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Economic Structures And Skills Mismatch As Determinants Of Regional Unemployment - Some Considerations With Respect To The Middle Lower Rhine Area

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**ECONOMIC STRUCTURES AND SKILLS
MISMATCH AS DETERMINANTS OF
REGIONAL UNEMPLOYMENT
SOME CONSIDERATIONS WITH RESPECT TO
THE MIDDLE LOWER RHINE AREA**

Abstract: The paper deals with the specific labour market problems of the “Middle Lower Rhine Area”, which is situated in the west of Düsseldorf between the river Rhine and the Dutch-German border. In comparison to German average this region still has a high industrial orientation. As a consequence of structural change the unemployment ratio of this north-rhine-westphalian region lies above state-average.

After a short description of the regional labour market situation by employment and unemployment data, two questions will be dealt with more detailed:

- To what extend are the above average levels in the past of the regional unemployment ratio and the increase of unemployment determined by the given economic structures of that region? Shift-share-analysis on basis of unemployment data by skills is used to answer this question.
- To what extend has structural change led to increasing problems of skills matching. Mismatch indicators will be calculated and the development of long-time unemployment will be analysed on basis of unemployment data by skills and qualifications to deal with this question.

In comparison to other membership countries of the European Union - like Denmark, Great Britain or the Netherlands - the Federal Republic of Germany suffers persistently from high unemployment. Even though there has been a slight amelioration on the labour market nearly 4 millions of unemployed show that the target of high employment is violated. Besides unemployment differs considerably by regions: While there are Districts of Labour Administration (in the following: DLA) in Bavaria where the unemployment rate meanwhile has fallen below 5 percent, there are districts in the "Neue Länder" (former German Democratic Republic) where unemployment rates of more than 25 percent can still be observed. Therefore, discussions on how to reduce unemployment do not only take place on the national but also on the regional level.

As an extensive and careful analysis of the conditions on the regional labour market is the required basis for appropriate policy measures the Chamber of Industry and Commerce of the Middle Lower Rhine Area had commissioned the University of Applied Sciences to analyse the developments and structures on the regional labour market more detailed (R. Hamm, M. Wenke, 1998 and 2000). After a short characterisation of labour market in the Middle Lower Rhine Area (chapter 1) two special aspects of this analysis shall be dealt with in the following:

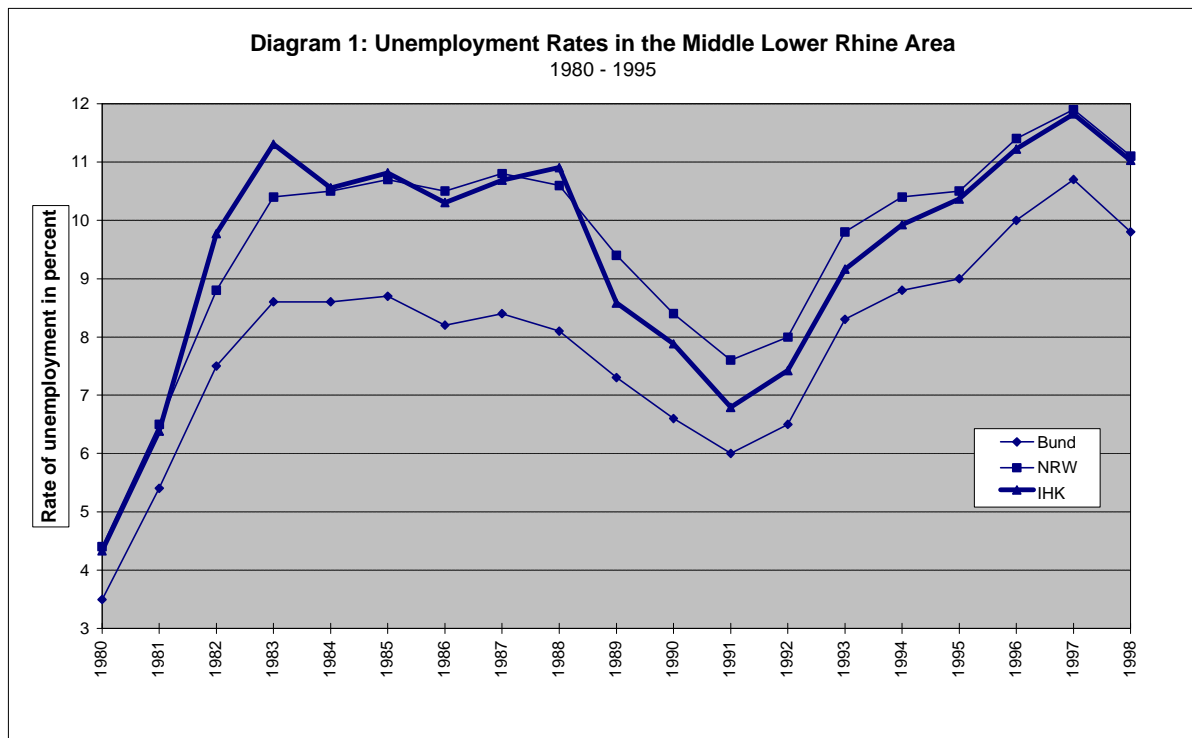
- Which dependencies exist between the regional development of employment and the qualification of labour force (chapter 2)?
- To what extent has structural change caused an increase of skills mismatch or occupational mismatch (chapter 3)?

1. The Situation of the Labour Market in the Middle Lower Rhine Area

The Middle Lower Rhine Area (in the following: MLRA) is situated in the west of Düsseldorf between the river Rhine and the Dutch German border. The region consists of the two counties of Neuss and Viersen and the two cities Mönchengladbach and Krefeld. In the MLRA the secondary sector is of a greater importance than in the north-rhine-westphalian average, while the tertiary sector is underrepresented. Nevertheless in the last 20 years a considerable structural change from the secondary to the tertiary sector has taken place; but in the region this change occurred starting from a higher share of manufacturing industries than in the national or state average. Most important branches of regional industry are skeleton construction, mechanical engineering and motor vehicles as well as the chemical industry, while textile mill products and apparel

and other textile products, which have been of great regional importance in the past meanwhile only play a minor part.

Diagram 1 shows the development of the regional unemployment rate of the MLRA in comparison to the national and state average. All three quotas have been developing in a similar way: A steep rise of unemployment at the beginning of the eighties, after that high and stable quotas between 1983 and 1988, then a decrease of unemployment rates until 1991 and finally a rise until 1997. The year 1998 marks the turning point of labour market development. At the moment 11 percent of the labour force in the MLRA are unemployed. In comparison with the north-rhine-westphalian developments it is striking that unemployment in the MLRA rises above state average when unemployment is high and falls below it when unemployment is low. This indicates a more than average regional sensitivity to the business cycle.

