	-0.22686	-16.679	-0.26026	-43.286
	JSR_{t-3}	-0.05775	-14.684	-0.02021	-3.930	-0.01950	-10.020
	JSR_{t-4}	-0.16739	-9.853	-0.17643	-8.176	-0.19601	-17.222
Participants in Job	JCS_t	-0.22891	-10.582	-0.80882	-11.170	-0.57561	-24.329
Creation Schemes	JCS_{t-1}	0.10867	4.938	0.70078	9.942	0.44409	16.818
	JCS_{t-2}	0.02905	1.110	-0.18448	-4.934	-0.09876	-6.471
	JCS_{t-3}	0.02508	1.090	0.08935	2.716	0.05231	3.601
	JCS_{t-4}	-0.34166	-13.836	-0.32745	-9.104	-0.30724	-28.214
Participants in	VT_t	-0.06393	-9.214	-0.09785	-3.957	-0.12285	-15.771
Vocational Training	VT_{t-1}	0.03014	4.154	0.14929	6.193	0.13211	17.264
	VT_{t-2}	-0.02374	-2.777	-0.00127	-0.089	-0.01271	-2.089
	VT_{t-3}	-0.02476	-2.271	-0.00237	-0.134	-0.00480	-0.627
	VT_{t-4}	-0.10967	-11.612	-0.06938	-5.474	-0.08818	-19.577
Participants in Struct.	SAS_t	-0.16175	-2.117	0.47517	2.363	-0.24361	-6.836
Adjustment Schemes	SAS_{t-1}	0.39741	7.868	-0.16508	-1.178	0.38803	9.061
	SAS_{t-2}	-0.12253	-2.273	0.11163	0.963	-0.10350	-3.296
	SAS_{t-3}	0.14962	1.929	0.26848	2.886	0.31850	9.969
	SAS_{t-4}	-0.74807	-11.127	-0.82901	-8.934	-0.52644	-14.107
Vacancies	VAC_{t-1}	-0.18526	-6.162	-0.18187	-4.570	-0.09537	-8.978
	VAC_{t-2}	-0.18199	-4.986	-0.17354	-4.556	-0.08879	-6.536
	VAC_{t-3}	-0.06785	-2.129	-0.08490	-2.368	0.03536	4.449
	VAC_{t-4}	-0.37863	-7.811	-0.38969	-7.275	-0.26954	-17.167
Reg. Pop. Density	$REGPOP_t$	0.02528	3.899	0.02725	3.679	0.02823	7.507
Employed	$EMPL_{t-1}$	0.08449	13.317	0.00696	0.670	0.01653	3.652
National Unemployed	$UNEMPL_{t-1}$	-0.23163	-1.614	-1.27370	-4.369	-1.26487	-11.214
	$UNEMPL_{t-2}$	0.30616	5.136	0.56102	5.672	0.63664	14.772
National Vacancies	$NAVAC_{t-1}$	-8.64539	-33.977	-6.79745	-14.589	-7.56823	-41.632
	$NAVAC_{t-2}$	-0.68342	-1.534	-5.22038	-5.051	-4.31981	-11.563
Seasonal Dummy 1	SD_1	-0.01803	-19.914	-0.01912	-11.031	-0.01985	-32.680
Seasonal Dummy 2	SD_2	-0.00345	-4.641	-0.00696	-6.212	-0.00474	-10.756
Seasonal Dummy 3	SD_3	0.00412	5.018	-0.00507	-3.163	-0.00382	-6.186
Wald test of joint significance		91407.22(32)		64251.01 (32)		1061616.76 (32)	
Sargan test		106.23 (56)		104.39 (56)		125.08 (120)	
First-order serial correlation		-1.35 (141)		-2.09 (141)		-1.70 (141)	
Second-order serial correlation		0.70 (141)		0.70 (141)		0.59 (141)	
N,T		141,8		141,8		141,8	

*Degrees of freedom for the test statistics are in parenthesis.
Columns 2-4 report the Arellano and Bond two-step estimates.

