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Does active labour market policy affect structural unemployment? An empirical investigation for West German regions, 1986 to 1993

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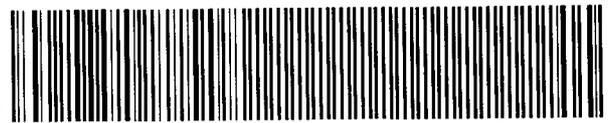
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Does Active Labour Market Policy
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Thiess Büttner¹, Hedwig Prey¹

Abstract

In this paper, the impact of two instruments of active labor market policy (ALMP), namely continuous training programs and job creation schemes, on structural unemployment in West Germany for the period 1986 to 1993 is estimated using data for 74 planning regions. Based on a disequilibrium approach, we focus on a possible effect of ALMP programs on the labor market mismatch. Taking care of endogeneity, we do not find an effect of training programs on the mismatch. For job-creation schemes, the estimates reveal positive effects on the matching-efficiency, indicating that they contributed to a reduction in the structural rate of unemployment in West Germany during the time period considered.

Keywords: evaluation, active labor market policy, labor market mismatch, West Germany

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Does Active Labour Market Policy Affect Structural Unemployment?

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1 Introduction

In recent years, interest in the effects of Active Labor Market Policy (ALMP henceforth) has considerably increased. This is not only due to rising labor market problems, and therefore a closer look at policy options, but also to the fact that questions have arisen in the economic literature as to whether ALMP really successfully contributes to combat unemployment or whether negative side-effects outweigh the benefits. In Germany, Active Labor Market Policy is a policy tool dating back to 1969 when the Labor Promotion Law (“Arbeitsförderungsgesetz”) was enacted. Two important instruments of ALMP are public job creation schemes (“Allgemeine Maßnahmen zur Arbeitsbeschaffung”), and the public support of continuous training (“Maßnahmen zur beruflichen Fortbildung und Umschulung”). The regulations of the Labor Promotion Law have become increasingly important to the West German Labor Market since the unemployment rate rose to more than 9 percent in 1983 and has remained at a high level since then. Also, after unification in 1990, large transfers were made to deal with increasing unemployment in East Germany of which a great part has gone into active labor market policies like training programs and job creation schemes.

In spite of the often propagated necessity of ALMP, its beneficial effect is not generally proved to exist, even on the microeconomic level. For Germany, there are a few studies dealing with the effects of training programs or job creation schemes on the participant’s future employment chances, earnings, or on the expected duration of unemployment after the program but a positive effect on the individual level is

not always found.² On the macroeconomic level there are even more doubts about the benefits of active labor market programs. In general, there are a number of macroeconomic variables like aggregate labor demand, wage-setting behaviour and labor market mismatch that are affected by ALMP. These effects are extensively discussed, for example, in Calmfors (1994) or Jackman (1995). Accordingly, it can be argued that ALMP programs can help to adjust the qualification structure of the labor force to labor demand, that they provide work experience instead of idleness while being jobless, and that they improve the effectiveness of the job search of participants. Thus, problems of matching jobs with vacancies may become smaller. This would reduce the need for employers to offer high wages for open posts to attract labor and positively affect regular labor demand. On the other hand, the existence of ALMP programs may also influence the reservation wage of job seekers which is an important determinant of matching. Providing higher income security during unemployment or anticipating a possible improvement of the individual labor market opportunities through ALMP may very well result in an increase of the reservation wage (relative to the wage rate offered by firms) and then decrease the probability that a match is formed, see Franz/Siebeck (1992). If employers want to hire, they have to offer a higher wage rate to attract labor and hiring costs therefore rise.

Estimates about the effect of ALMP on wages reveal wage-increasing effects in the case of Ireland and Spain (OECD (1993)), in all other countries, ALMP seems to have no or a small moderating impact on wages (OECD (1993), Kraft (1994), Pannenberg/Schwarze (1996)). Other studies have focused on the effects of ALMP on aggregate employment or on the matching efficiency of the labor market. The OECD (1993) found positive effects of ALMP on employment in a cross-country analysis for 21 OECD countries. Kraft (1994) estimated a simultaneous cross-country wage and employment equation system and found positive employment effects of ALMP for five European countries (including Germany). The results of Calmfors/Skedinger (1995), on the other hand, indicate that job creation schemes in Sweden significantly crowded out employment in Sweden in the period 1966 to 1990. For training programs they found ambiguous effects on regular employment. Estimating a matching function, Burda/Lubyova (1995) found a positive relationship between ALMP

²For example, Lechner (1996) does not find any positive effect of continuous training in East Germany on employment probabilities, but positive and large effects on earnings. This is partly contrary to the results reported in Fitzenberger and Prey (1996) and Fitzenberger and Prey (1997), where positive employment effects, after publicly supported training in external educational institutions are found. Steiner and Kraus (1995) analyze the effects of job creation schemes on future employment probabilities and draw mixed conclusions. Job creation schemes seem to improve men's employment chances, but this is not the case for women.

spending and outflows from unemployment into regular jobs for the Czech and Slovak Republics. The results of Schmid (1995) also indicate a moderate but positive effect of ALMP on the matching efficiency for Germany, France, and Sweden for the period 1974 to 1989. Up to now, there have been no clear-cut findings on the effects of ALMP. The results of empirical work differ for the countries that are analyzed. Also, the results often suffer from the unresolved problem of endogeneity and therefore have to be interpreted with care. This is because ALMPs are not only supposed to reduce labor market problems but are at the same time the result of those problems. Policy makers usually react to changes in the unemployment rate with a change in ALMP implementation.

With this paper we want to provide empirical evidence about the macroeconomic effects of active labor market policy on the labor market mismatch in Germany. It is based on a disequilibrium approach of the labor market. This approach not only provides an operational concept of mismatch and the Beveridge curve, it may also be implemented into a general model-based macroeconomic analysis of active labor market policy, where effects on labor demand, wages, and labor supply can be explicitly accounted for. However, the current paper focuses on the more narrow issue whether effects on the mismatch can be found. The empirical analysis is based on data for 74 regions in West Germany for the period 1986 to 1993, where the level of active labor market policy as well as the mix of measures undertaken shows considerable variation. Whereas cross-sectional information generally provides better opportunities with respect to the identification of effects, regional disaggregation within a country has advantages compared to cross-country studies since unobserved heterogeneity is reduced and the policy measures are comparable.

The next section describes the most important regulations and some empirical facts about participants in public job creation schemes and publicly supported continuous training programs. In the third section, the disequilibrium framework used in the empirical analysis is introduced. Also, some considerations are made regarding the endogenous character of ALMP measures and whether there are options for local labor market policy in West Germany. Finally, in the last section, we explain the estimation strategy where we are aware of the endogeneity problem of ALMP and present empirical results. When applying an instrumental variable approach to account for the possible endogeneity of active labor market policies, we do not find a significant effect of training programs on the mismatch prevailing in the aggregate labor market. However, our results indicate a positive impact of job creation schemes on the mismatch indicator. This points to a mismatch-decreasing impact of these programs which contributed to a reduction of the structural rate of unemployment (SUR) in West Germany during the period under consideration.

2 Publicly Supported Training Programs and Job Creation Schemes in West Germany

In Germany, the institutional setting of the two most important instruments of ALMP, training programs and job creation schemes, are regulated through the Labor Promotion Law ("Arbeitsförderungsgesetz", **AFG**) from 1969. The focus of this paper is on continuous training programs ("Fortbildung und Umschulung") which we refer to as **FuU** in the remainder, and on job creation schemes ("Allgemeine Maßnahmen zur Arbeitsbeschaffung"), which are referred to as **ABM**. **FuU** and **ABM** are viewed as the main instruments of ALMP and, compared to the other instruments, make up most of the budget for ALMP of the Federal Office of Labor ("Bundesanstalt für Arbeit", **BA** henceforth)³.

To receive public support for training programs, they have to be aimed at individuals who have serious problems finding a job to match their occupational skills or at those persons who are currently employed but are threatened by lay-offs in the near future. Participants can receive financial support from the **BA** in various forms. During full-time training programs, income maintenance ("Unterhaltsgeld") can be paid which is at about the same level as unemployment compensation. For receiving income maintenance, the participant must have contributed to the unemployment insurance system for at least two of the last three years. This implies either having worked (and having paid to the unemployment insurance) or having received unemployment benefits within this time period. This implicitly excludes for example self-employed people, civil servants, social welfare recipients or graduates from university without work experience from receiving income maintenance. However, there are a number of exceptions to these requirements.