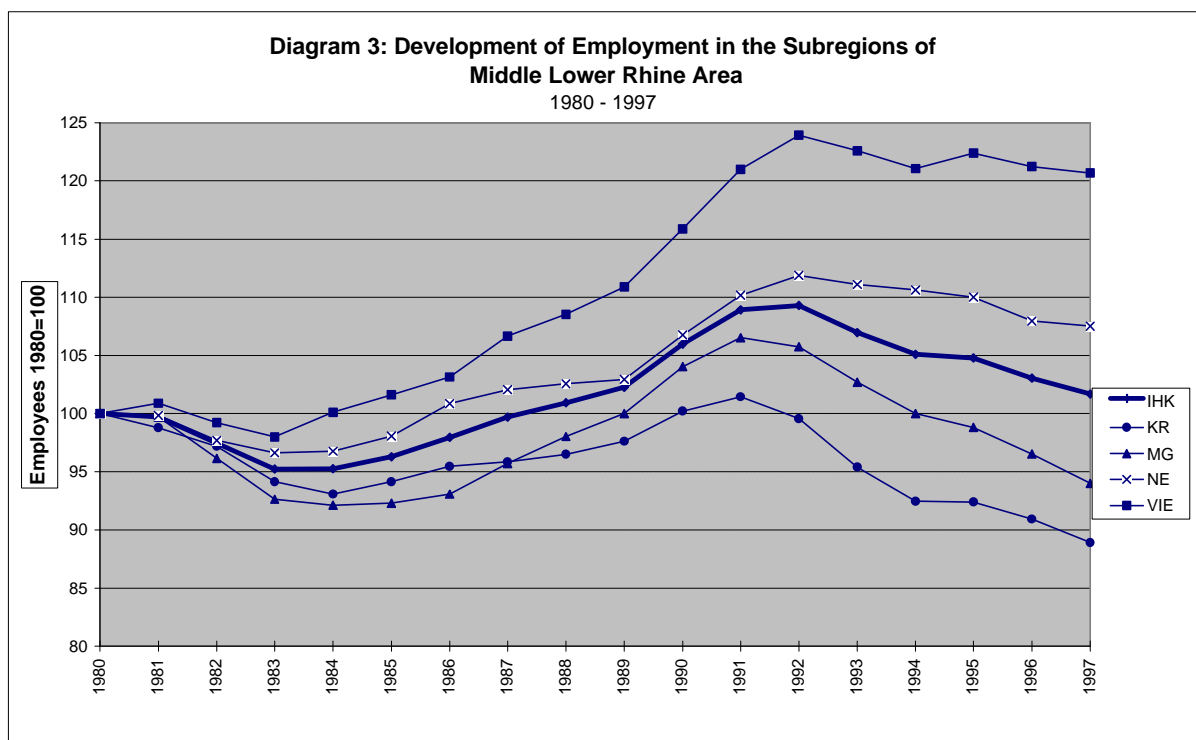
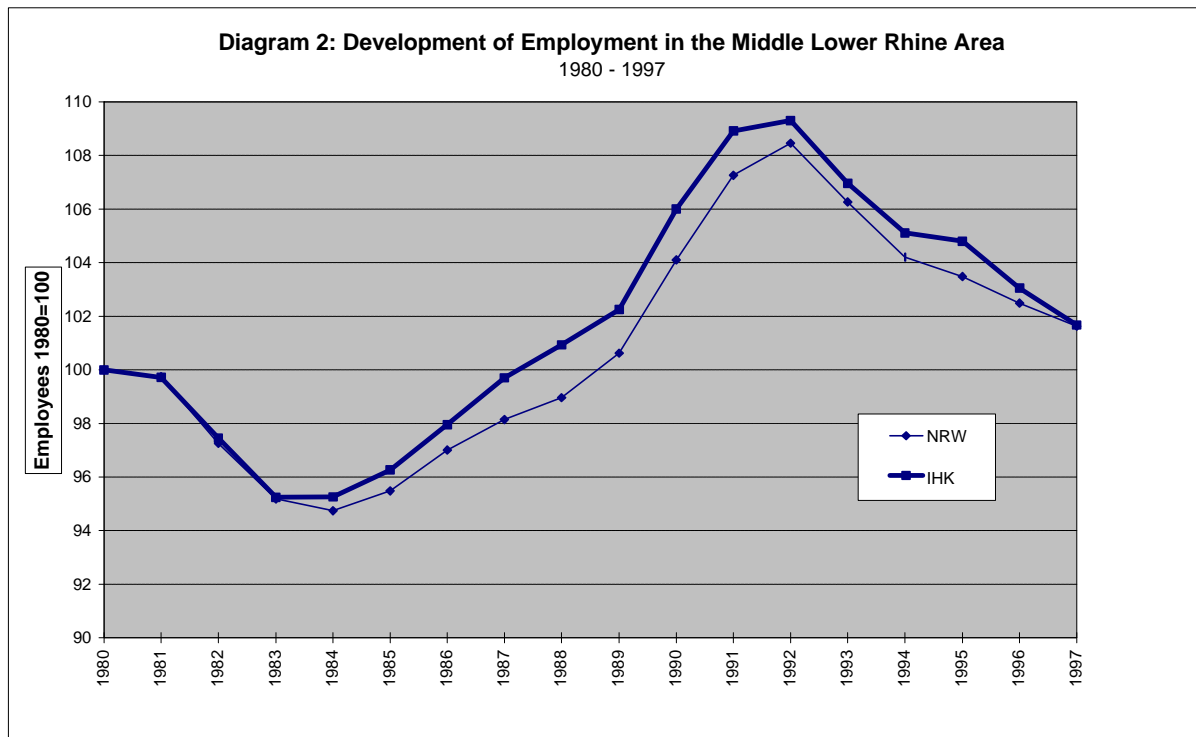


From the viewpoint of the MLRA one might be content with these figures. Regional unemployment rate is comparable to the state average and one can hope that the region will be favoured by a further upturn in the business cycle. However, a more disaggregated view shows that the unemployment rates noticeably differ in the parts of the MLRA. In September 1998 an unemployment rate of only 9,0 percent could be observed in the county of Neuss, while it was 13,6 percent in the city of Krefeld. The city of Mönchengladbach (12,6 percent) and the county of Viersen (9,7 percent) take the middle positions in this comparison. As the MLRA consists of two cities with more than

average and two counties with less than average rates of unemployment an analysis of the total region covers some of the special labour market problems existing in the subregions.

