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ADJUSTMENT TO REGIONAL LABOUR MARKET SHOCKS

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Abstract: This paper analyses regional labour market adjustment in the Finnish provinces during 1976-2000. It investigates the inter-relations of employment, unemployment, labour force participation and migration to see how a change in region-specific and total labour demand is adjusted. The analysis reveals that a region-specific labour demand shocks adjust mainly via participation whereas total shocks are adjusted by unemployment. The region-specific component of labour demand shock has shorter-lived effects on unemployment and participation, but its effect on employment is permanent. Conversely, total shocks leave no permanent effect. Migration is more important in the region-specific case where, after a few years, it gets a large role in the adjustment process.

Key words: Labour market, employment, unemployment, migration, shock adjustment

JEL classification: J6, R23

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Tiivistelmä: Tässä työssä analysoidaan alueellisten työmarkkinoiden sopeutumista maakunnittain vuosina 1976-2000. Työn kysyntään kohdistuvien kokonais- ja aluespesifien shokkien sopeutuminen riippuu työllisyyden, työttömyyden, työvoimaan osallistumisen ja muuttoliikkeen välisistä reaktioista. Tulosten mukaan aluespesifit shokit sopeutuvat pääosin osallistumisasteen kautta, kun taas kokonaisshokit (alueille yhteiset ja aluespesifit shokit) sopeutuvat pääosin työttömyyden kautta. Aluespesifeillä shokeilla on vain lyhytaikaisia vaikutuksia työttömyyteen ja osallistumisasteeseen, mutta vaikutukset työllisyyteen ovat pysyviä. Sitä vastoin kokonaisshokeilla ei ole pysyviä vaikutuksia mihinkään komponenttiin. Muuttoliike on aluespesifissä shokissa tärkeämmässä asemassa kuin kokonaisshokissa, koska pysyvä työllisyyden pieneneminen tarkoittaa poismuuttoa alueelta.

Asiasanat: Alueelliset työmarkkinat, työllisyys, työttömyys, muuttoliike, osallistumisaste

Contents

1. Introduction

A worrying phenomenon is the slow but steady rise of unemployment in many developed countries in the 1980s and 1990s. The recession in the 1990s doubled or even tripled the number of unemployed in most European countries. Moreover, regional unemployment disparities in the European Union member countries seem to be at a permanently high level, with no apparent convergence in sight in the near future. It has been argued that these disparities are a result of different regional labour market adjustment dynamics following economic up- and downturns (Demertzis and Hughes Hallett, 1996). That phenomenon was observed in Finland as a result of the 1990s recession: some regions have recovered in only four years, whereas others have experienced worsening unemployment for 8 or 9 years in a row.

Labour market fluctuations are connected to fluctuations in the aggregate economy (Kydland, 1994; Millard et al., 1997). During contractions, workers adjust to falling labour demand by looking for a new job while remaining unemployed in their own area, exiting the labour force, or migrating to another area (Gordon, 1985a; Mauro and Spilimbergo, 1999). Seminal studies by Blanchard and Katz (1992) and Decressin and Fatas (1995) have established that the adjustment of labour markets to regional shocks occurs mainly via the participation rate (in Europe) or inter-regional migration (in the USA). More recently, Bentivogli and Pagano (1999) confirm that migration is much less responsive to relative unemployment differences in Europe than in the US. In Finland adjustment has taken place via the unemployment rate during the last decade (Böckerman, 1998), but participation rate during longer run (Pekkala and Kangasharju, 2002). Those studies analyse the adjustment to so-called region-specific shocks, leaving out the common, national level shock. However, there are good reasons to believe that the adjustment mechanism may differ between the region-specific- and the total-shock case. For example, when the aggregate economy is booming but one region is lagging behind, migration may play a significant role in balancing regional labour demand and supply. However, when the whole economy is in recession, unemployment and participation become more important, as moving will not improve the chances of finding a job.

The present study seeks to find new information about the labour market adjustment mechanisms in the Finnish regions. We analyse data on the 11 Finnish provinces during 1976-2000.[i] First we examine how a labour market shock (i.e. a change in the number of employed persons in the region compared to that in the whole economy) is absorbed by growing unemployment rate, falling participation rate (i.e. exits from labour force) and migration to other labour market areas. Next we test whether the adjustment process is different when the whole economy is hit by a shock. In other words, we formally examine whether

there are differences in the mechanism of adjustment depending on the nature of the shock (i.e. region-specific vs. total).

The results suggest that, firstly, regional unemployment rates and employment growth tend to be rather persistent in Finland, due to regional homogeneity and notable similarity of regional changes in employment and labour force participation. Secondly, in the region-specific case labour market adjustment initially occurs via participation, and to some extent unemployment. Only after a few years, when much of the shock has already been absorbed, inter-regional migration becomes an important adjustment mechanism. We find that the adjustment process is very different in the case of a total (region-specific plus common national) shock. In that case unemployment is the main adjustment mechanism and migration never attains a great role. Finally, the duration of the adjustment process and the extent of permanent effects also vary between these two scenarios.

