Regional disparities in a small country?

An assessment of the regional dimension to the Dutch labour market
on the basis of regional unemployment and participation differentials

Wouter Vermeulen*), **)
w.vermeulen@cpb.nl

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*): Free University Amsterdam, Department of Spatial Economics
De Boelelaan 1105, 1081 HV, Amsterdam
**): CPB Netherlands Bureau for Economic Policy Analysis
P.O. Box 80510, 2508 GM, The Hague

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Abstract: *We investigate the regional dimension to the Dutch labour market by evaluating regional unemployment and participation differentials. Given wage bargaining at the national level, this paper argues that large and persistent regional differences in (hidden) unemployment are an appropriate indicator of such a regional dimension. Inactivity is assumed to reflect hidden unemployment to the extent that it correlates to observed unemployment. Using data from 1975 to 2003, we find that the variation of aggregate unemployment over provinces (European NUTS2) was small but persistent. Composition of the regional labour force with respect to educational attainment could not account for this variation, so a regional dimension to the labour market seems to exist. The regional dimension appears to be particularly strong for women, youths and lower educated workers. Although regional variation in inactivity is large and persistent, it seems to reflect hidden unemployment to a limited extent. Estimating the correlation to unemployment in a regional fixed effects model, we found a statistically significant relationship for males only.*

Key words: regional labour markets, unemployment, hidden unemployment, persistence

Classification-JEL: J61, J64, R23

1 Introduction

Differences in regional labour market performance are a concern for policy makers in many countries.[1] Presently, the European Union spends a considerable part of its resources on regional policies, promoting development of regions that lag behind. In the Netherlands, the government will spend almost 2 billion euros in a program called *Kompas voor het Noorden* (compass for the North) over the period 2000 - 2006.[2] Its purpose is to close the gap in unemployment and inactivity between the northern region and the rest of the country. Moreover, some large infrastructural investments have been discussed in the light of their redistributive effects on local labour markets.[3]

Existence of a regional dimension to the labour market should be a *conditio sine qua non* for implementation of regional labour market policies. However, the small size of the Netherlands justifies the question how significant structural differences between regions with respect to the labour market can actually be. The mere observation that the country can be subdivided into regions that are closed in terms of commuting falls short of demonstrating a regional dimension to the labour market, because it ignores other adjustment mechanisms. In this paper we argue that a regional component to the labour market may be indicated by large and persistent differences in regional unemployment and inactivity rates.[4] We address the questions how large regional disparities with respect to these variables *are* in the Netherlands, and to what extent they tend to *persist*.

In a survey of regional disparities in its member countries, the OECD points to a strong correlation between regional unemployment and inactivity differentials (OECD, 2000). Differences in unemployment underestimate regional discrepancies, when inactivity rates are a reflection of *hidden unemployment*. This can be argued to be the case when for instance, adverse regional shocks are absorbed through an increase in entitlements to sickness or disability benefits.[5] However, participation differentials do not need to be a consequence of

[1] I thank Piet Rietveld and Jos van Ommeren for valuable comments on this paper. At CPB, discussions with, amongst others, Albert van der Horst, Rob Euwals and Pierre Koning were most useful to me. The help and advice of Jelte Haagsma in putting together the dataset was indispensable.

[2] See IBO (2003-2004) for a recent overview of regional policies in the Netherlands and an assessment of their effectiveness and desirability.

[3] Investment in the *Zuiderzeelijn*, a fast train between the North and the West of the country, has been discussed from this perspective.

[4] In their analysis of regional unemployment differentials in Europe, Overman and Puga (2002) address a similar issue. They find a regional dimension to the labour market that is strong in comparison with the national component. However, their analysis does not indicate whether this conclusion holds for small countries like the Netherlands to the same extent as it does for large countries like Italy or Spain.

[5] Beaty and Fothergill (2002) and Fothergil (2001) argue that regional unemployment rates underestimate the true scale of the regional problem in the UK. Beatty et al. (2000) develop an explicit theory of employment, unemployment and sickness, and O'Leary et al. (2005) verify empirically the important role of ill health in explaining regional variation in inactivity rates in this country.

labour market opportunities. Instead, they may be related to differences in regional circumstances, such as natural scenery, or attitudes. In order to address the question to what extent persistent differences in regional inactivity rates indicate a regional dimension to the labour market, the relationship between unemployment and inactivity is analysed in a number of regressions. The underlying assumption is that inactivity differentials reflect hidden unemployment to the extent that they correlate to observed unemployment. We include regional fixed effects that control for all time invariant differences between regions.

It has been recognized in the literature that the way in which workers respond to local labour demand shocks depends on their educational attainment.[6] For example, interregional migration rates are generally higher for groups with a higher level of education. Moreover, differences in regional unemployment rates seem to correlate strongly to the share of lower educated workers in the labour force in most OECD countries.[7] Can regional differences in the composition of the (potential) labour force explain differences in unemployment and inactivity rates? Or is the regional dimension to the labour market relatively strong for groups with a lower level of education? In order to address these issues, we decompose unemployment and participation rates to educational attainment. The scale and persistence of regional disparities are analysed for three subgroups separately. We further account for heterogeneity by distinguishing gender and age in our analysis.

The next section argues theoretically why large and persistent differences in regional unemployment and participation may be considered as an indication of the regional dimension to the labour market. Sections 3 explores unemployment and participation rates for four parts of the Netherlands. We consider aggregate outcomes over the period 1975 – 2003, and outcomes for subgroups of the potential labour force over the period 1992 – 2002. By means of a shift-share analysis, we asses the role of composition effects with respect to educational attainment in determining regional disparities. Section 4 provides a more formal analysis of persistence at the level of provinces (European NUTS2 regions). Section 5 turns to the relationship between unemployment and inactivity. Correlations between the two variables are presented for several subgroups of the population. We then perform a number of regression analyses distinguishing gender, some of which control for unobserved regional heterogeneity. The final section concludes and draws some implications for regional policy. Our empirical analyses are performed on labour force survey data from 1975 to 2003. These data are discussed in the appendix.

[6] Mauro and Spilimbergo (1998) analyse the response to regional shocks of both skilled and unskilled workers in Spain, they find that labour market adjustment is particularly sluggish for the low-skilled.
[7] See for example OECD (2000) and Overman and Puga (2002).

2 A regional dimension to the labour market?

A regional dimension to labour markets can only exist because adjustment over space is costly. Workers may adjust the location of their labour supply through commuting or migration. The costs of commuting increase with the distance between two locations, and they are born daily. Therefore, workers provide labour on a location not too distant from their place of residence. Through migration, they can supply labour in more distant locations. The costs to migration are large, although they are born only once. This distinction may be used to define regional labour market areas. It is common in the literature to delineate such areas by minimising commuting flows between them.[8] Within regional labour market areas, spatial adjustment of labour supply may be expected to occur in the short run (commuting), whereas the costly adjustment between these areas (migration) would take more time.

Although such a division of a country into regional labour markets may be useful, it does not necessarily imply a regional dimension to the labour market. If barriers to migration are not too high, workers may arbitrage on any discrepancies between local labour markets. Besides labour, capital may be expected to arbitrage on such discrepancies as well.[9] Firms may relocate to regions with relatively favourable labour market conditions, or new firms may start up in such regions. Moreover, adjustment of capital may take place simply because firms in thick local labour markets are able to hire more workers. Much less is known about the costs to spatial adjustment of capital than is known about the costs to migration.[10] However, migration and adjustment of capital together may lead to arbitrage between local labour markets in a relatively short period of time, so that the regional dimension to the labour market is limited.[11] Note that from this point of view, the regional dimension to the labour market may vary over different groups of the population, because they experience different barriers to migration.[12]

[8] A recent study that applies this method for the Netherlands is Cörvers and Hensen (2003), see also Van der Laan and Schalke (2001).