Two figures of labour market development show the regional problem: In September 1980 there were 18 800 people unemployed in the MLRA. Until 1997 the number of unemployed had increased to more than 60 000. Comparing the MLRA with North Rhine-Westphalia and Germany the strong increase of unemployment in the recession at the beginning of the eighties is striking. In all three cases in 1983 the number of unemployed people was 2,5 times as high as in 1980. This increase was partly compensated during the upswing caused by the German unification at the end of the eighties and the beginning of the nineties. Since 1991 in Germany (82 percent), in North-Rhine-Westphalia (60 percent) and in the MLRA (75 percent) the figures have increased again.

In Diagrams 2 and 3 the regional development of employment since 1980 is plotted. In the MLRA in 1997 more than 375 000 employed persons were registered in the national insurance system. This value lies approximately 2 percent (6 000 people) above the level of 1980. One can see that the number of employees in the MLRA has developed nearly parallel to that of North-Rhine-Westphalia: In the recession at the beginning of the eighties the figures decreased. The lowest level was reached in 1984, followed by a steady increase until 1992. After 1992 a considerable decrease of employment can be observed leading to a value in 1997 exceeding 1980's value by 2 percent. How must this medium run regional development of employment be judged against the background of the business cycle? At the starting point of the analysis (1980) the economy was booming. The next year of a booming economy was 1992; and in addition the situation in this year was influenced by the German unification. Between those two periods of booming economy, an increase of employment is evident. Even if one takes into consideration that the process of unification has extended and reinforced the German booming phase at the beginning of the nineties the MLRA must be described as a region with increasing employment in the medium run.



Middle Lower Rhine average: In the county of Viersen the number of employees increased by more than 20 percent, in the county of Neuss the increase came up to 7

has been totally different. In 1997 employment in Mönchengladbach approaches 95 percent of the 1980 level; the comparable value for Krefeld not even reaches 90 percent.

With regard to employment, too, the development of the MLRA is the result of two particularly well developing counties and two particularly unfavourably developing cities.

A shift-share-analysis was used to find out which share of regional unemployment can be attributed to economic structures of the MLRA. The criterion used for this was unemployment by occupation. It was assumed that the unemployment rate for each occupation in the MLRA is as high as the state average. On the basis of the quotas hypothetical unemployment figures by occupation could be calculated for the region. Aggregation then yielded a hypothetical total number of unemployed and a hypothetical unemployment rate (expected values).

For 1998 the results of the shift-share-analysis show that unemployment in the MLRA lies above state average. This can be explained only for the smaller part by the occupational structures of the employed people which are unfavourable under the aspects of labour market, i.e. occupations with a relative high degree of unemployment at the state level are represented more than average in the region. Apart from this, in 1998 the actual value of regional unemployment exceeded the value being expected on the basis of regional occupational structures by about 3 000 people. A more detailed look at the results for manufacturing and service jobs shows that the results just being described, hold for both groups of occupations. These results can be summarized as follows: On the one hand a more than state average rate of unemployment can be expected for the MLRA due to the unfavourable occupational - and this also means - economic structures. On the other hand further determinants of regional labour market situation must be unfavourable, too. Two of these factors - qualification of workers and problems of matching - will be dealt with in particular in the following context.

2. Qualification and Regional Development of Employment

In a paper of the German “Institut für Arbeitsmarkt- und Berufsforschung” (Institute for Labour Market and Occupational Research) from 1993 the following statement can be found: “Human capital will become the most important factor of production in Germany”. Indeed the human capital intensity has increased considerably in the past. General structural trends like the tertiarisation of the economy, the internationalisation of production, the rise of global markets, the acceleration of product cycles and the change of production and management techniques gave reason to expect that service jobs, especially qualified production oriented services will gain importance. So the

following considerations, which deal with the relationship between the regional development of employment and the qualification level of employees.

Table 1: Development of Employment by Qualification

1990 - 1998, changes in %

	No professional Training	Professional Training	University of Applied Sciences	University	Total
North-Rhine-Westphalia	-23,2	-0,4	16,4	33,8	-2,4
Middle Lower Rhine Area	-27,0	-2,3	13,5	26,6	-4,5
DLA Krefeld	-29,0	-2,7	19,1	24,8	-5,3
DLA Mönchengladbach	-25,4	-1,9	9,2	28,1	-3,9

Own calculations on basis of statistical data

As table 1 shows the employment figures in the different groups of qualification have developed less favourable in the MLRA than in the state average. It is striking that the

employment went down by 4.5 percent the number of employees with professional training only dropped by 2.5 percent. On the contrary the number of employees with an

increase. This increase amounts to 13.5 percent for the universities of applied sciences and even to 26.6 percent for the universities. As expected the development of

decrease of 27 percent can be observed.

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employment?

- How must the regional qualification profile be judged in the different groups of occupations?

Are there any occupations with a need of qualification in the MLRA?

To test the relationship between qualification and employment in detail a rank correlation between the development of employment by occupation between 1990 and

(table 2). The results of this calculation show a clear relationship between these two

favourable has been the development of employment in the analysed period of time. In addition, this result is confirmed by a cross-section regression between the same

