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REGIONAL DISPARITIES IN GROSS JOB AND WORKER FLOWS IN FINLAND***

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ABSTRACT: The aim of this study is to characterize the structure and the evolution of Finnish regional labour markets in terms of gross job and worker flows using plant-level data. There is no solid evidence that the job creation rate is on average lower in Eastern and Northern Finland. The rapid rise in regional unemployment disparities in the 1990s can be explained via the rise in the disparities in job destruction rates across regions during the great depression of the 1990s. There are some interesting differences in the adjustment of labour demand during the great depression of the early 1990s. For example, the results indicate that the magnitude of structural change measured by the churning rate (i.e. excess worker reallocation) is especially high in Uusimaa. This suggests that the intensity of structural change is high in Uusimaa, where the unemployment rate has been lower than in Finland on average. Kainuu has the lowest level of the churning rate, where the unemployment rate has been highest during the past few decades. Thus, the results suggest that the most important structural features that explain the high unemployment rate of Kainuu is the fact that the structural change within plants does not "revitalize" the economic activities of the region enough. In addition, there was a sharp decline in the churning rate in all provinces during the great depression of the 1990s. (JEL R23).

KEY WORDS: Job flows, worker flows, churning, regions

BÖCKERMAN, Petri – **MALIRANTA**, Mika, **TYÖPAIKKOJEN JA TYÖNTEKIJÖIDEN BRUTTOVIRTOJEN ALUEELLISET EROT SUOMESSA.** Helsinki, ETLA, Elinkeinoelämän Tutkimuslaitos, The Research Institute of the Finnish Economy, 2000, 27 s. (Keskusteluaiheita, Discussion Papers, ISSN, 0781-6847; no. 716).

TIIVISTELMÄ: Tutkimuksen päämääränä on luonnehtia Suomen alueellisten työmarkkinoiden rakennetta ja kehitystä työpaikka- ja työntekijävirtojen avulla. Tarkastelu perustuu toimipaikka-aineistoon. Tulokset eivät anna tukea näkemykselle, jonka mukaan Itä- ja Pohjois-Suomessa työpaikkojen syntymisaste olisi erityisen alhainen. Työttömyysasteen alue-erojen voimakasta nousua 1990-luvulla selittää työpaikkojen häviämisasteen alue-erojen merkittävä kasvu laman aikana. Eri maakuntien työmarkkinoiden sopeutumisessa ilmenee mielenkiintoisia eroja 1990-luvun syvän laman aikana. Esimerkiksi rakennemuutos on kirnuamisasteella mitattuna erityisen voimakasta Uudellamaalla, jossa on myös Manner-Suomen alhaisin työttömyysaste. Matalin kirnuamisaste on puolestaan Kainuussa, jossa on korkein rakenteellinen työttömyysaste Suomen maakunnista. Tulokset tukevatkin näkemystä, joka mukaan Kainuun korkean työttömyyden taustalla vaikuttaa se, että maakunnan toimipaikoilla ei tapahdu riittävästi rakennemuutosta, joka "uudistaisi" alueen tuotantotoimintaa. Lisäksi 1990-luvun alun syvän laman aikana kirnuamisaste aleni kaikissa maakunnissa. (JEL R23).

AVAINSANAT: Työpaikkavirrat, työntekijävirrat, kirnuaminen, alueet

Ei-tekninen tiivistelmä

Suomen talouden elpyminen 1990-luvun alun syvästä lamasta on lisännyt voimakkaasti työllisyyden ja työttömyyden alue-eroja maassamme. Työllisyys on parantunut ripeästi Uudenmaan, Turun ja Oulun työvoimapiireissä, mutta Itä- ja Pohjois-Suomessa työttömyys on pysynyt edelleen korkealla tasolla. Suomen työmarkkinoiden alueellisia piirteitä ja kehitystä tarkastelevat aiemmat empiiriset tutkimukset perustuvat karkeaan aggregaattiaineistoon, jolloin ei ole mahdollista luonnehtia ja eritellä tarkasti työllisyyden nettomuutokseen vaikuttavia rakenteellisia taustatekijöitä. Tutkimuksen tarkoituksena on kuvata alueelliseen työllisyyteen vaikuttavia tekijöitä (työpaikkojen syntymistä ja häviämistä sekä työntekijävirtoja) kattavalla toimipaikkatason aineistolla vuosina 1987-1996. Käyttämällä toimipaikkatason aineistoa on mahdollista pureutua työllisyyteen vaikuttaviin rakenteellisiin tekijöihin sillä tasolla, jolla viime kädessä maakunnan taloudelliset päätökset tehdään, työpaikat sijaitsevat ja tuotanto valmistuu.

Työpaikkavirtojen tarkastelu ei anna tukea sille usein toistetulle näkemykselle, jonka mukaan Itä- ja Pohjois-Suomessa työpaikkojen syntymisaste olisi ollut keskimäärin alhaisemmalla tasolla kuin Etelä-Suomessa. Työpaikkojen vaihtuvuus ei ole ollut myöskään vastasyklistä tarkasteltaessa maakuntien kehitystä. Havainto ei ole sopusoinnussa niiden teoreettisten mallien kanssa, joiden mukaan taantuman aikana tapahtuu voimakasta nousua nimenomaan työpaikkojen häviämisasteessa. Suomen 1990-luvun alun syvän laman aikana myös työpaikkojen syntymisaste on alentunut merkittävästi kaikissa maakunnissa.

Vuosina 1991-1993 esiintynyttä voimakasta kasvua maakuntien välisissä työttömyyden alue-eroissa voidaan selittää työpaikkojen häviämisasteen alue-erojen rajulla kasvulla. Työpaikkojen syntymisasteen alue-erojen laajuus sitä vastoin pieneni 1990-luvun syvän laman aikana.

Syvän laman aikana tapahtunut työpanoksen sopeuttaminen on poikennut maakuntien välillä mielenkiintoisella tavalla. Kainuussa työttömyyden kasvua selittää sekä työntekijöiden palkkaamisen väheneminen että työntekijöiden irtisano(utu)misen yleistyminen 1990-luvulla. Uudellamaalla työntekijöiden ulosvirtaus toimipaikoista lisääntyi vuonna 1989, mutta 1990-luvun syvän laman aikana työntekijöiden irtisano(utu)misaste pysyi verrattain vakaana. Näin ollen, työpanoksen kysyntää sopeutettiin toimipaikkatasolla lähinnä työntekijöiden palkkaamista vähentämällä. Työntekijöiden ulosvirtauksen kasvu ja erityisesti irtisanomisien lisääntyminen toimipaikoista on alueen näkökulmasta kivuliaampi sopeutumistapa kuin työntekijöiden palkkaamisasteen aleneminen taantuman aikana.

Työpaikka- ja työntekijävirtojen avulla voidaan kuvata myös rakennemuutoksen voimakkuutta alueellisilla työmarkkinoilla. Työntekijöiden ylimääräinen vaihtuvuusaste (eli kirnuamisaste) ilmentää sitä osaa työntekijöiden vaihtuvuudesta, joka ei liity työpaikkojen syntymiseen ja häviämiseen toimipaikoissa. Rakennemuutos on kirnuamisasteella tarkastellen erityisen voimakasta Uudellamaalla, jossa on myös Manner-Suomen alhaisin työttömyysaste. Matalimmillaan kirnuamisaste on puolestaan Kainuussa, jossa on korkein työttömyysaste kaikista Suomen maakunnista. Työpaikka- ja työntekijävirtojen tarkastelu antaakin tukea näkemykselle, jonka mukaan Kainuun korkean työttömyyden taustalla vaikuttaa se, että maakunnan toimipaikoissa ei tapahdu riittävästi rakennemuutosta, joka "uudistaisi" alueen tuotantotoimintaa.