The aim of job creation schemes is to finance jobs for unemployed persons to foster future regular employment. Financial support usually amounts to 50 % to 75 % of a normalized wage and is granted to the institution which employs the person and which has to finance the remainder of the wage. Only specific types of activities are eligible for **ABM**. These activities have to be in the public interest and they have to be augmentative, which means that they could not have been done at all, or only later without the financial support. Also, only in local labor markets with very high unemployment rates (above 30 % over the West German average) can *public* institutions apply for support within an **ABM** program. This reflects the often stated

³In March 1997, the German government decided upon a reform of the **AFG**, which is called "Arbeitsförderungs-Reformgesetz, **AFRG**" by then. However, because our investigation refers to a time period before 1997, we restrict the discussion to the regulations of the **AFG**.

fear that local governments may try to finance local (usually tax financed) activities through ABM and therefore through the unemployment insurance system. Financial support during ABM can only be granted to persons who were unemployed (or equivalently: have received unemployment benefits or are eligible for income maintenance) before the ABM scheme for at least 6 of the last 12 months. However, there are some exceptions to the requirements for the reason of serious social problems or problems of the local labor market.⁴

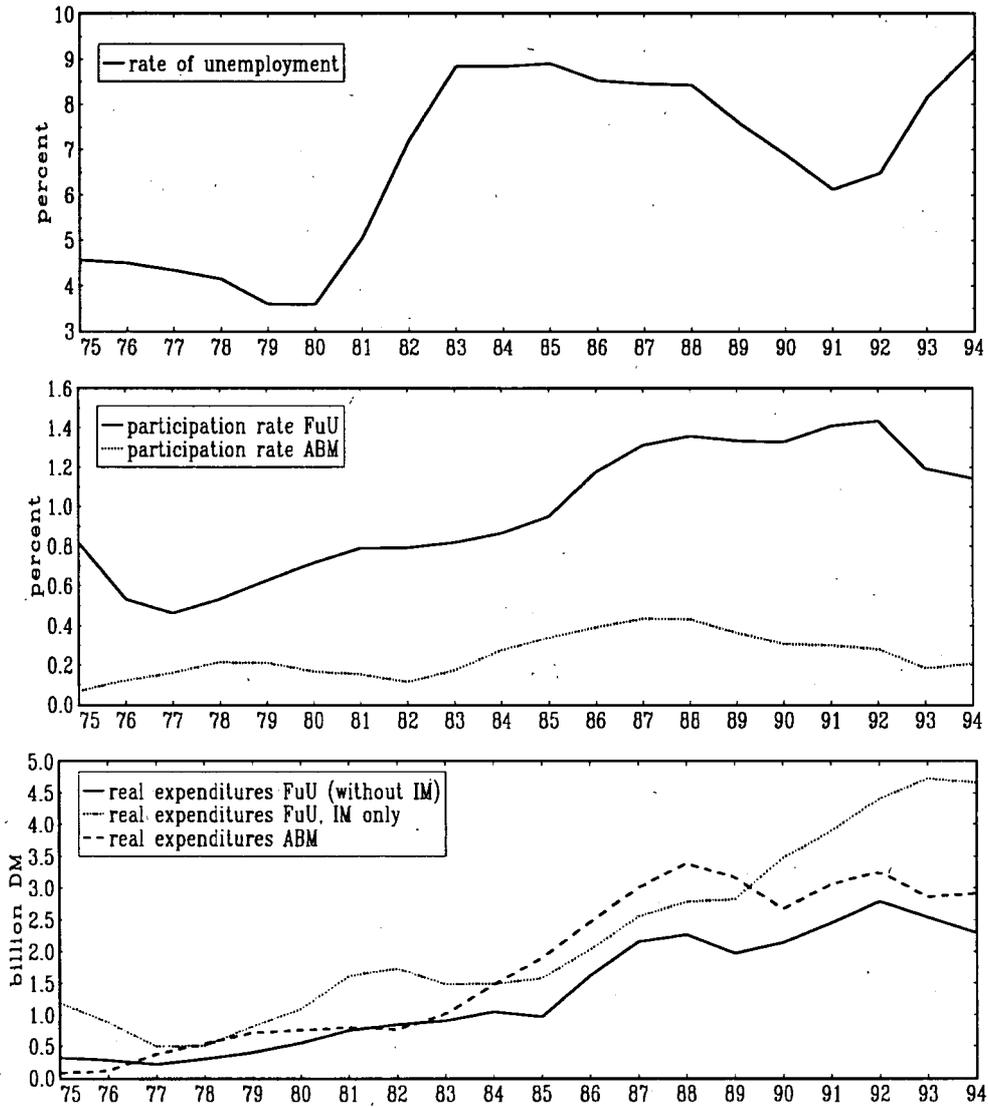
In the first years after the Labor Promotion Law was agreed upon, the instruments of ALMP were implemented and increasingly employed (see figure 1). In 1975, support of training programs was already the most important instrument, whereas job creation schemes were only rarely used until the second half of the seventies. As is documented in table 1 and figure 1, both expenditures (in real terms) and the number of participants in FuU increased almost steadily until 1992, not always in line with the unemployment rate. The number of persons being employed in job creation schemes was smaller than the number of participants in FuU over the whole period (see table 1). Also, there was a remarkable reduction in ABM participation during the years 1987 to 1993: the number of ABM employees fell from 114700 persons in 1987 to 50520 persons in 1993. Comparing expenditures for FuU and ABM, both develop similar in size but considering the fewer participants in ABM, ABM programs are much more expensive per capita than FuU programs.

There is little detailed information about the labor market position of ABM participants before the program apart from the fact that they are unemployed. A special investigation by the BA of about 2,657 ABM participants from 1989 (Spitznagel (1989)) has revealed that 71.7 % belonged to the group of unemployed with very unfortunate attributes for future employment prospects, such as long-term unemployed, persons older than 50 years, and young people without an occupational degree. According to this study, the employers of ABM participants are to a great extent within the public sector or non-profit organisations, only 2.5 % of the ABM employees were employed by private enterprises⁵ (see table 2). The high proportion of ABM employees within the public sector is quite surprising considering the restrictive regulations in the AFG according to which public ABM-employers are

⁴For example, the "required" duration of the unemployment spell for being eligible to ABM may be shorter for persons older than 50 years or for persons younger than 25 years without any occupational degree. In East Germany, public institutions could receive financial support for ABM without the regional unemployment rate being 30 % above the East German average.

⁵In September 1996, this general picture has not changed substantially: almost 44 % of the ABM participants are employed within public institutions or churches, 53.7 % within private, charitable institutions and enterprises, and only 2.4 % in private enterprises, Source: Bundesanstalt für Arbeit, data for West Germany.

Figure 1: Unemployment Rates, Participation Rates in Continuous Training and Job Creation Schemes, and Real Expenditures, West Germany 1975–94



Notes: All rates are based on the dependent labor force ("abhängig beschäftigte Arbeitnehmer plus Arbeitslose"); annual averages; FuU: Continuous Training, ABM: Job Creation Schemes, IM: Income Maintenance during training; all expenditures deflated with the West German GDP deflator (1991=100); Source: Bundesanstalt für Arbeit and SVR (1995).

Table 1: Participants in FuU and ABM, West Germany 1975 to 1995

year	75	76	77	78	79	80	81
FuU	191.5	125.5	109.4	128.1	152.3	177.1	198.7
ABM	15.8	28.8	37.8	51.2	51.2	41.3	38.5
year	82	83	84	85	86	87	88
FuU	201.5	209.1	221.6	245.8	308.1	346.1	361.5
ABM	29.2	44.7	71.0	87.0	102.4	114.7	114.9
year	89	90	91	92	93	94	95
FuU	357.9	363.4	389.0	399.8	333.3	317.7	318.0
ABM	96.9	83.4	83.0	78.2	50.5	57.4	70.1

Notes: In thousands, FuU (continuous Training): participants, end of December; ABM (job creation schemes): employed persons in ABM, yearly averages. Source: ANBA, Jahresszahlen.

to be supported only in labor market areas with exceptionally high unemployment rates. However, this points to a remarkable flexibility how to interpret the AFG. The proportion of those who stay within the job immediately after finishing the ABM is relatively low, the maximum is at 12.9 % for non-profit organisations such as churches or charities. Most of the ABM participants are unemployed immediately after the program. The study also gives some information about the labor market status four years after the program, in 1989. According to this, about 40 % of former ABM participants have found a job, and 26 % are still (or again) unemployed.⁶ The results of this study can only serve as a starting point for the evaluation of ABM in Germany, which is partly a result of the lack of data. Nevertheless, there is some microeconomic evidence of the influence of ABM schemes on the participants' labor market status after the program, see Steiner/Kraus (1995).