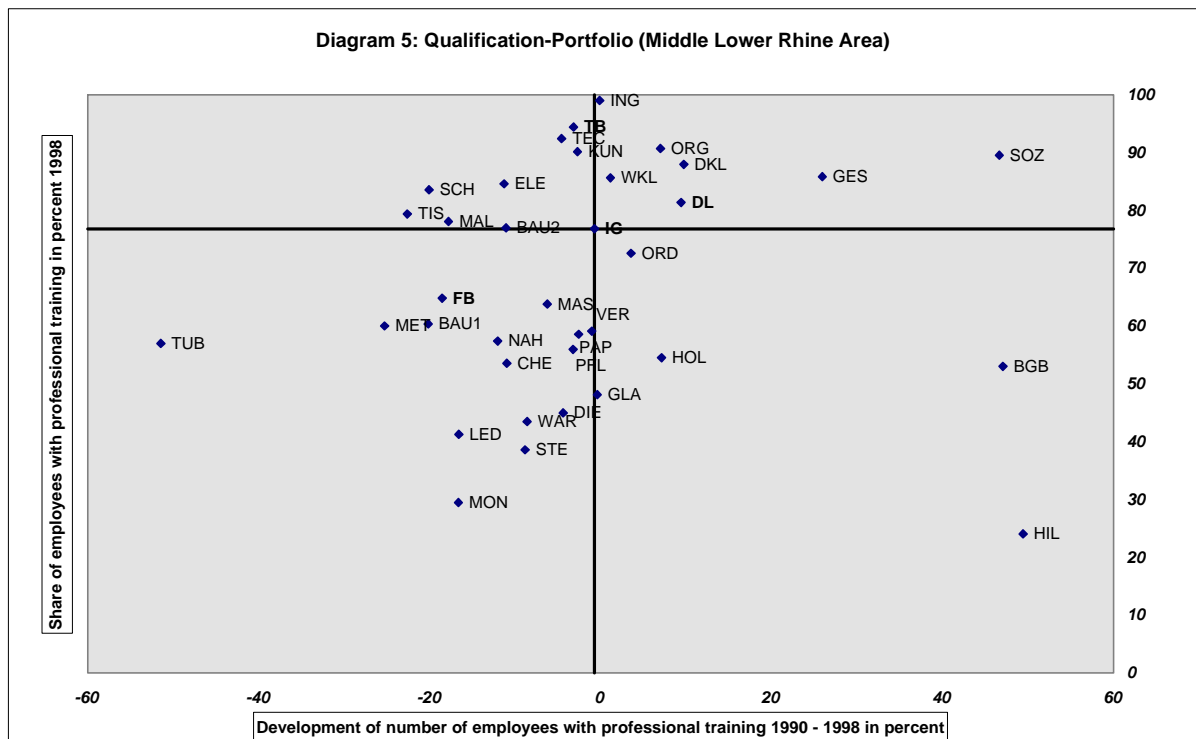
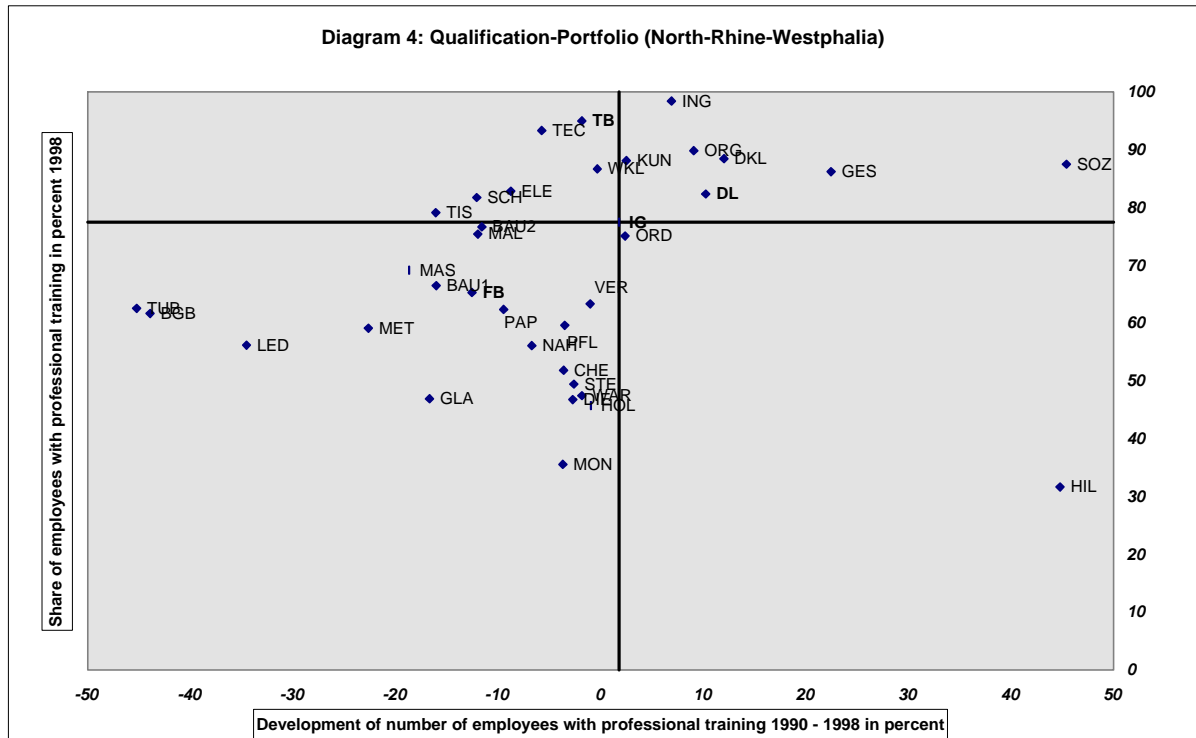
furthermore these coefficients are statistically significant. The determination coefficients are satisfying with respect to a cross-section regression. So a positive relationship between the level of qualification and the development of employment can be stated.

Table 2: The Relationship between

	Correlation

For judging the quality of the regional qualification level in the MLRA a "qualification-portfolio-analysis" has been carried out on basis of data on the number of employees by occupation. For this analysis a static indicator and a dynamic one have been selected. The share of employed people with professional training (including those with a university education) in 1998 is the static indicator; it allows a statement on the present level of qualification or rather the regional equipment of human capital. The development of the number of qualified workers in the period of time between 1990 and 1998 is the chosen dynamic indicator, which informs about the previous development but can also give hints on development potentials for the future. The used portfolio-diagrams (diagram 4 and 5) - with the static indicator drawn on the y-axis and the dynamic one on the x-axis - compare the structure of qualification in different occupations of a region. Comparing the diagrams permits to find out structural peculiarities of the regarded region. Furthermore the regional averages of both variables have been integrated into the diagram; they constitute four segments with different constellations of the two selected indicators.

Occupations with an above average development of employment in the field of qualified workers and with an above average level of qualification can be found in the upper right segment of the diagrams. This segment is called "qualification intensive". In the case of MLRA this group almost exclusively exists of service jobs, namely social and educational services, health services, service and product traders, organisational and administrative jobs and finally engineering jobs. As the degree of qualification is already high in these occupations corresponding requirements of qualified workers can be expected for the future.



Occupations with a below average level of qualified workers and an above average development of qualified jobs are called “hungry for qualification”. Under the assumption that the demand for qualified workers continues in these occupations resulting in an increasing level of qualification, this group encloses occupations with an exceptional high need for qualified workers in the future. In the case of MLRA this only concerns security services and jobs in the woodworking and lumbering industry.

Another group called “full of qualification” includes those occupations, which can be characterised by a more than average level of qualification combined with a less than average development of the numbers of qualified workers. To keep the high level of qualification qualified workers will be needed in this group of occupations; but the development below average lets expect only a limited future expansion of the figures in this group. In the MLRA this concerns occupations in the production sector (especially handicrafts such as electricians, locksmiths, painters, carpenters etc.), technical jobs as well as writing and artistic jobs.