[9] Capital mobility is often overlooked as a regional adjustment mechanism. However, in a study of population-employment interaction in the Netherlands, Vermeulen and Van Ommeren (2005a) find that jobs follow people in the long run. Their results indicate that this adjustment is triggered at least partly by labour supply, implying that regional labour markets clear through adjustment of capital to some extent. Less is known about spatial adjustment of capital at the micro-level. One exception is Holl (2004), who employs Portuguese firm-level data to show that local labour market conditions such as labour force qualification and labour costs are important determinants of the number of firm start-ups in a region.

[10] Depreciation rates applied by most firms would suggest that costs to a spatial shift of production may be rather limited if a (multi-plant) firm is able to smooth this shift over time.

[11] Under stronger assumptions, the factor price equalisation theorem would imply that labour markets clear nationally through interregional trade even if labour and capital were immobile.

[12] In the introduction to this paper, we already mentioned that responses to regional shocks are likely to vary with educational attainment. Migration as an adjustment to regional shocks may also be less attractive for married women, who often have part-time jobs, and adjust their location of labour supply to the job location of the breadwinner. Furthermore, barriers to migration increase with age, as older workers have less time to earn back the moving costs. For this reason, we distinguish gender, age and educational attainment in our empirical analysis.

In the absence of wage rigidities, any noncompetitive regional wage differential would vanish rapidly in labour markets with a limited regional dimension.[13] On the other hand, if the regional dimension were large, such wage differentials would be *persistent*. An evaluation of regional wage differentials and their persistence could thus indicate the regional dimension to the labour market. However, in the Netherlands, as in many European countries, wages are rigid over space, because of wage bargaining at the national level.[14] Such an evaluation would therefore underestimate the regional dimension. If wages are set above local productivity, excess supply of labour results, which may translate into observed unemployment as well as inactivity. Therefore, we assess the regional dimension to the Dutch labour market by analysing unemployment and participation differentials and their persistence. Large and persistent differences in (hidden) unemployment are considered evidence of such a regional dimension.

It is important to bear in mind, however, that persistent regional differences in unemployment and inactivity do not necessarily imply a regional dimension to the labour market. Regional differences in participation may be the result of differences in circumstances or attitudes, rather than labour market conditions. Moreover, it may be that people accept a higher probability of unemployment and lower wages in a region because they are compensated. Amenities like natural scenery, proximity to the beach or a historical city centre are one potential source of compensation. Alternatively, housing markets may compensate for less favourable local labour market perspectives.[15] If this is the case, persistent regional unemployment and participation differentials do not indicate a regional component to labour markets, because these differentials would be the outcome of a competitive equilibrium even if migration and adjustment of capital were costless.

[13] By a regional noncompetitive wage differential we mean a variation in regional wages that would disappear in a competitive equilibrium, with costless migration and adjustment of capital.

[14] Spatial wage rigidities hamper regional adjustment processes, because they reduce the incentive for workers to move to regions where labour demand is high and at the same time they reduce the incentive for firms to relocate to regions where labour supply is high. As a result, temporary regional shocks may have long-run consequences. The important role of spatial wage rigidities in many European countries is discussed for example in OECD (1989, 2000) and Overman and Puga (2002).

[15] A standard reference is Roback (1982), who studies the relationship between amenity differentials and labour and land markets. Compensating differentials in housing markets in the Netherlands are analysed by Vermeulen and Van Ommeren (2005b).

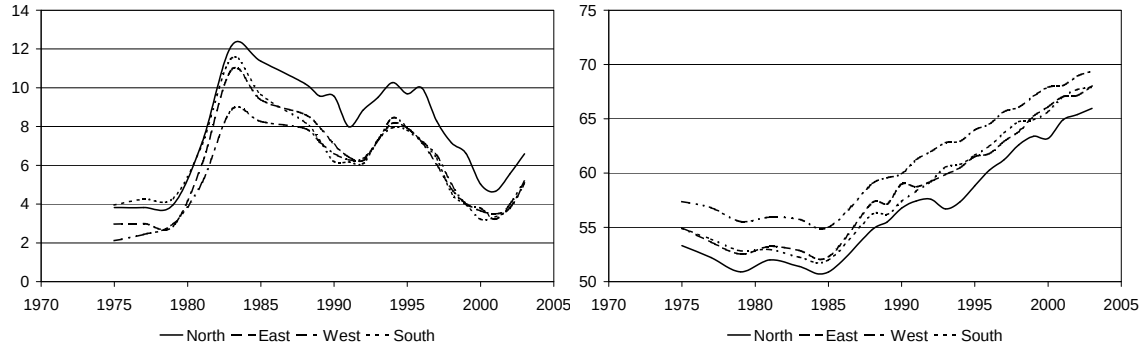
3 A first look at the data

This section explores regional unemployment and participation at the level of country parts (European NUTS1). First we consider aggregate figures, starting in the seventies. Next, the role of composition with respect educational attainment is analysed, covering a shorter time period. Can we attribute regional unemployment and participation differentials to composition effects? We end this section with an analysis of regional outcomes for several subgroups of the population.

Aggregate data

Figure 3.1 shows unemployment and participation for four country parts, over the period 1975 – 2003. Because definitions have changed over this period (see appendix), we have scaled these numbers to consistent time series for national unemployment and participation.

Figure 3.1 Aggregate unemployment (left) and participation rates (right) for four country parts



At the start of our period of observation, the unemployment rates for country parts ranged from 2 to 4 percent of the labour force. Unemployment was highest in the South and it was lowest in the West. During the economic downturn in the beginning of the eighties, unemployment rose in all country parts at a similar pace. At the unemployment peak of 1983, the rates varied between 8 and 11 percent. However, the North took over from the South as the region with the highest unemployment rate. Over the eighties, unemployment in the South converged to the West and East, whereas unemployment in the North remained about 2 percent higher. During the economic rise that characterised the nineties, this pattern has remained stable. In 2003, unemployment rates in the South, West and East were almost equal, mounting to about 5 percent. Unemployment in the North was still almost 2 percent higher. The general picture seems to be that regional unemployment rates closely follow national developments, and that *a regional component to the business cycle is virtually absent*. Except for the South during the seventies and eighties, the regional pattern is very stable over time.

Participation in the Netherlands was relatively stable during the eighties and nineties, averaging about 60 percent, whereas it rose spectacularly in the nineties. In 2003, almost 70 percent of the population aged between 15 and 65 was in the labour force. The regional dimension to this development appears to be modest. Over the entire period of observation, participation in the West was higher and in the North it was lower than the national average. Participation in the South and East were similar and somewhat below this average. It does seem however, that regional differences have become somewhat smaller, in particular during the nineties. Whereas participation in the West was more than 4 percent higher than in the North in 1975, this difference reduced to about 3 percent in 2003.

These figures suggest a relationship between participation and unemployment at the national level. The rise in participation during the nineties may be related to a fall in unemployment to some extent. At the regional level, it also appears that participation and unemployment are negatively correlated. In particular, unemployment in the North has always been higher than the national average, and participation has always been below. However, the fall in unemployment in the South relative to the other regions is not reflected in its participation rate, which remained at its position somewhat below the national average.

A composition effect of educational attainment?

