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# REGIONAL LABOUR MARKET DYNAMICS IN THE NETHERLANDS

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## ABSTRACT

This paper analyses the response of the Dutch labour market to a regional labour demand shock. European-wide studies and US labour market studies found that in Europe adjustment to such a shock runs primarily through changes in participation, while in the US this is through migration of workers. The main explanation for this phenomenon is the rigid labour market in Europe, against the flexible labour market in the US, which is expressed by the fact that mobility among US workers is much higher than among European workers. A similar approach to the Dutch labour market shows that adjustment to labour demand shocks is primarily through changes in participation. In that sense it fits the European picture. As far as the speed of adjustment to a shock is concerned, the Dutch labour market seems more in line with American than with European levels. A disaggregate analysis shows that particularly the response of the northern labour market stands out. Adjustment to a shock is absorbed faster than in other Dutch regions. Furthermore, unemployment and migration are more important as absorption channels than in the other regions.

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# 1. Introduction

This paper analyses developments in regional labour markets in The Netherlands in the past decade and investigates whether labour market shocks are shared by all regions under consideration and how regions have adjusted to those shocks. In essence adjustment to a shock in regional labour demand is through changes in regional unemployment and labour participation rates and through migration. One of the reasons for investigating regional rather than national labour markets is the fact that region-specific shocks may trigger different adjustment mechanisms than nation-wide shocks. Migration from one region to another within a country is one such response that can be analysed using regional data and much less with national data, since migration between countries is far less important as adjustment mechanism. This is especially true for Europe, with its cultural differences and language barriers between countries.

This paper is in the tradition of the seminal paper of Blanchard and Katz (1992) on labour demand shocks to US regional labour markets and of Decressin and Fatás (1995) on European labour markets. A labour demand shock in the US is more likely to lead to migration of workers as adjustment mechanism, workers moving into and out of jobs as a similar shock in Europe would do. In Europe such a shock has a much stronger effect on the participation rate. It is frequently argued that the flexibility of the US labour market, or the inflexibility of European labour markets, lies at the heart of these differences. Because of the favourable social security arrangements in Europe, a worker losing her job is less inclined to migrate to other regions to look for work. In the US the arrangements are less abundant which triggers a much higher level of mobility of workers when the loose their job.

The economic upsurge of the second half of the 1990s has caused a major increase in employment in the USA, while the EU was lagging behind. One notable exception in Europe has been The Netherlands that has witnessed 'American' employment growth figures during that period. One explanation for this 'Dutch Miracle' is the policy of wage moderation that could be sustained due to major revisions in the Dutch social security system. See also Broersma *et al.* (2000). One of the questions addressed in this paper is: is this high level of flexibility evenly distributed over Dutch regions, or is there a difference in adjustment speed, and  hence flexibility, between Dutch regions.

Even within a small country as The Netherlands, labour market characteristics between regions differ considerably. The unemployment rate in the northern province of Groningen is known to be consistently higher than the national average, while the central province of Utrecht lies consistently below this level. This paper analyses the extent in which regional labour market dynamics is common to regions in The Netherlands, according to a subdivision of Labour Services Netherlands (Arbeidsvoorziening Nederland) based on their 18 regional labour service offices (RBA). It also studies the trends and fluctuations in relative employment, unemployment and participation in these 18 Dutch RBA-areas.

We find that the reaction of the Dutch regional labour market, based on these 18 RBA-areas, to a one period labour demand shock resembles the European reaction according to the analysis of Decressin and Fatás (1995). A labour demand shock in a Dutch regional labour market model leads to substantial changes in participation as a means to absorb that shock. The effects of the shock on unemployment and migration are limited. In addition the speed of adjustment to a labour demand shock in The Netherlands is of a similar level as the USA and amounts to at most five years, while for the EU Decressin and Fatás (1995) show that it takes almost ten years to absorb such a shock completely. This points towards the fact that the Dutch labour market is more flexible than one usually thinks and is more in line 'American' level than with European.

When a further subdivision of the national labour market is made into composite regions North, East, West and South, based on aggregating these 18 areas, we do find substantial differences between these regions in terms of adjustment patterns to a labour demand shock. In the East, West and South, the participation rate is still the major absorption channel of the shock, while in the North it is mainly the unemployment rate that takes care of absorbing the shock. In the periods after the shock we find in the three aforementioned regions that in the longer run the share of migration as absorptive mechanism becomes more important while the importance of unemployment falls. In the North, on the other hand, we find that in the longer rum participation will absorb a larger share of the remaining shock rather than migration and unemployment.

An obvious explanation for this phenomenon is the fact that the North is since long a high unemployment region, so there is a large reservoir of unemployed from which workers can be found to fill the new jobs that come with the shock. In the other regions unemployed workers are less abundant and mostly newcomers on the labour market, like (re-)entering women or school leavers fill the new jobs. This work potential will be opened up in the North at a later stage. Initially, migration is also a relatively important absorption mechanism in the North. Hence, in case of a positive shock, workers are recruited from other regions and in case of a negative shock, workers move to other regions, at a higher rate than for the other regions.

Another difference between the North and the other three regions is the speed of adjustment in response to the shock. In the North, we find the shock is absorbed after some three to five years. In the other three regions it seems to take a longer period of time, ranging from five to seven years. A higher speed of adjustment points towards a more flexible labour market. In other words. There is indeed evidence that supports the view that reallocation rate of unemployed workers and of migration flows, in the northern labour market are indeed much higher than in other parts of The Netherlands.

This paper is organised as follows. In section 2 we present the data we use in this investigation. Section 3 studies whether labour market shocks are common to all Dutch regions or whether there are region-specific shocks as well. Section 4 is about the adjustment to a labour demand shock of the Dutch labour market. Section 5 expands the analysis to the difference in adjustment in four regional labour markets. Section 6 looks at evidence that can explain our empirical findings and finally section 7 concludes.


## 2. Data

*Employment*
Employment is measured as the number of jobs of employees in each of the 18 RBA-areas. This number is based on the Survey of Employment and Wages (Enquête Werkgelegenheid en Lonen, abbreviated to EWL) of Statistics Netherlands. This is a large survey based on 67 thousand Dutch firms and institutions, which cover some 82% of all jobs.[1] These survey results are distributed by region.

Regional employment data for this study have been drawn from this survey for a number of reasons. First of all, it is large enough survey to cover the smallest area. Another major source for employment data is the Labour Force Survey (Enquête Beroepsbevolking, or EBB) of Statistics Netherlands. This is a monthly survey held among some 10 thousand persons. In annual terms this is about 1% of employment and is thus a much smaller survey than the EWL. This implies that the EBB has a fairly high uncertainty threshold, of 5000 persons,

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[1] We follow Blanchard and Katz (1992) who also used establishment-based (non-agricultural) employment. In other words, the number of (non-agricultural) jobs.

below which results are not reported. Changes in (un)employment in small regions may easily remain below this threshold.

Another reason for not utilising the EBB is the fact that it is a survey among persons, where the residence of workers is central instead of the working place. According to the EBB it is therefore possible that a change in employment in region *i* (that is: working persons *living* in region *i*) is caused by an increase in the number of jobs in region *j*. Hence, regional employment growth according to the EBB includes commuting to other regions. We are however interested in employment - in terms of jobs - within a particular region. Our employment data allow for this. Where the persons that fill these jobs come from is of secondary interest. For the moment is suffices to simply assume that these workers come from the same region. In fact when we speak of spatial adjustment in this study we mean migration *plus* commuting.

The employment data from the EWL have some drawbacks. First they consist only of jobs of employees. Hence, self-employed are not taken into account. The number of self-employed differs between regions. Particularly agricultural regions, like Friesland (RBA 2), have a relatively high share of self-employed (farmers). Urban areas, like Rijnmond (RBA 13) have a lower share. Overall, roughly 12% of the employed labour force is self-employed, in Friesland it is almost 15% and in Rijnmond some 9%. Hence disturbing effects of leaving this group out are not too serious. Moreover, the *differences* in regional employment are a central issue in this paper and changes in employment will not be affected much when self-employed are neglected.

A second drawback concerns the frequency of the data. Quarterly data are available on an aggregate level. Regional data however are only available with an annual frequency. In order to arrive at regional quarterly data, we have interpolated the regional data in order to be compatible with the quarterly unemployment data that are available. When these interpolated data are compared with the deseasonalised national quarterly data, both series are very similar. We end up with employment data from 1993.2-1999.3 for each of the 18 RBA-areas.

*Unemployment*
Unemployment data are available according to different definitions. Most frequently used are the registered unemployment and the unemployed labour force. Both are drawn from a survey. The unemployed labour force stems from the Labour Force Survey (EBB) we spoke of earlier. The registered unemployment stems from a separate survey called the Registered Unemployment Survey (Statistiek Geregistereerde Werkloosheid). Both are hampered by the fact that changes in unemployment in small regions may fall below the uncertainty threshold of these surveys, when these two measures are used. So here the same problem occurs as with employment.