The rest of the paper is organised as follows: the second chapter introduces the theoretical framework used in the analysis of regional labour markets. The third section discusses the general development of Finnish regional labour markets and analyses the mechanisms of adjustment. The final section concludes the paper.

2. Regional labour market adjustment

2.1 Regional labour markets and economic fluctuations

The analysis of regional labour market adjustment during different phases of the business cycle is closely connected to labour mobility. How do the workers react who lose their jobs when there is a negative shock to regional labour demand, say, a recession? They can either stay unemployed in their area of residence looking for a new job, exit the labour force (i.e. become "discouraged") or move to another area. And, similarly, where do workers to new jobs come from? The channel of labour market adjustment to demand shocks has been analysed extensively by Blanchard and Katz (1992) and Decressin and Fatas (1995). Both of those studies emphasise the importance of regional dynamics, as opposed to national dynamics that may actually be a relatively poor aggregation of regional evolutions. Recent empirical work provides support for the decisive role of region-specific shocks and hints to the possibility that such shocks may propagate from region to region (Clark, 1998).

The earlier literature has, however, ignored some clear distinctions in the types of labour demand shocks that a region can be subject to. Importantly, a pure region-specific shock is likely to evoke different adjustment dynamics than a shock that hits all regions simultaneously. There are good theoretical reasons to think so. The explanation is based on the availability of job opportunities outside the region. For one, migration behaviour differs between aggregate level economic booms and recessions, as external labour market opportunities, i.e. availability of jobs in other regions, differ in those two states. Indeed, it has been demonstrated that when the aggregate economy is in bust, inter-regional migration flows tend to be small, whereas migration during booms is usually very active (e.g. Ogilvy, 1979; Gordon, 1985b; Pissarides and Wadsworth, 1989; Milne, 1991; Green et al., 1998). This means that migration should have a smaller role in adjusting total shocks, compared to region-specific shocks. Secondly, due to high union power in most western economies wages tend to be fairly uniform across regions and are inflexible downwards. This suggests that firms cannot adjust to a negative demand shock in one region by decreasing pay (e.g. Bean, 1994). Hence unemployment in that region reacts more heavily. During region-specific booms firms can compete by increasing wages where labour demand is high. This dampens labour demand and is likely to draw workers from outside labour force back to the market.

2.2 The similarity of regional labour market shocks

The main aim of the present study is to evaluate the effects of region-specific shocks. However, a large share most economic fluctuations tend to be shared by

all regions of the economy. The extent to which regions experience similar annual employment changes can be estimated by running for each region

$$\Delta\log(N_{it}) = \alpha_i + \beta_i*\Delta\log(N_{et}) + \eta_{it}, \quad (1)$$

where N_{it} represents the employment in region i in year t and N_{et} the national average employment. α_i is the constant and η_{it} is the error term. Above i refers to region (i = 1,…,n) and t refers to year (t = 1,…, T). The magnitude of the average R^2 of the regressions reveals the common component in regional shocks and β_i the elasticity of regional employment with respect to national.

Obviously, if the national aggregate shock affects all regions similarly, there is very little tendency of such shocks to affect regional employment and unemployment disparities. In other words, the magnitude of region-specific shocks will be very small, whereas that of a total (common plus region-specific) shock may be vast. Conversely, if the importance of regional factors is great, then all regions tend to experience shocks differently, and regional disparities are likely to be affected. Indeed, earlier findings imply that much (over 40 per cent in the US and 80 per cent in the EU) of the employment fluctuation can be explained by the region-specific component (Decressin and Fatas, 1995; Clark, 1998).

2.3 The adjustment of regional labour markets

In the analysis of total shocks, we use regional variables that are employment (N_{it}), change of employment (ΔN_{it}), employment rate (E_{it}) and participation rate (P_{it}). The relative importance of adjustment mechanisms to labour demand shocks can be analysed from the following system of equations:

$$\Delta N_{it} = \lambda_{i10} + \lambda_{11}(L)\Delta N_{it-1} + \lambda_{12}(L)E_{it-1} + \lambda_{13}(L)P_{it-1} + \varepsilon_{i\rho t} \quad (2)$$

$$E_{it} = \lambda_{i20} + \lambda_{21}(L)\Delta N_{it} + \lambda_{22}(L)E_{it-1} + \lambda_{23}(L)P_{it-1} + \varepsilon_{i\sigma t} \quad (3)$$

$$P_{it} = \lambda_{i30} + \lambda_{31}(L)\Delta N_{it} + \lambda_{32}(L)E_{it-1} + \lambda_{33}(L)P_{it-1} + \varepsilon_{i\tau t}, \quad (4)$$

where λ_{it} refers to the coefficient and (L) denotes a lag structure. Error terms are denoted by $\varepsilon_{i\rho t,}$ $\varepsilon_{i\sigma t}$ and $\varepsilon_{i\tau t}$. Using the analytical framework described above we can ascertain how a drop in regional employment is absorbed. We let year t changes in employment affect the participation- and employment rates, but not the other way round. In other words, we assume that all period t changes in employment are caused by labour demand factors, not supply factors. Assuming the symmetry of adjustment regardless of the direction of the shock (positive or negative), the result is simply reversed in order to derive the effect of a positive labour demand shock.[ii] To study the region-specific component of labour demand shocks we

need to isolate the regional changes from the common labour market changes shared by all regions.