Regarding FuU, the fraction of participants who were unemployed before the program is lower than that of ABM, see table 3. In general, FuU participants must be unemployed before the program or their job must be at risk which implies that they might be still employed before the program. The fraction of unemployed persons participating in FuU was relatively low until 1994, roughly between 42% and 51 %, see table 3. Along with major changes in the AFG regarding FuU and with substantial cuts in expenses for financial support, this picture has changed since 1994, and the proportion of unemployed has increased considerably, up to 85.5 % in 1995. Up to now, there are only few empirical studies on the labor market performance

⁶Cf. Spitznagel (1989), pp. 530.

Table 2: Structure of employers during ABM schemes which had begun in August 1985 and the participants' employment status directly after the ABM, West Germany:

employer	during ABM	immediately after ABM (col.2=100%)			
	2,694 persons =100%	employed same employer	else-where	un-emp-loyed	other*
local governmts. & munic. off.	51.5 %	7.6	13.9	62.0	16.5
federal offices & institut.	13.1 %	5.5	11.0	61.8	21.7
other public employer	3.8 %	4.0	10.0	73.0	13.0
non-profit org.**	25.6 %	12.9	15.2	56.2	15.7
non-profit enterprises	3.0 %	12.5	22.5	51.3	13.7
private enterprises	2.5 %	10.4	11.9	52.2	25.5
other	0.4 %	-	18.2	18.2	63.6

Notes: * includes persons in vocational training, persons whose labor market status is unknown after the ABM, or others; **: own calculations. Source: Spitznagel (1989), p. 537.

Table 3: Fraction of FuU participants, unemployed before the program:

year	85	86	87	88	89	90	91	92	93	94	95
unempl. (%)	50.0	50.6	48.5	42.6	45.1	46.9	46.6	46.2	43.4	68.9	85.5

Notes: Participants in FuU (including "Einarbeitung"), end of December, West Germany; Source: ANBA: Jahrezahlen 1990 (pp.198f.), Jahrezahlen 1994 (pp.194f.), Jahrezahlen 1995 (p.274f.), own calculations.

of trainees after FuU in West Germany, for example Blaschke/Nagel (1995), Prey (1997), and Staat (1997)⁷. Blaschke/Nagel (1995) estimate that about 50.7 % of former FuU participants who had finished a full-time program by the end of 1993 were within regular employment about 7.5 months after completion of the program⁸. Prey (1997) found no significant employment effects of publicly supported training programs for women and even significantly negative effects for men in the longer run. Staat (1997) could not find positive effects of public training programs on the shortening of the participants' job-search duration.

⁷More microeconomic analysis has been done on the effect of FuU on earnings, see, for example, Pischke (1996), Pfeiffer/Brade (1995) or Pannenberg (1995). Hujer/Maurer/Wellner (1997a,b) provide microeconomic evidence on the effects of training programs on the duration of unemployment. Unfortunately they do not distinguish between private and public programs.

⁸The employment rate of the trainees before the program was at 38 %, see Blaschke/Nagel (1995:199)

The description of FuU and ABM so far points to important aspects for the following empirical analysis. First, both types of programs form an important part of ALMP in West Germany. The number of participants in FuU has increased steadily between 1987 to 1993 whereas the number of ABM employees decreased by more than 60,000 persons during the same period. This suggests either a change in the perceived effectiveness of ABM or a tightness of the BA's budget which restricts the implementation of the relatively expensive ABM programs. The question is whether the emphasis on FuU can be justified by an empirical investigation. Second, receiving financial support from the BA requires individual experience with unemployment or belonging to a group with unfortunate labor market prospects according to age (older than 50 years or younger than 25 years), occupational education, and sex (female). Thus, participation in ALMP programs partly reflects labor market problems, i.e. ALMP program participation is endogenous to unemployment. And third, the regulations about participation and financial support for FuU and ABM programs are specified in the AFG and are very much tied to individual characteristics of the participants. At the first glance, this leaves only little room for local policy makers to influence the implementation of ALMP programs. However, we will point to some possibilities in the next sections.

3 Effects of ALMP on the Labor Market Mismatch

Our analysis is based on a disequilibrium framework which we think is a natural starting point for the question at hand. It is based on the notion that a single labor market⁹ may be in a temporary disequilibrium where either notional labor demand, LD_i , or labor supply, LS_i , cannot be realized, see e.g. Smolny (1993) and Franz (1993), because of adjustment costs or because of short-run price rigidities, for example. It can be shown that – under reasonable assumptions – the aggregation of the micro markets indexed by i can be approximated by a CES-type function, stating the following relationship between aggregate employment (LT), aggregate labor supply (LS), and aggregate labor demand (LD)¹⁰:

$$LT = [LD^{-\rho} + LS^{-\rho}]^{-1/\rho} \quad (1)$$

Figure 2 gives a schematic view on the labor market equilibrium. Actual employment, LT (labor transacted), is characterized by the minimum of $\{LD, LS\}$, repre-

⁹This micro labor market may, in the extreme case, be represented by labor supply and labor demand of a single firm. It can also be thought of demand and supply of qualified labor within a certain occupation.

¹⁰Cf. Lambert (1988).

sented by the bold arms of the labor demand and the labor supply schedule and the size of the mismatch parameter ρ which determines the deviation of actual employment LT from the minimum condition of the micromarkets. A distinction between the *regular* labor market and the ALMP-supported labor market is made. Persons who are currently participating in an ALMP program (ALMP in figure 2) are not part of regular employment, regular labor demand, or unemployment (U in figure 2), but merely belong to the distinct labor market group of the non-employed. The difference between the labor supply schedule and the LT schedule in figure 2 therefore represents aggregate non-employment or joblessness which consists of registered unemployed persons plus ALMP participants. The difference between regular labor demand and regular labor transacted is represented by the number of vacancies (V in figure 2) for regular jobs. The parameter ρ , $\rho > 0$, can be interpreted as a parameter indicating the mismatch between labor supply and regular labor demand. There is a negative relationship between ρ and the labor market mismatch: the higher ρ , the lower the mismatch. For $\rho \rightarrow \infty$, the LT schedule is identical with the bold part of LS and LD in figure 2, and the minimum condition of the micro markets is fully mirrored on the aggregate level. For $\rho \rightarrow 0$, the area between LT and the bold arms of LS and LD in figure 2 enlarges and mismatch increases.

As the parameter ρ represents a measure of mismatch, we focus on its possible determinants. In our context, we are interested in the question whether programs of ALMP can contribute to a significant increase of ρ , that is a reduction of mismatch, and, therefore, to an increase of aggregate employment at given labor demand and supply. From the estimated ρ , it is possible to derive the structural rate of unemployment SUR . The SUR describes the aggregate unemployment rate which would exist, if *aggregate* labor demand and *aggregate* labor supply were identical in size.¹¹ Then, the aggregate unemployment rate is fully reflected by the sum of excess demand and excess supply for labor on the various micro markets and therefore covered by the size of the mismatch parameter ρ . The SUR is derived from equation 1 when labor demand equals supply ($LS = LD$):

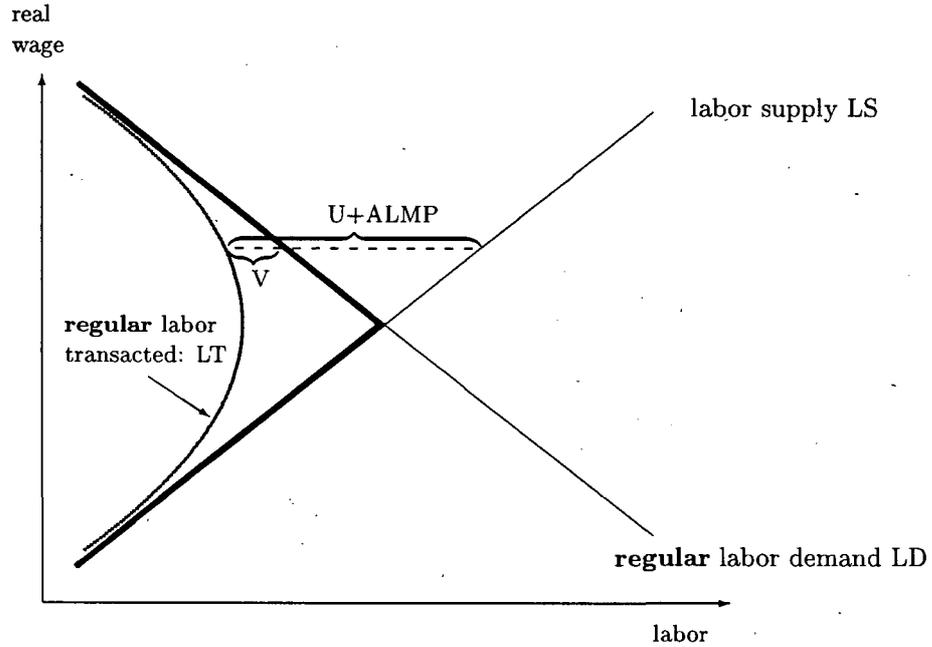
$$SUR = 1 - 2^{(-\frac{1}{\rho})} \quad (2)$$

The model can be represented by a Beveridge curve¹². To illustrate this, equation

¹¹Often, the SUR is called "structural rate of unemployment at equilibrium, $SURE$ " which is somewhat misleading because there is no equilibrium in the usual sense. Equilibrium here refers to an equality of *aggregate* labor demand and labor supply with the concomitant existence of numerous disequilibria at the micro level.