It is well known that unemployment and participation rates vary strongly with educational attainment. Differences are particularly marked for the lower educated. In 2002, unemployment for this group was 3 percent higher than for the higher educated, and participation was more than 30 percent lower.[16] Therefore, it can be expected that in regions where the share of lower educated persons is high, unemployment is high and participation is low. Can this composition effect explain the regional variation?

To address this question, we perform a *shift-share* analysis. The *share* or composition effect is defined as the regional unemployment (participation) rate that would result if unemployment (participation) rates in all regions were equal to the national rate for three population groups, classified with respect to the level of education.[17] The *shift* or structural component is the difference between observed regional unemployment (participation) rates and the share. Shift and share of regional unemployment are shown in Table 3.1 for the four country parts. Shift and share of regional participation are shown in Table 3.2. We can decompose the population to educational attainment only for the period 1992 – 2002, so the tables show averages over this period.

[16] We should note however, that younger age cohorts have higher average levels of education, so the large difference in participation can be attributed partly to an age effect.

[17] For the analysis of unemployment, we decompose the labour force to education attainment, whereas for the analysis of participation, we decompose the *potential* labour force (population aged between 15 and 65).

Table 3.1	Unemployment and shift and share with respect to educational attainment		
Region	Unemployment	Share	Shift
North	7.8	6.0	1.8
East	5.7	6.0	-0.3
West	5.6	5.9	-0.3
South	5.8	6.0	-0.2
Netherlands	5.9	5.9	0

Evaluating the share of regional unemployment, we must conclude that composition of the labour force with respect to educational attainment explains little of the regional variation in unemployment at this spatial level of aggregation. One explanation for this finding is that the share of lower educated in the labour force is relatively homogeneous over these regions. The difference of about 2 percent between the North and the West should thus be explained by other factors.

Table 3.2	Participation and shift and share with respect to educational attainment		
Region	Participation	Share	Shift
North	61.5	63.7	-2.2
East	63.6	64.0	-0.3
West	65.9	65.1	0.8
South	63.9	63.7	0.2
Netherlands	64.5	64.5	0

Evaluating the share of regional participation in Table 3.2, we observe that composition effects can explain a more substantial part of regional participation differentials. In particular, they explain a third of the 4.4 percent difference between the West and the North. However, composition effects cannot account for the remaining 3 percent difference in participation. Therefore, the larger part of regional differences at this spatial level of aggregation can not be attributed to composition effects.

A closer look at some subgroups

We further explore the role of heterogeneity by analysing regional unemployment and participation rates of a number of subgroups of the population. Besides educational attainment, we also consider gender and age.

Figure 3.2 Female unemployment (left) and participation rates (right) for four country parts

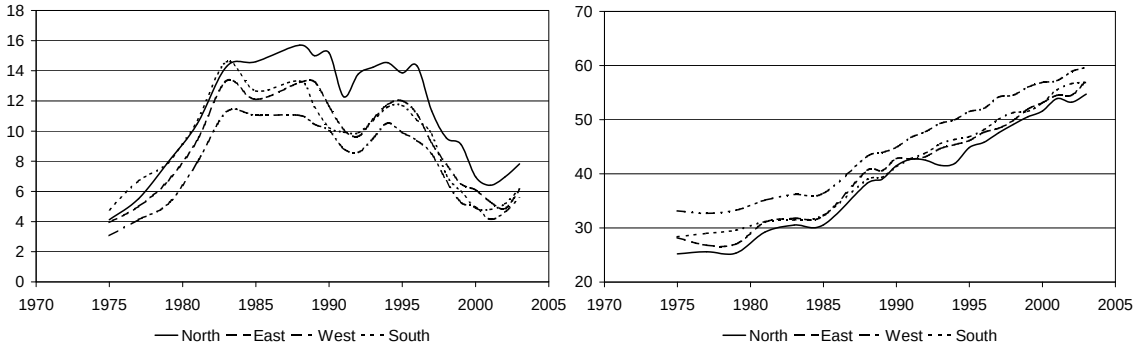
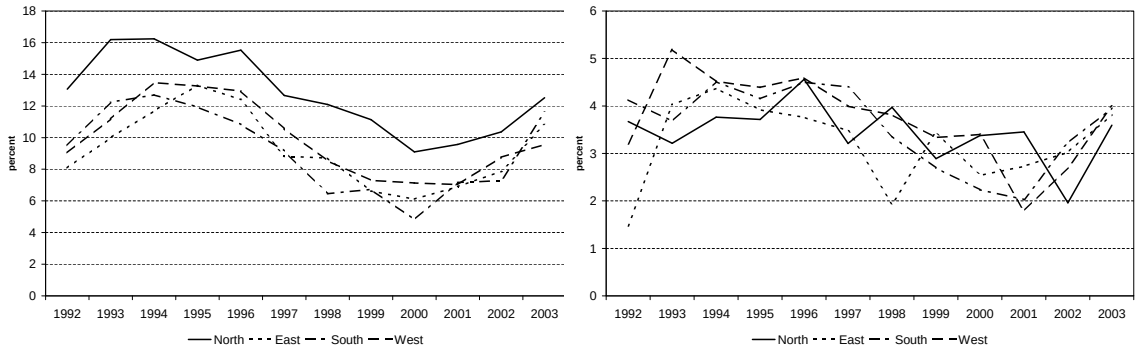


Figure 3.2 shows unemployment and participation rates for women. A first thing to note is that female unemployment is substantially higher and female participation is substantially lower than the aggregate rates. The increase in female participation is tremendous, having more than doubled over our period of observation. Indeed, it was this development that fuelled the increase of aggregate participation. The regional patterns are similar to the aggregate ones, unemployment is highest in the North and participation is highest in the West. The difference in regional unemployment rates is particularly high during the second half of the eighties and the beginning of the nineties, and decreases to about 2 percent between the North and other regions in 2003. Regional differences in participation are more pronounced for women than for men, although they seem to have decreased somewhat over time.

Figure 3.3 Unemployment in the age groups 15 - 24 (left) and 55 - 65 (right)



Regional differences in unemployment decrease with age. This is illustrated in Figure 3.3, which plots regional unemployment rates for the age groups 15 - 24 and 55 - 64. Whereas unemployment in the North exceeds other regions by about 5 percent for the former group, there seems to be no regional pattern to unemployment in the latter age group.

Figure 3.4 Unemployment rates for lower (left) and higher (right) educated workers

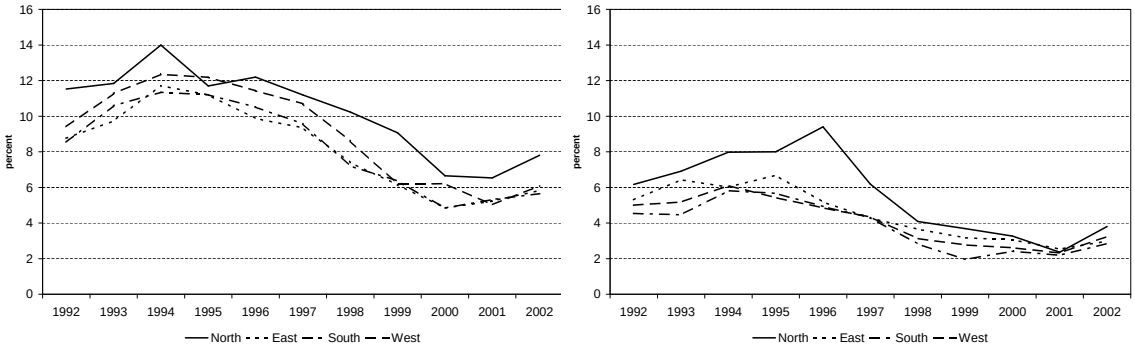


Figure 3.4 shows unemployment rates for the lower and higher educated. The regional pattern for lower educated workers is stable over time. In particular, unemployment in the North for this group is about 2 percent above the national average for the entire period, which underlines the limited explanatory power of composition effects. The pattern is quite different for the higher educated workers. Being quite small in 1992, regional differences increase with the following rise in aggregate unemployment. Unemployment then is particularly high for the North. Towards the end of the nineties, however, these differences decrease rapidly and they seem to have disappeared completely in 2001. The peak of unemployment for higher educated workers in the North seems to be related to a relatively large student population in the northern city of Groningen. During troughs, graduated students experience more difficulties in finding a job. While searching, they stay in their student city where housing costs are relatively low.[18]