In order to avoid these sample issues, we use an alternative unemployment measure which is not based on a survey, but on an actual count of non-working job searchers registered at the employment offices. This is the definition of Labour Services Netherlands (Arbeidsvoorziening Nederland), which is available as monthly series for each of the 18 RBA-areas. This unemployment definition is more extensive than both the registered unemployed and the unemployed labour force definitions. The only criterion here is that unemployed, between 15-64 years of age, are listed at an employment office as job searcher and that they do not have a job already.[2] This unemployment definition includes for example persons following courses to enhance their chances of getting a job. The main difference with

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[2] Registered unemployed are also listed at the employment agencies, but should be able to start a job of at least 12 hours a week within 2 weeks after a job offer has arrived. The unemployed labour force consists of persons between 15-64 who are willing, are available and do efforts in order get a job for at least 12 hours a week.

registered unemployed is that the immediate availability for a job is not necessary here. The main difference with the unemployed labour force is the 'active search' criterion which is not necessary here. The level of unemployment according to not-working job searchers is therefore higher, but the pattern and trend is in fact very similar to the other two regular definitions.[3] The monthly series, covering 1993.03-1999.10, are adjusted to yield quarterly data for 1993.2-1999.3 and seasonally adjusted for an adequate comparison with the employment data.

*Participation*
Like Blanchard and Katz (1992) we define the regional labour force as the sum of regional establishment-employment and unemployment from the employment offices. Decressin and Fatás (1995) conduct a similar exercise to get labour force data for Germany and the UK. In fact the labour force data constructed in this way do not differ much from the official labour force data of Statistics Netherlands. These official data are not used here for the same reason as before, *viz.* the small sample properties of the Labour Force Survey (EBB) which are likely to become binding for small RBA-areas. Our labour force definition is consistent with the employment and unemployment measures we use and since both measures refer to the regions in which the jobs and unemployed are registered. There is no disturbing effect of commuting. All three measures concern one and the same region.

To get participation rates we take the ration of this labour force and the population of working age, *i.e.* between 15 and 64 years old. Data on the population between 15-64 is drawn from the Labour Force Survey of Statistics Netherlands. The number of observations on this variable is sufficiently large, even for the smaller regions, so that the sampling properties of which we spoke are less serious in this case. Since these data are available only annually, they are interpolated (without imposing a seasonal pattern) to a quarterly frequency. Since this population measure moves very gradually over time, interpolation will not cause any major disturbance.

## 3.  Common labour market disturbances

The main purpose of this section is to determine whether labour market disturbances in The Netherlands are distributed symmetrically across regions and compare those results with the USA and other European countries. In other words, how much of a typical movement in regional employment is common to all regions and how much is region-specific? In addition it also specifies region-specific variables that are used later on for evaluating regional adjustments to a labour market shock.

To determine the extent to which changes in employment are common to all regions, we estimate the following equation for each RBA-area *i*

$$\Delta \log(N_{i,t}) = a_i + b_i \Delta \log(N_t) + h_{1,i,t}, \tag{1}$$

where ? is the difference operator, $? x_t = x_t - x_{t-1}$, $i_n$ is the employment in region *i*, *N* is the nation-wide employment and *?* is a disturbance term. This equation is estimated using quarterly data from 1993.2 to 1999.3. When ß*i* differs significantly from unity this means that a nation-wide labour demand shock will not make itself felt in region *i* to the same extend. Put in another way: regions may respond differently to common nation-wide shocks. The estimation results for ß for each region are presented in Table 1.

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[3] An additional drawback is that the files at the employment offices are contaminated in the sense that persons may not be removed when they have found a job, because they do not report the job finding.

Similar specifications can be formulated to check whether shocks in the unemployment rates and in the participation rates are common to all regions.

$$\left(\frac{U}{LF}\right)_{i,t} = \boldsymbol{m}_i + \boldsymbol{g}_i \left(\frac{U}{LF}\right)_t + \boldsymbol{h}_{2,i,t} \tag{2}$$

and

$$\log\left(\frac{LF}{B}\right)_{i,t} = \boldsymbol{l}_i + \boldsymbol{d}_i \log\left(\frac{LF}{B}\right)_t + \boldsymbol{h}_{3,i,t} \tag{3}$$

where $LF$ is the labour force, $LF = U + N$, and $U$ is the number of unemployed, index $i$ refers to the region, $B$ is the population between 15 and 64 years of age. Parameter values of $?_i$ and $d_i$ that differ from unity again imply the existence of region-specific responses to nation-wide shocks.[4] The estimated values for ß, ? and d for each region are in Table 1. In fact these estimation results refer to elasticities. Thus in terms of equation 1 it shows that when national employment changes with 1%, that in reaction regional employment changes with ß%.

The adjusted $R^2$s in Table 1 indicate the extend to which the pattern of regional labour market indicators (employment growth and unemployment and participation rates) fits the pattern of the corresponding national indicator over the whole sample. The ß's give the 'average value' over the sample with which regional indicators follow the national ones. A value of ß close to unity can easily go together with a low $R^2$.

The average adjusted $R^2$ for the employment equations equals 0.49. Hence only a limited part of the movement in national employment is reflected in regional employment. In fact our result is close to the value of 0.6 that Decressin and Fatás (1995) report for the USA. Their EU-value is a much smaller with only 0.2. Blanchard and Katz (1992) found an adjusted $R^2$ of 0.66 for the USA. So the changes in regional employment that are shared by all regions is much higher in the USA and The Netherlands than in Europe.

The null hypothesis of a unit elasticity of regional employment changes with respect to nation-wide employment changes is rejected in five of the 18 RBA-areas. Hence a small number of regions does not follow the national employment growth path on a one-to-one basis. The values of ß indicate that the variation in regional employment is for a large part region-specific. This is in striking contrast to the other two equations for unemployment and participation rates.[5] A vast majority of regions is indeed ruled only in part by national shocks. However, the high frequency of the data causes a high fit and elasticities close to unity but statistically different from it.

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[4] The transformation of the variables in equations (1)-(3) is based on the notion of unit roots in either of the time series: $N$, $U$ and $B$. Only when these variables are stationary – in the sense of not containing a unit root – inference based on equations (1)-(3) is valid. The level of regional employment, $N_i$, is in fact an unbounded variable, which is usually assumed to contain a positive time trend. In case of our regional employment data, presence of a unit root is logical in terms of the unbounded character and is confirmed by formal tests. Therefore, we have taken the first difference of the log of the regional employment level. Regional unemployment and participation are both in *rates*, *i.e.* relative to the labour population and the population of working age, respectively. Hence both are bounded variables, from below by 0 and from above by 1. Therefore presence of a time trend which is increasing over time is not logically consistent with this character. Here the bounded character of both rates prohibits the presence of a unit root for reasons of logical consistency.
[5] Decressin and Fatás (1995) use the employment rate, which is in fact the mirror image of the unemployment rate since $\log(N/LF) \tilde{} -(U/LF)$.

**Table 1 – Common shocks in regional employment, unemployment and participation**

| RBA-area | ß | adj. $R^2$ | ? | adj. $R^2$ | d | adj. $R^2$ |
|---|---|---|---|---|---|---|
| 1. Groningen | 0.52* | 0.34 | 0.84* | 0.93 | 0.63* | 0.91 |
| 2. Friesland | 0.86 | 0.62 | 1.26* | 0.99 | 0.58* | 0.90 |
| 3. Drenthe | 0.68 | 0.16 | 0.76* | 0.96 | 1.24* | 0.96 |
| 4. IJssel-Vecht/Twenthe | 0.61 | 0.11 | 1.04 | 0.98 | 1.80* | 0.97 |
| 5. IJssel/Veluwe | 1.57 | 0.24 | 0.99 | 0.95 | 0.75 | 0.47 |
| 6. Arnhem-O-Gld/Nijm-Riv.land | 0.97* | 0.79 | 1.11* | 0.98 | 0.87* | 0.98 |
| 7. Flevoland | 0.39* | 0.09 | 1.18* | 0.89 | 1.56* | 0.74 |
| 8. Midden-Nederland | 1.04 | 0.86 | 0.90* | 0.98 | 1.65* | 0.98 |
| 9. Noord-Holland Noord | 1.46 | 0.39 | 1.26* | 0.98 | 1.29* | 0.90 |
| 10. Zuidelijk Noord-Holland | 1.46* | 0.95 | 0.99 | 0.98 | 1.34* | 0.99 |
| 11. Rijnstreek | 0.88 | 0.80 | 1.02 | 0.99 | 0.68* | 0.97 |
| 12. Haaglanden | 1.47 | 0.52 | 0.71* | 0.89 | 0.53* | 0.66 |
| 13. Rijnmond | 1.19 | 0.76 | 1.04 | 0.93 | 0.62* | 0.88 |
| 14. Zeeland | 0.68 | 0.11 | 0.51* | 0.90 | 1.43* | 0.96 |
| 15. Midden- en West-Brabant | 1.50* | 0.62 | 1.15* | 0.97 | 0.75* | 0.82 |
| 16. Noordoost-Brabant | 0.99 | 0.10 | 1.12* | 0.99 | 1.30* | 0.91 |
| 17. Zuidoost-Brabant | 1.24* | 0.84 | 1.23* | 0.88 | 1.29* | 0.91 |
| 18. Limburg | 0.97 | 0.46 | 0.88 | 0.97 | 0.66* | 0.83 |