¹²Cf. Franz and Smolny (1994).

Figure 2: Labor market in a disequilibrium context



(1) is reformulated to:

$$1 = \left(\frac{LS}{LD}\right)^{-\rho} + \left(\frac{LD}{LT}\right)^{-\rho} \quad (3)$$

Having in mind that the unemployment rate ur and the vacancy rate vr can be expressed as $ur \equiv (LS - LT)/LS$ and $vr \equiv (LD - LT)/LD$, respectively, the following relationship between unemployment and vacancies emerges:

$$1 = (1 - ur)^\rho + (1 - vr)^\rho \quad (4)$$

with the slope: $\frac{\partial ur}{\partial vr} = -(LS/LD)^{1-\rho} < 0$.

Whereas this specification of the Beveridge curve assumes, that unemployment and vacancies are always consistent with their steady state relationship, the empirical

Beveridge curve displays cyclical shifts¹³. To capture those short run dynamics the basic CES function may be extended to control for employment shifts, as Franz and Smolny (1994) have shown. The dynamic representation of equation 5 is given by:

$$LT_t = \{LD_t^{-\rho} + LS_t^{-\rho} + [(1 + \delta) LT_{t-1}]^{-\rho}\}^{-1/\rho} \quad (5)$$

Now, it is assumed that the minimum condition of the micro markets is not only subject to labor demand LD and labor supply LS but also to the employment of the previous period. Changes in employment take time and cannot exceed the factor $(1+\delta)$. Thus, a further source of employment constraint is introduced by the existence of sluggish employment adjustment in the micro markets. In the presence of mismatch, aggregate employment can never exceed $(1 + \delta)$. The Beveridge curve representation is then given by:

$$1 = (1 - ur_t)^\rho + \left(\frac{1 + \Delta lt_t}{1 + \delta}\right)^\rho + (1 - vr_t)^\rho \quad (6)$$

where $lt = \log(LT)$. With this formulation, the position of the Beveridge curve is not only characterized by the mismatch parameter, but also by the growth rate of employment: as employment expands the Beveridge curve shifts outwards.¹⁴ The long-run *SUR* for the dynamic case is defined as¹⁵:

$$SUR = 1 - \left(\frac{1 - (1 + \delta)^{-\rho}}{2}\right)^{1/\rho} \quad (7)$$

Measures of ALMP, such as training programs or job creation schemes, can serve as a means for the BA to influence ρ . But, as it has been outlined above, some negative effects of ALMP programs on the matching process may also arise. The subject of our empirical investigation is whether the positive or negative effects of ALMP on the matching efficiency dominate.

To find effects of ALMP, we endogenize the mismatch parameter ρ of equation 5 by making it a function of ALMP measures which we represent by the fraction of FuU or ABM participants and the pool of non-employed. Calmfors and Skedinger (1995) introduce this indicator of ALMP and call it the *accommodation ratio*. We will follow this notation and refer to our ABM and FuU variable as *ABM accommodation ratio* and *FuU accommodation ratio* in the remainder.

¹³Cf. Franz and Smolny (1994). See also Blanchard and Diamond (1989) for a general overview of the concept of the Beveridge Curve.

¹⁴See also Mulhaupt (1996), p. 52

¹⁵see Franz and Smolny (1994), pp.224ff.

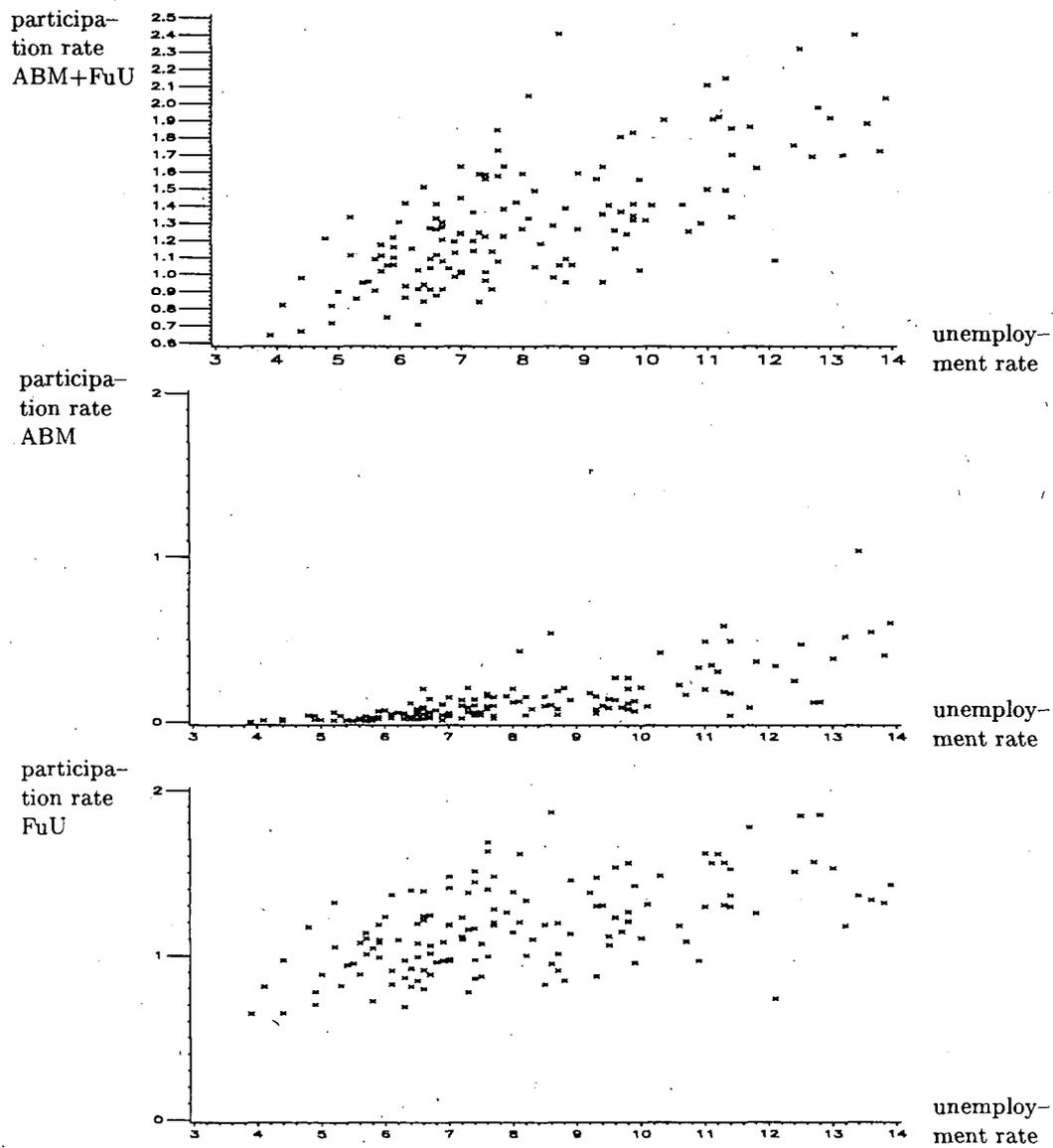
As it is common to empirical studies of this kind one has to be aware of the endogenous character of our ALMP variables. It should be intuitively clear that the inverse of the parameter ρ is an indicator of local labor market problems. And the labor office is supposed to react to these problems through an increase in the implementation of the instruments of active labor market policy, namely training programs and job creation schemes. For West Germany, this close relationship between instruments of ALMP (measured as participants in FuU and employees in ABM) and labor market problems, measured by the unemployment rate, can be seen both in time series data (see figure 1), and in regionally disaggregated data (see figure 3). Figure 3 shows a positive relationship between the local participation rate in ABM and/or FuU and the local unemployment rate. However, there is still a remarkable dispersion across Employment Service Districts.