Table A.6: **Sensitivity of the Results Regarding the Instrumentation Approach - East Germany***

Variable		Arellano Bond-Estimates - IV A Param.	t-value	Arellano Bond-Estimates - IV B Param.	t-value	Arellano Bond-Estimates - IV C Param.	t-value
Job Seeker Rate	JSR_{t-1}	0.09057	0.988	0.07388	0.693	0.15517	1.682
	JSR_{t-2}	-0.21261	-2.397	-0.27185	-3.400	-0.22607	-2.390
	JSR_{t-3}	-0.16131	-2.176	-0.14301	-1.681	-0.15339	-1.661
	JSR_{t-4}	0.33497	5.397	0.30206	4.658	0.30117	4.807
Participants in Job	JCS_t	0.01207	0.592	0.00350	0.106	-0.00023	-0.009
Creation Schemes	JCS_{t-1}	0.04733	2.617	0.07212	1.960	0.06728	2.159
	JCS_{t-2}	0.02339	1.555	0.02039	0.936	0.02860	1.671
	JCS_{t-3}	0.02931	1.847	0.05192	2.446	0.03990	2.070
	JCS_{t-4}	-0.06250	-2.794	-0.04578	-1.899	-0.04494	-2.142
Participants in	VT_t	-0.03995	-1.023	-0.13205	-1.168	-0.03144	-0.474
Vocational Training	VT_{t-1}	0.03845	1.133	0.24368	3.266	0.14801	2.391
	VT_{t-2}	-0.06022	-2.056	-0.08683	-2.966	-0.07441	-2.266
	VT_{t-3}	-0.00163	-0.047	-0.00450	-0.108	-0.01350	-0.368
	VT_{t-4}	0.01631	0.471	0.04173	1.046	0.02411	0.662
Participants in Struct.	SAS_t	0.10604	2.484	0.10542	1.528	0.10254	1.894
Adjustment Schemes	SAS_{t-1}	0.08333	2.065	0.07693	1.191	0.07285	1.393
	SAS_{t-2}	0.04573	1.229	0.05136	1.326	0.02144	0.630
	SAS_{t-3}	-0.03606	-1.176	-0.05049	-1.640	-0.03162	-0.920
	SAS_{t-4}	-0.11236	-3.449	-0.08186	-2.669	-0.07962	-2.408
Vacancies	VAC_{t-1}	0.23939	1.213	0.32191	1.688	0.11492	0.542
	VAC_{t-2}	0.27658	1.444	0.02342	0.105	0.21790	0.981
	VAC_{t-3}	-0.03236	-0.150	0.05704	0.243	0.00462	0.018
	VAC_{t-4}	0.10322	0.760	0.03416	0.201	0.10006	0.471
Reg. Pop. Density	$REGPOP_t$	0.02490	0.753	0.01610	0.465	-0.00490	-0.138
Employed	$EMPL_{t-1}$	-0.16979	-3.233	-0.22095	-3.991	-0.16836	-2.730
National Unemployed	$UNEMPL_{t-1}$	2.61927	2.108	1.96271	1.280	1.62019	0.990
	$UNEMPL_{t-2}$	0.25885	0.492	0.50125	0.899	0.50669	0.972
National Vacancies	$NAVAC_{t-1}$	0.85727	0.407	-1.92566	-0.899	-1.05131	-0.516
	$NAVAC_{t-2}$	1.01249	0.285	-0.06809	-0.017	-1.34862	-0.312
Seasonal Dummy 1	SD_1	0.00707	1.062	0.00303	0.391	0.00097	0.116
Seasonal Dummy 2	SD_2	-0.02759	-3.881	-0.02392	-2.564	-0.02661	-2.945
Seasonal Dummy 3	SD_3	-0.00419	-0.506	-0.00455	-0.575	-0.00721	-0.875
Wald test of joint significance		730608.98(32)		347232.53 (32)		92921.20 (32)	
Sargan test		183.12 (56)		159.72 (56)		248.70 (120)	
First-order serial correlation		-1.24 (34)		-1.54 (34)		-2.07 (34)	
Second-order serial correlation		0.80 (34)		0.54 (34)		0.29 (34)	
N,T		34,8		34,8		34,8	

*Degrees of freedom for the test statistics are in parenthesis.
Columns 2-4 report the Arellano and Bond two-step estimates.