1 Introduction

Market economies are in a state of continuous turbulence. Joseph A. Schumpeter (1942) has called this underlying process of capitalism "creative destruction". In fact, according to the growing number of establishment-level studies, it is fair to say that the continuous reallocation and the reorganisation of scarce resources culminates in the function of labour markets, where the reallocation of resources takes the form of gross job flows (i.e. job creation and destruction), and gross worker flows (i.e. hirings and separations of workers).

This reorganisation view of labour markets underlines the fact that the pool of available jobs is not stagnant over time. Instead, the labour markets are subject to simultaneous job creation and destruction. There are two broad approaches to characterize this structural change in labour markets in terms of gross job and worker flows. The so-called excess job reallocation provides a measure of structural change among the plants of the economy. In contrast, the fact that also the available vacancies of the labour markets are subject to various idiosyncratic shocks within plants is captured by the so-called churning rate. These key concepts of the underlying structural change of labour markets are defined in the following section of this study.

The issues concerning regional labour markets has gained growing interest in Finland, because there has been a rapid rise in the regional disparities in unemployment rates as a part of the export-led recovery from the great depression of the early 1990s (see, for example, Böckerman, 1998; Tervo, 1998; Huovari, 1999). However, the available empirical studies on Finnish regional labour markets have been conducted by using aggregate data on (net) employment changes.[1] The main shortcoming of these traditional investigations of aggregate outcome is that they mask the underlying establishment-level dynamics of labour demand adjustment in Finnish regional labour markets.

[1] Böckerman (2000) provides a summary of the literature.

The aim of this study is to characterize the structure and the evolution of Finnish regional labour markets in terms of gross job and worker flows. The study is based on establishment-level analysis. The evaluation of gross job and worker flows decomposes the net employment change and constitutes a more detailed picture of regional labour markets in Finland. The sectoral composition of the study also goes, as in Ilmakunnas and Maliranta (2000), beyond narrow "manucentrism", which has been a typical feature of earlier empirical investigations into gross job and worker flows.

This study appears in six parts. The first section of the study provides the applied measures of gross job and worker flows. The second section of the study provides a brief snapshot of the so-called "basic facts" of the emerging literature on job creation and destruction and gross worker flows. The third section of the study articulates some main underlying properties of the establishment-level data. The fourth section of the study is an investigation of gross job flows in Finnish regional labour markets. The fifth section of the study includes the elaboration of gross worker flows and the so-called churning rate. The last section concludes the study.

2 The applied measures of gross job and worker flows

The gross flows of jobs and workers are measured as the number of jobs created or destroyed or workers moving in and out of establishments (i.e. hirings and separations of workers). This means that the measure of the job creation rate is calculated as follows:

$$(1)\ JC_t = \sum_i \Delta E_{it}^{+} / ((\sum_i E_{it} + \sum_i E_{i,t-1})/2),$$

where E denotes employment in firm i year t and the superscript "+" refers to positive changes. The number of employees is measured by the average of period t and $t-1$ employment. In other words, to convert time-t job creation and destruction measures to rates, job creation and destruction are divided by the average of employment at t and $t-1$ in order to achieve several technical advantages over more conventional growth rate measures (see, for example, Davis, Haltiwanger & Schuh 1996, 189-190).

Unlike the conventional growth rate measures, which divide employment change by lagged employment and range from –1.0 to ∞, the applied growth rate measure ranges from –2.0 to 2.0 and the growth rate measure is symmetric around zero. In addition, Baldwin and Picot (1995) argue that this average measurement also removes part of the bias induced by transitory movements of the economy.

The measure of the job destruction rate is calculated as follows:

$$(2)\ JD_t = \left| \sum_i \Delta E_{it}^{-} \right| / \left(\left(\sum_i E_{it} + \sum_i E_{i,t-1} \right) /2 \right)$$

Thus, the job destruction rate is defined as the absolute value of the sum of negative employment changes, divided by the average number of employees. The superscript "-" refers to negative changes.

The definitions of job creation and destruction mean that the net rate of change of the employment (NET) is simply the difference of the measures of job creation and destruction:

$$(3)\ NET_t = JC_t - JD_t$$

The sum of job creation and destruction rates is called the gross job reallocation rate (JR):

$$(4)\ JR_t = JC_t + JD_t$$

The excess job reallocation rate (EJR) equals (gross) job reallocation minus the absolute value of the net employment change:

$$(5)\ EJR_t = JR_t - |NET_t|$$

This means that excess job reallocation is an index of simultaneous job creation and destruction in the economy. Thus, it is also a natural measure of heterogeneity in the

plant-level employment outcome among plants. In other words, if excess job reallocation is above zero, then the magnitude of (gross) job reallocation is above what has been necessary to accommodate the net employment changes of the regional labour markets.

Comparison of information in two consecutive years can be used for calculating the number of employees who have entered a plant during the year and are still working at the same plant (see, for example, Ilmakunnas, Laaksonen & Maliranta, 1999). The sum of these employees over all plants is worker inflow, or hiring. It is also possible to identify those employees who are no longer working at a plant. This means that the sum of these employees is worker outflow, or separation.

Dividing the worker inflow and outflow in a period of time by the average of employment in periods t and t-1 delivers the worker inflow rate (WIF) and the worker outflow rate (WOF). The difference between WIF and WOF is the net rate of change in employment:

(6) $NET_t = WIF_t - WOF_t$

Also, the worker flow rate (WF) is simply the sum of the hiring (WIF) and separation rates (WOF). In addition, the so-called churning rate (CF) can be defined as follows:

(7) $CF_t = WF_t - JR_t$

The churning rate can also be called by the expression "excess worker turnover rate" for obvious reasons. These definitions mean that the churning rate ties worker flows and job flows together and, therefore, completes the picture of the underlying dynamics of labour adjustment at the establishment-level in Finnish regional labour markets. In addition, the churning rate is a natural measure of underlying structural change of regional labour markets within plants.

3 The "basic facts" of the literature

The emerging empirical literature on gross job and worker flows contains a number of so-called "basic facts". However, due to the limited availability of data, the available key empirical findings take as the reference point the (U. S.) manufacturing industries rather than all industries of the modern economies[2] (so-called "manucentrism").

The first basic fact of the literature concerns the magnitude of measured gross job flows. For example, using annual data, roughly 1 in 10 jobs are created and another 1 in 10 are destroyed each year in the U. S. manufacturing industries. It has become clear that the gross flows are large relative to the net employment change. Job reallocation is also a large part of total worker reallocation. In fact, most studies indicate job reallocation is about half of the total worker reallocation.

The second basic fact of the literature on job creation and destruction is the dominant role of pure plant-specific and firm-specific factors in accounting for the largely observed magnitudes of gross worker flows (see, for example, Haltiwanger 1997). In other words, the idiosyncratic component is predominant and most of the excess reallocation is within narrowly defined sectors. This means that the restructuring between various sectors is only a small portion of the total reallocation of the economy (so-called "sectoral shifts").