Our exploration of unemployment and participation for subgroups suggests that the regional dimension to the labour market indeed depends on the particular subgroup under consideration. The regional dimension seems to be stronger for female, young or lower educated workers. These findings are further investigated in the next section, where we consider persistence of unemployment and participation differentials at the level of provinces.

[18] We have verified that most of the unemployed during this peak in the North were in the age groups 15 – 25 and 25 – 34.

4 Persistence of regional differences

After our first look at the data, we now analyse unemployment and participation at a finer geographical scale. In the seventies, the Netherlands consisted of 11 provinces (European NUTS2 level). In 198X, Flevoland became the twelfth province. This section focuses on persistence of regional differences at this scale. We present correlations over the period 1975 – 2003 for aggregate, male and female unemployment and participation. A distinction to age and educational attainment can only be made for the period 1992 – 2002. We start with an exploration of the regional variation at the level of provinces.

Variation at the level of provinces

The variation of unemployment and participation is measured by weighted standard deviations. We weight unemployment to the regional labour force and participation to the regional potential labour force. In this way, a regional deviation from the national rate contributes more to the standard deviation when this region is large. Table 4.1 presents weighted standard deviations for the years 1975, 1989 and 2003. Besides gender, Table 4.2 distinguishes age and educational attainment for a shorter time period. In order to reduce measurement errors, we have averaged unemployment and participation rates for all population subgroups over the periods 1992 – 1995 and 199 – 2002 here.

Table 4.1 Weighted standard deviations at province level 1975 – 2003

Variable	Unemployment			Participation		
Period	1975	1989	2003	1975	1989	2003
Aggregate	1.08	1.25	0.79	1.68	2.27	1.68
Male	1.20	1.19	0.67	1.93	1.81	1.32
Female	0.74	1.87	1.11	2.78	3.32	2.57

The average weighted standard deviation of aggregate unemployment in Table 4.1 is about 1. This means that almost 70 percent of the regional unemployment rates vary less than 1 percent from the national rate, and about 30 percent vary more than 1 percent. The variation is larger in 1989 than in other years. In this year the level of unemployment is higher as well, so regional differences seem to be larger in troughs of the business cycle. In 1975, a small proportion of females participate in the labour force and regional variation in unemployment rates is small. However, 1989 the variation of unemployment for women is already larger than for men. This pattern is prolonged in 2003.

The variation of aggregate participation averages about 2, which means that about 30 percent of regional participation rates vary more than 2 percent from the national rate. The variation in regional participation rates is therefore significantly stronger than the variation in regional

unemployment rates. Furthermore, in the high-unemployment year of 1989, regional variation in participation is larger than in other years. Female participation varies much more over regions than male participation, in 1989 and 2003 almost twice as much.

Table 4.2 Weighted standard deviations at province level 1992 – 2002

Variable	Unemployment		Participation	
Period	1992 - 1995	1999 - 2002	1992 - 1995	1999 - 2002
Aggregate	0.80	0.66	1.96	1.54
Male	0.81	0.54	1.49	1.34
Female	2.07	1.31	3.08	2.41
Age 15 - 24	1.87	1.71	1.94	1.94
Age 25 - 54	0.71	0.58	1.67	0.97
Age 55 - 65	0.57	0.47	2.24	2.19
Lower educated	1.16	1.09	1.80	1.24
Medium educated	0.69	0.63	1.65	1.22
Higher educated	0.95	0.54	1.42	1.45

For aggregate, male and female unemployment and participation, our findings in Table 4.2 are in line with Table 4.1. Note that the level of unemployment was higher in the period 1992 – 1995 than in 1999 – 2002, and the variation of regional unemployment and participation rates was higher in this period as well. The pattern of standard deviations over age groups confirms our notion from the previous section, that regional unemployment differentials are stronger for young workers. In particular, about 95 percent of regional unemployment rates in the age group 55 – 65 vary less than 1 percent from the national rate. The regional variation for the age group 15 – 24 is three to four times larger.

The pattern of standard deviations of regional unemployment rates over education groups is less pronounced than the pattern over age groups. Unemployment rates vary less for the higher educated than for the lower educated, but in the period 1992 – 1995, the regional variation for the medium educated is smaller than for the higher educated. It is interesting however, that the regional variation for the higher educated decreases much stronger in the 1999 – 2002 upswing of the business cycle that for all other population groups.[19] In this period, about 95 percent of regional unemployment rates for the higher educated vary less than 1 percent from the national rate.

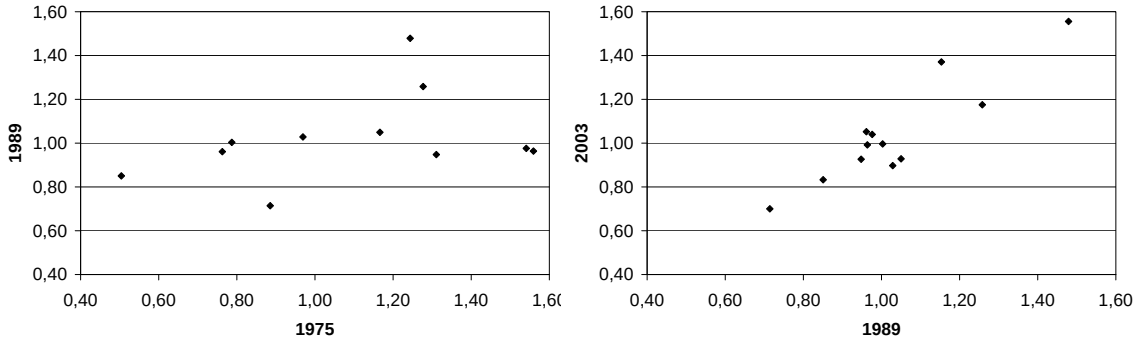
[19] One possible explanation for this finding is that in the Netherlands there is no speculative migration, so people search from their current region of residence, and move after they have found a job (see also our discussion of unemployment for the higher educated in the precious section). Since people are more likely to find jobs during upswings of the business cycle, migration as arbitrage on regional labour market differentials may be more significant during such periods. Since the higher educated are more mobile than other education groups, this effect may be more apparent for this group.

Regional differences in participation are relatively small for the age group 25 – 54. Moreover, the variation reduces in the upswing of the business cycle. This does not hold for the other age groups, where about 30 percent of the regions have participation rates that vary more than 2 percent from the national rate in both periods. The pattern of regional variation in participation over educational attainment is not very clear. In 1992 – 1995, participation differentials are smallest for the higher educated and in 1999 – 2002 they are largest.