Table A.7: **Lag Coefficients for West and East Germany**

Programme		West Germany				East Germany			
		lag		cum.		lag		cum.	
		coeff.	s.e.	lag coeff.	s.e.	coeff.	s.e.	lag coeff.	s.e.
JCS	t	-0.57561	0.024	-0.57561	0.024	-0.00023	0.026	-0.00023	0.026
	$t+1$	0.22580	0.021	-0.34981	0.031	0.06724	0.030	0.06701	0.038
	$t+2$	0.13668	0.012	-0.21313	0.036	0.03908	0.018	0.10609	0.051
	$t+3$	0.05660	0.014	-0.15653	0.038	0.03079	0.019	0.13689	0.064
	$t+4$	-0.21293	0.029	-0.36946	0.035	-0.05938	0.020	0.07751	0.064
	$t+5$	-0.14241	0.020	-0.51186	0.025	-0.00192	0.014	0.07559	0.055
	$t+6$	0.02008	0.012	-0.49179	0.022	0.02195	0.012	0.09754	0.050
SAS	t	-0.24361	0.036	-0.24361	0.036	0.10254	0.054	0.10254	0.054
	$t+1$	0.29564	0.046	0.05203	0.068	0.08876	0.050	0.19129	0.057
	$t+2$	0.07202	0.031	0.12405	0.089	0.01203	0.041	0.20332	0.065
	$t+3$	0.27362	0.029	0.39767	0.087	-0.06555	0.033	0.13778	0.076
	$t+4$	-0.39943	0.061	-0.00176	0.064	-0.07525	0.032	0.06253	0.077
	$t+5$	-0.28204	0.039	-0.2838	0.060	0.02803	0.022	0.09056	0.072
	$t+6$	0.01905	0.021	-0.26476	0.061	-0.00910	0.015	0.08146	0.069
VT	t	-0.12285	0.008	-0.12285	0.008	-0.03144	0.066	-0.03144	0.066
	$t+1$	0.08552	0.009	-0.03733	0.014	0.14313	0.062	0.11169	0.093
	$t+2$	0.05170	0.007	0.01437	0.018	-0.04509	0.042	0.06660	0.085
	$t+3$	-0.00506	0.007	0.00931	0.022	-0.04803	0.034	0.01857	0.090
	$t+4$	-0.08115	0.008	-0.07183	0.022	-0.00457	0.036	0.01400	0.107
	$t+5$	-0.04723	0.006	-0.11906	0.017	0.06017	0.017	0.07417	0.115
	$t+6$	0.01228	0.006	-0.10678	0.013	-0.02672	0.018	0.04745	0.105