The third fact is that most of the reallocation reflects the persistence of underlying employment changes. For example, Davis, Haltiwanger and Schuh (1996) report that about 20 for % of job destruction and 15 for % of job creation is accounted for by the entry and exit of firms in the case of the U. S. manufacturing industries. This feature of job creation and destruction means that to the extent that plant-level employment changes are also persistent for continuing plants, they must be associated with long-term joblessness or worker reallocation across plants.

The fourth basic fact is the concentration and the lumpiness of underlying employment movements. In particular, many empirical investigations find that births and

[2] Davis and Haltiwanger (1999) provide a list of "basic facts" of the literature on reallocation with additional references.

deaths account for large fractions of job creation and destruction. Births and deaths are simply the extremes of an underlying growth-rate distribution. From a regional point of view, a high concentration of job creation and destruction may accentuate various negative feedback effects on local economies[3].

The fifth basic fact is about the distinct cyclicality of job creation and destruction. In the case of U. S. manufacturing, a noteworthy feature of plant-level data is the relatively volatile nature of job destruction. In particular, job destruction is more responsive to changes in activity than is the rate of job creation (see, for example, Hall 1999). The available sample period of the longitudinal data sets for many European countries is, on the other hand, quite short, which means that a definite conclusion about relative volatility on job creation and destruction is hard to reach with existing data sets.

The sixth fact is that gross job flows indicate some systematic differences by underlying plant characteristics. In particular, the most important stylized fact is that the excess reallocation rate decreases in the size and age of the firm in the case of U. S. manufacturing industries. These systematic differences by plant characteristics are also found in a number of other countries. However, Haltiwanger and Krizan (1999, 93) stress that the dominance of idiosyncratic element serves as an important caution in attributing net growth to plants classified by any observable plant characteristics.

The list of these "basic facts" of literature on gross job and worker flows reflects the underlying feature that the analysis of regional labour markets in terms of these measures is almost a neglected issue. Thus, this study aims to provide some fundamental stylized facts about Finnish regional labour markets in terms of gross job and worker flows.

[3] Ramey and Shapiro (1998) provide a number of interesting case studies on the fact that reallocation can be very costly to the local economy. For example, they find by using information on auction values that in the case of the closure of a Californian aerospace plant, the equipment resale prices averaged only 35 percent of net-of-depreciation purchase values.

4 Data

The Nordic countries along with Finland seem to have a number of advantages for the use of linked employer-employee data compared with other nations (see, for example, Ilmakunnas, Maliranta & Vainiomäki, 1999). In particular, the size of the country is quite small, which makes it possible to form various registers, which cover the entire population of establishments and employees. This means that the linking process of the registers and other data sets is quite manageable.

This study uses a large longitudinal data of employees over the period 1987-1996 (see Ilmakunnas & Maliranta, 2000). The calculation of gross job and worker flows is based on establishment-level analysis, and Finland is divided into 20 provinces (NUTS3). The period of this study includes the great depression of the early 1990s (see, for example, Honkapohja & Koskela, 1999). Thus, it is interesting to investigate the underlying fluctuations of gross job and worker flows.

Employment Statistics constitutes the backbone of this study. Employment Statistics covers information on the employment status of the entire population in the second week of December. Also, the study includes all major sectors of the Finnish economy. The public sector is excluded from the analysis owing to the great number of practical problems to derive the measures of gross job and worker flows. Thus, the study includes the non-farm business sector of Finnish economy excluding social and personal services. Employment Statistics is amended by several available registers held by Statistics Finland, especially Business Registers[4]. The calculation of underlying gross job flows naturally requires the setup of a base year. This means that the annual measures of gross job and worker flows are calculated from 1988 to 1996.

5 Gross job flows

5.1 Creation

The results indicate that the job creation rate was highest in the period from 1988 to 1996 in Pohjois-Pohjanmaa, Etelä-Pohjanmaa, Lappi, and Uusimaa (Table 1). The

[4] Ilmakunnas, Maliranta and Vainiomäki (1999, 5-10) provide a detailed illustration of linkage procedures in the case of Finnish manufacturing industries.

outstanding success of Pohjois-Pohjanmaa in terms of job creation can mainly be explained by the cluster of information technology around the region of Oulu. In contrast, the lowest job creation rate was in Ahvenanmaa, Päijät-Häme and Kymenlaakso from 1988 to 1996. During the great depression of the early 1990s there was a sharp decline in the job creation rate across all provinces of Finland. In addition, Kainuu experienced a kind of "double dip" in terms of job creation during the 1990s.

An interesting fact is that there was no continuous rise in regional disparities as measured by standard deviation in terms of the job creation rate from 1988 to 1996. The level of regional disparities was lowest during the great depression of the 1990s. Also, the results indicate that there is no solid evidence at all for the widely held view that, compared with Southern Finland, the job creation rate is lower in Eastern and Northern Finland, where the unemployment rate has been much higher than in Southern Finland during the past few decades.

5.2 Destruction

The results indicate that the job destruction rate was on average highest in Lappi in the period from 1988 to 1996, and lowest in Ahvenmaa (Table 2). In addition, there is no evidence at all for the equally widely held view that the job destruction rate is on average higher in Eastern and Northern Finland. For example, the average job destruction rate in Uusimaa and Lappi was exactly the same from 1988 to 1996.

During the great depression of the early 1990s, there was a sharp rise in job destruction rate in all provinces. The highest level of the job destruction rate was reached during 1991 or 1992; there were no clear-cut disparities in this respect across the provinces of Finland, except in Ahvenanmaa. The highest level of job destruction rate was in Kainuu during the great slump of the 1990s.

The regional disparities in terms of the job destruction rate was highest during the depression. Thus, the results indicate that during the great depression of the early 1990s there was a decline in the disparities in the job creation rate across all provinces

of Finland, but the pattern of job destruction was more concentrated across provinces.[5]

5.3 Job reallocation

The results indicate that there is some evidence that the lowest level of regional disparities in terms of gross job reallocation was reached during the great depression of the early 1990s (Table 3). In addition, the magnitude of gross job reallocation was highest in Etelä-Pohjanmaa, Pohjois-Pohjanmaa, and Lappi. Ahvenanmaa, especially, has been "an island of sleepy life" in terms of the reallocation of regional labour markets. The results also indicate that the underlying fluctuations of gross job reallocation were not counter-cyclical in Finnish regions from 1988 to 1996. This result of the fluctuations of gross job flows is in sharp contrast with the one of the leading models on gross job flows by Davis and Haltiwanger (1990), which argues that recessions are intensive times of restructuring in labour markets.

5.4 Excess reallocation

The lowest level of excess reallocation (e. i. simultaneous job creation and destruction) was on average in Ahvenmaa, Etelä-Savo, Pohjois-Savo and Pohjois-Karjala from 1988 to 1996 (Table 4). The results also indicate that the underlying magnitude of excess reallocation has been somewhat stronger in Southern Finland with respect to Eastern and Northern Finland. However, the province of Kainuu is an exception to this pattern of the excess reallocation of Finnish regional labour markets.

Also, there has been no continuous rise in regional disparities in terms of excess re-allocation across provinces in Finland. However, the patterns with respect to the fluctuations of excess reallocation were not identical across provinces from 1988 to 1996. In some provinces (for example, the province of Keski-Suomi), there was a decline in excess reallocation during the depression, but in some provinces (for example, the province of Kainuu), there was, in fact, a rise in excess reallocation during the slump of the early 1990s. This means that the structural change of regional labour markets among plants was halted in Keski-Suomi during the depression, but in

[5] However, the conclusion concerning the regional disparities of job destruction rates does not hold in the case that the regional disparities are measured by using variation coefficient (see Table 2).

the province of Kainuu there was, instead, an acceleration of structural change among plants during the economic slowdown.