Following Decressin and Fatas (1995) we allow the possibility that regions react differently to aggregate fluctuations by introducing a number of region-specific variables. Firstly, the regional relative to national employment change is:

$$\Delta n_{it} = \Delta\log(N_{it}) - \beta_i * \Delta\log(N_{et}) \quad (5)$$

where N_{it} is the number of employees in region i and N_{et} refers to that of the country, and the same for employment rate difference is:

$$e_{it} = \log(E_{it}) - \delta_i * \log(E_{et}), \quad (6)$$

where E_{it} is the regional- and E_{et} denotes national employment rate. Note that $\log(E_{it}) \cong -U_{it}$ is used as an approximation for regional unemployment here. Hence, the regional relative to national unemployment rate is:

$$u_{it} = U_{it} - \delta_i U_{et} \quad (7)$$

where U_{it} stands for regional- and U_{et} for national unemployment rate, and finally the regional relative to national labour force participation rate is:

$$p_{it} = \log(P_{it}) - \xi_i * \log(P_{et}), \quad (8)$$

where P_{it} indicates the regional- and P_{et} the national labour force participation rate. Above variables may be calculated as simple log-differences from the national average if no differences in regional reactions to national development are found (i.e. $\beta_i=1$, $\delta_i=1$, $\xi_i=1$). However, if regions do react differently to the national aggregate changes ($\beta_i \neq 1$, $\delta_i \neq 1$, $\xi_i \neq 1$), we must use the beta-, delta- and xi-differences defined above. Note that examining the effects of common shocks would not be sensible in this framework, due to the definition of region-specific shocks (a part of the common shock is subtracted from regional total shock to obtain region-specific shock). The framework requires LHS and RHS variables to be defined at same level of area-aggregation in order to calculate the effect of migration. Defining both sides at the national level would cancel out the effect of migration, as immigration plays a negligible role. Defining LHS at regional and RHS at national level might be interesting but the role of migration could not be reliably calculated.

3. Labour market adjustment

3.1 Regional labour market during fluctuations: informal analysis

Throughout the paper we have argued that there may be asymmetries in reaction to region-specific versus total labour demand shocks. Before proceeding to the formal analysis let us have a look at the development of regional labour markets in Finland during the last "business cycle", 1987-97. Those years were characterised by vast changes in regional labour demand, i.e. large shocks, and stand apart of the long-term development (figure 1). We have actual data for the 20 Finnish NUTS3 regions on the flows (i.e. actual numbers, pools) of persons to (and from) employment, where we know if those individuals come from (go to) other regions, unemployment or if they enter (exit) the labour force. In an average region, employment grows moderately during boom periods (1988-89, 1994-97) and declines sharply in recession (1990-93) (figure 2). Also, the shares of migration, participation and unemployment of the total employment flow appear to differ considerably between boom and recession (figure 3).

Figure 1. Unemployment and participation rate in Finland, 1976-2000

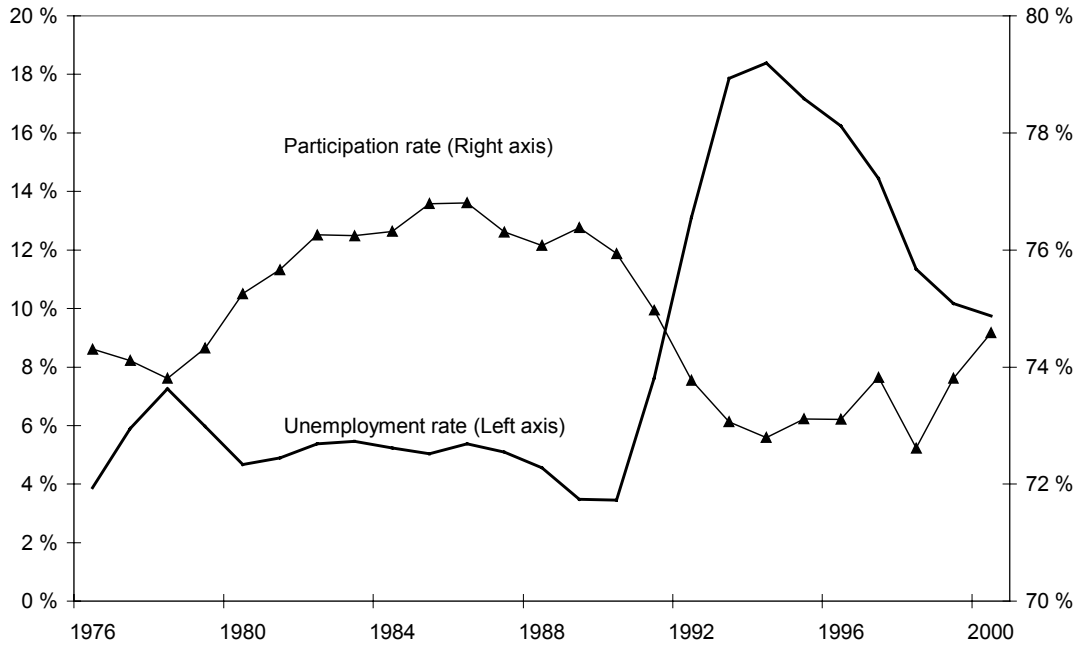


Figure 2. Sources of employment changes during boom and recession (average of 20 regions)