A possibility to deal with endogeneity is instrumenting the ALMP indicator variable provided there are adequate instrumental variables. We employ an approach using determinants of the decision process to implement ALMP as instruments. As described in section 2, financial support for ALMP programs is very much tied to individual characteristics that are hardly endogenous. These are, for example, the duration of unemployment before the start of a program, skill-specific labor market opportunities, having contributed to the unemployment insurance within the last three years, and so on. This individualistic concept of entitlement for financial support by the Federal Bureau of Labor restricts the possibility of local labor market policy. But there are a few regulations which suggest a possible influence by local labor market authorities. Figure 3 points to these possibilities as it shows quite substantial variation in the relationship between the unemployment rate and the participation rates across employment service districts.

For example, a local parliament can influence the provision of institutions eligible for financial support, therefore encouraging unemployed persons to participate in ALMP programs. Also, there is the possibility that local authorities initiate labor market programs (FuU, ABM), overtake some of the costs and then receive additional financial support from the BA – even if not all of the participants fulfill the requirements¹⁶. According to the AFG, support for ABM schemes can only be granted if the activity is augmentative and not substituting regular jobs. Of course, there is some scope of interpretation which can be exploited by the local labor office. Finally, the administrative order for ABM contains a passage advising the preferred

¹⁶For example, Huebner et. al. (1992) describes the case of Bremen, where the city of Bremen cooperated with the local labor market office. They started a program for fighting long-term unemployment, where one third of the participants would have not been eligible by normal standards ("Sozialhilfeempfänger", social welfare recipients), cf. Huebner et.al. (1992), p.35.

Figure 3: Participation Rates in Continuous Training and Job Creation Schemes and Unemployment Rates by Employment Service Districts, West Germany 1993



Both the participation rates and the unemployment rates are based on dependent civil labor force ("abhängige zivile Erwerbspersonen"); Arbeitsamtsbezirke; Source: Bundesanstalt für Arbeit and Bundesforschungsanstalt für Landeskunde und Raumordnung (BfLR).

inclusion of unemployed persons into ABM who have serious problems finding a job. However, the director of the local labor office may declare further persons not necessarily fulfilling the requirements for financial support as being eligible, if there are serious labor market problems within the region¹⁷. The consequences of this administrative order depend very much on the balance of power within the local policy area. In some cases, this passage has been used by local political authorities to influence the structure of program participation¹⁸, where they included persons into the programs who would normally not be eligible, for example welfare recipients or university leavers¹⁹.

Considering these incentives and the options of local governments to influence the structure of program participants and/or of expenditures on ALMP programs within the region, we included two groups of variables into our set of instruments: those which reflect the structure of the population with respect to age and the female participation rate, and those which reflect the local "propensity" to implement instruments of ALMP, e.g. political majorities and the proportion of welfare recipients in the population. However, one could very well argue that local political majorities are also influenced by a tight labor market situation as voters may vote for those politicians or parties which they think have the best labor market policy. A similar argument can be applied to the inclusion of social welfare recipients into our set of instruments. Often, social welfare recipients are former unemployed persons whose eligibility for financial support through the unemployment insurance has faded out. Thus, to some extent they are the result of past labor market problems. However, in the estimates, the instruments were not rejected as valid instruments.

4 Empirical Application to the Planning Regions

To estimate the effect of the ALMP on the labor market, regionally disaggregated data for West Germany in the years 1986 to 1993 have been collected from a number of sources. The regional units of observations are the 74 planning regions ("Raumordnungsregionen"). The 74 planning regions are aggregates of 327 districts ("Kreise- und kreisfreie Städte") designed to combine major towns and cities with their related hinterland and to give a reasonable approximation of regional labor

¹⁷See ABM-Anordnung 1984, §2, par.2, no.5.

¹⁸See, for example, Huebner et.al. (1992), p.34

¹⁹This points to an often stated problem of the community level that local governments try to put welfare recipients (for whose payments the local community would be responsible) into labor market programs, thus transferring costs to the Federal Bureau of Labor.

markets, a description of datasources and definitions can be found in appendix A.

The application of the disequilibrium framework as a precondition requires operational definitions of the three labor market quantities labor supply (LS), labor demand (LD), and labor transacted (LT). For that purpose, data on registered employment from the social security statistics, on registered unemployment and on vacancies are used. However, there are conceptual difficulties, as registered employment may contain participants in labor market programs. This is especially relevant for ABM participants, as these are almost completely statistically treated as employed during the program, since they contribute to the social security system. It is less relevant for FuU participants as a considerable fraction are unemployed before the begin of the program, and even if they were employed their jobs are supposed to be in jeopardy if they were to be supported by the BA. During the FuU program, only few persons will be employed and covered by the social security statistics. Therefore FuU participants are not included in the registered employed but are treated as a single category beside registered unemployed. Thus, labor supply can be defined as registered employment plus registered unemployment plus participants in FuU measures. Also, labor demand and labor transacted have to be corrected for ABM participants. Subtracting ABM participants from total employment yields what can be referred to as *regular* employment, a measure of labor transacted, and adding the vacancies yields *regular* labor demand.

The impact of these definitions of labor supply, labor demand and employment on the measured rate of unemployment, is displayed in table 4. Column (1) reports statistics for the average rate of unemployment defined as the number of unemployed divided by the sum of registered employment and the number of unemployed, i.e. without taking program participants into account. In contrast to that, column (2) displays statistics for the average rate of unemployment, defined as the number of unemployed and participants in active labor market programs divided by the sum of registered employment, unemployment and FuU participants. Whereas the extreme observations and the mean all increase, the coefficient of variation remains constant, indicating that neglecting ALMP participation leads to underestimation of unemployment, but does not affect the distribution of unemployment.

As a starting point to the empirical study consider the estimation of a basic CES function with fixed regional and time effects only.

$$\ln LT_{r,t} = -(1/\rho_{r,t}) \ln \left(LD_{r,t}^{-\rho_{r,t}} + LS_{r,t}^{-\rho_{r,t}} \right) + \epsilon_{r,t} \quad (8)$$

$$\rho_{r,t} = \alpha_0 + \alpha_r + \beta_t \quad (9)$$

Table 4: Unemployment among the planning regions, 1986-93

	average rate of unemploy- ment		structural rate of unemployment		
	without ^{a)} ALMP	with ^{b)} ALMP	without ^{a)} ALMP	with ^{b)} ALMP	
	(1)	(2)	(3)	static	dynamic
minimum	3.99	4.89	2.56	2.81	2.71
maximum	13.46	18.14	5.09	6.21	4.77
mean	7.58	9.77	3.40	3.88	3.51
coeff. of variation	0.34	0.34	0.19	0.19	0.13
bottom tenth	4.43	5.90	2.67	3.05	2.92
top tenth	11.18	13.97	4.22	4.87	4.11

Notes: ^{a)} Employment, labor demand, and supply defined without active labor market policy,

^{b)} employment, labor demand, and supply corrected for program participation (see text).

$$\text{with } \sum_r \alpha_r = 0 \quad , \quad \sum_t \beta_t = 0$$

where r is the regional, t is the time index, and α_r and β_t are dummies for the region and the time period, respectively. Application to the planning regions in the eight consecutive years between 1986 and 1993 yields region-specific mismatch parameters ($\rho_r = \alpha_0 + \alpha_r$). From this region-specific structural unemployment rates are obtained using equation (2). Column (3) of table 4 displays some statistics for the estimated SUR based on the definition of labor market aggregates without ALMP. Compared to the average unemployment rate the figures are much lower, indicating regional rates of structural unemployment to vary between 2.56 % and 5.09 %. Column (4) reports statistics for the adjusted or regular employment and labor demand and the extended labor supply definition. The estimated rates of structural unemployment are varying between 2.81 % and 6.21 % which is somewhat larger, but, however, still much lower than the corresponding average unemployment rates as depicted in column (2). According to the coefficient of variation, also the dispersion of structural unemployment rates is much smaller than that of average unemployment rates. However, one might also apply the dynamic extension of the CES equation (see equation 5 above), which takes into account sluggish employment

adjustment, and can be estimated as:

$$\ln LT_{r,t} = -(1/\rho_{r,t}) \ln \left(LD_{r,t}^{-\rho_{r,t}} + LS_{r,t}^{-\rho_{r,t}} + [(1 + \delta) LT_{r,t-1}]^{-\rho_{r,t}} \right) + \epsilon_{r,t} \quad (10)$$

where $\rho_{r,t}$ is given by the linear equations (9), as above. Note that the adjustment parameter (δ) is assumed to be equal across the regions, which presupposes that the speed of employment adjustment is a national rather than a regional characteristic. Application to the regional data yields a similar set of region specific mismatch parameters, which, however, give rise to structural rates of unemployment as defined by equation (7). Column (5) in table 4 display some statistics, obtained from an application to the adjusted labor market quantities. As compared to estimates without dynamic adjustment in column (4) the figures are reduced and also show smaller dispersion.