6 Gross worker flows

6.1 Hiring

The hiring rate is a measure of the inflow of workers into the population of establishments. The results indicate that there were no major changes in the hiring rate from a regional disparities point of view from 1988 to 1996 (Table 5). The lowest level of hiring is on average in Kainuu and Ahvenmaa, and the highest in Pohjois-Pohjanmaa and Uusimaa. During the great slump of the early 1990s there was also a sharp decline in the hiring rate in all provinces of the Finnish economy.

In addition, the hiring rate can be decomposed by the sources of worker inflow. The worker inflow rate from unemployment displays distinct regional pattern (Table 6). In particular, the worker inflow rate from unemployment seems to be at a higher level in Eastern and Northern Finland compared with Southern Finland. This regional pattern of the worker inflow from unemployment is a reflection of the fact that the average duration of unemployment spells is substantially shorter in Eastern and Northern Finland compared with Southern Finland due to the allocation of various active labour market measures to the high unemployment provinces of Eastern and Northern Finland.

6.2 Separation

The separation rate is a measure of the outflow of workers from the population of establishments. Also, there have not been major changes in the regional disparities in separation across provinces of Finland (Table 6). The lowest level of separation has been in Kainuu, Ahvenanmaa, Kymenlaakso, and Satakunta. On the other hand, the highest level of separation has been in the provinces of Uusimaa, Pohjois-Savo and Lappi.

Labour demand by firms can be tailored downwards during the depression at the establishment-level either by reducing hirings (e. i. worker inflow) or by increasing separation (e. i. worker outflow). The results indicate that there were indeed some

interesting differences in the adjustment of labour demand during the great depression of the early 1990s. For example, the rapid rise in unemployment in Kainuu can be explained by a rise in the separation rate and a decline in the hiring rate during the great depression in Finland.[6] In contrast, during the same period there was no rise at all in the separation rate in the province of Uusimaa. This means that the rise in the unemployment rate in Uusimaa can be explained by a decline in the hiring rate, which, from the point of view of the province, is "an easier" mechanism to adjust the labour demand than a rise in the separation rate.

The variation of the hiring rate instead of the separation rate is also from the point of view of union and firm insiders, a much more desirable way for establishments to tailor downwards their demand of labour during the depressions. In fact, the decline in the hiring rate means that the relative bargaining position of union and firm insiders becomes even stronger during the times of economic slowdown. This is due to the fact that the inflow of unemployed workers into establishments does not in this case deteriorate the bargaining power of insiders, because the wage claims by recently unemployed workers are not as high as whose by union and firm insiders that have long-term contracts.

The separation rate can also be decomposed by the destinations of worker outflow. The worker outflow rate into unemployment reveals some interesting features (Table 8). The results indicate that the worker outflow rate into unemployment is highest in the province of Lappi. This observation is consistent with the earlier notion about the role of various active labour market measures in Eastern and Northern Finland. In addition, it is interesting to note that by 1996 the worker outflow rate into unemployment was not yet declined to the levels before the great depression of the 1990s.

[6] Ilmakunnas and Maliranta (2000) conclude that the volatility of the hiring rate was stronger than the volatility of the separation rate during the great depression of the early 1990s in Finland. The observation is in line with a recent study using French establishment-level data by Abowd, Corbel and Kramarz (1999), which concludes that the adjustment of employment is made primarily by reducing hires, not by changing the separation rates.

6.3 Worker reallocation

In line with earlier observations, the measure of worker reallocation does not indicate major changes in regional disparities from 1988 to 1996 (Table 9). The magnitude of worker reallocation has been highest in Uusimaa, and the lowest worker reallocation rate has been in the provinces of Itä-Uusimaa, Kainuu and Satakunta. The results also indicate that the worker reallocation rate was indeed counter-cyclical from 1988 to 1996 in contrast to the job reallocation rate.

6.4 Churning

The elaboration of gross job and worker flows together delivers a complete picture of labour demand adjustment in the regional labour markets of Finland. As noted earlier, the so-called churning rate is also a natural measure of underlying structural change within plants. The results indicate that the magnitude of structural change measured by the churning rate is high in Uusimaa compared with the other regions of Finland (Table 10). This means that the intensity of structural change within plants is indeed high in Uusimaa, where the unemployment rate has been low with respect to the other provinces of Finland.

The high churning rate in Uusimaa can be explained by the high level of education of workers, the diversity of the production structure, and the large geographical scope of regional labour markets. In addition, migration from the rest of the country to Uusimaa can give a boost to churning in Uusimaa, because most of the immigrants are young and well-educated.[7] In contrast, Kainuu has the lowest level of the churning rate, where the unemployment rate has been highest among the regions of Finland during the past few decades.

In addition, there was a sharp decline in the churning rate in all provinces during the great depression of the 1990s. There also seems to be evidence that the level of the churning rate has been permanently lower since the great slump of the early 1990s.

[7] A related study, by Piekkola and Böckerman (2000), finds that the churning rate is higher among employees with a higher university education compared with the employees with basic education only. The churning rate is also higher among young employees of the Finnish economy.

Thus, the results support the view that one of the most important underlying structural features that explain the high unemployment rate of Kainuu is the fact that the structural change does not "revitalize" the economic structure of the region enough. In fact, the recent empirical investigation by Ilmakunnas, Maliranta and Vainiomäki (1999) indicates that a rise in the churning rate gives a boost to the productivity at the establishment-level after controlling other key factors (such as the education of workers) that affect the productivity of establishments. This observation is in line with productivity measures based on regional GDP data that indicate that labour productivity is indeed higher in Uusimaa with respect to the other provinces of Finland. In fact, an investigation of regional disparities in labour productivity by Maliranta (1997) indicates that the level of productivity in Uusimaa is much higher compared with the other regions of Finland after controlling other key factors. Thus, it can be argued that the underlying disparities in churning rates is a missing piece of the productivity puzzle of Finnish regions.

7 Conclusions

The results suggest that gross job reallocation has not been counter-cyclical by using establishment-level data from the provinces of Finland. This observation is not in line with the established "basic facts" of the literature on gross job and worker flows. One explanation is that the establishment-level data of this study includes a number of non-manufacturing industries. Also, the violent depression of the 1990s caused a sharp crash in job creation rates across Finnish regions. However, the fluctuation of worker reallocation has indeed been counter-cyclical in Finnish regions over the period of investigation.

Also, there is no solid evidence at all for the widely held view that the job creation rate is on average lower in Eastern and Northern Finland, where the unemployment rate has been much higher than in Southern Finland during the past few decades. The rapid rise in regional unemployment rate disparities during the 1990s can be explained by the sharp rise in the regional disparities in job destruction rates during the great depression of the 1990s. In contrast, during the slump of the 1990s, there was a decline in regional disparities in job creation in Finland.

In addition, there are some interesting differences in the adjustment of labour demand during the great depression of the early 1990s. For example, the rapid rise in unemployment in Kainuu can be explained by a rise in the separation rate and a decline in the hiring rate during the great depression in Finland. In contrast, during the same period there was no rise at all in the separation rate in the province of Uusimaa. This means that the rise in the unemployment rate in Uusimaa can be explained by a decline in the hiring rate, which, from the point of view of the province, is a less painful mechanism to adjust the labour demand than a rise in the separation rate.