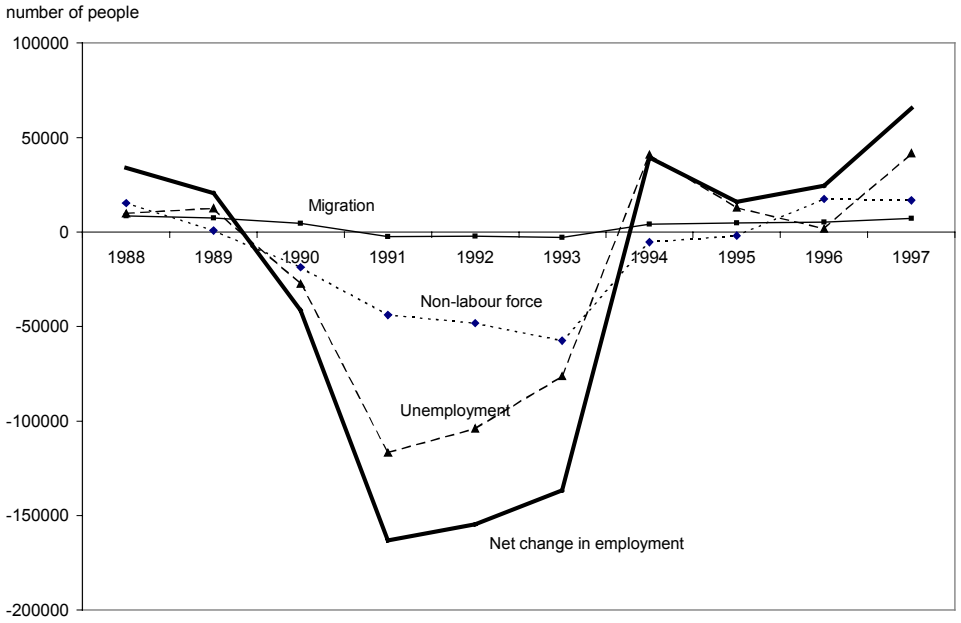
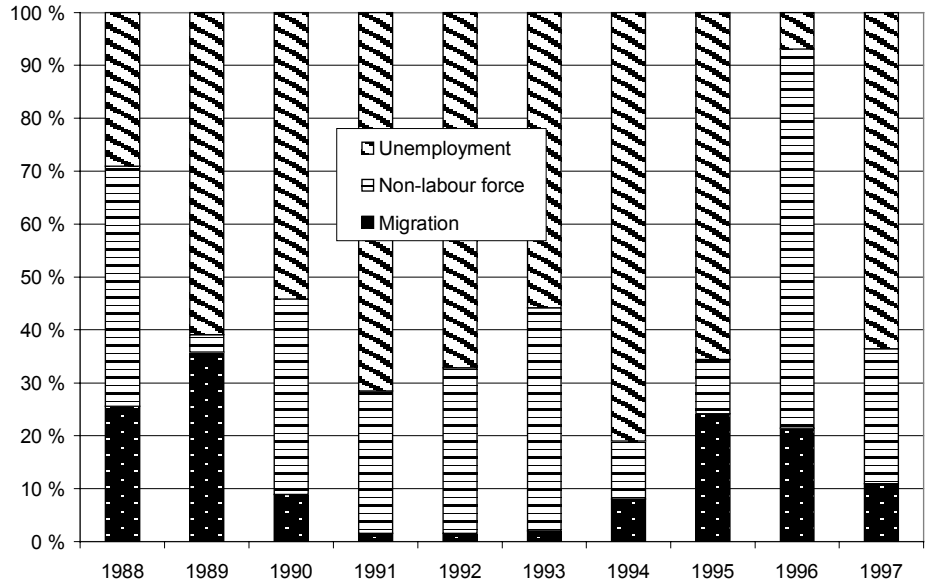


Figure 3. Shares of non-labour force, unemployment and migration of the total employment change



To calculate the average shares of adjustment mechanisms in case of total shocks, we pool the regional data into 189 region/year observations (20 regions times 10 year-to-year transitions minus 11 region-year observations when the change in employment was between –0.3 and +0.3 per cent) and analyse the flows between pools of employment, unemployment, non-participation and migrants (table 1). It turns out that the flows to and from unemployment adjust the greatest share of the total employment change. Participation has the second greatest role whereas migration adjusts less than a tenth of the whole shock. Dividing the annual regional observations into "positive shocks" (i.e. in year t regional employment grows by more than 0.3 per cent) and "negative shocks" (i.e. employment falls by more than 0.3 per cent) does not change the main message: unemployment remains the main channel of adjustment.[iii] Although relative shares of pools differ between boom and bust, the relative importance of adjustment mechanisms remains similar throughout the business cycle. Note that, surprisingly, the share of unemployment is higher in boom than in bust. This is not what theory would predict. This may be due to the severity of the shock in 1990-93: the perceived changes of finding a new job were so slight that most persons who lost their job exited labour force and started/continued their studies while waiting for better times.