Persistence

Now that we have seen how large regional differences are for different subgroups, we analyse to what extent they persist. As we have argued in section 2, large and persistent unemployment and participation differentials may indicate a regional dimension to the labour market. Scatterplots of regional unemployment and participation rates to their time lags, and correlation coefficients are our main tools of analysis.[20] Throughout this analysis, we divide regional rates by national rates, which allows us to focus on the regional dimension. When we consider persistence of 1975 regional differentials, the province of Flevoland is left out of our sample.

Figure 4.1 Scatterplots of regional unemployment in 1989 to 1975 (left) and in 2003 to 1989 (right)



Scatterplots of regional unemployment rates in 1989 to 1975 and in 2003 to 1989 are shown in Figure 4.1. Scaled to the national rate, the variation in 1975 is smaller than in 1989. Most regions have moved closer to the national average during this period, and the correlation between the two years is modest. A notable exception is the province of Groningen, where unemployment was 25 percent above the national rate in 1975 and almost 50 percent above the national rate in 1989. From 1989 to 2003, regions seem to have stuck to their relative position much more than in the previous period. Moreover, it appears that unemployment in the majority of regions was very close to the national rate over this period. The provinces of Groningen,

[20] We rely less on regression analyses because of a measurement error problem. Our data are derived from labour force surveys, so that regional unemployment and participation rates are only estimates (see appendix). Since subgroups of the population vary in size, these estimates vary in precision. For example, there are less higher educated than lower educated workers. A smaller estimated rate of persistence for the higher educated may thus be a consequence of the larger measurement error for this group. Note that a simple comparison of correlation coefficients already suffers from this problem. Therefore, this paper puts more emphasis on the analysis of scatterplots, which are less vulnerable because they are nonparametric.

Flevoland and Friesland have remained above this level and the provinces of Zeeland and Utrecht have remained below. Overall, it seems that persistence of regional unemployment differentials was much stronger in this latter period than in the period 1975 – 1989. [21]

Figure 4.2 Scatterplots of regional participation in 1989 to 1975 (left) and in 2003 to 1989 (right)

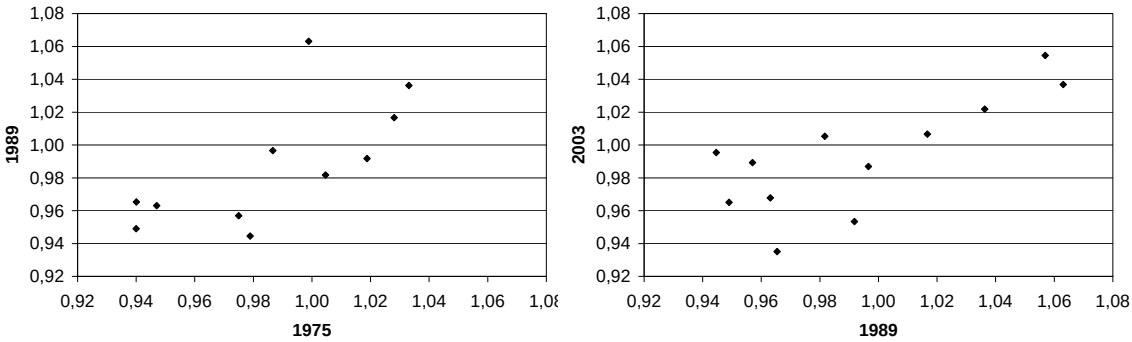


Figure 4.2 shows scatterplots of participation rates in 1989 to 1975 and in 2003 to 1989. Scaled to the national rate, variation in participation rates is much smaller than variation in unemployment rates. The correlation between participation and lagged participation is quite strong in both periods. In particular in the period 1975 – 1989, persistence was much stronger than for unemployment. A remarkable outlier in this first period is the province of Utrecht, which had an average participation rate in 1975 and the higher participation rate of all regions in 1989. In the second period, the province of Drenthe moved from the lowest participation rate to an average value.

Table 4.3 Weighted correlation coefficients for the period 1975 – 2003

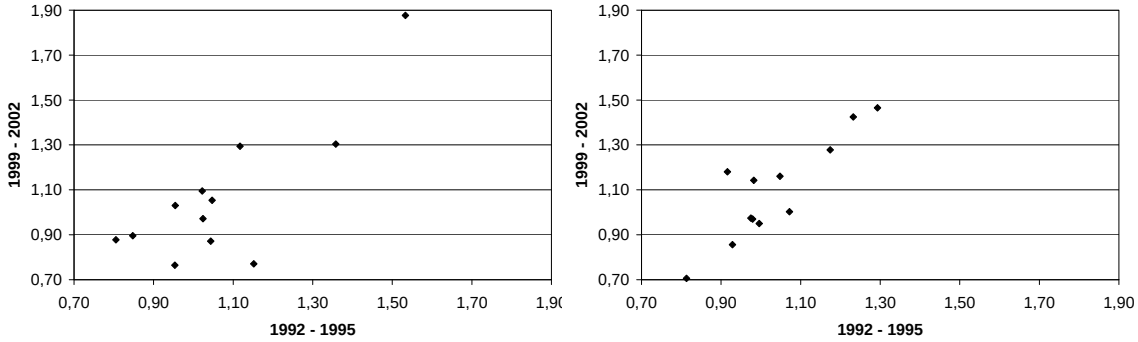
Variable	Unemployment			Participation		
Period	1975 - 1989	1989 - 2003	1975 - 2003	1975 - 1989	1989 - 2003	1975 - 2003
Aggregate	0.30	0.83	0.20	0.75	0.80	0.75
Male	0.07	0.89	-0.11	0.62	0.71	0.61
Female	0.48	0.73	0.52	0.87	0.85	0.84

Table 4.3 shows correlation coefficients for the two periods and the entire period of observation. Like for the standard deviations, we have weighted regions to the size of their (potential) labour force in our computations. The pattern of correlation coefficients for aggregate unemployment and participation is in line with our analysis of the scatterplots. The relative position of regions in terms of unemployment changed substantially over the period 1975 – 1989, and remained rather stable from then until 2003. Regional participation differentials were about equally persistent in both periods. Disaggregating to gender, it appears

[21] During the period 1975 – 1989, some industries suffered large job losses due to restructuring. These industries were not equally represented over the regions, which may explain shifts in the relative position of regions in terms of unemployment. In the period 1989 – 2003, region-specific demand shocks were probably substantially smaller.

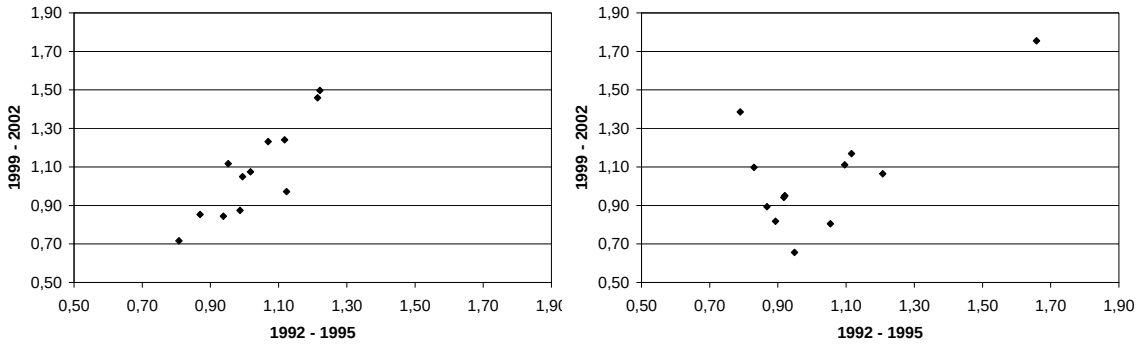
that there was virtually no correlation between male unemployment differentials in 1975 and 1989. Female unemployment differentials on the other hand, were fairly persistent in the same period. Also for participation it appears that regional differentials were more persistent over the entire period for females than for males.