The results indicate that the magnitude of structural change measured by the churning rate is high in Uusimaa compared with the other provinces of Finland. This means that the intensity of structural change within plants is indeed high in Uusimaa, where the unemployment rate has been low with respect to the other regions of Finland. On the other hand, Kainuu has the lowest level of the churning rate, and the unemployment rate has been highest during the past few decades. Thus, the results support the view that one of the most important underlying structural features that explain the high unemployment rate of Kainuu is the fact that the structural change within plants does not "revitalize" the economic structure of the region enough. There was also a sharp decline in the churning rate in all provinces during the great depression of the 1990s.

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Table 1: Job creation rate in the regions of Finland

	1988	1989	1990	1991	1992	1993	1994	1995	1996	AVG
Uusimaa	19.50	20.28	18.39	10.29	10.13	10.98	16.92	17.97	15.84	15.59
Varsinais-Suomi	20.49	18.02	16.59	10.51	9.62	10.56	19.99	18.49	14.60	15.43
Satakunta	20.66	19.51	13.55	9.90	10.17	8.35	18.26	12.66	10.33	13.71
Häme	21.44	21.59	15.84	8.25	7.21	9.67	15.03	18.67	14.12	14.65
Pirkanmaa	21.05	19.74	20.29	9.66	9.66	11.11	17.00	16.59	12.99	15.34
Päijät-Häme	19.41	18.97	14.39	7.64	8.43	10.71	14.83	13.75	12.37	13.39
Kymenlaakso	15.49	18.06	13.72	9.13	8.55	11.13	15.07	16.52	12.65	13.37
Etelä-Karjala	20.00	19.97	19.56	10.11	9.54	10.74	15.88	16.79	14.22	15.20
Etelä-Savo	18.24	19.78	14.78	8.78	11.13	7.88	17.77	18.76	13.88	14.56
Pohjois-Savo	19.56	19.36	15.90	9.22	9.44	11.37	17.27	16.12	16.29	14.95
Pohjois-Karjala	17.74	16.80	15.19	9.28	8.32	10.74	16.03	17.10	12.70	13.77
Keski-Suomi	18.87	18.91	18.01	9.35	10.44	9.64	15.53	16.32	12.87	14.44
Etelä-Pohjanmaa	17.12	27.32	16.66	10.05	11.01	10.87	20.70	19.01	13.93	16.30
Vaasan rannikkoseutu	16.51	25.21	16.58	9.34	10.52	11.12	16.68	14.71	16.08	15.20
Keski-Pohjanmaa	14.20	17.59	16.04	9.51	11.22	8.34	15.06	17.49	12.54	13.56
Pohjois-Pohjanmaa	21.86	22.34	15.99	11.12	11.90	12.39	19.04	22.35	16.57	17.06
Kainuu	17.81	17.07	12.76	10.04	18.43	9.53	16.02	12.14	9.86	13.74
Lappi	17.55	19.81	18.82	11.28	13.07	8.59	17.52	18.33	16.33	15.70
Itä-Uusimaa	24.83	13.71	15.08	6.52	10.01	9.45	15.78	11.08	15.66	13.57
Ahvenanmaa	11.07	17.98	14.84	7.87	12.82	5.50	8.98	8.25	7.43	10.53
STD	2.99	2.94	2.03	1.16	2.36	1.59	2.42	3.25	2.39	
AVG	18.67	19.60	16.15	9.39	10.58	9.93	16.47	16.15	13.56	
VCF	0.16	0.15	0.13	0.12	0.22	0.16	0.15	0.20	0.18	

"avg" refers to average, "std" refers to standard deviation and "vcf" refers to variation coefficient.

Table 2: Job destruction rate in the regions of Finland

	1988	1989	1990	1991	1992	1993	1994	1995	1996	AVG
Uusimaa	16.21	18.64	16.78	21.86	20.77	19.23	14.87	14.16	12.64	17.24
Varsinais-Suomi	15.12	19.12	17.65	20.51	20.36	20.05	12.82	13.54	13.27	16.94
Satakunta	18.37	16.19	16.55	20.85	22.12	15.72	11.42	11.13	12.09	16.05
Häme	14.24	17.98	16.58	19.78	21.03	18.51	11.78	14.76	12.85	16.39
Pirkanmaa	18.65	19.93	18.65	23.51	19.87	18.49	12.25	12.37	11.63	17.26
Päijät-Häme	16.74	14.63	19.13	21.07	21.58	19.34	11.21	12.18	12.51	16.49
Kymenlaakso	13.44	16.20	16.67	20.06	19.57	17.76	9.29	14.94	11.98	15.55
Etelä-Karjala	13.94	21.22	15.49	24.15	20.54	18.13	13.23	13.90	14.73	17.26
Etelä-Savo	18.54	17.72	17.67	22.37	22.16	18.72	13.37	19.25	13.34	18.13
Pohjois-Savo	14.96	15.98	18.69	23.58	24.31	18.22	14.46	15.18	14.08	17.72
Pohjois-Karjala	15.43	17.25	16.64	23.67	20.54	18.62	12.08	16.71	13.21	17.13
Keski-Suomi	15.51	16.93	19.68	20.67	24.03	18.77	12.12	13.99	10.01	16.86
Etelä-Pohjanmaa	19.64	18.81	17.75	24.79	24.68	20.90	12.32	15.96	10.91	18.42
Vaasan rannikkoseutu	20.80	24.46	18.45	20.26	21.70	17.90	12.41	12.05	10.82	17.65
Keski-Pohjanmaa	21.65	17.29	20.79	24.40	18.59	19.22	13.27	13.81	10.33	17.70
Pohjois-Pohjanmaa	13.40	14.83	20.27	22.50	22.91	19.26	14.52	15.92	13.26	17.43
Kainuu	11.73	13.48	17.82	31.10	21.31	16.77	10.06	15.34	13.32	16.77
Lappi	14.36	15.33	22.88	25.35	23.94	20.38	14.93	17.57	13.64	18.71
Itä-Uusimaa	21.50	12.62	14.38	17.67	19.20	16.20	11.65	13.93	13.20	15.59
Ahvenanmaa	8.52	7.88	18.01	12.45	10.07	12.22	8.63	5.91	12.84	10.73
STD	3.38	3.43	1.93	3.61	3.10	1.91	1.73	2.75	1.26	
AVG	16.14	16.82	18.03	22.03	20.96	18.22	12.33	14.13	12.53	
VCF	0.21	0.20	0.11	0.16	0.15	0.10	0.14	0.19	0.10	