Table 1. *Relative magnitudes of adjustment mechanisms in 1988-97, flows between pools of employment, unemployment, participation and migration*

	All "total shocks"	**Negative "total shocks"**	**Positive "total shocks"**
Average employment change	-1.6%	-4.9%	1.8%
Average share of mechanism:			
Migration	0.08	0.070	0.087
Participation	0.27	0.381	0.160
Unemployment	0.65	0.549	0.753
All mechanisms	1.00	1.00	1.00
N	189	96	93

*Notes: "Shock" includes all region/year-observations when employment growth is greater than +0.3% or fall is faster than –0.3%. A change between –0.3% and 0.3% was not considered a "shock". 11 observations fell in that range.

Next we move on to the description of region-specific shocks, i.e. those that are purged of the common economy-wide movements, using the province level data. Other studies (Blanchard and Katz, 1992; Decressin and Fatas, 1995) have looked exclusively at the regional component of the shocks. The adjustment to pure region-specific shocks may differ from the adjustment to overall shocks, as explained in previous sections. Also, whereas the above analysis reveals the

flows between "pools", it does not tell anything about how the "rates" are affected. For example, knowing that unemployment and participation (and thus labour force) pools changed, we still don't know how their relationship (unemployment rate) changed. And it would indeed be interesting to see how a change in employment affects the employment- and participation rate. Finally, 1988-97 is a short period and contains very untypical years in the Finnish history (figure 1), and may thus be unrepresentative of the long-term development.[iv] Hence, to investigate the adjustment to region-specific and total regional labour demand shocks we adopt a more formal approach in the following section to analyse a much longer data set.

3.2 Common labour market disturbances and persistence

Below we use province level data for the 11 continental provinces of Finland during 1976-2000. At provincial level, spatial labour mobility is mainly represented by long-distance migration. Commuting from province to province is almost negligible. In this section we first isolate the pure regional movements by calculating variables (5)-(8). In order to determine whether simple log-relative variables suffice, or whether beta-adjusted relative variables are needed, the degree of commonality in regional versus national employment shocks is estimated. We estimate (1) for each province and test whether β_i differs significantly from unity.

The results indicate that most (75 per cent) of the regional employment changes are common to all provinces (table 2). The R^2 is particularly high in Kymi, Turku and Pori, and Uusimaa, where the aggregate changes dominate. Conversely, regional factors tend to dominate in Keski-Suomi, Pohjois-Karjala and Lappi. Moreover, the β_i-coefficient is close to one for all provinces, indicating that regional employment moves together with the aggregate. We cannot reject the null hypothesis $\beta_i=1$ for any of the provinces at the conventional 5 per cent level of significance. Unemployment- and participation rates behave differently, however. The hypotheses $\delta_i=1$ and $\xi_i=1$ are rejected for most provinces at the 5 per cent level. We therefore opt for using the beta-, delta- and xi-adjusted differences in the next stage. Also, the use of adjusted differences removes the otherwise arising multicollinearity problem between employment and participation.

Table 2. Regression results for regional employment growth, unemployment rate and the log of participation rate in 1976-2000

Province	βi	R^2	δi	R^2	ξI	R^2
Uusimaa	0.97	0.93	0.85***	0.99	1.05	0.88
T&P	1.17	0.88	0.98	0.99	0.82**	0.80
Häme	0.95	0.74	1.16***	0.99	0.63***	0.66
Kymi	0.86*	0.86	1.08***	0.98	0.78*	0.64
Mikkeli	1.05	0.70	1.08**	0.98	1.75***	0.86
P-Karjala	1.07	0.68	1.16***	0.97	1.69***	0.78
Kuopio	1.05	0.80	1.14***	0.99	1.50***	0.83
K-Suomi	1.00	0.64	1.19***	0.97	0.81	0.39
Vaasa	0.82*	0.75	0.94**	0.98	1.36***	0.86
Oulu	1.01	0.83	1.03	0.97	0.86	0.66
Lappi	1.16	0.68	1.26***	0.96	1.34**	0.77

*Notes: The estimated equations are: (1) $\Delta\log(N_{it}) = \alpha_{1i} + \beta_i\Delta\log(N_{et}) + \mu_{1it}$, (2) $U_{it} = \alpha_{2i} + \delta_i U_{et} + \mu_{2it}$ and (3) $\mathrm{Log}(P_{it}) = \alpha_{3i} + \xi_i\log(P_{et}) + \mu_{3it}$. Note that Uit = -log(Eit). The estimation period is annual data for 1976-2000. *** signals a coefficient significantly different from 1 at 1%, ** significantly different from 1 at 5%, and * significantly different from 1 at 10%.