Figure 4.3 Scatterplots of regional unemployment for the age groups 15 - 24 (left) and 25 - 54 (right)



Persistence for age and education groups is analysed for the periods 1992 – 1995 and 1999 – 2002. Figure 4.3 plots regional unemployment rates scaled to the national rate in 1999 – 2002 to 1992 – 1995 for the age groups 15 – 24 and 25 – 54. Persistence for young workers does not seem to be very strong except for two regions. Unemployment in the province of Groningen rose from 50 percent above the national rate to almost 90 above the national rate and unemployment in the province of Friesland remained stable at about 30 percent of the national rate. Regional unemployment rates for the age group 25 – 54 seem to have been more persistent, with as an exception the province of Zeeland (from 10 percent below to 20 percent above the national rate).

Figure 4.4 Regional unemployment lower (left) and higher (right) educated relative to national



Regional unemployment rates for the lower and higher educated in 1999 – 2002 to 1992 – 1995 are shown in Figure 4.4. Persistence seems to be stronger for the former than for the latter group. Again, the province of Groningen is an exception. Unemployment for the higher educated remains about 70 percent above the national rate over this period. As we have pointed out in the previous section, this may be related to the relatively high proportion of students in

this region. Note also the province of Zeeland, where unemployment for the higher educated has increased from 20 percent below to 40 percent above the national average.

Table 4.4 Weighted correlation coefficients for 1992 - 2002 period

Variable Period	Unemployment (1992-1995) – (1999-2002)	Participation (1992-1995) – (1999-2002)
Aggregate	0.92	0.94
Male	0.88	0.90
Female	0.89	0.97
Age 15 - 24	0.80	0.81
Age 25 - 54	0.87	0.90
Age 55 - 65	-0.22	0.88
Lower educated	0.77	0.80
Medium educated	0.92	0.80
Higher educated	0.80	0.90

These patterns of persistence of regional unemployment differentials over age and education groups are confirmed in Table 4.4, which shows weighted correlation coefficients. The correlation coefficient for the age group 15 – 24 is somewhat lower than for the age group 25 – 54. However, if we leave out the outlier Groningen, the correlation for the former age group drops from 0.80 to 0.60.[22] We have seen that there is little regional variation in unemployment rates for the age group 55 – 65, this table indicates that these differences are not persistent either. The correlation coefficient for the higher educated is higher than for the lower educated. If we leave out again the outlier Groningen, this correlation drops from 0.80 to 0.60.[23] Persistence of regional unemployment differentials seems to be strongest for the medium educated.

For participation, patterns of persistence over population groups are less pronounced than for unemployment. We remark that persistence seems to be somewhat less strong for the age group 15 – 24. For the higher educated, regional differences seem to be more persistent than for other education groups.

[22] Leaving out the same region for the age group 25 – 54, the correlation drops only from 0.87 to 0.82.

[23] Leaving out Groningen for the lower educated, the correlation drops from 0.77 to 0.72.

5 Inactivity and hidden unemployment

In the previous sections, we have seen that regional differences in participation are larger than regional differences in unemployment. Furthermore, we have argued that a regional dimension to the labour market may be indicated by large and persistent differences in unemployment and hidden unemployment. We want to find out therefore, to what extent regional differences in inactivity reflect hidden unemployment. Obviously, hidden unemployment is not directly observed. This section aims to throw light on the issue through an analysis of the relationship between unemployment and inactivity.

A definition of hidden unemployment

The distinction between unemployment and inactivity can be formalized in a search framework, the unemployed engage in job search and the inactive do not. Consequently, most labour force surveys count respondents as unemployed if they are available for a job immediately, and if they have been engaged in job search recently. However, there are reasons to believe that the difference between unemployment and inactivity is not always clear cut. For one reason, people can spend any amount of time on job search, so search effort is a continuous variable. Definitions of unemployment necessarily make this variable dichotomous and therefore a bit arbitrary. Moreover, the observation of search effort is biased through the benefit system. People on unemployment benefits will tend to report that they spend a lot of time on job search because the terms of the benefit system force them to engage in search. On the other hand, people on disability benefits may underreport their search effort out of a fear to lose these benefits. In line with such arguments, a significant share of newly employed workers were previously inactive rather than unemployed.

It has also been noted that economic behaviour may result in a positive relationship between unemployment and inactivity. The decision to invest in search depends on labour market conditions, because returns on this investment increase with the probability of finding a job. Unemployment may be expected to reduce this probability, and therefore increase the rate of inactivity. In other words, low returns on investment in thick labour markets may discourage unemployed workers from search.[24]

Both problems of measurement and behavioural relationships between unemployment and inactivity imply that some people are counted as inactive, although they could be reasonably expected to hold on to a job in a tight (local) labour market. We consider these people as the hidden unemployed. So in our definition, disabled workers who would find a job if labour

[24] Indeed, a discouraged worker effect has been observed in aggregate US time series of unemployment and participation (cf. Blundell and MaCurdy, 1999, Benati, 2001). Decressin and Fatas (1995) have shows that in Europe, labour demand shocks are absorbed through participation to a large extent. Adverse shocks would thus translate into inactivity, as well as unemployment. Their results have been verified for the Netherlands by Broersma and Van Dijk (2002).

markets were tight are hidden unemployed. Also, married women who would like to work but have given up (active) search because there are no appropriate jobs, are considered hidden unemployed. As a final example, people who retire early because of redundancies are hidden unemployed in this definition. (Observed) inactivity of these groups is a reflection of labour market conditions, to which a regional dimension may exist.

The correlation between unemployment and inactivity

Inactivity does not need to be related to labour market conditions. It may be that participation in an amenity-rich region is low because leisure time is highly valued. Alternatively, different attitudes towards the division of labour within a household may determine participation differentials. For the assessment of a regional component to the labour market, we should therefore distinguish hidden unemployment from inactivity that does not reflect labour market opportunities. Our identifying assumption is that inactivity reflects hidden unemployment to the extent that it correlates to observed unemployment. Given its definition, it is unlikely that hidden unemployment is large in a region where unemployment is low, since job search is likely to be successful there. Therefore, if inactivity is large in such a region, this probably reflects circumstances other than labour market conditions.