* significantly different from 1 at 5%

These results imply that there are arguments for constructing region-specific variables in our subsequent analysis. These region-specific variables are constructed as the residuals from equations (1)-(3) using the estimated coefficient values of ß, ? and d in the following way.

$$n_{i,t} = \log(N_{i,t}) - \hat{b}_i \log(N_t) \tag{4}$$

$$e_{i,t} = \log\left(\frac{N_{i,t}}{LF_{i,t}}\right) - \hat{g}_i \log\left(\frac{N_t}{LF_t}\right) \tag{5}$$

$$p_{i,t} = \log\left(\frac{LF_{i,t}}{B_{i,t}}\right) - \hat{d}_i \log\left(\frac{LF_t}{B_t}\right) \tag{6}$$

where $n_i$ is the so-called ß-difference and the series $e_i$ and $p_i$ are named accordingly.[6] Equations (4)-(6) are related to the concept of regional components, where the coefficient values of ß, ? and d are set to unity.[7] Further, $LF_{(i)}$ is the labour force and $B_{(i)}$ is the population of working age, in region $i$ or nation-wide, respectively. Note that these transformations imply that we allow different regions to respond differently to common shocks.

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[6] Since $\log(N/LF) \sim -(U/LF)$, equation (5) is equivalent to $u_i = (U_i/LF_i)-?(U/LF)$, where $U$ is unemployment.

[7] We have also conducted a similar analysis as the one of this paper on these actual regional components of employment, unemployment and participation. However, because for many regions these parameter values do differ from unity, we proceed with the ß-differences.

## 4. National adjustment to regional demand shocks

This section is about the mutual relationship of employment growth and relative employment and participation rates in reaction to a labour market shock. There are a number of adjustment mechanisms that come into play in case of a (positive) regional employment shock. First, such a shock may result in a fall in regional unemployment, *i.e.* an increase in the employment rate. The newly created jobs as a result of the shock, are filled by unemployed job searchers. Second, it may result in a rise of the participation rate, *i.e.* the newly created jobs are absorbed by persons previously not in the labour force. Third, such a shock may induce spatial adjustment of labour by means of migration or commuting.

In this section the adjustment mechanisms to an employment shock in The Netherlands are at stake. In many ways the growth rates of employment in The Netherlands of the past years have been more of an 'American' level than in line with the rest of Europe. Average annual employment growth in the USA was some 1.3% during the period 1990-1999. For The Netherlands this was about 1.6%, while in the EU-15 average employment growth during that period was zero. See also figure 1.

**Figure 1. Employment growth in The Netherlands, USA and the EU-15**
**(1990=100)**
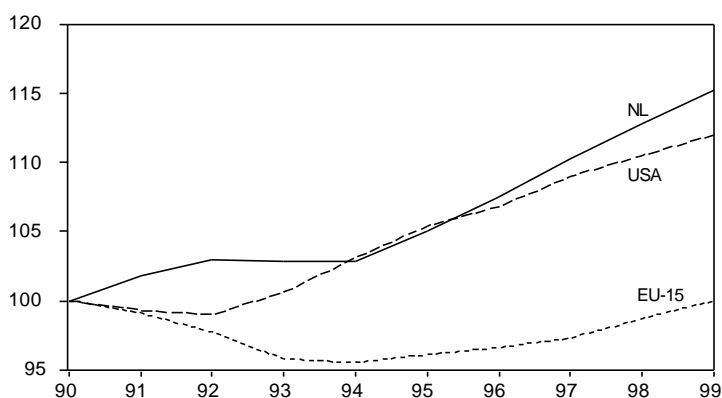


Source: CPB (2000, pp. 218-219)

One explanation for these exceptionally high growth rates, in relation to the EU, is the policy of sustained wage moderation, which is upheld in The Netherlands over the past two decades. One possible reason why such a policy could be upheld for so long has to do with the restructuring of social security provision starting in the second half of the 1980's. See Broersma *et al.* (2000).

Is this phenomenon also present when models of regional labour markets are at stake? In other words, do regional labour market models reflect this asserted flexibility of the Dutch labour market in terms of speed and mechanism of adjustment?

To answer this question, we estimate the joint behaviour of relative employment growth, the relative employment rate and the relative participation rate for all 18 RBA areas. To the extent that a regional labour demand shock is not reflected in unemployment or participation rates it must be absorbed by interregional migration (among these 18 areas) or migration from abroad. We specify the following system

$$\Delta n_{i,t} = f_{i,1,0} + f_{k,1,1}(L)\Delta n_{i,t-1} + f_{k,1,2}(L)e_{i,t-1} + f_{k,1,3}(L)p_{i,t-1} + e_{i,r,t} \tag{7}$$

$$e_{i,t} = f_{i,2,0} + x_1\Delta n_{i,t} + f_{k,2,1}(L)\Delta n_{i,t-1} + f_{k,2,2}(L)e_{i,t-1} + f_{k,2,3}(L)p_{i,t-1} + e_{i,s,t} \tag{8}$$

$$p_{i,t} = f_{i,3,0} + x_2\Delta n_{i,t} + f_{k,3,1}(L)\Delta n_{i,t-1} + f_{k,3,2}(L)e_{i,t-1} + f_{k,3,3}(L)p_{i,t-1} + e_{i,t,t} \tag{9}$$

where $n$, $e$ and $p$ are defined in equations (4)-(6), the lag polynomial $f_{k,i,j} = \sum_{k=0}^{1} f_{k,i,j} L^k$ and $L$ is the usual lag operator. Note that $?n$ in system (7)-(9) has an instantaneous effect on both $e$ and $p$. Hence current changes in relative employment are assumed to affect unemployment and participation rates but not *vice versa*. We allow for region-specific fixed effect, reflected by the f's. This system is simultaneously estimated with OLS on pooled data on all 18 RBA-areas over the period 1993.2-1999.3. The resulting model is next used to conduct an impulse response analysis.

We follow Blanchard and Katz (1992) in determining the labour demand shocks from which the adjustment paths are studied. We associate unexpected changes in regional relative employment with changes in labour demand. Since current changes in relative employment do affect unemployment and participation rates but not *vice versa*, it suffices to determine the effect of a shock in relative employment, *i.e.* the e-term of equation (5), in order to understand the dynamic effects of an innovation in labour demand on relative employment, employment rates and participation rates.[8]

Figure 2 shows the impulse responses of employment, employment rates (the mirror image of the unemployment rate) and labour force participation rates to a 1 percentage point shock in relative employment for The Netherlands.[9] This figure shows that the initial shock of 1 %-point is almost completely absorbed by an increase in the relative regional participation rate. The effect of the shock on the employment rate is very small. Hence, a positive labour demand shock in The Netherlands in the 1990's leads to an increase in participation rather than a fall in unemployment. Like unemployment, international migration is also a minor adjustment mechanism.[10] Notice that some 25 periods (quarters) or six years after the shock the impulse is completely absorbed. The initial shock has invoked a reallocation process, with obsolete jobs being destroyed and new jobs being created which eventually has resulted in a new relative employment equilibrium which lies 0.6%-point above the original level.

It is not self-evident from figure 2 which mechanisms rule the adjustment to the shock after the initial period. Furthermore, the impulse in the relative participation rate, $p_i$, closely mimics the pattern of the impulse in $n_i$ for the first eight periods (two years) and diverges afterwards. Hence participation remains to play a prominent role in the absorption of the shock. In addition, unemployment falls only modestly over the whole period. The difference between the employment response on the one hand and the participation and unemployment responses on the other hand, refers to absorption through spatial adjustment and possible other mechanisms. Figure 2 indicates that the role for spatial adjustment as adjustment mechanism is small .

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[8] This means that a 1 percentage point shock in equation (5) affects $?n_{i,t}$ of equation (5), but also equations (6) and (7) through the inclusion of $?n_{i,t}$.

[9] This means a 1 percentage point shock in the $?n$-equation (5) for 1 period.

[10] Sprangers (1995) and Nicolaas and Spranger (2000) provide evidence that international labour migration in The Netherlands rose from 11 thousand persons in 1991 to more than 15 thousand in 1998. This means that some 3% of the Dutch employment inflow in 1998 (640 thousand persons) is by foreign labour migrants. Since the outflow of (former) labour migrants is not known we cannot establish the share of labour migrants in the Dutch net employment change. Hence, also the impact of a labour demand shock on migration is difficult to assess beforehand.