Even though a large share of shocks (up to 75 per cent) is common to all provinces, studying both the total and region-specific shock is meaningful due to following reasons. First, we only subtract the beta-, delta and xi-adjusted part of common shock, meaning that these two series differ not only by the size of the common shock. Secondly, even though 25 per cent may sound small in statistical sense, it is a very large change in economic sense (it can mean up to a 2.5 percentage points in employment and 2 percentage points in unemployment in some years). Economic significance should be the criteria to follow not the statistical significance (McCloskey and Ziliak, 1996).

3.3 The mechanism of labour market adjustment

We assume here that regardless of the direction of the labour demand shock the same adjustment mechanism follows.[v] This allows us to compare the Finnish results with those for Europe and the US. Noting that relative employment change, relative employment rates and relative participation rates are inter-connected, we estimate the equations (2)–(4) separately. Separate estimation is efficient and unbiased because equations (3) and (4) have the same regressors and the endogenous variable in equation (2) is one of the regressors in equations (3) and (4) (Greene, 2000). In each equation we use two lags for each variable and pool the provinces together to form a cross-sectional time-series panel. We also allow for region-specific fixed effects. Moreover, we estimate employment

in first differences rather than in levels, due to the persistence of growth rates and the apparent trend in the provincial data.[vi] In contrast, we use relative employment and participation for the following formal analysis.[vii] Augmented Dickey-Fuller test statistics support these choices.[viii]

Let us first look at adjustment to a region-specific shock. The changes in relative employment are mainly explained by the first lags of employment- and participation rate together with the second lag of employment change. Employment- and participation rate are explained by the current employment change and lags for most variables (Table 3).

Table 3. Regression results for labour market adjustment in 1976-2000, region-specific model

Variable	Employment change model	Employment rate model	Participation rate model
Dn	-	0.273 (8.31)***	0.648 (15.39)***
Dn1	0.123 (-0.93)	-0.091 (-1.36)	-0.005 (-0.06)
Dn2	-0.115 (-1.90)*	0.021 (0.67)	-0.035 (-0.89)
Le1	-0.330 (-2.07)**	0.619 (7.62)***	0.459 (4.41)***
Le2	0.112 (0.69)	-0.074 (-0.90)	-0.013 (-0.13)
Lp1	-0.232 (-1.83)*	0.259 (4.01)***	0.712 (8.60)***
Lp2	0.159 (1.25)	-0.124 (-1.92)*	-0.032 (0.38)
R^2 within=	0.23	0.41	0.64
N =	253	253	253
Breusch-Pagan =	7.32***	0.15	0.32
Hausman =	129.4***	55.89***	93.67***

*Notes: Difference variables (Δ) indicated by D and level variables by L. Lags indicated by numbers (1 or 2). T-values are in brackets. Significance indicated by * (10%),** (5%) and *** (1%).

Figure 4. Response to a negative labour demand shock, region-specific case

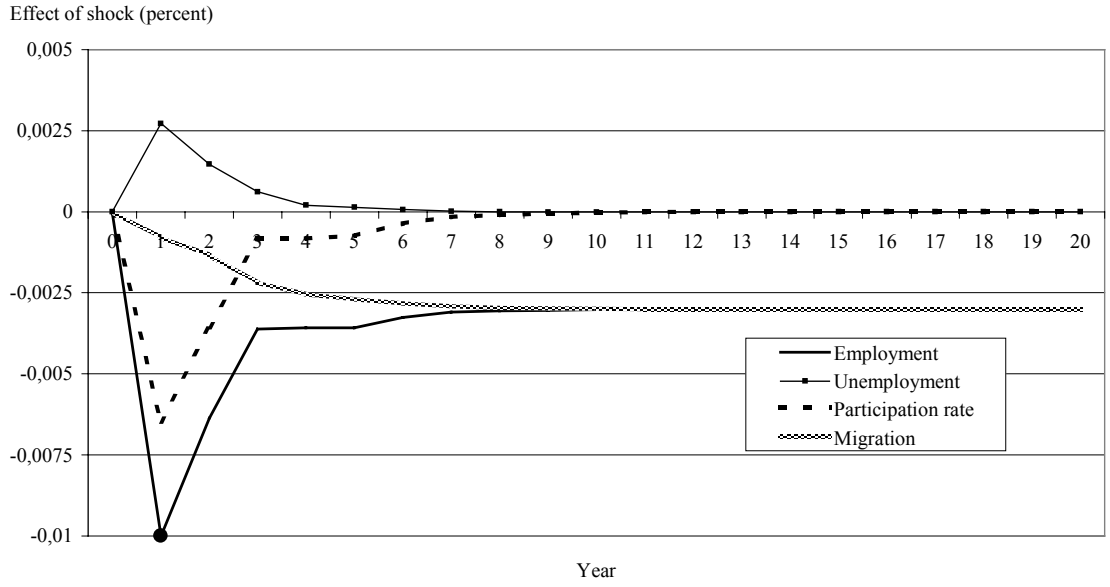


Figure 4 displays the response of employment, unemployment and labour force participation to a one-per cent negative shock in labour demand. The shock is absorbed mainly by participation and, to some extent, unemployment. It takes about 4 years for the effect on unemployment to disappear and about 6-7 years for participation. The effect on employment remains permanent after 6 or 7 years. The remaining part of the shock is absorbed by migration, which initially has the smallest role to play compared to other adjustment mechanisms.