Further insights into the regional SUR estimates can be obtained from an inspection of figure 4. It plots the structural rates of unemployment obtained from the adjusted labor market quantities using a static and dynamic CES approach, corresponding to columns (4) and (5) of table 4. Both plots display a characteristic north-south disparity with lower rates of SUR in the south. The largest rates are found in the north-western area ("Ostfriesland"). The industrialized Ruhr- and Saar-areas also show larger values. Generally the estimates are in line with the common belief about the location of larger structural labor market problems.

As a measure of the local activity in labor market programs two accommodation ratios are defined as done in Calmfors/Skedinger (1995): the ratio of participants in ABM measures and the ratio of persons participating in FuU measures, both relative to joblessness. The jobless, in turn, are defined as the registered unemployed plus the program participants. Figure 5 depicts the average regional accommodation ratios. They clearly show regional variation in the policy mix, where the south-western regions are engaged in FuU measures, whereas northern regions favor ABM measures. Comparing figures 5 and 4, a noticeable regularity emerges which points to a relationship between the accommodation ratios and the *SUR* across the planning regions. In the south of Germany, FuU accommodation ratios are high and the *SUR* is low. In the north, one finds high ABM accommodation ratios along with a high *SUR*. This might imply that ABM measures are less successful in reducing structural unemployment than FuU measures. But it might also reflect the endogeneity of the measures, if in regions with a high *SUR*, ABM measures are implemented, perhaps because they are thought to be more effective than FuU measures in reducing structural unemployment.

Testing for the effects of ALMP is done by augmenting the equation for the mis-

Figure 4: SUR in the Planning Regions, average 1986-93

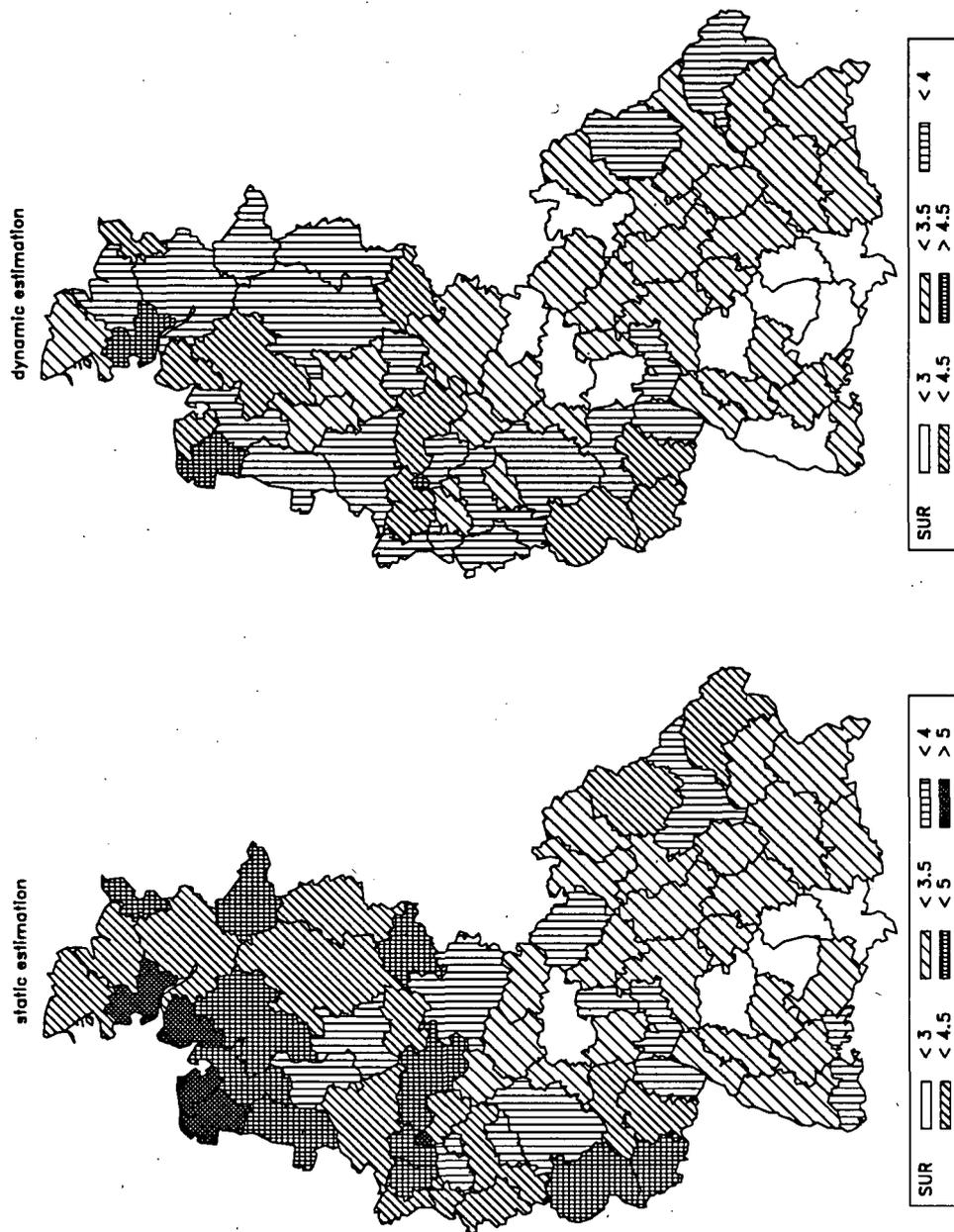
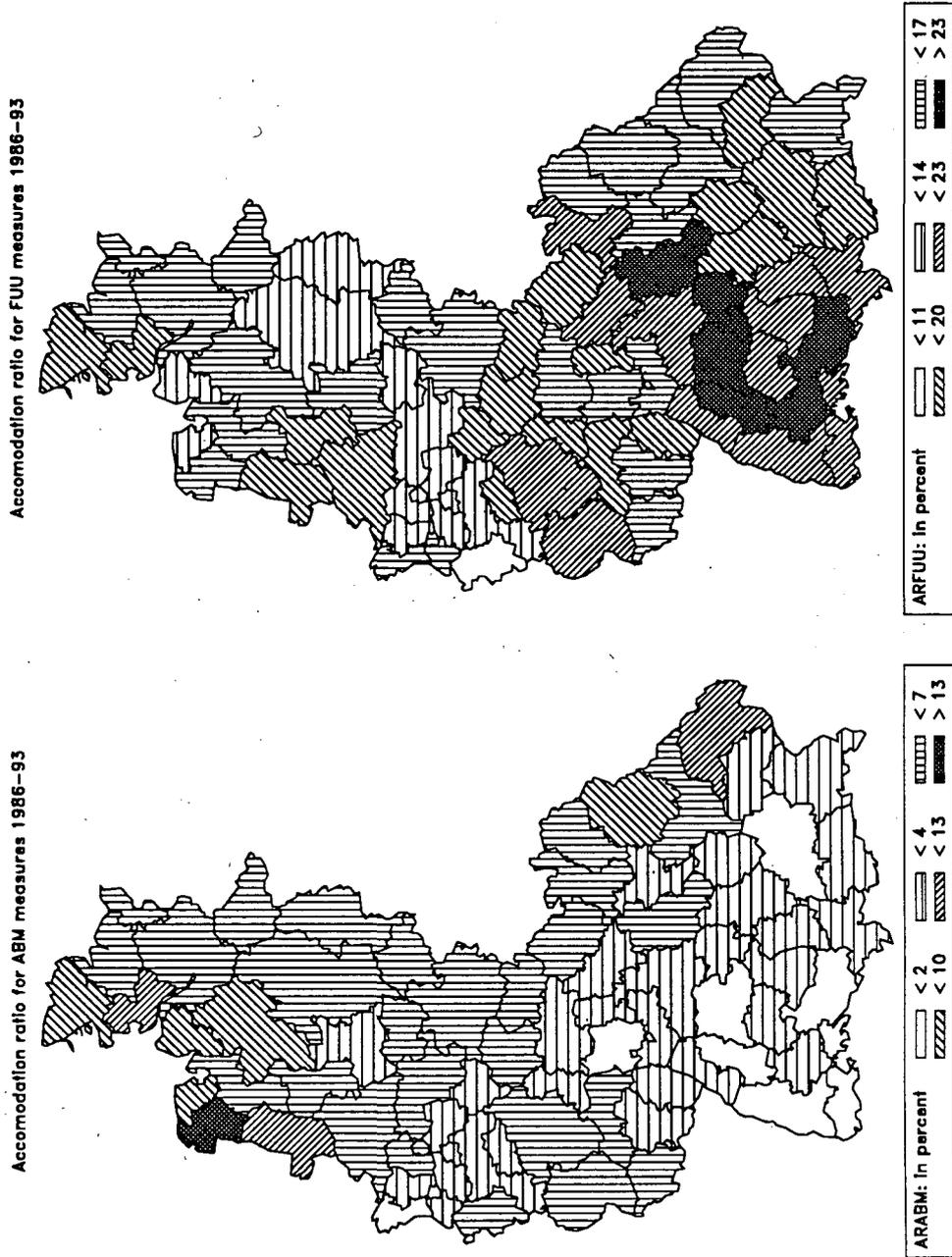