Table 3: Gross job reallocation rate in the regions of Finland

	1988	1989	1990	1991	1992	1993	1994	1995	1996	AVG
Uusimaa	35.71	38.92	35.17	32.15	30.90	30.21	31.79	32.13	28.49	32.83
Varsinais-Suomi	35.61	37.14	34.24	31.02	29.98	30.61	32.81	32.03	27.86	32.37
Satakunta	39.03	35.70	30.10	30.75	32.29	24.07	29.68	23.78	22.42	29.76
Häme	35.68	39.57	32.42	28.03	28.25	28.18	26.81	33.43	26.98	31.04
Pirkanmaa	39.69	39.67	38.95	33.17	29.52	29.61	29.24	28.96	24.63	32.60
Päijät-Häme	36.15	33.60	33.52	28.71	30.01	30.05	26.04	25.93	24.88	29.88
Kymenlaakso	28.93	34.26	30.39	29.19	28.11	28.90	24.36	31.46	24.64	28.91
Etelä-Karjala	33.94	41.19	35.06	34.25	30.08	28.86	29.11	30.69	28.95	32.46
Etelä-Savo	36.78	37.50	32.45	31.16	33.29	26.59	31.14	38.01	27.22	32.68
Pohjois-Savo	34.52	35.35	34.59	32.79	33.75	29.60	31.73	31.31	30.37	32.67
Pohjois-Karjala	33.17	34.05	31.82	32.96	28.86	29.36	28.11	33.81	25.91	30.89
Keski-Suomi	34.38	35.84	37.69	30.03	34.47	28.41	27.65	30.31	22.88	31.30
Etelä-Pohjanmaa	36.76	46.13	34.42	34.84	35.69	31.77	33.01	34.97	24.83	34.71
Vaasan rannikkoseutu	37.31	49.67	35.03	29.60	32.22	29.02	29.09	26.76	26.90	32.84
Keski-Pohjanmaa	35.85	34.88	36.83	33.91	29.81	27.56	28.33	31.30	22.87	31.26
Pohjois-Pohjanmaa	35.26	37.17	36.26	33.62	34.80	31.64	33.56	38.27	29.83	34.49
Kainuu	29.54	30.55	30.59	41.14	39.74	26.31	26.07	27.48	23.18	30.51
Lappi	31.91	35.14	41.70	36.63	37.01	28.96	32.45	35.89	29.97	34.41
Itä-Uusimaa	46.33	26.33	29.46	24.19	29.21	25.65	27.43	25.01	28.86	29.16
Ahvenanmaa	19.59	25.86	32.85	20.32	22.88	17.73	17.60	14.16	20.27	21.25
STD	5.13	5.59	3.13	4.39	3.75	3.12	3.71	5.53	2.89	
AVG	34.81	36.43	34.18	31.42	31.54	28.15	28.80	30.29	26.10	
VCF	0.15	0.15	0.09	0.14	0.12	0.11	0.13	0.18	0.11	

Table 4: Excess reallocation rate in the regions of Finland

	1988	1989	1990	1991	1992	1993	1994	1995	1996	AVG
Uusimaa	32.42	30.24	36.73	28.48	37.29	33.48	26.88	27.88	36.49	32.21
Varsinais-Suomi	29.92	30.86	31.02	34.25	33.02	28.40	26.80	23.45	28.72	29.60
Satakunta	42.99	17.04	37.29	36.04	32.39	35.96	39.48	29.26	32.41	33.65
Häme	39.94	35.44	31.96	33.59	33.86	37.61	48.93	34.57	29.66	36.17
Pirkanmaa	26.96	30.67	25.24	15.77	33.56	33.18	27.09	31.67	37.30	29.05
Päijät-Häme	28.77	27.43	30.99	29.56	31.79	30.38	36.02	33.33	33.16	31.27
Kymenlaakso	32.08	31.97	25.52	37.64	28.75	29.68	20.57	21.02	19.81	27.45
Etelä-Karjala	16.49	19.32	15.29	18.25	20.21	17.57	18.44	18.56	18.71	18.09
Etelä-Savo	20.10	18.68	19.02	22.24	20.07	22.56	13.04	15.74	20.27	19.08
Pohjois-Savo	19.24	20.34	14.43	19.31	16.85	17.09	19.08	22.26	18.88	18.61
Pohjois-Karjala	16.63	20.88	22.02	21.05	22.44	23.80	36.86	26.14	20.02	23.32
Keski-Suomi	20.13	21.96	21.12	16.69	19.34	22.22	21.42	22.27	21.47	20.74
Etelä-Pohjanmaa	15.75	22.74	21.48	19.29	21.74	22.25	16.69	24.78	19.07	20.42
Vaasan rannikkoseutu	17.18	18.89	11.01	29.74	25.63	22.84	23.55	24.50	22.41	21.75
Keski-Pohjanmaa	18.59	26.46	26.74	28.91	24.16	24.24	24.63	24.81	26.54	25.01
Pohjois-Pohjanmaa	29.05	20.12	29.86	23.29	17.26	28.33	27.09	22.25	29.52	25.20
Kainuu	24.74	24.36	29.89	27.80	37.52	30.37	33.42	27.98	31.91	29.78
Lappi	24.11	27.62	31.85	24.28	35.13	22.15	11.82	25.29	26.53	25.42
Itä-Uusimaa	20.66	25.71	23.27	24.74	23.96	28.43	26.69	28.16	25.40	25.22
Ahvenanmaa	20.03	21.81	21.64	20.65	26.52	19.72	27.28	26.39	14.85	22.10
STD	7.83	5.25	7.23	6.58	6.82	5.93	9.19	4.69	6.54	
AVG	24.79	24.63	25.32	25.58	27.08	26.51	26.29	25.52	25.66	
VCF	0.32	0.21	0.29	0.26	0.25	0.22	0.35	0.18	0.26	

Table 5: Hiring rate in the regions of Finland

	1988	1989	1990	1991	1992	1993	1994	1995	1996	AVG
Uusimaa	35.99	39.17	35.51	22.63	20.68	21.14	28.69	31.89	29.14	29.42
Varsinais-Suomi	35.19	33.70	30.17	20.81	18.50	19.80	31.01	29.13	24.97	27.03
Satakunta	33.23	33.30	25.26	18.94	18.18	16.22	27.04	22.87	19.56	23.84
Häme	34.16	36.24	29.55	17.59	14.86	18.78	24.31	28.00	24.01	25.28
Pirkanmaa	33.03	34.58	33.15	19.02	18.04	19.30	26.59	27.14	22.39	25.91
Päijät-Häme	32.68	35.33	27.91	17.65	16.53	18.94	25.05	24.21	22.20	24.50
Kymenlaakso	27.52	32.45	25.87	18.63	16.40	19.55	24.31	26.01	22.49	23.69
Etelä-Karjala	31.49	33.66	31.86	18.48	16.82	18.12	23.78	27.47	24.08	25.08
Etelä-Savo	30.20	33.92	27.10	17.44	18.74	15.25	26.50	28.19	22.59	24.44
Pohjois-Savo	32.64	36.34	31.72	21.56	19.75	21.74	28.18	27.64	25.40	27.22
Pohjois-Karjala	30.18	32.96	28.67	18.16	15.91	17.87	25.89	25.93	20.84	24.05
Keski-Suomi	31.78	33.93	31.13	19.58	18.52	18.70	25.07	26.16	22.56	25.27
Etelä-Pohjanmaa	29.18	39.77	28.22	19.13	19.50	18.95	29.98	28.28	22.46	26.16
Vaasan rannikkoseutu	27.74	38.03	30.91	17.33	19.72	17.74	24.57	23.62	26.79	25.16
Keski-Pohjanmaa	28.58	34.95	29.22	19.39	19.25	15.11	24.16	26.71	22.23	24.40
Pohjois-Pohjanmaa	35.54	37.70	28.94	21.39	22.15	22.47	28.69	32.46	26.83	28.46
Kainuu	29.56	31.27	25.17	18.14	26.80	16.46	25.40	20.07	17.73	23.40
Lappi	30.07	34.97	31.78	22.12	21.35	16.64	27.94	28.43	26.49	26.64
Itä-Uusimaa	35.72	33.35	27.91	16.44	18.55	16.18	26.29	19.47	23.96	24.21
Ahvenanmaa	26.14	31.59	29.10	18.72	21.35	13.82	18.76	19.23	16.46	21.69
STD	2.95	2.38	2.65	1.72	2.64	2.27	2.68	3.66	3.08	
AVG	31.53	34.86	29.46	19.16	19.08	18.14	26.11	26.15	23.16	
VCF	0.09	0.07	0.09	0.09	0.14	0.13	0.10	0.14	0.13	