**Figure 2. Impulse responses to labour demand shock in The Netherlands, based on 18 RBA-areas**
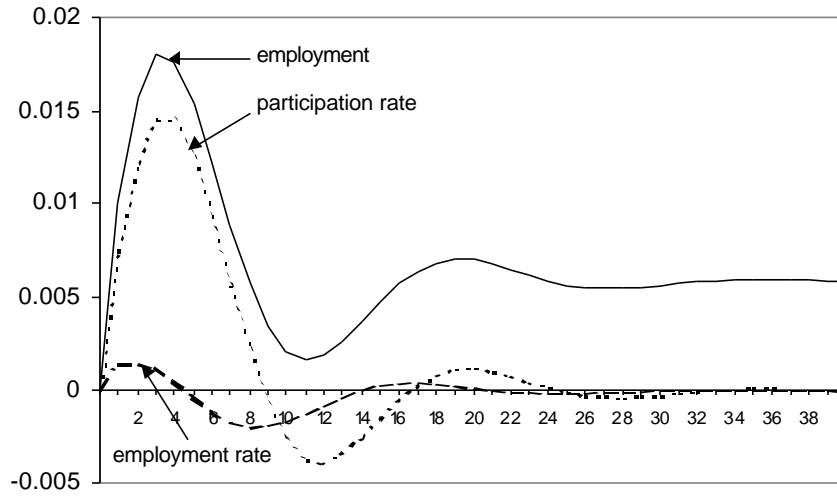


This is confirmed in figure 3, where the size three different absorption mechanisms, *viz.* participation, unemployment and spatial adjustment, to the shock in ? $n_i$ is presented. Indeed also in the medium term, participation is still the dominant absorption mechanism. There is only some small effect on spatial adjustment and unemployment. Note that the migration-effect in the fifth quarter pertains only to the remnant of the initial shock, which is by then only 20% of its original size. Of that remnant one third is absorbed by spatial adjustment and two third by participation. The effect on unemployment is also versatile. Of the initial shock we find that some 15% is absorbed by unemployment and afterwards this effect dies out very quickly.

**Figure 3. Absorption mechanism of the shock in ?$n_i$. over time**
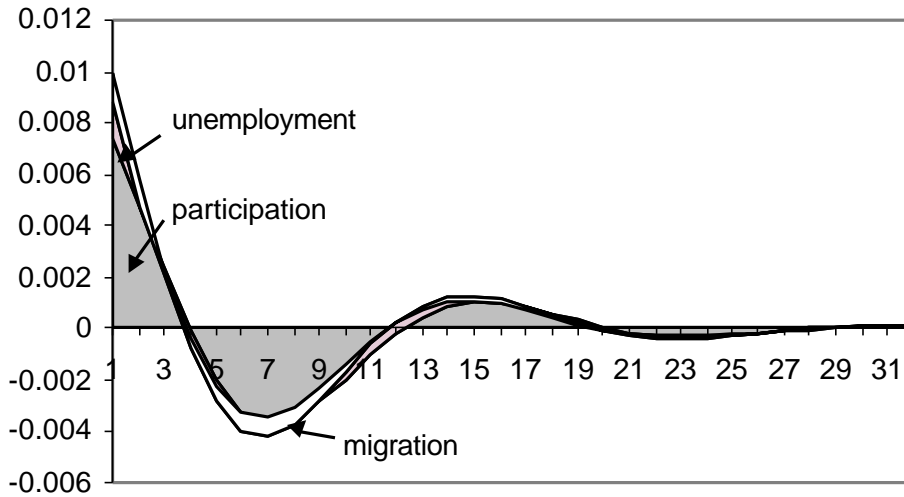
Figure 4 presents the role of the three absorption channels in a yet another way. Its shows the shares of participation, unemployment and spatial adjustment in response to the labour demand shock in the first period, immediately after the shock, and the shares of the cumulative absolute responses after 15 periods. This figure also shows that participation is the main adjustment channel, while unemployment and spatial adjustment are small. Note that over time spatial adjustment becomes slightly more important as absorptive mechanism, while the unemployment share remains virtually the same.

**Figure 4. Absorption of a labour demand shock in The Netherlands by shares of the responses in participation (1), unemployment (2) and migration (3) in the first period and the shares of the cumulative (absolute) response of these adjustment mechanisms after 15 periods.**



shares after 1 period



cumulative shares after 15 period
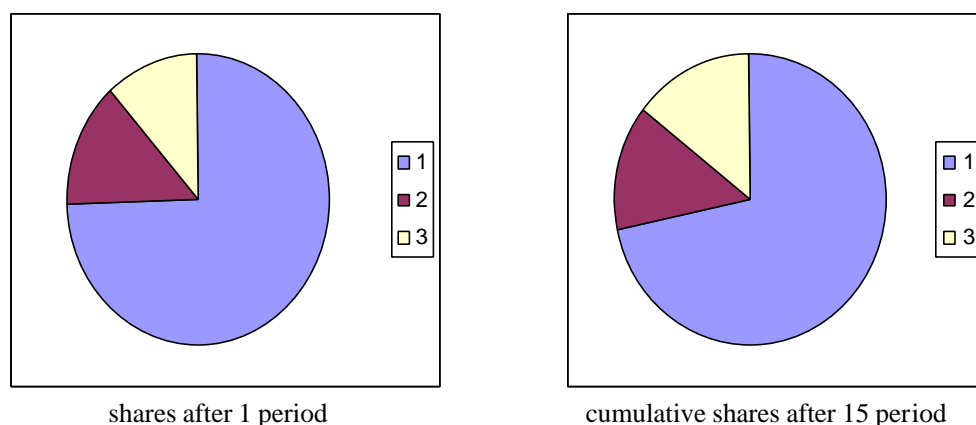
When these results are compared to those of Blanchard and Katz (1992) for the USA and Decressin and Fatás (1995) we find that the speed of adjustment of six years comes closer to the US figure of six years than the European figure of some nine years. Hence in terms of flexibility of the labour market, the Dutch situation more resembles the US than the EU.[11]

However, as far as the three adjustment channels are concerned, we find that The Netherlands mimics the situation of the European countries, where a labour demand shock is mainly absorbed through adjustments in labour participation.

## 5. Regional adjustment to regional demand shocks

In this section we attempt to fully exploit the regional character of our data. The central question here is: are similar adjustment patterns, as the ones of figures 2-4, observed for labour demand shocks in specific regions within The Netherlands? This implies that we next shift focus from nation-wide to regional analysis. Unfortunately the number of observations does not allow estimation of system (7)-(9) for each of the 18 RBA-areas. In fact the regions we construct have to consist of at least four RBA-areas in order to yield stable system

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[11] We do acknowledge that our study is based on a more recent sample than the other two studies. Blanchard and Katz' study refers to the 1950-1990 era, while Decressin and Fatás' is based on roughly the 1970's and 1980's. As far as the European situation is concerned, we do not expect any major changes in terms of labour market institutions. The fact that the European employment performance in the 1990's was virtually flat, as shown in Figure 1, corroborates this premise.

specifications. We therefore combine the 18 RBA-areas to yield four larger districts, as defined in Table 2.[12]

**Table 2 – Aggregation of 18 RBA-areas in four districts**

| District | RBA-area | RBA number |
|---|---|---|
| North: | Groningen | 1 |
| | Friesland | 2 |
| | Drenthe | 3 |
| | Noord-Holland Noord | 9 |
| East: | IJssel-Vecht/Twenthe | 4 |
| | IJssel/Veluwe | 5 |
| | Arnhem-O-Gld/Nijm-Riv.land | 6 |
| | Flevoland | 7 |
| West: | Midden-Nederland | 8 |
| | Zuidelijk Noord-Holland | 10 |
| | Rijnstreek | 11 |
| | Haaglanden | 12 |
| | Rijnmond | 13 |
| South: | Zeeland | 14 |
| | Midden- en West-Brabant | 15 |
| | Noordoost-Brabant | 16 |
| | Zuidoost-Brabant | 17 |
| | Limburg | 18 |

We run the system (7)-(9) for these four districts, where we pool the data for each of the composing RBA-areas allowing for fixed region-specific effects. Notice that the variables, $n$, $e$ and $p$, refer to the ß-differences, are all taken relative to the averages of the district in which the RBA-area is located and *not relative to the nation-wide situation*, as in the previous section. So $n_i$ refers to the ß-difference of employment in area $i$ relative to the total employment in the district in which $i$ falls. The same is true for regional unemployment and participation rates.