A below average development of qualified workforce and a below average level of qualification are the characteristics of the fourth group of occupations; this group is called “with poor qualification”. In the MLRA this group consists of general, in most cases comparatively simple service jobs and of some manufacturing jobs. Workers with metal jobs, with apparel, textile and leather jobs, with jobs in the food and kindred product industry as well as jobs in the stone and clay industry are stemming from those sectors of the economy which had to suffer from adjustment problems in the past. It may be possible that these serious problems of structural change have prevented a further extension of the status of qualified workforce. As far as the firms in these branches of industry succeed in solving their adjustment problems an improvement of the level of qualification might be the result.

Comparing the qualification-portfolios of North-Rhine-Westphalia and MLRA no essential differences can be observed. So the described results not only hold for the region but seem to be of global importance. It is striking, however, that in North-Rhine-Westphalia about 40 percent of all employees and 48 percent of all qualified workforce respectively can be assigned to jobs, which have been characterised as “qualification intensive”, while the corresponding values for the MLRA only amount to 37.7 and percent 45.5 percent. This, too, indicates qualificalional deficits of the region. Remembering the relationship between the level of qualification and the development of employment these deficits may contribute to explain the below state average development of employment in MLRA.

3. Structural Unemployment and Mismatch

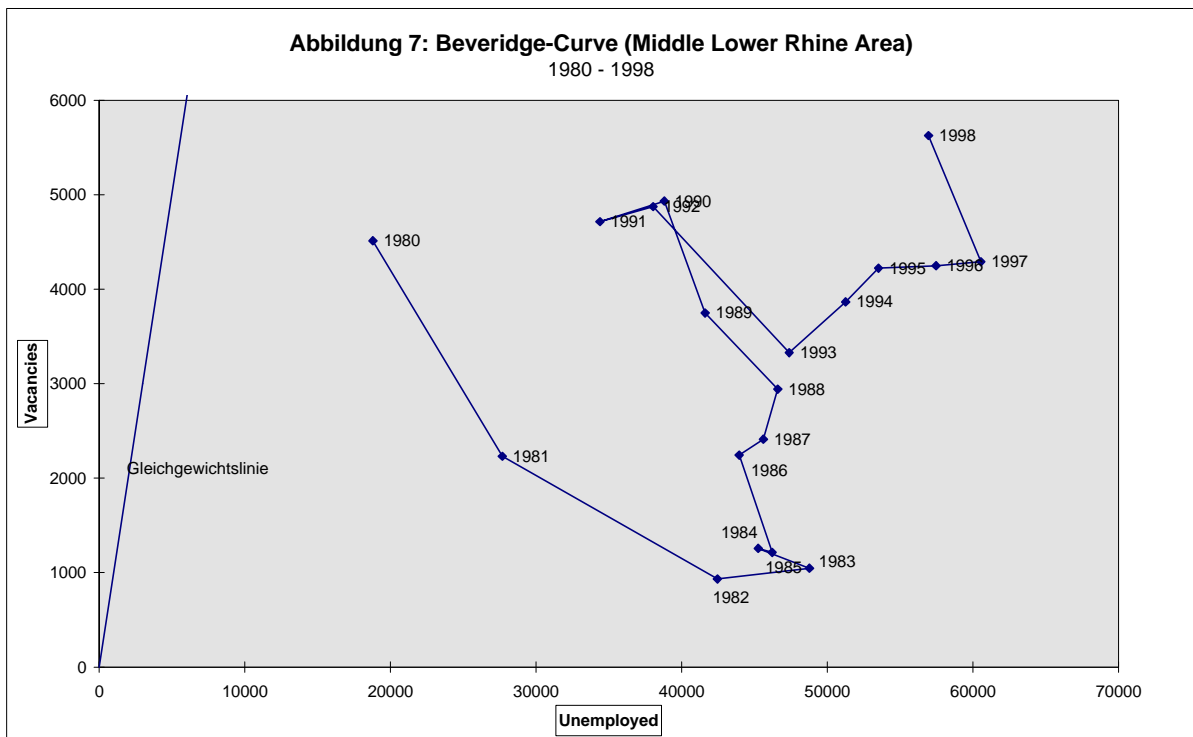
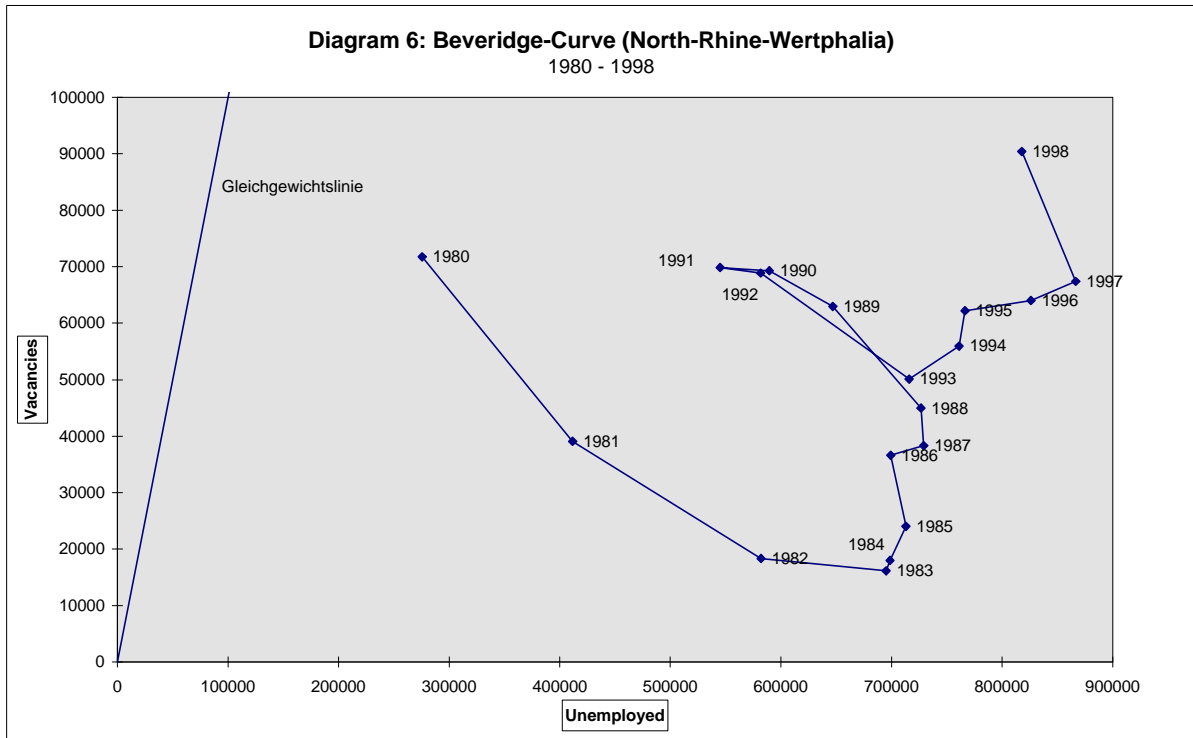
3.1. Causes of Mismatch