Figure 5: Accomodation in ALMP measures, average 1986-93



match parameter (9) by a linear function of the accomodation ratios, such that the mismatch parameter is defined as:

$$\rho_{r,t} = \alpha_0 + \alpha_r + \beta_t + \gamma^{ABM} accr_{r,t}^{ABM} + \gamma^{FuU} accr_{r,t}^{FuU} \quad (11)$$

with $\sum_r \alpha_r = 0$, $\sum_t \beta_t = 0$

where $accr^{ABM}$ and $accr^{FuU}$ denote the two accomodation ratios. The model to be estimated is obtained by inserting this equation into the static (equation (8)) or dynamic CES function (equation (10)). In the former case, estimation can be carried out in two separate steps: the nonlinear term (equation (8)) is solved by numerical methods for the implied mismatch coefficients $\rho_{r,t}$ which can then be regressed on a set of fixed regional and time effects as well as the accomodation ratios. In the dynamic case, this decomposition is not possible, and non-linear least squares is applied directly to the CES function after inserting the equation for the mismatch parameter²⁰.

Table 4 shows the results of our estimates. In the first column, results of a basic regression are displayed where the mismatch parameter is regressed on the contemporaneous accomodation ratios without using regional fixed effects. As the accomodation in ABM is negatively related to the mismatch parameter, which itself is inversely related to the SUR it suggests that ABM measures increase labor market mismatch. Conversely, accomodation in FuU measures seems to decrease mismatch. These correlations support the above finding that regions with high structural unemployment rates also have high accomodation ratios in ABM and low accomodation ratios in FuU measures. To account for average differences among regions, we included regional fixed effects. Corresponding results are presented in column (2). According to the Wald statistic the regional effects are highly significant. Now, both accomodation ratios are no longer significant. However, as ALMP programs last for up to two years, the impact might not be visible while people are still participating in the program. Moreover, the endogeneity of the ALMP programs render it difficult to identify the effects. As the participants are to a large extent recruited from the pool of unemployed, the accomodation ratios at time t might merely reflect the region's previous unemployment problem, and not the effect of the program. Because unemployment is negatively correlated with the mismatch parameter ρ , we expect the coefficients of the accomodation ratios to be downwards biased if an endogeneity problem exists.

This hypothesis is partly confirmed when looking at column (3) of table 4 where the lagged ALMP variables, i.e. the values of the previous year, enter the ρ -equation.

²⁰ Estimation is carried out with the TSP 4.3 package.

Table 5: The effect of ALMP on labor market mismatch

observations	592		518	444		
method	(1) OLS	(2) LSDV	(3) LSDV	(4) LSDV(IV)	(5) NLS(FV)	(6) NL2SLS
δ					0.18 (9.33)	0.15 (2.58)
$\gamma_{r,t}^{ABM}$	-66.8 (-13.5)	5.62 (0.91)				
$\gamma_{r,t}^{FuU}$	45.20 (14.3)	6.60 (1.37)				
$\gamma_{r,t-1}^{ABM}$			27.42 (3.45)	100.2 (4.30)	95.02 (4.20)	79.81 (2.62)
$\gamma_{r,t-1}^{FuU}$			-5.51 (-1.01)	-34.00 (-1.47)	-30.94 (-1.60)	-43.37 (-1.41)
WALD(α_r)		4,224	4,567	2,874	3,696	2,380
TOR.(d.o.f)				11.5(9)		8.56(9)

Notes: Estimates in columns (2) to (6) are obtained from estimation with regional fixed effects. All estimations also employ time effects. Estimates in column (4) are obtained from standard instrumental variables estimation. Column (5) shows results from a nonlinear least squares regression using fitted values for the accommodation ratios. Column (6) displays results obtained by applying Amemiya's (1974) nonlinear two stage least squares, the set of instruments is the same as in column (4). t-statistics in parentheses are based on heteroscedasticity robust standard errors. All Wald-statistics refer to 73 degrees of freedom. TOR: Test of overidentifying restrictions. d.o.f.: degrees of freedom.

In the case of ABM there is a significant positive effect, whereas the coefficient of FuU programs is not significantly different from zero.

The issue of the endogeneity of the ALMP is further explored by the application of a instrumental variable approach, where the accommodation ratios are regressed on a number of exogenous variables and the fitted values are used in the estimation of the ρ equation. Following the suggestions in the previous section, two groups of instrumental variables are employed. One group reflects the structure of the labor supply with respect to sex and age, i.e. the proportion of young people (< 25 of age) and elderly people (> 50 of age) in the labor force. The second group consists of variables which might increase the propensity of local authorities to press for labor market policies, namely the proportion of social welfare recipients in the population

and the majorities of votes given to political parties within a planning region (see table 7 in appendix B for the results). With respect to the accommodation ratios, all instrumental variables are lagged by one period. This has been found necessary in order to pass the test for the validity of instruments. The effect of this instrumental variable approach on the estimate of the mismatch parameter can be seen in column (3) of table 4. According to the test of overidentifying restrictions (TOR), the set of instruments cannot be rejected. Whereas the coefficient of the ABM accommodation ratio increases, the FuU accommodation ratio still shows no effect. The estimation therefore supports a positive effect of the ABM measures on the mismatch parameter. Recalling that the mismatch parameter is inversely related to the *SUR*, we can deduce that those measures seem to decrease the structural rate of unemployment at equilibrium.

As was discussed above, there is a more general concept of labor market mismatch, which takes into account sluggish employment adjustment. Then, the simple CES function underlying the calculation of the regional mismatch parameter used as the endogenous variable in columns (1) to (4) is no longer valid. Instead, the dynamic CES function has to be applied. This requires simultaneous estimation of the ρ equation and the dynamic CES function. Column (5) presents corresponding results after using fitted values for the accommodation ratios as in the instrumental variable estimates of column (4). Again, the significant effect of the ABM measures is supported. Although the two stage procedure is easily to interpret, it does not allow us to test for the validity of instruments. This can be done by making use of Amemiya's (1974) nonlinear instrumental variable estimator. Using the same set of restrictions, the corresponding results support the finding as well as the set of instruments. As displayed in column 6, the positive effect of the ABM measures and the insignificant effect of the FuU measures are confirmed. According to the TOR statistic, the validity of instruments cannot be rejected. To summarize our results, an increase in the ABM measures reduces the structural rate of unemployment. However, no effects are found for the FuU measures.

According to our results, an increase in the ABM measures reduces the structural rate of unemployment. An interpretation of the coefficient can be found by a simulation exercise: By what extent shall the ABM measures be increased to reduce each region's *SUR* to an arbitrarily chosen minimum level like that of the planning region with the lowest *SUR*? Without aiming to give a policy recommendation, this exercise gives an intuition on the size of the effects. The minimum *SUR* is calculated for planning region 36 ("Unterrhein") having a value of 2.81 % in case of the static CES function. Using the coefficient of the ABM-accommodation ratio as estimated in column (4) of table 5 for each region, the number of additional ABM participants

can be calculated who would have to be placed into ABM programs to increase the ρ parameter to the level of the planning region 36. Summing up the numbers would result in a total of 156,070 additional ABM-participants in West Germany. This is almost twice the average actual number of 92.8 thousand participants in the western regions in the years 1986 to 1992, but less than half the number of FuU participants, where the corresponding number during this period is about 306,700.