So for each of these four districts we again determine the region-specific variables, constructed as the residuals of equations (1)-(3) but now relative to the district they refer to. So first we estimate the elasticities of district labour market shocks to each region therein. These elasticities are next used to construct the ß-differences, which on their turn are used to estimate system (7)-(9), with which we conduct a similar impulse response analysis as the one in the previous section. For convenience sake we do not report all the elasticity values needed to for these ß-differences, but proceed with studying the speed of adjustment and the share of each of the three mechanisms of adjustment to a unit labour demand shock for each of the four districts.

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[12] Notice that the geographical North is The Netherlands is usually made up of Groningen (RBA 1), Friesland (RBA 2) and Drenthe (RBA 3). However, based solely on these areas we could not obtain a stable system (7)-(9). Therefore, we have augmented the North with Noord-Holland Noord (RBA 9), which is not only geographically located in the vicinity of the other three areas, but also has similar characteristics, like a relatively high unemployment, the rural character and focus on agriculture and manufacturing. In that sense it fits to the other areas. The subsequent analysis was also conducted with RBA-4 attached to these three northern areas instead of RBA-9. The resulting impulse responses were comparable to the ones presented here but less pronounced: participation is the main adjustment channel (68%), but less than national (74%) and the impact of unemployment is relatively large (22%) compared to national (14%). In due course adjustment in this alternative northern model shifts from participation to unemployment and particularly migration and commuting.

*North*

Figures 5A-5C show the adjustment paths, impact and shares of the absorption channels, respectively, for the northern regions of The Netherlands. There are two eye-catching differences with figures 2-4. First the speed of adjustment in the North. Figure 5A shows that the shock has been absorbed completely after five years, when a new employment equilibrium level is reached of 0.6 %-point above the initial level. The adjustment speed nation-wide was some six years. This points towards the fact that the northern labour market might be more flexible than the national labour market. Second, the impact of the different absorption channels. Figure 5A, 5B and particularly figure 5C, show that the initial impact of the shock in terms of adjustment channel is almost evenly spread among participation, unemployment and spatial adjustment. In fact the main adjustment is through changing unemployment rates. Initially, some 38% of the shock is absorbed by a fall in unemployment, 35% is absorbed by increasing participation and 27% through spatial adjustment. Figure 5C in particular, shows that in due course the impact of spatial adjustment and unemployment slightly diminishes favouring the role of participation.

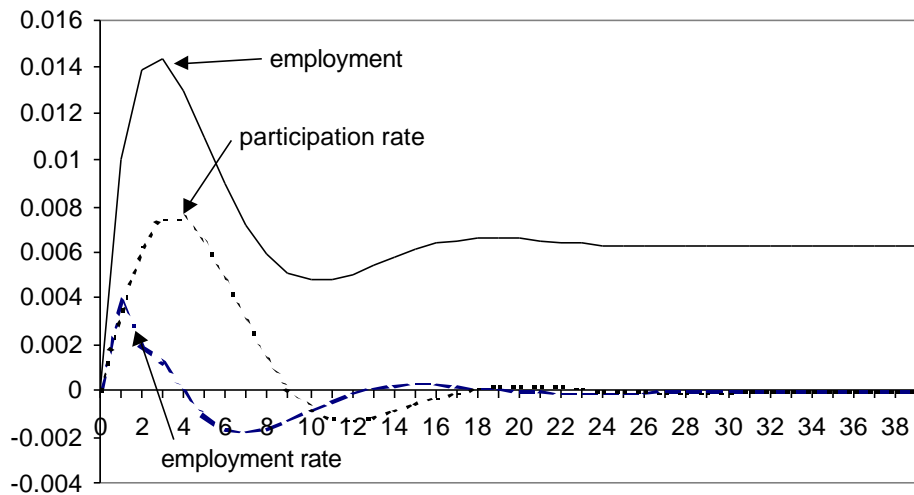**Figure 5A. Impulse responses to labour demand shock in the North**



**Figure 5B. Absorption mechanisms of the shock in ?$n_i$ in the North**
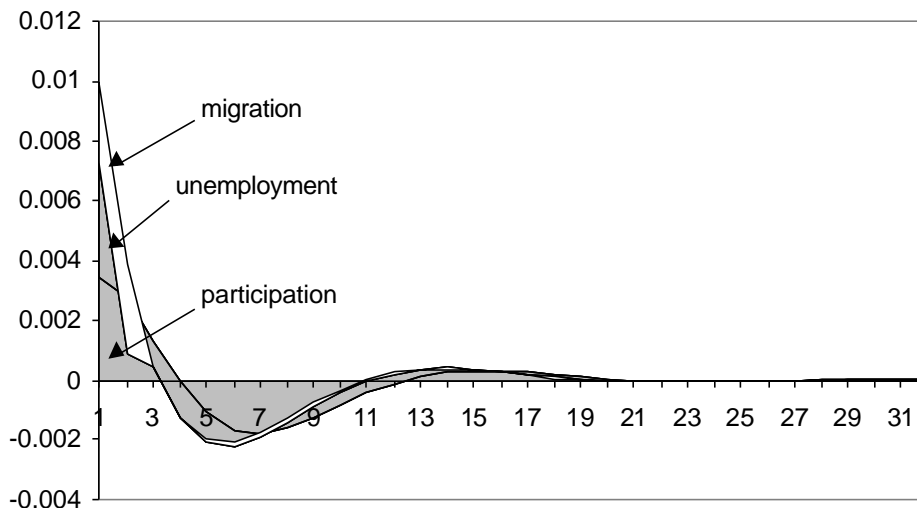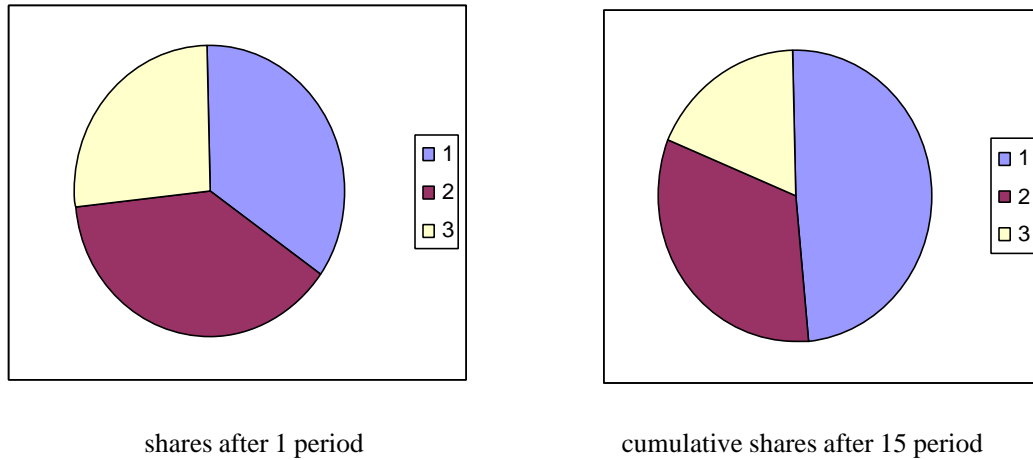
**Figure 5C. Absorption of a labour demand shock in the North by shares of the responses in participation (1), unemployment (2) and spatial adjustment (3) in the first period and the shares of the cumulative (absolute) response of these adjustment mechanisms after 15 periods.**



shares after 1 period



cumulative shares after 15 period

*East*
The impulse responses of the eastern regions in figure 6A show longer adjustment paths than those of the North. The shock has died out completely after about 28 periods, or seven years. The new equilibrium level is fairly high with some 0.8 %-point above the original level. Figure 6A shows a peculiar pattern in the sense that the response of the regional participation rate overshoots the employment level. [13]

**Figure 6A. Impulse responses to labour demand shock in the East**



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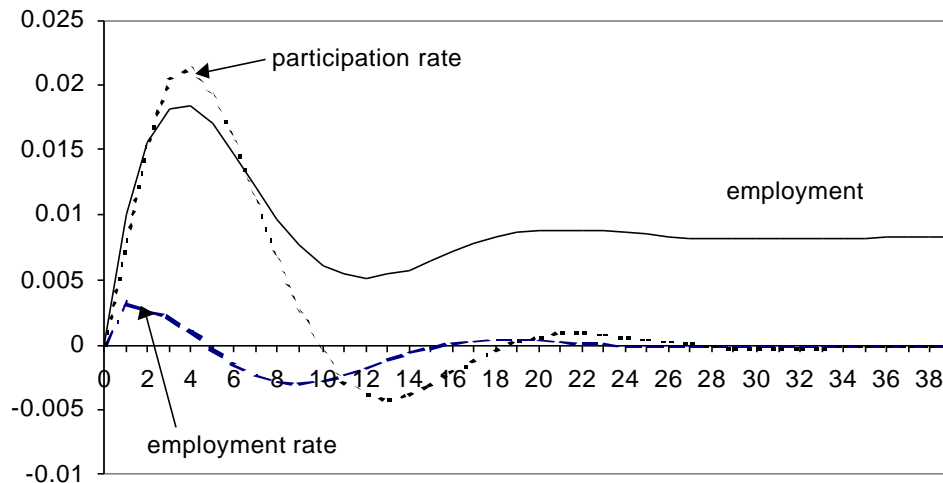
[13] Theoretically this is possible considering an employment shock might invoke many more persons outside the labour force to participate than the size of the actual shock. When they realise that their reaction to the shock was too strong they move out of the labour force again.