The following considerations deal with the question, to which part high unemployment can be explained by mismatch. The term “mismatch-unemployment” is used, if high

unemployment coincides with a considerable number of vacancies (O. Landmann, J. Jerger, 1999, p.32). One might object to the following considerations that the number of unemployed because of mismatch in any case cannot be higher than the number of vacancies. In 1998 there have been 57 000 unemployed in MLRA while there have been only 5 600 vacancies at the same time. This would mean that at most 10 percent of total unemployment could be explained by matching problems. But this is not the whole story because the firms do not report all vacancies to the Labour Administration. The importance of mismatch has to be ranked much higher, if one considers that the "degree of bringing in the Labour Administration" only amounts to 40 percent. Furthermore for taking the right policy measures against unemployment not only the extent of mismatch unemployment but also its determinants are of highest importance.

Referring to Franz and other authors four explanations of mismatch can be distinguished:

- Regional discrepancies. In this case (immobile) job searchers and immobile (vacancies) are in different regions of the economy.
- Discrepancies of profile. They can result from at least two reasons:
 - Occupational profile. In this case the vocational training of the person looking for a job does not agree with the requirements of the vacancy.
 - Skill profile. In this case the level of qualification of the person looking for a job disagrees with the qualification needed for the vacancy.
- Deficits of information. In this case the person looking for a job does not know about the suitable vacancy and the firm does not know about suitable persons in the unemployed labour force.
- Insufficient willingness to work. One certainly must speak of mismatch, too, if – for different reasons – people are not willing to take up work, though they are unemployed job searchers on the basis of official statistics.



The Beveridge-curve (O. Landmann, J. Jerger, 1999, p. 49ff) is an instrument for analysing mismatch-unemployment. It describes the relation between the unemployment rate and the rate of vacancies¹. As the slope of the Beveridge-curve shows the number of vacancies will be low, if the number of unemployed is high, because in this situation a vacancy can be filled promptly from the pool of unemployed. Vice versa the number of vacancies will be large, if there are only few unemployed

people, because the firms have no problems to fill their vacancies. These considerations lead to a hyperbolic Beveridge-curve. The intersection of the Beveridge-curve with the 45⁰-line represents a situation where the number of vacancies corresponds exactly to the number of unemployed; in this situation unemployment is fully explained by mismatch. An outward shift in the empirically observed Beveridge-curve then points to an increasing mismatch (R. Fehn, 1997, p. 34f).

Diagrams 6 and 7 show the respective Beveridge-curves for North-Rhine-Westphalia and the MLRA for the time period from 1980 to 1998. Both graphs show very similar slopes of the curve. From 1980 to 1985 a movement on a stable Beveridge curve in south-eastern direction can be seen. Between 1985 and 1987 an outward shift of the curve can be observed. Data from 1988 to 1993 again yield points that could be situated on a new Beveridge-curve situated in greater distance from the origin. As the curve has a much greater distance to the origin its intersection with the 45⁰-line must be much more distant to the origin, too, and this would mean a higher level of mismatch-unemployment. Until now it is difficult to judge the results of the years 1994 to 1998 because it might be possible that a part of this time period belongs to the just described Beveridge-curve. But it might as well hint to a further outward shift of the curve; the value for 1998 gives some indication for this.

Irrespective of the correct judgement of the recent data, which will be possible only in the course of time it can be stated that mismatch has increased during the past in North-Rhine-Westphalia and likewise in the MLRA. In the following it will be analysed whether rising discrepancies of occupational or skill profiles can explain this increasing mismatch unemployment.

3.2. Occupational Mismatch

To estimate the level and the development of occupational mismatch the following indicator has been used (W. Franz, 1994, p. 217; R. Jackman, S. Roper, 1987):

$$MO = \sum |U_i/U - V_i/V|$$

with: U_i = Number of unemployed in occupation i
 V_i = Number of vacancies in occupation i
 U = Total number of unemployed
 V = Total number of vacancies

For the calculation of this indicator official data of unemployment and vacancies by occupation disaggregated by five "sections of occupation" have been used first. Afterwards the sections "production jobs", "technical jobs" and "service jobs" have

been further disaggregated and the calculations have been repeated for 31 "groups of occupation". The values of the indicator have been calculated for the years 1980, 1985, 1990, 1995 and 1998 for North-Rhine-Westphalia, for the MLRA and the DLA of Krefeld and Mönchengladbach, which form the MLRA.

The results of this procedure are presented in table 3. On the level of sections of occupation they show:

- Between 1980 and 1998 the value of the mismatch indicator continuously went down in North-Rhine-Westphalia. So the increase of mismatch indicated by the outward shift of the Beveridge-curve cannot be explained by rising discrepancies of occupational profile at the level of sections of occupation. On the contrary, occupational mismatch unambiguously decreased at the chosen level of disaggregation. As unambiguous are the results for the MLRA. At the beginning of the eighties the value for the indicator remained relatively stable for the region, showing a slight increase for the DLA Krefeld and a slight decrease for the DLA Mönchengladbach. Between 1985 and 1990 the value of the indicator went down considerably and in the following period of time another but slowed down decrease can be recognized. In the MLRA as well as in both DLA the values of the mismatch indicator in 1998 are situated below those of previous years. As in North-Rhine-Westphalia the mismatch indicator gives no hint to an increase of occupational mismatch between 1980 and 1998 on the regional level.
- Furthermore it is striking that at the beginning of the period of analysis the values of the indicator for the MLRA and its subregions proved to be higher than that one for North-Rhine-Westphalia. As during the eighties the MLRA has been characterised by serious problems of structural change occupational mismatch has been of greater importance to the region than to the rest of the state. This conclusion holds to a higher extend for the DLA Krefeld than for the DLA Mönchengladbach. In 1998 these differences nearly have vanished. This could indicate that MLRA succeeds in solving its problems of structural adjustment.