B Figures

Figure B.1: **Participants in ALMP and Unemployed in West Germany, 04/97-04/00**

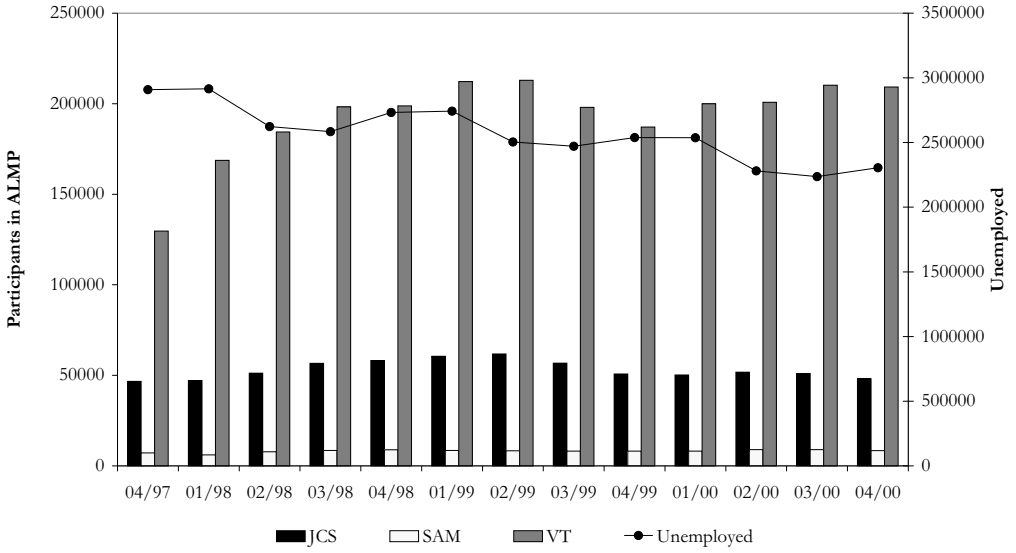


Figure B.2: **Participants in ALMP and Unemployed in East Germany, 04/97-04/00**

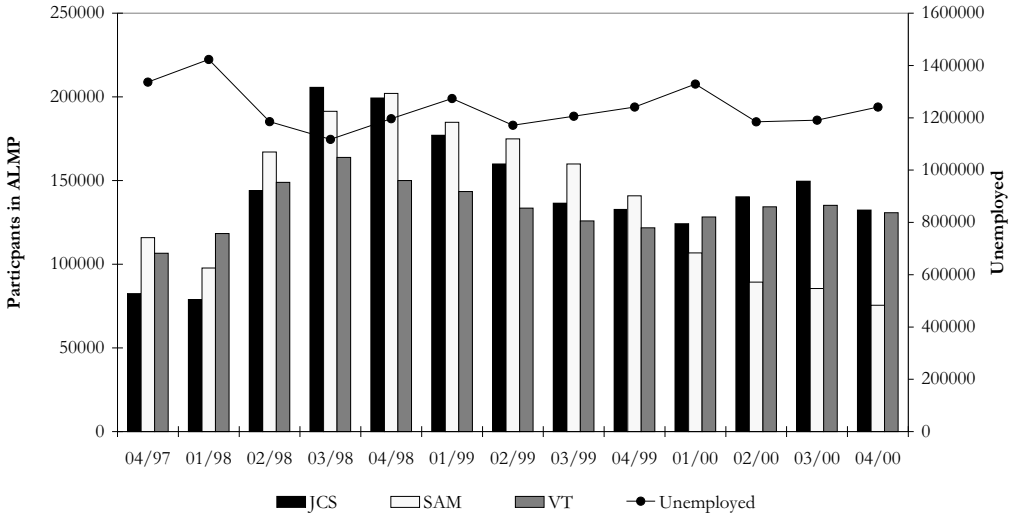
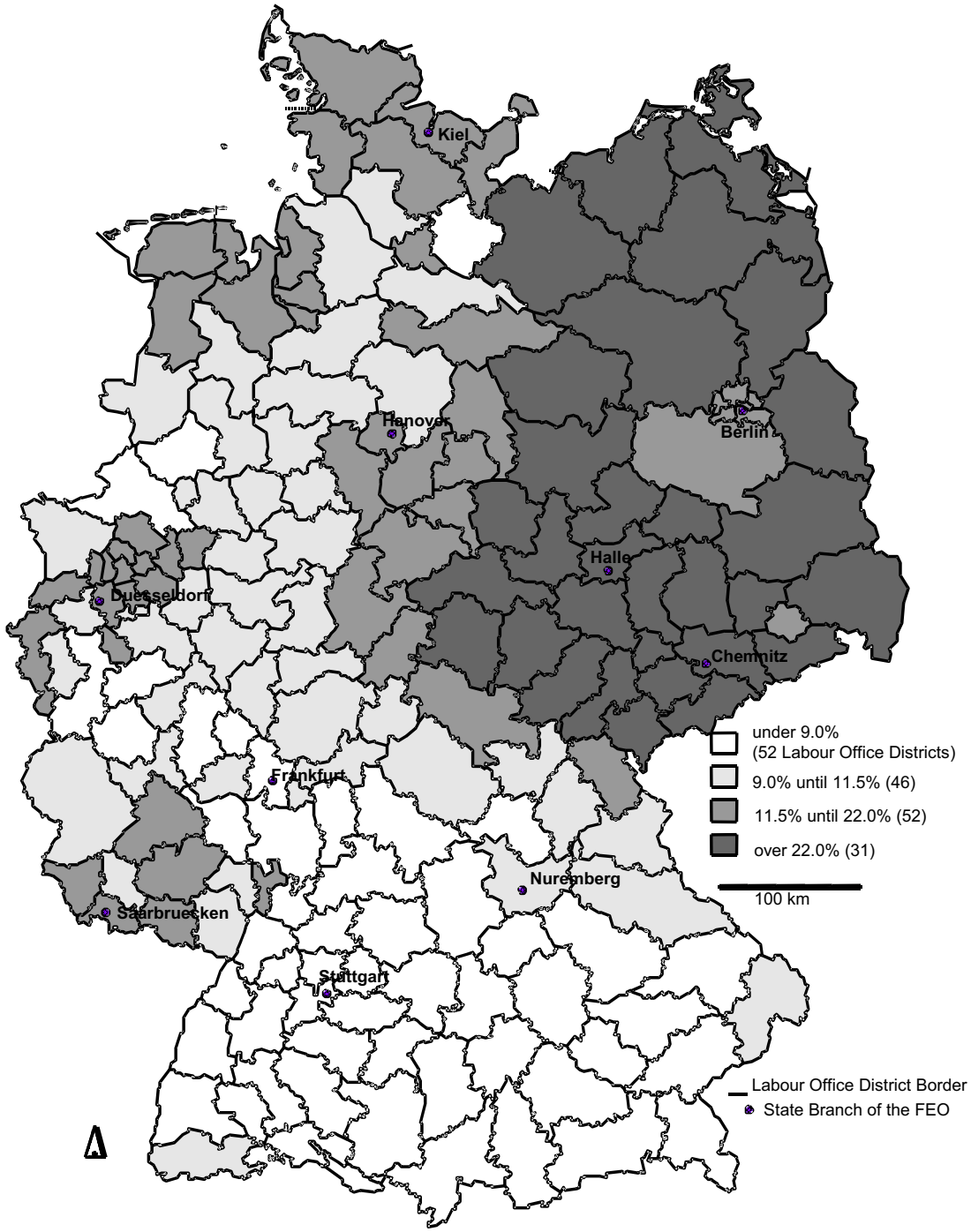