After two years, when much of the shock has already been absorbed, the share of migration grows markedly (table 4). At the same time, the relative importance of unemployment rate as an adjustment mechanism wears off, just like the participation rate. These region-specific results differ somewhat from the European ones, where migration only plays a minor role. However, like in Europe, participation is the most important mechanism of labour market adjustment also in Finland (compare with Decressin and Fatas, 1995; Broersma and Van Dijk, 2001). The results are more or less in line with the US in the sense that the effects last about the same time (6 years) (Blanchard and Katz, 1992). Hence migration appears to be an important adjustment mechanism in a single-country context, where it evens out regional labour market imbalances. In a multi-country context the barriers of mobility are much higher. This finding is theoretically very plausible (Richardson, 1973; Gordon, 1985a).

Table 4. The role of adjustment mechanisms over time: region-specific and total shock

	Region-specific model Cumulative sum of shares, %				Total model Cumulative sum of shares, %			
Year	Employ-ment	Unemploy-ment rate	Participa-tion rate	Migration + error	Employ-ment	Unemploy-ment rate	Participa-tion rate	Migration + error
1	100.0	27.3	64.8	8.0	100.0	62.9	33.0	4.1
3	100.0	24.1	54.3	21.6	100.0	69.0	27.3	3.7
5	100.0	19.0	45.8	35.2	100.0	68.1	26.5	5.4
10	100.0	12.3	30.8	56.9	100.0	60.8	28.1	11.1

* Notes: The employment shock is normalized at 100% in each year, even though the size of the left-over shock is falling. The share of each mechanism is measured as per cent and the shares of the 3 mechanisms sum up to 100%. As migration is obtained as a residual in the system, we cannot separate it from the error term.

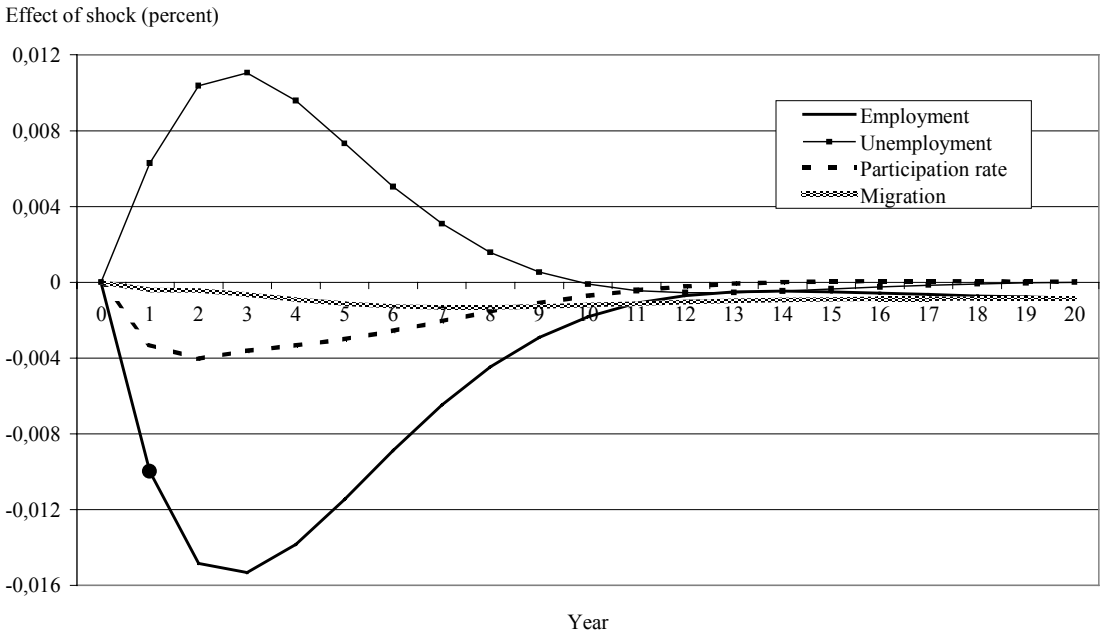
When the whole nation is experiencing negative development, the region-specific share of that development may be small. To analyse the adjustment to total shocks, we estimated the same equations as above, but now with total changes of employment, employment rate and participation rate.[ix] In other words, without relating the variables to national average (table 5). In turns out that now most of the employment shock is absorbed by unemployment rate, with participation taking the second place (figure 5). This result is identical to the descriptive analysis presented earlier (table 1). Secondly, the adjustment process appears smoother than in the region-specific case, and the system takes somewhat longer to re-stabilise. However, the permanent effect is negligible. This is plausible, as the economy tends to return to its long-term level of employment and unemployment. Moreover, migration has a much smaller role, just as expected, when common shocks dominate. Even as time passes, the dominating role of unemployment remains strong and the role of participation does not change much either (table 3). Interestingly, unlike in the region-specific case, migration never reaches any great role in the total-shock scenario. To conclude, the two types of labour demand shocks seem indeed to evoke very different mechanism of adjustment in the regional labour markets.