Figure 5.1 Scatterplots of regional inactivity to unemployment in 1975 (left) and 2003 (right)

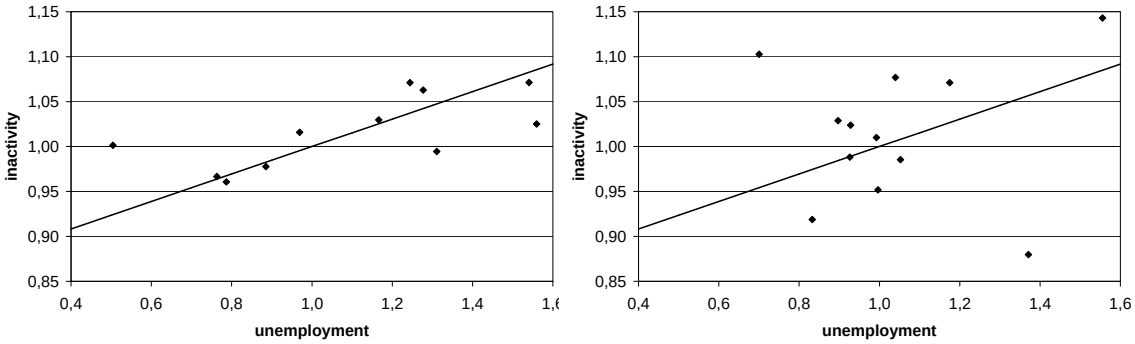
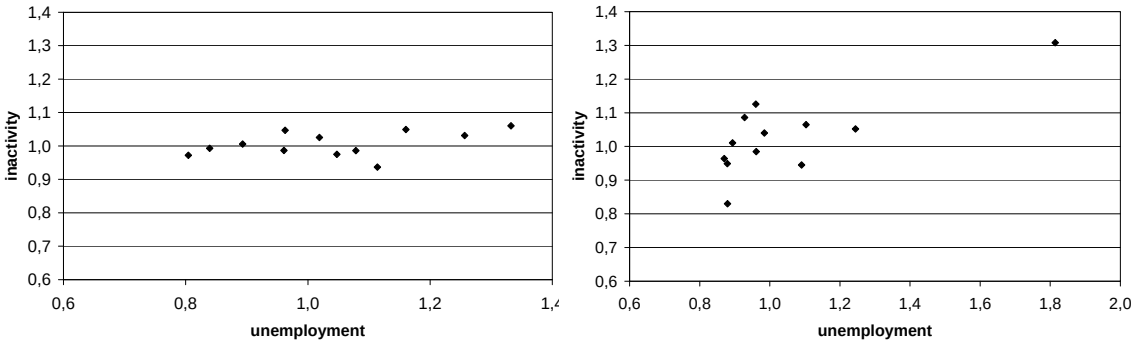


Figure 5.1 shows scatterplots of inactivity to unemployment, both divided by the national rate, for 1975 and 2003. Since the national rate of inactivity is substantially larger than the unemployment rate, the regional variation of scaled unemployment is larger than the regional variation of scaled inactivity. In both years, a positive relationship seems to exist, although the correlation is not very strong. Outliers in 1975 are the province of Utrecht, with a small unemployment rate but an average rate of inactivity, and the provinces of Drenthe and Limburg, with high unemployment rates and relatively low rates of inactivity. In 2003, unemployment and inactivity are both remarkably large for the province of Groningen. Outliers are the province of Flevoland, with high unemployment but a low rate of inactivity, and the province of Zeeland, with a low rate of unemployment and a high rate of inactivity.

Table 5.1	Weighted correlation coefficients of unemployment and inactivity		
Period	1975	1989	2003
Aggregate	0.72	0.38	0.47
Male	0.40	0.39	0.45
Female	0.59	0.46	0.58

Table 5.1 shows correlation coefficients for the scaled variables in the years 1975, 1989 and 2003. In the computations, provinces are weighted to the relative size of the potential labour force. The correlation between aggregate unemployment and inactivity is stronger in 1975 than in later years. For males and females, correlation coefficients vary less over time. The relationship between unemployment and inactivity appears to be stronger for females.

Figure 5.2 Scatterplots of regional inactivity to unemployment for lower (left) and higher educated (right)



Using data from 1992 to 2002 we disaggregate unemployment and inactivity to age and educational attainment as well. Figure 5.2 shows a scatterplot of scaled unemployment and inactivity for lower and higher educated workers, averaged over this period. The correlation seems particularly week for the lower educated. The province of Groningen has the highest rate of both unemployment and inactivity. Inactivity is remarkably low for the province of Flevoland, where unemployment is above the national rate. Inactivity here is very low for the higher educated as well, though unemployment is below the national rate too. For the higher educated, unemployment and inactivity in Groningen are far above the national rate.

Weighted correlations for all subgroups are shown in Table 5.2. It appears that for the period 1992 – 2002, the relationship between unemployment and inactivity is stronger for males than for females. It seems strongest for the age group 15 – 24 and almost absent for the age group 55 – 65. However, leaving out the province of Groningen, the correlation for the former age group drops from 0.64 to 0.20. The relationship is more robust for the age group 25 – 54, where by leaving out the same province, the correlation drops from 0.55 to 0.48. The correlation between unemployment and inactivity increases with educational attainment, but again, the correlation for the higher educated is dominated by the province of Groningen.

Table 5.2 Weighted correlation coefficient of unemployment and inactivity	
Period	1992 – 2002
Aggregate	0.56
Male	0.67
Female	0.50
Age 15 – 24	0.64
Age 25 – 54	0.55
Age 55 - 65	0.09
Lower educated	0.29
Medium educated	0.51
Higher educated	0.71

Regressions of inactivity on unemployment

In order to quantify the effect of unemployment on inactivity, we perform a number of regressions. Inactivity, scaled to the national rate, is the dependent variable and unemployment, scaled to the national rate, is the explanatory variable in these regressions. We use all odd years in the data from 1975 to 2003.[25] Leaving out the province of Flevoland, the 11 provinces are weighted to the potential labour force. Four different estimation methods are applied. We start with a simple ordinary least squares (OLS) estimate, including a constant to the explanatory variables. The causal relationship we have in mind behind the regression model is that people invest less in search if the probability of finding a job is small, so high unemployment causes high inactivity. However, a low rate of inactivity may cause a high rate of unemployment, if wages do not adjust to excess labour supply, which would result in a simultaneity bias. Moreover, a measurement error in unemployment may bias the OLS coefficient downwardly as well. To overcome these biases, we use instrumental variables (IV) in a second regression, with the 2 year time lag of unemployment used as an instrument. In order to control for unobserved regional heterogeneity, we also present two regressions with regional fixed effects (FE). These regional effects may control for composition of the population, regional amenities, differences in attitudes and other variables, to the extent that they are time-invariant. The second FE model uses instrumental variables again. Results are shown in Table 5.3, where reported standard errors are robust to heteroskedasticity and temporal autocorrelation.

[25] The reason is that until 1987, we only have data on odd years. Using all data from 1987 onwards would give more weight to this latter period. Since autocorrelation in the data is substantial, leaving out the even years leads to a limited loss of information.

Table 5.3	Estimates of the effect of unemployment on inactivity (robust standard errors between brackets)			
Estimation method	OLS	IV	FE	FE + IV
Aggregate	0.153 (0.025)	0.228 (0.029)	-0.019 (0.022)	0.010 (0.040)
Male	0.222 (0.063)	0.328 (0.073)	0.067 (0.051)	0.158 (0.071)
Female	0.162 (0.040)	0.236 (0.058)	-0.036 (0.018)	-0.060 (0.046)

The OLS estimate for aggregate data indicates that regions with an unemployment rate that is twice the national rate, on average have a rate of inactivity that is 15 percent (of the national rate) above national inactivity. Suppose that the national unemployment rate is 5 percent and the national inactivity rate is 40 percent. A region with an unemployment rate of 10 percent would thus on average have an inactivity rate of 46 percent. These numbers illustrate that the OLS estimate of the effect of unemployment on inactivity is quite strong indeed.

As expected, the IV estimate of the effect is larger than the OLS estimate, because it corrects for biases due to simultaneity and measurement error. However, fixed effects estimates are substantially smaller than the OLS and IV estimates, and they are not statistically significant. This indicates that the correlation between unemployment and inactivity is largely due to unobserved regional variables that are positively correlated with both variables. Note however, that standard errors of the IV estimates of the FE model are quite large. Although the OLS and IV estimates are rejected, a smaller effect may still exist.