Table 6: Worker inflow rate from unemployment in the regions of Finland

	1988	1989	1990	1991	1992	1993	1994	1995	1996	AVG
Uusimaa	1.19	1.15	0.78	0.56	1.87	3.32	6.41	5.11	3.22	2.62
Varsinais-Suomi	2.22	1.91	1.68	1.02	2.67	4.80	9.73	5.82	3.16	3.67
Satakunta	3.19	3.17	1.92	1.25	2.24	4.35	9.60	5.39	2.82	3.77
Häme	2.10	2.06	1.08	0.87	2.35	4.46	8.51	5.48	3.40	3.37
Pirkanmaa	2.77	2.71	1.76	1.26	2.91	5.08	9.07	5.72	2.93	3.80
Päijät-Häme	2.78	2.29	1.28	0.92	2.26	5.01	8.84	5.74	3.51	3.63
Kymenlaakso	2.75	2.71	1.60	1.28	2.24	4.65	8.18	5.22	3.06	3.52
Etelä-Karjala	3.14	2.90	2.04	1.06	2.02	4.50	8.07	6.19	3.16	3.68
Etelä-Savo	4.10	3.21	2.29	1.34	2.15	5.28	10.03	5.53	3.53	4.16
Pohjois-Savo	3.99	3.36	2.34	1.34	2.09	5.31	8.83	5.63	3.34	4.02
Pohjois-Karjala	4.39	3.99	2.72	1.63	2.63	5.97	9.62	5.72	3.27	4.44
Keski-Suomi	3.06	2.73	1.71	1.46	2.42	5.15	9.76	6.86	3.61	4.09
Etelä-Pohjanmaa	2.98	3.09	2.30	1.91	2.80	6.29	13.02	6.40	3.62	4.71
Vaasan rannikkoseutu	1.62	1.86	1.35	1.07	2.40	4.21	7.82	4.39	3.02	3.08
Keski-Pohjanmaa	2.40	2.60	2.07	1.61	2.59	5.52	9.53	6.77	3.90	4.11
Pohjois-Pohjanmaa	4.06	4.07	1.97	1.50	3.37	6.12	10.55	6.90	3.75	4.70
Kainuu	5.59	4.98	2.59	1.59	2.53	7.11	9.36	4.72	2.78	4.58
Lappi	4.69	4.81	2.68	1.95	3.40	6.26	9.79	6.87	4.72	5.02
Itä-Uusimaa	1.66	1.67	1.01	1.00	2.19	3.83	6.72	4.39	2.87	2.81
Ahvenanmaa	1.67	2.81	1.31	0.75	1.59	2.86	4.83	5.61	2.46	2.65
STD	1.16	1.00	0.57	0.37	0.45	1.05	1.70	0.77	0.49	
AVG	3.02	2.90	1.82	1.27	2.44	5.00	8.91	5.72	3.31	
VCF	0.38	0.34	0.31	0.29	0.19	0.21	0.19	0.13	0.15	

Table 7: Separation rate in the regions of Finland

	1988	1989	1990	1991	1992	1993	1994	1995	1996	AVG
Uusimaa	32.69	37.53	33.90	34.20	31.31	29.39	26.64	28.09	25.94	31.08
Varsinais-Suomi	29.81	34.80	31.23	30.81	29.24	29.29	23.84	24.18	23.64	28.54
Satakunta	30.94	29.99	28.26	29.89	30.13	23.59	20.20	21.34	21.32	26.18
Häme	26.96	32.63	30.30	29.13	28.68	27.62	21.05	24.09	22.74	27.02
Pirkanmaa	30.63	34.77	31.51	32.87	28.26	26.68	21.84	22.91	21.03	27.83
Päijät-Häme	30.00	30.99	32.65	31.07	29.68	27.57	21.42	22.64	22.34	27.60
Kymenlaakso	25.47	30.60	28.82	29.57	27.42	26.18	18.53	24.43	21.82	25.87
Etelä-Karjala	25.43	34.92	27.79	32.52	27.82	25.51	21.12	24.58	24.59	27.14
Etelä-Savo	30.49	31.86	29.99	31.02	29.77	26.09	22.10	28.68	22.06	28.01
Pohjois-Savo	28.04	32.95	34.52	35.92	34.62	28.59	25.36	26.70	23.19	29.99
Pohjois-Karjala	27.87	33.41	30.12	32.55	28.13	25.75	21.94	25.54	21.35	27.41
Keski-Suomi	28.42	31.96	32.80	30.90	32.12	27.82	21.67	23.83	19.70	27.69
Etelä-Pohjanmaa	31.69	31.26	29.31	33.87	33.17	28.98	21.60	25.23	19.44	28.28
Vaasan rannikkoseutu	32.03	37.29	32.78	28.24	30.90	24.52	20.29	20.97	21.54	27.62
Keski-Pohjanmaa	36.02	34.64	33.97	34.28	26.63	25.99	22.37	23.03	20.01	28.55
Pohjois-Pohjanmaa	27.08	30.19	33.23	32.77	33.16	29.34	24.18	26.04	23.53	28.83
Kainuu	23.48	27.68	30.23	39.21	29.68	23.70	19.44	23.27	21.20	26.43
Lappi	26.88	30.50	35.84	36.19	32.23	28.42	25.35	27.67	23.80	29.65
Itä-Uusimaa	32.39	32.25	27.21	27.59	27.74	22.93	22.15	22.32	21.50	26.23
Ahvenanmaa	23.58	21.49	32.27	23.30	18.60	20.54	18.41	16.89	21.87	21.89
STD	3.25	3.52	2.40	3.49	3.36	2.44	2.20	2.73	1.64	
AVG	28.99	32.08	31.34	31.79	29.46	26.42	21.98	24.12	22.13	
VCF	0.11	0.11	0.08	0.11	0.11	0.09	0.10	0.11	0.07	