5 Summary

This paper has analyzed the macroeconomic impact of two instruments of active labor market policy (ALMP), namely programs to support continuous training and job creation schemes, on the labor market mismatch in West Germany for the period from 1986 to 1993. The effect of ALMP on macroeconomic variables like employment or wages has so far not proved to be unambiguously clear, although a number of studies have dealt with this question. For one reason, this is due to the cross-country perspective of some studies, where only global conclusions about effects of ALMP can be made, disregarding country-specific characteristics of such policies. Another reason is the lack of a straightforward and general model in which such an analysis can be performed and different effects of ALMP can be analyzed. Another obstacle to such an analysis, however, is the endogenous character of active labor market policies. They are not only supposed to reduce a problem in the labor market but they are also a result of those problems, because policy makers usually react to unemployment with an increase in ALMP program implementation.

We suggest to evaluate the effect of ALMP on labor market mismatch by using a disequilibrium approach. It is based on the notion that a single segments of the labor market may be in a temporary disequilibrium due to the short-run rigidity of wages or institutional settings. The aggregation of these micro markets delivers an operational concept of the matching of aggregate labor market quantities. An indicator of labor market mismatch results which describes the deviation of actual aggregate employment from potential employment, and implies a well defined structural rate of unemployment.

By using data for 74 planning regions of West Germany we try to identify a possible effect of ALMP programs on this mismatch parameter. A discussion of the terms and conditions of labor market policy and in particular of local policy options suggests to use lagged values of welfare recipients, votes, female participation, and other characteristics of the population as instruments. The results of our estimates give a

disappointing picture of programs supporting continuous training. We do not find an effect of training programs on the mismatch parameter ρ for the period under consideration. Yet, for job creation schemes the estimates reveal positive effects on the mismatch parameter, indicating that they contributed to a reduction of the labor market mismatch. The size of the estimated effect can be illustrated by a simple simulation exercise: an increase of participation in ABM measures by approximately 150,000 previously unemployed persons would suffice to reduce the structural rate of unemployment (*SUR*) in every region to the actual minimum value of 2.81 %. However, as other effects of these measures on labor demand, labor supply and the wage rates have not been taken into account, this is a *ceteris-paribus* result, and can therefore be regarded as a first step only. Anyway, further research on the underlying process driving the effects of ABM is needed, such as the provision of work experience instead of idleness while being jobless.

A Data Description

A.1 Descriptive Statistics of the Data

The upper part of table 5 is concerned with variables employed in the estimation of mismatch, the lower part reports statistics of the instruments. The last three variables report the votes for the districts. For each district the share of votes accruing to the Social Democrats (SPD) has been computed. A dummy variable has been constructed, representing whether more than half of all votes went to the Social Democrats. The district level value of the dummy was then weighted with the district's population share to get observations for planning regions. The other variables report whether the sum of the votes for the Social Democrats and the Green Party, or the Liberal Party additionally makes up the majority of all votes in a planning region. Note that the variables are defined exclusively: for example, if the Social Democrats received more than 50 % of all votes in a region, only the SPD dummy was set to unity.

A.2 Sources of Data

Registered employment and female registered employment at the district level are taken from the statistics of employees ("Beschäftigtenstatistik"). It covers all employees which are obliged to contribute to the social security system. It is referenced on June 30th of each year.

Table 6: Descriptive statistics for pooled observations

variable	observations: 74 regions – 8 periods				
	mean	std dev.	coeff. of var.	min.	max.
ABM participants ^{a)}	1.159	1.268	1.094	0.019	8.206
FuU participants ^{a)}	4.143	3.102	0.749	0.997	18.53
Registered unemployment ^{a)}	24.98	22.53	0.902	4.515	137.4
Registered vacancies ^{a)}	3.336	3.344	1.002	0.419	28.35
Registered employment ^{a)}	288.0	233.0	0.809	63.2	1137.1
Joblessrate	0.098	0.035	0.357	0.039	0.221
Accommodation ratio ABM	0.039	0.027	0.692	0.002	0.160
Accommodation ratio FuU	0.152	0.042	0.276	0.070	0.279
social security recipients per total pop.	0.037	0.015	0.405	0.011	0.077
share of women in labor supply	0.416	0.027	0.065	0.327	0.0477
share of females in population	0.516	0.005	0.010	0.504	0.532
share of young (age < 25) in working-age pop.	0.207	0.024	0.116	0.152	0.296
share of old (age > 50) in working-age pop.	0.268	0.015	0.056	0.230	0.304
SPD majority	0.097	0.227	2.340	0.000	1.000
SPD & GREEN majority	0.192	0.272	1.417	0.000	1.000
SPD & FDP & GREEN majority	0.093	0.166	1.785	0.000	0.730

Note: ^{a)} in thousands.

The registered vacancies, the registered unemployed, and the participants in FuU and ABM measures by sex are taken from the statistic of the Federal Bureau of Labor (BA). They refer to the 141 employment service districts (“Arbeitsamtsbezirke”). They have been assigned to planning regions (“Raumordnungsregionen”) by a key, obtained from the Federal Office for Regional Planning (“Bundesforschungsanstalt für Landeskunde und Raumordnung”) in Bonn. All data are referenced on September 30th of each year.

Female unemployment has been computed from registered unemployment by using the share of female unemployed as reported at district level in the Eurostat-Regio database.

- The population of working age is defined as the population between the ages of 15 and 65. The younger population of working age refers to the ages 15–25, and the elder working population refers to the ages 50–65. The data source is the official statistic on population, and data have been obtained by the Federal Office for Regional Planning as well as the Statistical Office of Nordrhein-Westfalen. They are referenced on December 31st of each year.
- The share of social welfare recipients (“Empfänger laufender Hilfe zum Lebensunterhalt außerhalb von Einrichtungen”) in the population have been obtained by the Federal Office for Regional Planning. They are referenced on December 31st of each year.
- The data on votes for the district communities have been obtained from the statistical offices of the states (“Statistische Landesämter”). They generally refer to the last election of the district parliament (“Kreistagswahlen”).

B Results of Instrumenting the Accommodation Ratios

To deal with the endogeneity problem of active labor market policies, the accommodation ratios in the estimates of the mismatch parameter ρ were instrumented. All instruments are lagged by one period. The choice of the instruments is based on considering local policy options for influencing the size of ALMP programs that may be exogenous to the local unemployment problem, see the discussion in section 3. As can be seen from the table, the effects of the instruments on the FuU accommodation rate and the ABM accommodation rate differ considerably. While the instruments fail to explain the accommodation ratio of FuU, the ABM accommodation ratio is significantly affected by population composition and policy variables. The policy variables itself have negative effects on the ABM accommodation ratio whereas the interaction of the policy variables with the share of social welfare recipients in the population reveals positive effects. This points to a lower propensity of the conservative parties to implement ABM programs.

Table 7: Instrumenting ALMP

dep. variable	accomodation ratio ABM	accomodation ratio FUU
method	OLS	OLS
time dummies	yes	yes
region dummies	yes	yes
observations: 74 regions – 6 periods		
constant	-0.40 (-2.40)	0.60 (1.96)
social security recipients per total pop.	0.14 (0.76)	-0.49 (-1.40)
share of women in labor supply	-0.38 (-2.79)	-0.27 (-1.08)
share of females in pop.	0.68 (2.16)	-0.63 (-1.06)
share of young (age < 25) in working-age pop.	0.29 (1.81)	-0.42 (-1.39)
share of old (age > 50) in working-age pop.	0.69 (4.77)	0.31 (1.12)
majority of:		
SPD	-0.03 (-1.90)	0.03 (1.01)
SPD & GREEN	-0.04 (-3.66)	-0.01 (-0.35)
SPD & FDP & GREEN	-0.18 (-1.56)	0.01 (0.63)
social security recipients per total pop. times maj. of SPD	0.54 (1.88)	-0.10 (-0.18)
SPD & GREEN	0.75 (3.14)	0.21 (0.46)
SPD & FDP & GREEN	0.40 (1.53)	-0.51 (-1.04)
R^2	0.95	0.93

Notes: t-statistics in parentheses are based on heteroskedasticity robust standard errors. All explanatory variables are lagged by two periods.

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