Estimates are higher for males than for females. However, since national unemployment and inactivity rates are higher for women than for men on average, the effect is larger for females in terms of unscaled rates. For both groups, IV estimates are higher than OLS estimates, and the FE estimate is statistically insignificant. Estimating the FE model with IV, we do find a statistically significant effect for males, though it is smaller than the IV estimate without fixed effects.

Overall, it therefore seems that the relationship between unemployment and inactivity is substantially smaller once regional heterogeneity is accounted for, which suggests that hidden unemployment accounts for regional differences in inactivity only to a limited extent. However, even if the naive OLS coefficient would fully control for hidden unemployment, large regional differences in inactivity would remain. This is illustrated by the continuous lines in Figure 5.1, which are projections of the OLS model for aggregate unemployment and inactivity. Large deviations of regional inactivity rates from these projections indicate that regional participation differentials are to a large extent due to other circumstances than local labour market opportunities.

6 Conclusions and policy implications

We have studied the evolution regional unemployment and participation rates in the Netherlands, in order to assess the regional dimension to the labour market. Support through regional labour market policies is substantial nowadays, both at the national and at the European level. Such policies have limited use if this regional dimension is limited, which was a motivation for our research.

Theoretically, a regional dimension must be the result of costs to adjustment between regions of labour and capital. If these costs are low, noncompetitive regional differences in wages or unemployment should vanish quickly. This is a justification for delineations of local labour markets on the basis of commuting flows. However, such delineations overlook migration and capital mobility as spatial adjustment mechanisms, so that they do not necessarily imply a regional dimension to the labour market. Because of wage negotiation at the national level, an analysis of wage differentials would underestimate this regional dimension. Therefore, the empirical part of our paper has focused on regional unemployment differentials. Since reduced (local) labour market opportunities may translate into inactivity rather than unemployment, we have studied regional participation differentials as well.

The variation of aggregate unemployment over provinces (European NUTS2) appeared to be limited. About 95 percent of unemployment rates in these regions deviated less than 2 percent from the national rate. Over the same period, from 1975 to 2003, national unemployment rates have varied from about 3 percent to almost 14 percent. Regional unemployment rates have closely followed the national rate, and a regional component to the business cycle seems to have been rather small or even absent. The pattern of unemployment rates over regions has changed significantly during the seventies and the beginning of the eighties, but it has remained rather stable from then onwards. Disaggregating to gender, it appeared that regional differences were larger and more persistent for women than for men. This suggests that the regional component to the labour market is larger for women.

Over a smaller period, from 1992 to 2002, we were able to disaggregate unemployment and participation data to age group and educational attainment as well. By means of a shift-share analysis we have investigated to what extent regional differences in unemployment could be attributed to composition of the labour force with respect to educational attainment. We found that our subdivision to three education groups did not explain any regional differences in unemployment. In line with this, the variation of unemployment rates over regions was larger for lower educated than for higher educated workers. During an upswing of the business cycle, for this latter group regional differences vanished almost completely. Decreasing with age, the variation of regional unemployment rates is particularly strong for youths. However, the

regional pattern is slightly more persistent for the age group 25 – 54. The province of Groningen is a consistent outlier in these analyses, since it has a relatively large population of students, who after graduating search for jobs on the national market from their current location of residence. The overall picture emerging from these disaggregate data is that the regional dimension to the labour market is larger for young and lower educated persons.

The variation in aggregate participation rates over provinces was almost twice as large as the variation in unemployment rates. In spite of these deviations from the national rate, the evolution of regional participation rates has closely followed the national development. The pattern of participation rates over regions was more persistent than the pattern of unemployment. At the level of country parts (European NUTS1), participation in the North has always been lower than in the South, although in the seventies, unemployment in the North has grown relative to unemployment in the South and exceeded it from about 1980. The regional variation in participation rates for women almost doubled the regional variation for men. About 30 percent of provincial participation rates deviated more than 3 percent from the national rate for this group. Moreover, regional differences were more persistent for women than for men. Disaggregating participation to age groups and educational attainment yielded less pronounced insights. The regional variation in participation rates could to some extent be attributed to composition of the potential labour force with respect to educational attainment.

We have defined hidden unemployed informally as people counted as inactive, who would be likely to hold on to a job in tight (local) labour markets. On the assumption that inactivity reflects hidden unemployment to the extent that it correlates with observed unemployment, we have addressed the question to what extent regional participation differentials reflect a regional dimension to the labour market. We found that regional unemployment differentials correlate to inactivity, but that this variable cannot fully account for the large regional differences in inactivity. The relationship between these variables became even weaker when we controlled for time-invariant regional heterogeneity in fixed-effects regressions. Only for male workers, we found a statistically significant effect. Therefore, regional differences in inactivity should largely be attributed to heterogeneity in circumstances and attitudes that are not related to (local) labour market opportunities. This finding casts some doubts on the view that the regional labour force is flexible as participation acts a buffer to demand shocks. In particular, the increase in female labour participation probably reflects changing attitudes in society rather than a response to demand shocks.

Altogether, regional unemployment differentials, and regional inactivity differentials to a smaller extent, indicate a regional dimension to the labour market. Apparently, costs to regional adjustment of labour and capital are sufficiently large to hamper short-run arbitrage on regional differences. On the aggregate level, the differences are rather small. However, for vulnerable

groups such as youths and lower educated, the regional dimension is more pronounced. Moreover, we should bear in mind that aggregate regional differences are marked by female unemployment and participation, which vary stronger and more persistently than for male unemployment and participation. These findings would suggest some scope for regional labour market policies, although such policies should focus on vulnerable groups.

An important caveat to these recommendations is that we have not accounted for compensation in amenities or housing markets. To the extent that regional unemployment differentials persist because of compensation, they do not imply a regional dimension to the labour market. Therefore, we consider more research on compensating differentials useful for the assessment of regional policies.

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Appendix: the data

The data used in this paper stem from two series of labour force surveys. From 1975 until 1985 we use the AKT (Arbeidskrachtentelling), and from 1987 until 2003 we use the EBB (Enquete Beroepsbevolking). Both surveys were produced by Statistics Netherlands (CBS). The AKT was held once every two years, and the EBB is a yearly survey. These surveys contain information about roughly 100.000 households.

Definitions of labour participation and unemployment have varied over our period of observation. The most recent definitions are that someone working for 12 hours a week or more is counted to the working labour force, and that someone who does not have a job of 12 hours or more but who is immediately available and has been actively engaged in search in the past month is counted as unemployed. The working labour force and the unemployed constitute the labour force. The unemployment rate is the number of unemployed divided by the labour force. The potential labour force consists of all people aged between 15 and 65. The ratio of the labour force to the potential labour force is the participation rate.

We have dealt with inconsistencies in definitions in two ways. Statistics Netherlands has consistent time series of unemployment and participation at the national level. Regional rates were scaled to these national rates in the graphs in sections 3 and 4. In all other analyses, we have scaled unemployment and participation to the national rate in the original (inconsistent) data. This makes our analyses robust to changing definitions to the extent that they did not affect the regional distribution of unemployment and participation.

For the years 1992 - 2002 (EBB), we have distinguished gender, age and educational attainment. A high level of education means a university degree or higher vocational training. A medium level of education means medium vocational training. People with only primary and secondary school degrees are counted as lower educated.

Because regional unemployment and participation are estimated with survey data, they are subject to measurement error. Measurement errors are larger when we distinguish population groups to gender, age and educational attainment. Therefore, we have worked as much as possible with averages over time.

All data are available upon request.