Table 3: Occupational Mismatch

Sections and groups of occupation

		Vacancies	Unemployed	Vacantie - Unemployment Ratio in %	Mismatch-Indicator Sections Groups of Occupation	
North-Rhine-Westphalia	1980	71746	275592	26,0	0,199	0,504
	1985	24091	712981	3,4	0,217	0,464
	1990	69275	589492	11,8	0,144	0,372
	1995	62196	766606	8,1	0,173	0,506
	1998	90344	817803	11,0	0,144	0,362
DLA Krefeld	1980	1802	9000	20,0	0,228	0,601
	1985	550	21709	2,5	0,289	0,568
	1990	2305	16854	13,7	0,220	0,455
	1995	1699	24642	6,9	0,593	0,718
	1998	2389	25900	9,2	0,433	0,592
DLA Mönchengladbach	1980	2709	9804	27,6	0,280	0,562
	1985	666	24500	2,7	0,240	0,519
	1990	2627	21956	12,0	0,086	0,500
	1995	2524	28877	8,7	0,454	0,718
	1998	3239	31058	10,4	0,261	0,467
Middle Lower Rhine Area	1980	4511	18804	24,0	0,253	0,552
	1985	1216	46209	2,6	0,238	0,476
	1990	4932	38810	12,7	0,134	0,473
	1995	4223	53519	7,9	0,510	0,707
	1998	5628	56958	9,9	0,323	0,515
Own calculations on basis of official data						

Viewing groups of occupation principally yields no other results. For North-Rhine-Westphalia it can be stated, that the values of the mismatch-indicator have decreased in the course of time. Despite an increase could be observed, the 1998 value of the mismatch indicator considerably falls short of the 1980 value. This confirms the result that no increase of occupational mismatch becomes obvious. In the MLRA the mismatch-indicator has gone down between 1980 and 1990, but in a more moderate manner than on the state level. Again, after 1990 an increase can be observed, which is more than compensated until 1998. So occupational mismatch has decreased on the regional level, too.

It is striking, that the regional and subregional values of the mismatch-indicator in all cases are higher than the north-rhine-westphalian ones. One explanation for this could be partly compensation of the occupational mismatch in the north-rhine-westphalian regions if the state in total is analysed. In other words: There is also a problem of regional mismatch within North-Rhine-Westphalia. As already mentioned the differences between the state and the regional values can give a hint on still existing problems of structural adjustment in some branches of industry on the other hand (i.e. textile and apparel products, ferrous primary metal products).

3.3. Skills Mismatch

According to the previous results a lack of correspondence between the occupations of the unemployed with those needed for the vacancies can give no explanation for rising mismatch-unemployment. In the following it will be analysed whether the problem of mismatch can be explained by increasing demand for qualification while the skills of the unemployed could not keep up with it.

Table 4: Skills-Mismatch

		Mismatch Indicator (3 levels of Qualification)
North-Rhine-Westphalia	1985	0,4521
	1990	0,3816
	1995	0,2207
	1998	0,2371
DLA Krefeld	1985	0,4925
	1990	0,3524
	1995	0,0750
	1998	0,2180
DLA Mönchengladbach	1985	0,6786
	1990	0,5139
	1995	0,0552
	1998	0,2118
Middle Lower Rhine Area	1985	0,7143
	1990	0,4396
	1995	0,0631
	1998	0,2145
Own calculations		

For estimating the level and the development of skills mismatch an indicator is applied, which is very similar to that used in analysing occupational mismatch:

$$MS = \sum |U_i/U - V_i/V|$$

with U_i = Number of unemployed with qualification i

V_i = Number of vacancies for qualification i

U = Total number of unemployed

V = Total number of vacancies

For the calculations official data of unemployment and vacancies by three types of skills have been used, namely "no professional training", "professional training" and "examination of a university". The values of this indicator have been calculated for the years 1985, 1990, 1995 and 1998 for North-Rhine-Westphalia, for the MLRA and the DLA Krefeld and Mönchengladbach.

Table 4 contains the results of these calculations. Similar to the analysis of occupational mismatch it can be seen, that for the state of North-Rhine-Westphalia the mismatch-indicator went down in the course of time. This hints to an assimilation of the skills

structure of the unemployed and that of the vacancies between 1985 and 1998. The results for the MLRA and its subregions are similar to this; the mismatch-indicators decreased since 1985. So an increase of skills mismatch seems to give no good explanation for the outward shift of the Beveridge-curve.

So far one topic has not been dealt with. One could imagine that an assimilation of structures takes place on the relatively low level of disaggregation with only three groups of qualification. But within the particular occupations the firms have rising problems in filling their vacancies for qualified workforce. As official data on unemployment and vacancies by occupation are available in a subdivision by three groups of qualification, some further analysis has been done to test, whether an increase of skills mismatch can be realised within the groups of occupation.

For this the following modified indicator has been used:

$$MOS = \sum \left| U_{i,Aus}/U_i - V_{i,Aus}/V_i \right| * (U_i/U)$$

with: $U_{i,Aus}$ = Number of unemployed with occupation i and vocational training
 U_i = Number of unemployed with occupation i
 $V_{i,Aus}$ = Number of vacancies for occupation i and vocational training
 V_i = Number of vacancies for occupation i
 U = Total number of unemployed

For all groups (sections) of occupations the share of unemployed people with vocational training in total unemployment is compared to the corresponding share of vacancies for people with vocational training in total vacancies.

So the maximum the absolute value included in the formula can take is the value one and the sum of these absolute values can at most add up to the number of analysed groups of occupation. If one exclusively takes into account the sum of differences ($\sum \left| U_{i,Aus}/U_i - V_{i,Aus}/V_i \right|$) an occupation with a low share in total unemployment enters the calculation of the indicator with the same weight as an occupation with a high share. This is the reason why the shares of the particular occupations in total unemployment are used as weights in these calculations. If a mismatch of skills occurs in a relatively important group of occupation this is considered by a higher weight in the calculation of the indicator. By weighting the differences with shares adding up to unity the maximum value of the MOS indicator is also unity.