Table 8: Worker outflow rate into unemployment in the regions of Finland

	1988	1989	1990	1991	1992	1993	1994	1995	1996	AVG
Uusimaa	1.13	1.00	1.41	6.18	7.42	8.58	5.08	4.73	4.41	4.44
Varsinais-Suomi	2.08	2.69	2.38	6.81	8.37	11.36	5.07	5.13	6.02	5.55
Satakunta	3.43	2.76	2.77	6.20	7.17	9.65	4.75	5.74	7.42	5.54
Häme	1.97	1.57	2.27	6.42	8.64	10.11	5.10	5.97	6.21	5.36
Pirkanmaa	2.86	2.35	2.74	7.05	7.15	10.18	5.01	5.12	6.16	5.40
Päijät-Häme	2.21	1.78	2.55	5.90	7.15	11.74	5.82	5.75	6.53	5.49
Kymenlaakso	2.55	2.42	2.76	5.25	5.35	9.75	4.57	4.92	6.50	4.90
Etelä-Karjala	2.37	2.36	2.43	5.04	5.22	10.29	5.23	5.57	8.00	5.17
Etelä-Savo	3.47	3.22	2.09	4.18	4.74	12.58	6.16	6.95	6.74	5.57
Pohjois-Savo	3.17	2.95	2.67	4.91	5.13	11.26	6.01	6.20	6.71	5.45
Pohjois-Karjala	3.29	3.31	3.08	5.06	5.20	11.27	6.48	6.59	7.72	5.78
Keski-Suomi	2.31	2.41	2.77	5.46	6.48	11.67	6.35	6.47	6.33	5.58
Etelä-Pohjanmaa	3.62	2.64	2.99	4.98	6.34	13.96	5.61	6.42	5.96	5.84
Vaasan rannikkoseutu	2.01	2.15	2.18	4.99	4.47	8.83	3.44	4.23	4.74	4.12
Keski-Pohjanmaa	3.68	2.79	2.15	4.86	4.28	12.61	5.62	7.05	5.98	5.45
Pohjois-Pohjanmaa	2.75	2.55	3.10	6.18	7.76	11.37	6.61	5.84	6.32	5.83
Kainuu	3.92	2.96	2.81	4.90	6.31	10.94	6.01	8.06	9.09	6.11
Lappi	3.52	3.26	3.63	6.82	8.39	13.49	7.88	7.94	7.89	6.98
Itä-Uusimaa	1.62	1.24	2.20	5.65	6.89	7.80	4.11	5.03	4.26	4.31
Ahvenanmaa	1.59	0.89	1.22	2.54	3.52	5.74	4.30	3.76	4.39	3.11
STD	0.81	0.73	0.56	1.05	1.49	1.96	1.01	1.13	1.28	
AVG	2.68	2.37	2.51	5.47	6.30	10.66	5.46	5.87	6.37	
VCF	0.30	0.31	0.22	0.19	0.24	0.18	0.19	0.19	0.20	

Table 9: Worker reallocation rate in the regions of Finland

	1988	1989	1990	1991	1992	1993	1994	1995	1996	AVG
Uusimaa	68.68	76.70	69.41	56.84	51.98	50.52	55.34	59.98	55.07	60.50
Varsinais-Suomi	65.00	68.50	61.40	51.62	47.74	49.08	54.85	53.30	48.60	55.57
Satakunta	64.17	63.30	53.52	48.83	48.31	39.81	47.23	44.20	40.88	50.03
Häme	61.12	68.87	59.85	46.72	43.54	46.40	45.36	52.10	46.75	52.30
Pirkanmaa	63.66	69.35	64.65	51.89	46.30	45.98	48.43	50.04	43.43	53.75
Päijät-Häme	62.68	66.32	60.56	48.72	46.21	46.51	46.47	46.86	44.54	52.10
Kymenlaakso	53.00	63.05	54.69	48.20	43.83	45.73	42.84	50.45	44.31	49.57
Etelä-Karjala	56.93	68.58	59.66	50.99	44.63	43.63	44.90	52.04	48.67	52.23
Etelä-Savo	60.68	65.78	57.09	48.46	48.51	41.34	48.60	56.87	44.65	52.44
Pohjois-Savo	60.68	69.29	66.23	57.48	54.38	50.32	53.55	54.33	48.59	57.21
Pohjois-Karjala	58.05	66.37	58.80	50.70	44.04	43.62	47.83	51.47	42.19	51.45
Keski-Suomi	60.19	65.89	63.94	50.48	50.64	46.52	46.74	50.00	42.26	52.96
Etelä-Pohjanmaa	60.87	71.03	57.52	52.99	52.68	47.93	51.58	53.51	41.90	54.45
Vaasan rannikkoseutu	59.77	75.32	63.69	45.57	50.62	42.26	44.85	44.59	48.33	52.78
Keski-Pohjanmaa	64.60	69.59	63.18	53.67	45.88	41.10	46.53	49.74	42.24	52.95
Pohjois-Pohjanmaa	62.62	67.88	62.17	54.15	55.31	51.81	52.87	58.50	50.36	57.30
Kainuu	53.04	58.95	55.40	57.35	56.47	40.15	44.84	43.34	38.93	49.83
Lappi	56.94	65.47	67.61	58.31	53.58	45.06	53.28	56.09	50.29	56.29
Itä-Uusimaa	68.11	65.60	55.12	44.03	46.29	39.12	48.44	41.79	45.46	50.44
Ahvenanmaa	49.72	53.07	61.38	42.02	39.95	34.36	37.17	36.12	38.33	43.57
STD	4.90	5.14	4.44	4.55	4.51	4.43	4.49	6.00	4.26	
AVG	60.52	66.95	60.79	50.95	48.54	44.56	48.09	50.27	45.29	
VCF	0.08	0.08	0.07	0.09	0.09	0.10	0.09	0.12	0.09	

Table 10: Churning rate in the regions of Finland

	1988	1989	1990	1991	1992	1993	1994	1995	1996	AVG
Uusimaa	32.97	37.78	34.24	24.69	21.08	20.32	23.55	27.85	26.59	27.67
Varsinais-Suomi	29.39	31.36	27.16	20.60	17.76	18.47	22.05	21.27	20.74	23.20
Satakunta	25.14	27.60	23.42	18.08	16.02	15.74	17.55	20.42	18.46	20.27
Häme	25.43	29.30	27.43	18.69	15.29	18.21	18.55	18.66	19.78	21.26
Pirkanmaa	23.96	29.68	25.71	18.72	16.78	16.37	19.18	21.08	18.80	21.14
Päijät-Häme	26.53	32.72	27.04	20.01	16.20	16.46	20.44	20.93	19.66	22.22
Kymenlaakso	24.07	28.79	24.30	19.01	15.71	16.84	18.48	18.98	19.67	20.65
Etelä-Karjala	22.99	27.39	24.60	16.74	14.55	14.77	15.79	21.35	19.72	19.77
Etelä-Savo	23.90	28.27	24.63	17.30	15.22	14.75	17.46	18.86	17.43	19.76
Pohjois-Savo	26.16	33.94	31.64	24.69	20.63	20.73	21.82	23.02	18.21	24.54
Pohjois-Karjala	24.89	32.32	26.97	17.75	15.18	14.26	19.72	17.66	16.28	20.56
Keski-Suomi	25.81	30.06	26.25	20.45	16.17	18.11	19.09	19.69	19.38	21.67
Etelä-Pohjanmaa	24.10	24.90	23.10	18.15	16.98	16.16	18.57	18.54	17.07	19.73
Vaasan rannikkoseutu	22.46	25.65	28.66	15.97	18.40	13.24	15.76	17.83	21.43	19.93
Keski-Pohjanmaa	28.75	34.71	26.36	19.76	16.07	13.53	18.20	18.44	19.37	21.69
Pohjois-Pohjanmaa	27.36	30.72	25.92	20.54	20.51	20.16	19.30	20.23	20.53	22.81
Kainuu	23.50	28.39	24.82	16.21	16.73	13.85	18.77	15.86	15.75	19.32
Lappi	25.03	30.33	25.92	21.68	16.57	16.10	20.84	20.20	20.32	21.89
Itä-Uusimaa	21.78	39.26	25.66	19.84	17.08	13.47	21.02	16.79	16.60	21.28
Ahvenanmaa	30.12	27.21	28.53	21.70	17.07	16.64	19.57	21.97	18.07	22.32
STD	2.81	3.75	2.66	2.42	1.85	2.33	1.96	2.58	2.34	
AVG	25.72	30.52	26.62	19.53	17.00	16.41	19.29	19.98	19.19	
VCF	0.11	0.12	0.10	0.12	0.11	0.14	0.10	0.13	0.12	

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