It is nevertheless obvious from figure 6A that participation is the major adjustment channel to the shock in the East. Figure 6B corroborates this finding and also shows that in due course, the role of spatial adjustment as means to absorb the remnants of the shock becomes more and more important. In the second year (period 5-8) after the shock spatial adjustment is as important as participation as absorptive channel.

Figure 6C also shows this growing impact of spatial adjustment as time moves on. In the first period, some 10% of the adjustment process is through spatial adjustment. The cumulative migration-effect after 15 periods is 26%. Nevertheless, changing participation rates are still the primary way in which the labour demand shock is absorbed.

**Figure 6B. Absorption mechanisms of the shock in ?$n_i$ in the East**
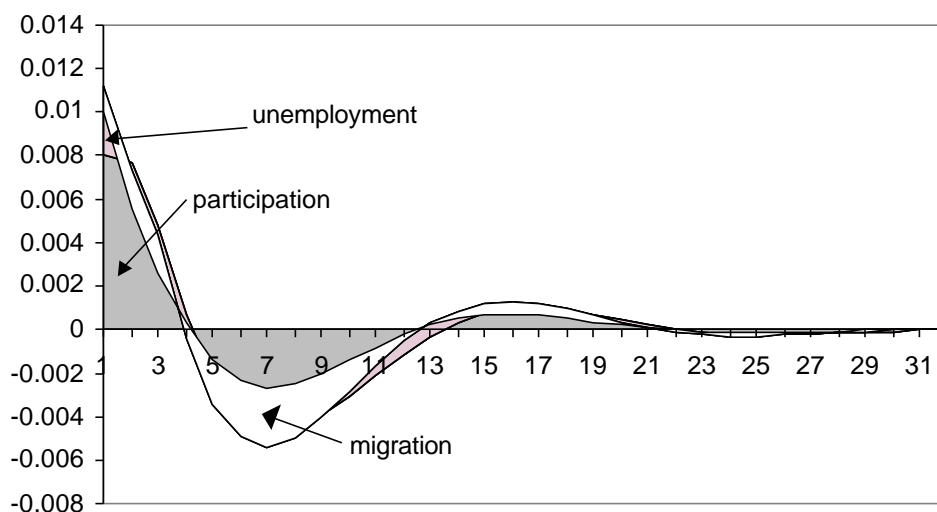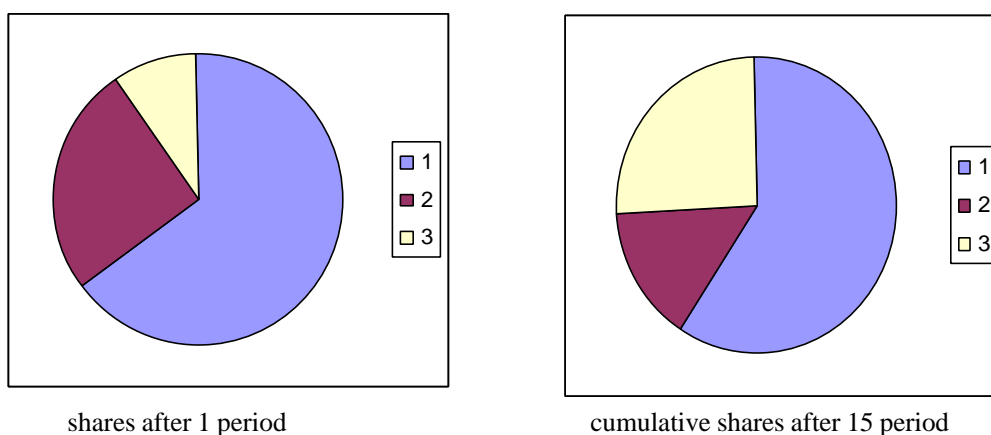


**Figure 6C. Absorption of a labour demand shock in the East by shares of the responses in participation (1), unemployment (2) and spatial adjustment (3) in the first period and the shares of the cumulative (absolute) response of these adjustment mechanisms after 15 periods.**



shares after 1 period



cumulative shares after 15 period

*West*

The adjustment speed of the western district to a labour demand shock, which can be obtained from Figure 7A, is relatively low compared to the North and East. Here it takes some 32 periods (eight years) before the effects of the shock have completely died out. Another different aspect of the impulse responses in the West is the relatively high new employment equilibrium level of 1.5 %-point above the original level.

Notice that a labour demand shock will always lead to some level of reallocation of jobs: new jobs are being created, some obsolete jobs are destroyed. This reallocation process has so far resulted in a new equilibrium employment level below the initial value of the shock. Now this reallocation process, associated with the labour demand shock in the West, has generated an even larger amount of additional jobs than implied by the initial shock. This means that jobs created in the West generate additional jobs as well, rather than destroying obsolete jobs as part this reallocation process. [14]

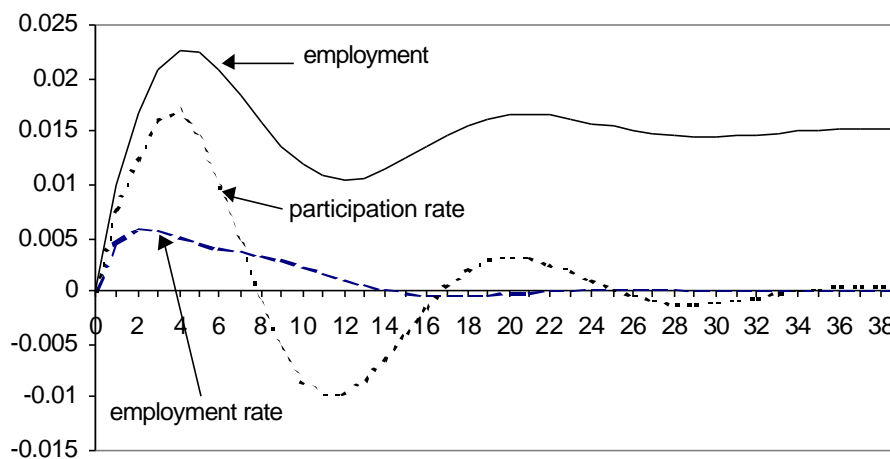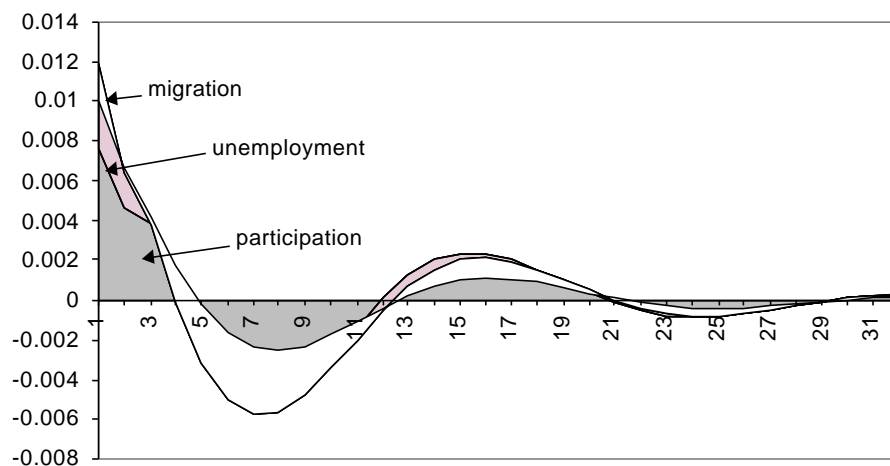**Figure 7A. Impulse responses to labour demand shock in the West**



**Figure 7B. Absorption mechanisms of the shock in ?$n_i$ in the West**



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[14] This job destruction process may still be present in the West, but it is probably small due to the fact that on average (*i.e.* the difference between job creation and destruction) it must lie 0.5 %-point above the initial level of the shock.