Table 5: Skills-Mismatch in Sections and Groups of Occupation

		Sum of Sections	Sum of Groups	Production Jobs	Sections Technical Jobs	Service Jobs
North-Rhine-Westphalia	1985	0,1507	0,1956	0,0964	0,0022	0,0486
	1990	0,1545	0,1858	0,0826	0,0040	0,0609
	1995	0,1309	0,1602	0,0918	0,0037	0,0331
	1998	0,1265	0,1355	0,0878	0,0044	0,0334
DLA Krefeld	1985	0,2767	0,3400	0,1383	0,0032	0,1211
	1990	0,1795	0,2221	0,1103	0,0023	0,0667
	1995	0,1568	0,2215	0,1161	0,0004	0,0391
	1998	0,1727	0,2321	0,1044	0,0086	0,0587
DLA Mönchengladbach	1985	0,2731	0,2807	0,1535	0,0054	0,1037
	1990	0,2144	0,2558	0,1077	0,0033	0,0962
	1995	0,1549	0,1333	0,1048	0,0032	0,0449
	1998	0,1450	0,1657	0,0977	0,0048	0,0401
Middle Lower Rhine Area	1985	0,2479	0,3103	0,1341	0,0044	0,0977
	1990	0,1907	0,2388	0,1121	0,0029	0,0731
	1995	0,1483	0,1658	0,1090	0,0012	0,0365
	1998	0,1457	0,1926	0,1010	0,0044	0,0385
Own calculations						

The indicator has been calculated for 32 groups of occupation on the one side and for five sections of occupation on the other side; besides for the subdivision of three sections of occupation comparable calculations have been done. The results are represented in table 5. Considering all occupations by sections or by groups respectively leads to continuously decreasing mismatch indicators for the north-rhine-westphalian economy in the course of time. The differentiated view of three sections of occupation also does not yield substantially differing results. Only in the fields of technical jobs skills mismatch seems to be increasing, though the level of mismatch there is lowest of the analysed sections. The results of MLRA differ from the north-rhine-westphalian ones in so far as in 1985 all regional indicators exceed the comparable state values. But since 1985 the values of the indicator decreased in the region and its subregions, too. These results mean that there are hints on a rising skills mismatch in particular occupations between 1985 and 1998 neither in North-Rhine-Westphalia nor in MLRA.

3.4. Some Additional Considerations

The thesis that increasing mismatch could be traced back to discrepancies of occupational or skills profile seems to be disproved. But there are some additional considerations which can contribute to maintain the thesis:

- The level of disaggregation by groups of occupation is not sufficient or the classification of jobs used by the official Labour Market Statistics is – because of

changing job characteristics - no longer up-to date. In both cases official data would be unsuitable for analysing occupational discrepancies.

- A look at the vacancies by skills shows, that the share of vacancies for persons without any vocational training in North-Rhine-Westphalia noticeably and in the two DLA forming MLRA considerably has increased since the middle of the eighties. At the same time the share of vacancies for people with a finished vocational training has decreased. So it might be possible, that firms especially report vacancies for less qualified workforce to the Labour Administration, while vacancies for skilled labour are filled in another way.
- This conjecture is at least supported by the results of a firm survey concerning vacancies carried out in MLRA. On the one side in this survey the firms have mentioned a lack of skills as one of the main problems in filling a vacancy. It shows on the other hand, that firms reported 45 percent of their vacancies for unskilled workers to the Labour Administration while the quota amounts to only 37 percent for skilled workers and is far below this value (8 percent) for management executives. This could mean that skills mismatch has increased, but it cannot be realised on the basis of official vacancy data. Though a final clarification of this problem must be outstanding as long as there only exist results from samples for one moment in time, the dimension of the problem can be seen by a look at the results of the firm survey: According to it the interviewed firms had 662 vacancies at their disposal – 14 percent for unskilled workers, 76.7 percent for workers with a finished vocational training and 8.9 percent for management executives (with examination of a university). If one assumes – in calculating the mismatch-indicator for MLRA in 1998 – that this skills structure of vacancies holds for the total regional economy, the value of the indicator would instead of 0.2145 amount to 0.7482. At first this value is higher than that one from 1985; this might hint to a long-run increase of skills mismatch. Secondly the value considerably lies above that one calculated on the basis of official labour market data. So an analysis on the basis of official vacancy data seems to underestimate the amount and the development of skills mismatch.

If, however, one neglects these considerations it must be stated that the observed rise in mismatch (outward shift of the Beveridge-curve) cannot be explained by increasing discrepancies of profiles. Out of the determinants named at the beginning of the chapter only a reduced intensity of job searching or a decreasing willingness to work of the

officially unemployed remain as possible explanations for increasing mismatch; in these cases "job-search-unemployment" or "seemingly job search unemployment" would rise. This conjecture is supported by the cited firm survey, which shows a lack of workers motivation as a main hindrance in filling the firms' vacancies.

5. Summary and Political Conclusions

The presented considerations hint to a positive relationship between the level of qualification and the development of employment. The analysis of regional qualification-portfolios permits some central conclusions:

- All efforts of firms concerned with vocational training, of other educating institutions and of education policy must aim to achieve a contribution to improve the qualification of labour force. These considerations are of tremendous importance for the MLRA because of the existing deficits of qualification.
- Obviously (regional) firms think highly of persons with an examination of a university of applied sciences; furthermore the perspectives of these persons on the labour market are better than those of other groups of qualification. So the regional role of the University of Applied Sciences Middle Lower Rhine must be stabilised, extended and intensified.
- As the process of tertiarisation continues, especially the service jobs will experience a high future demand for qualified workforce. Besides there are deficits in some production jobs, which must be removed in the future.
- The requirements of workforce, which are requested for by the firms, are continuously changing. All institutions involved in training and education have to react to this by a corresponding continuous adjustment of their qualification offers.
- Only if the firms offer sufficient training facilities for an increasing number of young people they create the supply for their own demand for qualified workforce. Therefore the intensification of the firms' readiness to train is imperative.

The observed outward shifts of the Beveridge-curves for North-Rhine-Westphalia and the MLRA give a clear hint on rising mismatch problems on the regional labour markets since the eighties. The question, whether these mismatch problems can be explained by rising discrepancies in the structures of unemployment and vacancies by occupations and skills has been analysed using different mismatch indicators. An analysis on basis

of official labour market data suggests that this is not the case. Rising discrepancies of qualification and skill profiles as an explanation for increasing mismatch-unemployment could only be maintained, if firms have changed their behaviour in so far that they report their vacancies for unskilled, but less and less those for skilled workers to the Labour Administration. This seems to be possible and plausible and it is supported by the results of a survey, which indicates that the level and development of skills mismatch is considerably underestimated by the use of official data. So the increase of mismatch-unemployment probably can partly be explained by rising discrepancies of profiles. The other part of this increase might be caused by reduced intensity of job searching or decreasing willingness to work of officially unemployed people.

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ⁱ As the rate of unemployment and the rate of vacancies are related to the same variable the relationship between the absolute figures of unemployment and vacancies can be used as well.