Figure B.3: **Job Seeker Rate in Germany (Monthly Average), 1999**[(a)]



(a) The job seeker rate is defined as the unemployment rate extended by the rate of people participating in ALMP measures.

Figure B.4: **Relation Between Job Creation Schemes and Training Measures, 1999**

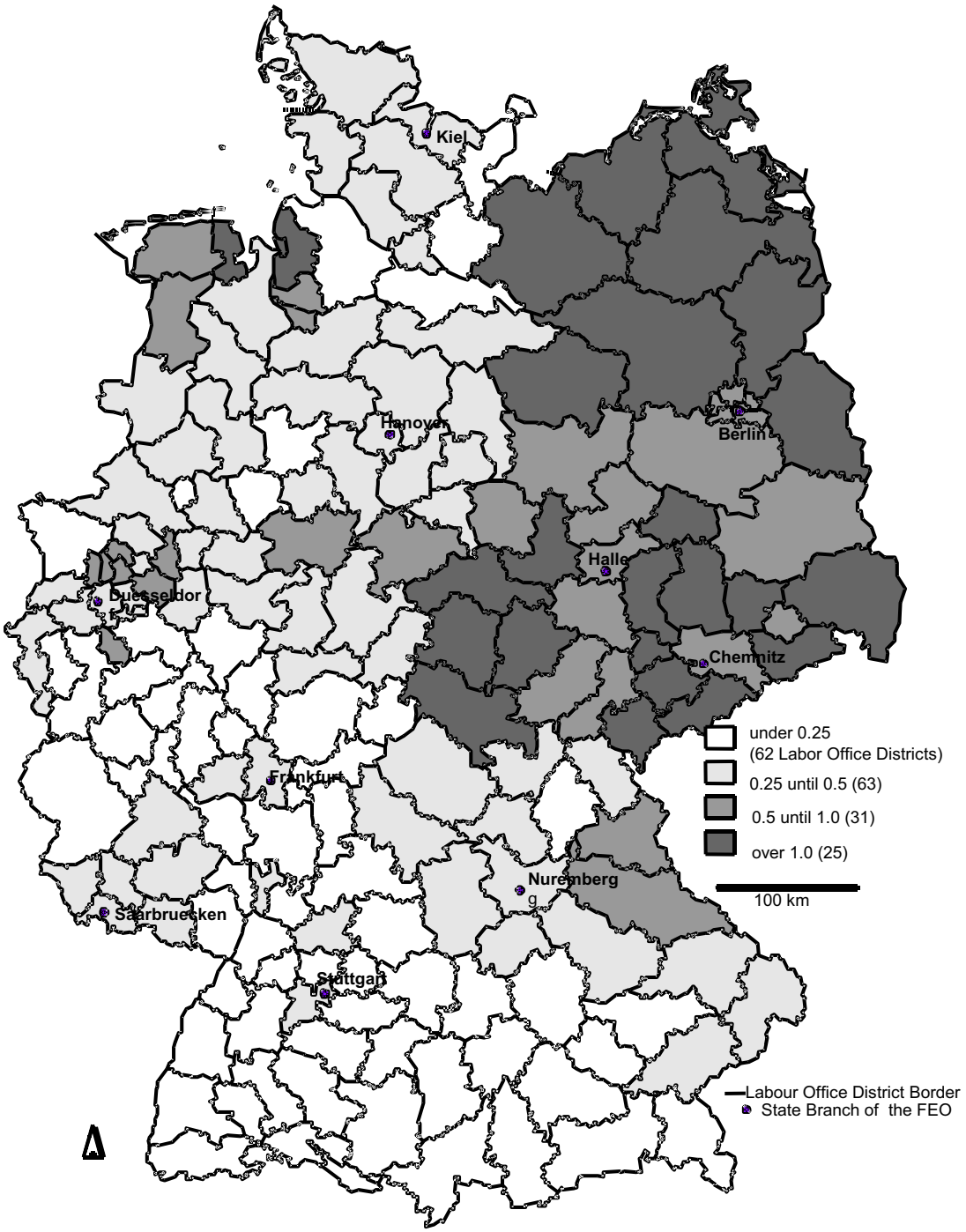
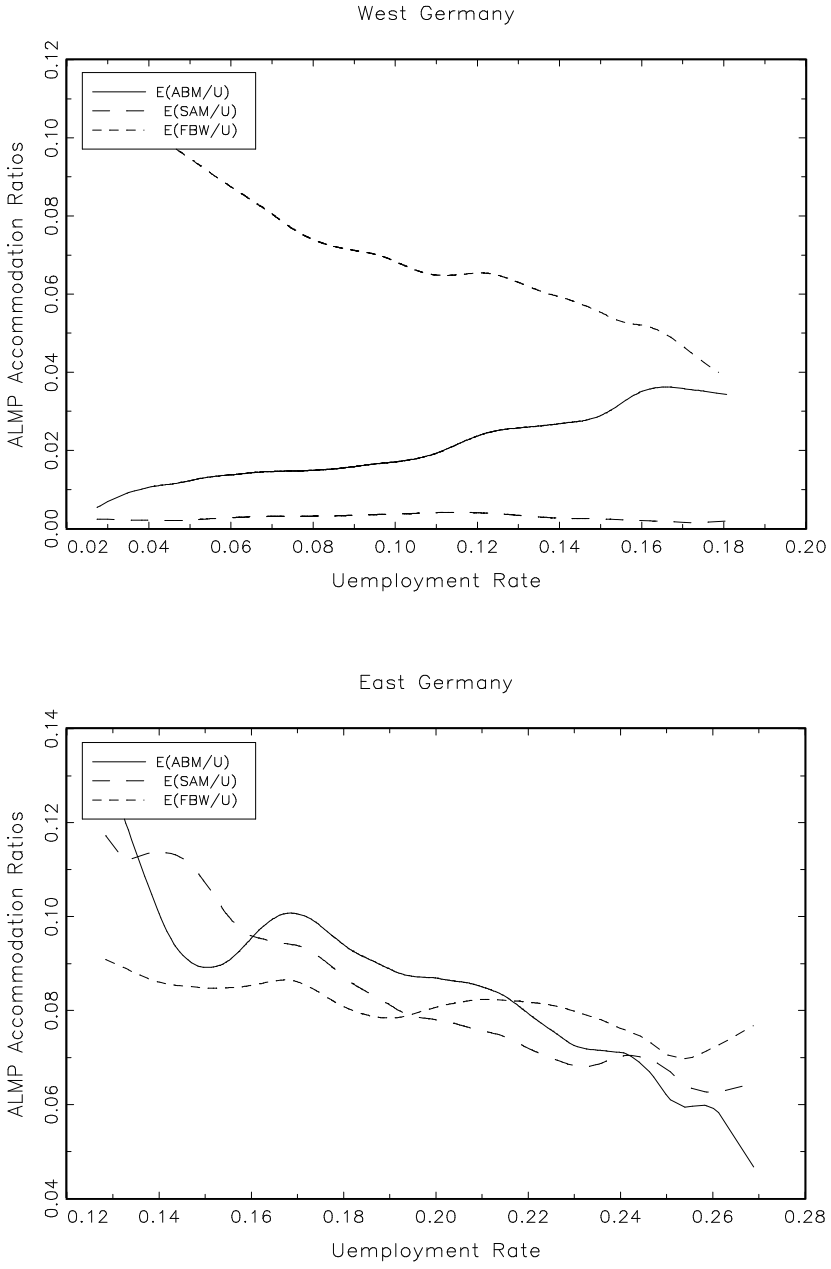


Figure B.5: **Nonparametric (Nadaraya-Watson) Estimates: Accomodation Ratio vs. Job Seeker Rate**[(a)]



(*a*) Note: Nonparametric Nadaraya-Watson estimates were implemented with a quartic kernel. Bandwidth $h = 0.015$. Number of observations for West (East) Germany: 1833 (442).

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