**Figure 7C. Absorption of a labour demand shock in the West by shares of the responses in participation (1), unemployment (2) and spatial adjustment (3) in the first period and the shares of the cumulative (absolute) response of these adjustment mechanisms after 15 periods.**



shares after 1 period                 cumulative shares after 15 period
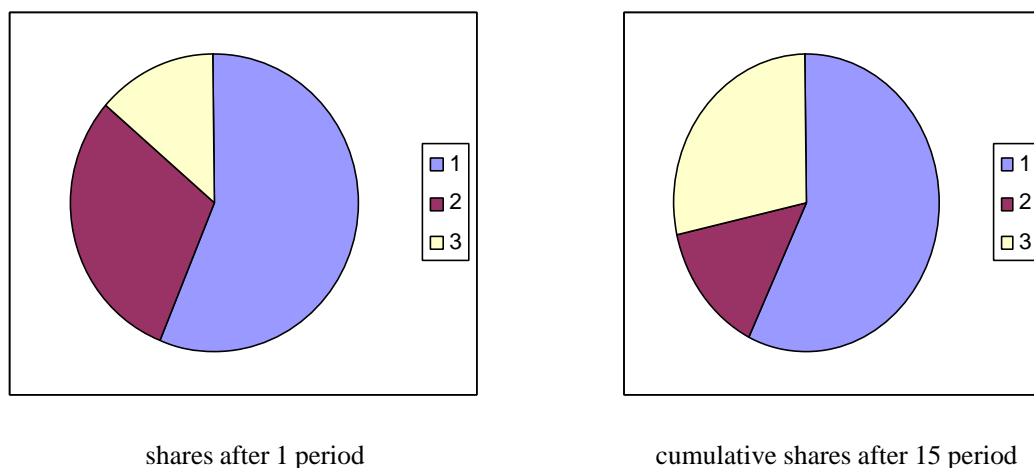
Figure 7C shows that also in the West a change in participation is the main adjustment channel through which the shock is absorbed. Initially, there is also a substantial share of unemployment as means of adjustment, but in due course we find that the share of spatial adjustment becomes more and more important, at the expense of unemployment. The share of participation remains almost constant at roughly 55%.

*South*
Finally, Figures 8 A-8C show the adjustment paths and patterns for the southern RBA-areas. The impulse response of figure 8A shows that the effects of the shock have died out after about seven years (28 periods). After that time a new employment equilibrium is reached which lies some 0.6 %-points above the original level.

**Figure 8A. Impulse responses to labour demand shock in the South**
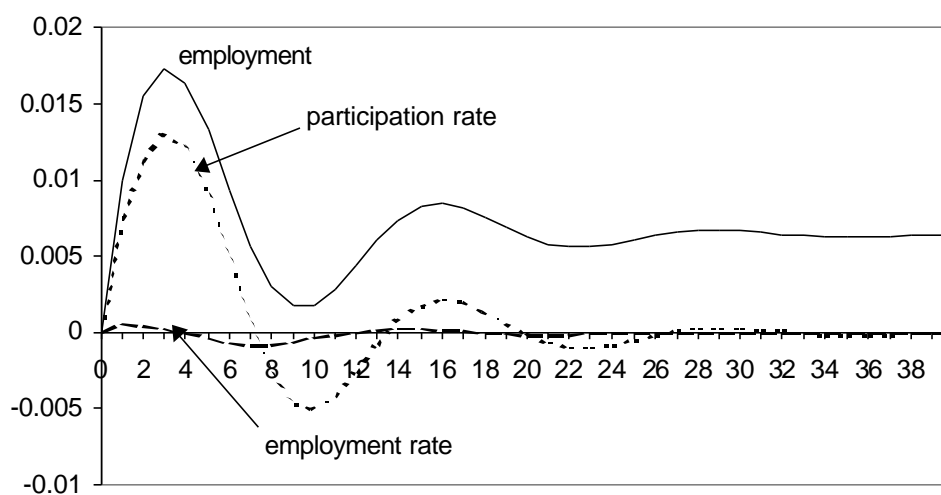


Also for the South the main adjustment channel to a labour demand shock is through changing participation rates. Figure 8B, and particularly 8C, show that there is virtually no

change in the absorption channel as time moves on. In the South spatial adjustment acts as the second important adjustment mechanism, both immediately after the shock as in the longer run. Unemployment is relatively insignificant compared to other regions.

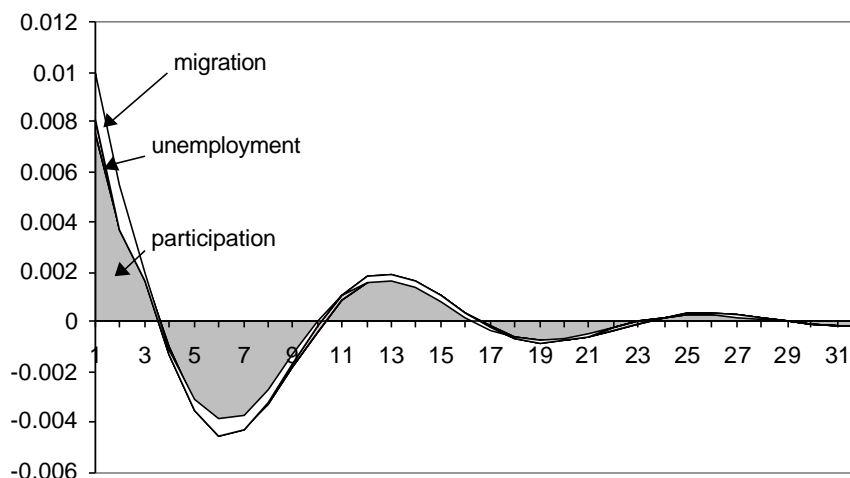**Figure 8B. Absorption mechanisms of the shock in ?$n_i$ in the South**



**Figure 8C. Absorption of a labour demand shock in the South by shares of the responses in participation (1), unemployment (2) and spatial adjustment (3) in the first period and the shares of the cumulative (absolute) response of these adjustment mechanisms after 15 periods.**



shares after 1 period



cumulative shares after 15 period
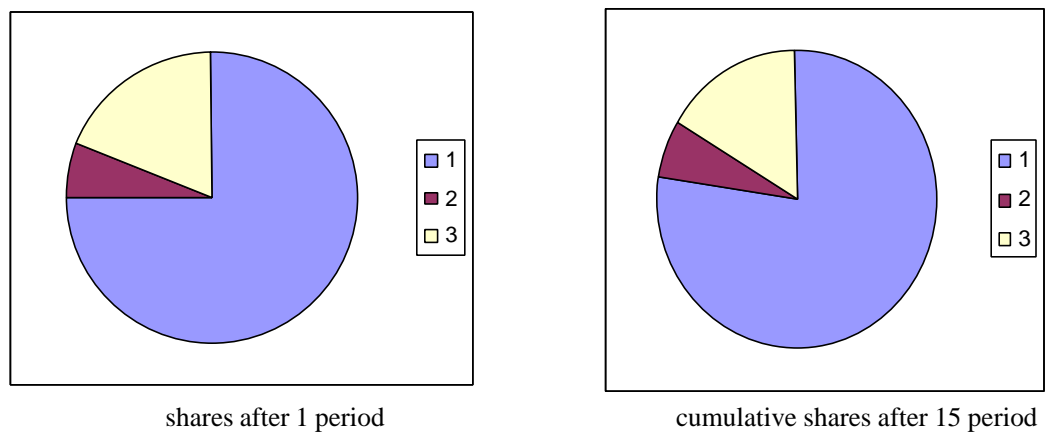
Summarising, this impulse response analysis shows:
1. Flexibility of the entire Dutch labour market is higher than the European average and more in line with that of the USA. Within The Netherlands we find the northern labour market to adjust more rapidly than any other region. This points to a more flexibly operating labour market in the North than in any other Dutch region.
2. A labour demand shock yields a new positive equilibrium value for the relative employment, *i.e.* this shock has a permanent (positive) effect on the regional employment. This new equilibrium is highest in the West and lowest in the North and South.

3. In the East, West and South, a positive labour demand shock is mainly absorbed through a rise in participation rates. Unemployment and spatial adjustment are of secondary interest. Of these secondary effects, in the East and West unemployment stands out, while in the South this is spatial adjustment.
4. In the North, absorption runs through all three channels in an almost even way, where unemployment has the highest (initial) share. In due course the remainder of the shock is absorbed mostly through adjustment of the northern participation rate.

Table 3 compares the main results of both the national and regional impulse response analysis of this paper.

**Table 3 – Comparison of main results of a 1 percentage point shock in relative employment, both national and regional**

|  | Netherlands | Regions: North | East | West | South |
|---|---|---|---|---|---|
| Absorption time (quarters)[*] | 26 | 17 | 27 | 35 | 28 |
| Final employment effect | 0.58% | 0.63% | 0.83% | 1.50% | 0.64% |
| Adjustment in period 1 by |  |  |  |  |  |
| - participation | 74% | 35% | 65% | 56% | 75% |
| - unemployment | 14% | 38% | 26% | 31% | 6% |
| - spatial adjustment | 12% | 27% | 10% | 14% | 19% |
| Absorption in period 15 by |  |  |  |  |  |
| - participation | 71% | 48% | 59% | 57% | 77% |
| - unemployment | 14% | 33% | 15% | 14% | 6% |
| - spatial adjustment | 14% | 19% | 26% | 29% | 17% |

[*] absorption completed when less than 1% of the initial shock is left

## 6. Corroboration of the results

Using a relatively simple labour market model to study the effect of regional labour demand shocks for The Netherlands, we have found a relatively high speed of adjustment to these shocks. In fact this adjustment speed is more of 'American' levels than of 'European'. This implies that the Dutch labour market operates in a more flexible way than the European average. One explanation for this flexible character in European perspective is given in Broersma *et al.* (2000).