Table 5. Regression results for labour market adjustment in 1976-2000, total model

Variable	Employment change model	Employment rate model	Participation rate model
DN	-	0.551 (23.35)***	0.242 (12.89)***
DN1	0.286 (0.91)	-0.259 (-2.28)**	0.031 (0.34)
DN2	-0.123 (-1.83)*	0.002 (0.08)	-0.027 (-1.37)
LE1	0.523 (1.47)	1.293 (10.00)***	-0.009 (-0.09)
LE2	-0.521 (-1.52)	-0.435 (-3.48)***	0.110 (1.11)
LP1	-0.423 (-0.91)	0.762 (4.51)***	0.625 (4.66)***
LP2	-0.087 (-0.18)	-0.423 (-2.39)**	0.119 (0.85)
R^2 within=	0.41	0.97	0.84
N =	253	253	253
Breusch-Pagan =	1.25	0.17	0.89
Hausman =	21.24***	29.99***	24.09***

*Notes: Difference variables (Δ) indicated by D and level variables by L. Lags indicated by numbers (1 or 2). T-values are in brackets. Significance indicated by * (10%),** (5%) and *** (1%).

Figure 5. Response to a negative labour demand shock, total-shock case



4. Conclusions

This paper analyses the adjustment of regional labour markets in Finland 1976 through 2000. The study focuses on labour market changes resulting from demand shocks. The aim was to identify the mechanism of adjustment to such shocks and compare the Finnish case to the European and U.S. experience. We found that a region-specific fall in labour demand leads to a small but permanent decrease in employment, and most of the change is absorbed by participation and unemployment, particularly in the first couple of years. After a few years, inter-regional migration gains a greater role as an additional adjustment mechanism. These findings correspond to the Blanchard and Katz's 1992 study on the U.S. regions. In Europe as a whole, however, migration generally plays a much smaller role in adjustment than in our single-country context (compare with Decressin and Fatas, 1995; Bentivogli and Pagano, 1999).

Contrary to earlier studies, which study merely the region-specific demand shocks, we also analyse the total shocks (region-specific plus common national shock). It is likely that the adjustment to these two types of shock will differ, due to the availability of outside labour market opportunities. Indeed, total shocks display different adjustment dynamics than the region-specific ones. The fall in employment is mainly absorbed by unemployment and has longer-lasting effects. The permanent effects are smaller, however. And finally, migration has a much smaller role in the adjustment to total than to region-specific shocks. This was true both with the province level data and the NUTS3-regions (and both positive and negative shocks in the NUTS3 case).

In conclusion, our results imply that the adjustment to region-specific and total regional labour demand shocks should be studied separately. The meaning and effects of these shocks are very different, but are often used interchangeably in the empirical literature. Moreover, inter-regional migration plays a role in labour market adjustment, but it also seems that migration works as an equalising mechanism only in a single-country context where the barriers of labour mobility are minimal. Finally, we did not account for the possibility that region-specific shocks may propagate from region to region. This should be considered in future studies. Also, testing the models for cases where the magnitude of region-specific shocks is greater (i.e. greater regional independence) would be illuminating.

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Endnotes:

i Ahvenanmaa had to be excluded from the analysis since no reliable data exist for that region.
ii The possible asymmetry between negative and positive shocks was studied earlier by Pekkala and Kangasharju (2002).
iii Any employment change between –0.3% and 0.3% was not considered as a ”shock”, simply as normal annual change, and was thus not included.
iv Years 1988-90, in particular, showed exceptionally fast economic growth whereas 1991-94 represented an exceptionally deep recession. Hence, almost 65 per cent of the period can be characterised as ”untypical”. Of the longer period those years form less than 30 per cent.
v This assumption is reasonable as table 1 shows how the relative magnitudes of the mechanisms remain unchanged regardless of the direction of the shock. This issue was also studied earlier by Pekkala and Kangasharju (2002). They noted that adjustment was rather symmetric between negative and positive shocks.
vi Time-series graphs of relative employment clearly show a trend: relative employment constantly grows in Uusimaa and constantly diminishes in all other provinces. Figures available by request.
vii Here we have no reason to assume otherwise. The time-series graphs show no trend, but instead the provincial series appear very stationary. Figures available by request.
viii Dickey-Fuller test results for the series used in analysis available by request.
ix Test results are available from authors by request.

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