Furthermore, impulses in labour demand are largely met by workers moving in and out of the labour force as a reaction to that shock. It is a well-known phenomenon that in the 1980's and early 1990s redundant workers moved out of the labour force rather than becoming unemployed. In addition, an increase in Dutch employment was not accompanied by an equal fall in unemployment, so it had to be non-participants entering the labour force that filled these new jobs.[15]

There are a number of reasons for these phenomena. First, early retirement and disability schemes which enabled employers to get rid of redundant personnel and the willingness of this personnel to move into these arrangements, as they meant that they did not become

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[15] Only the employment increase of the last couple of years goes with a dramatic fall in unemployment figures. Unfortunately, our data do not allow for a similar analysis on a shorter sample period than the one in this analysis.

unemployed (with a lower benefit). See for example Hassink *et al*. (1997). Second, a large part of these non-participants moving into employment consist of school-leavers who are of much more interest to employers than unemployed, because they are (considered to be) more motivated, have a higher productivity and are cheaper. The same can be said for another group of non-participants that have become of growing importance for the employment growth in The Netherlands: women.

When we consider the results of the four districts in which we subdivided The Netherlands based on the 18 RBA-areas, the adjustment paths of the North catch the eye, so we focus on those. Labour market adjustment in the North to a labour demand shock runs initially through unemployment, participation and spatial adjustment in an almost equal way. In due course, the role of participation becomes more important. In the other three districts, adjustment does mainly through changes in participation, both initially and in the longer run. For these three districts the role of spatial adjustment as absorptive channel to the shock becomes more important as time moves on.

In a flexible labour market persons loose their job earlier than in case of inflexible labour markets, but they also find a new job sooner. We found that persons loosing their job in the North become unemployed more frequently than elsewhere, or move to other regions more frequently to get a job. Following the same reasoning, once jobs are created in the North there is substantial inflow of unemployed workers to those jobs, but also an inflow of workers from other regions. In case of a negative shock, workers would more frequently move into unemployment and migrate to other regions than elsewhere. So we should consider the flows of persons moving into and out of unemployment and the flow of persons moving into and out of the northern district (as migrants) and ask the question: is the reallocation rate of these groups relatively high in the North?

Figure 9 shows the average reallocation of persons moving into and out of unemployment as percentage of the labour force for each of the 18 RBA-areas relative to the nation-wide reallocation rate between 1993 and 1999.[16] Indeed two of the northern RBA-areas, *viz.* Groningen and Friesland, have by far the highest reallocation rate of 1.5 percentage points above the national level.

**Figure 9. Regional unemployment turbulence (sum of unemployment inflow plus outflow as % of labour force) in 18 Dutch RBA-areas minus the national reallocation rate, averages 1993-1999**



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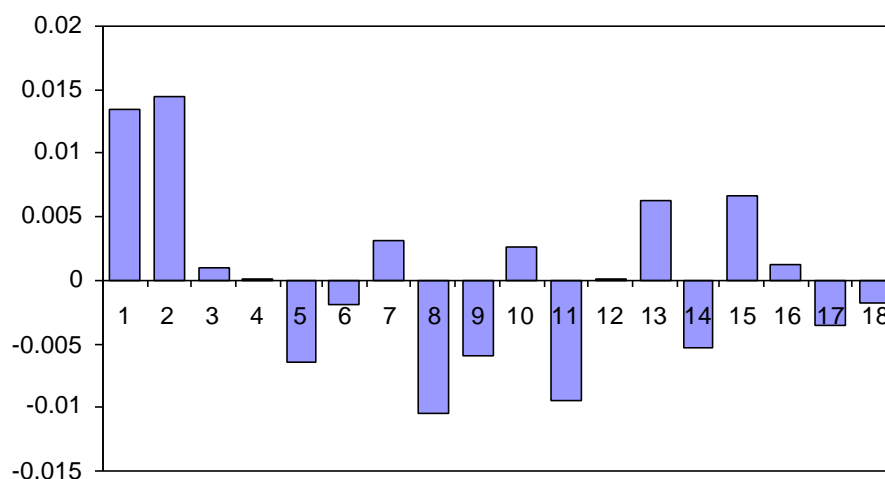
[16] Unemployment outflow will for the larger part consist of unemployed finding a job.

Figure 10 shows the reallocation of persons moving into and out each of the 12 Dutch provinces as percentage of the labour force relative to the nation-wide percentage between 1993-1998.[17] Apart from the province of Flevoland, which is known for its high in-migration rates because it is new land conquered from the sea, there is a clear positive reallocation rate of migration flows in the three northern provinces of Groningen, Friesland and Drenthe.[18] [19] [20]

**Figure 10. Regional migration reallocation rate (sum of migration inflow and outflow as % of labour force) in 12 Dutch provinces minus the national reallocation rate, 1993-1999**
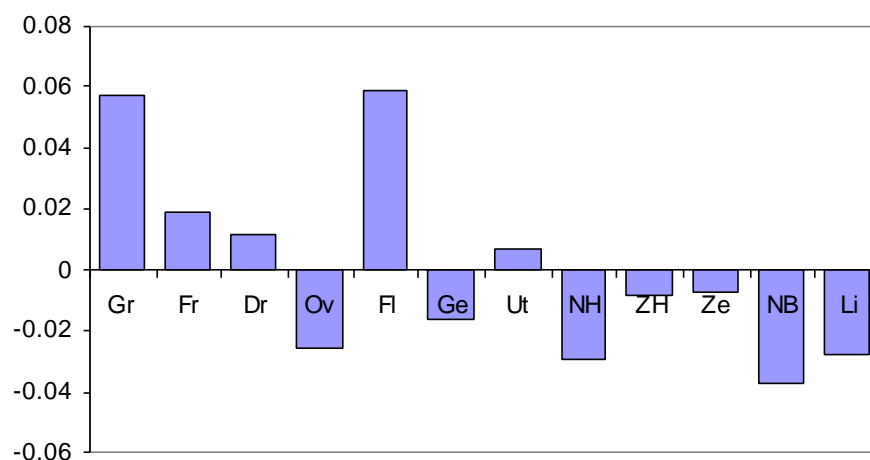


These two figures corroborate the fact that both unemployment and migration are important as means of adjustment to shocks in the northern district. There is substantially more unemployment reallocation and migration in- and outflow in at least two of the four RBA areas building the North than anywhere else.


## 7. Concluding remarks

This paper has studied regional labour market dynamics in The Netherlands over the past decade. We find that the speed of adjustment to a labour demand shock in The Netherlands is high compared to Europe and more in line with the situation on the US labour market. On the other hand, a shock in regional labour demand in The Netherlands is primarily absorbed by changing participation rates. The effect on unemployment or spatial adjustment as ways to absorb a shock is only minor. This corroborates the general situation on European labour markets. In other words, the Dutch labour market shows 'American' levels of flexibility, but 'European' ways of adjustment. This flexibility may explain the employment upsurge in The Netherlands, reaching 'American' growth rates, of the past few years.

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[17] Unfortunately, we have no migration figures for the 18 RBA-areas, but provinces do give a rough indication for the size of migration reallocation in our four districts.

[18] This is especially true for the province of Groningen, but this effect has to be mitigated somewhat when we realise the in- and outflow of student to the university in this small province.

[19] Obviously not all migration is linked to job opportunities, but this is true for all provinces so the rank order of the size of the migrant reallocation will remain the same.

[20] Groningen, Friesland and Drenthe are also among the provinces with highest mobility of movers in general, as was shown by Nicolaas (1995).

However, as far as adjustment channels in response to labour market shocks are concerned, The Netherlands neatly fit the European picture. This is also true when the analysis is applied to four distinct districts within The Netherlands. Only the northern district has a divergent adjustment pattern. It not only has by far the highest adjustment speed to a shock, also the adjustment channels are different. In the North adjustment to a labour demand shock is due to changes in all three possibilities: unemployment, participation and spatial adjustment, whereas in the other regions this is primarily due to changes in participation.

The North is known for its adverse labour market performance in terms of high unemployment and low participation rates. Obviously the availability of these relatively large reservoirs of (potential) job searchers means that in these parts a labour demand shock is absorbed relatively easily through unemployment. The fact that spatial adjustment also plays a relatively large role means that workers are not unwilling to move to the North to fill a job, or move from the North to other regions when opportunities are better over there or that commuting flows are relative important here as well.

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