NATIONAL BANK OF POLAND
WORKING PAPER
No. 44

Migration Flows and Labour Market in Poland

Katarzyna B. Budnik

Warsaw, November 2007

The author would like to thank Axel Heitmueller, Marcin Kolasa, Paweł Strzelecki and Halina Wasilewska-Trenkner for helpful comments to this paper.

Please send any suggestion to this draft at Katarzyna.Budnik@mail.nbp.pl

Design:

Oliwka s.c.

Layout and print:

NBP Printshop

Published by:

National Bank of Poland
Department of Information and Public Relations
00-919 Warszawa, 11/21 Świętokrzyska Street
phone: +48 22 653 23 35, fax +48 22 653 13 21

http://www.nbp.pl

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Abstract

In the paper temporary migration flows are analyzed in conjunction with information on labour market gross flows. Gross migration flows were calculated on the base of the household survey that is conducted jointly with the LFS survey in Poland. The results indicate that the propensity to emigrate is higher for unemployed as compared with employed or non-participants. Moreover, after the EU accession these were employed and unemployed who experienced the most pronounced increase in the propensity to emigrate. The steady-state analysis of the gross labour market and migration flows delivers the estimate of the ratio of the temporary emigrants to the total population of Poland in the period 1994–2006. The ratio rose sharply after the EU accession from around 2% in 2002 to roughly 6% in 2006. Although, higher intensity of migration movements is unlikely to considerably bias the labour market figures like the unemployment rate and the activity rate, it may still lead to notable biases in the estimates of the labour productivity if emigration trends are not properly accounted for in estimates of the LFS population data.

JEL Classification: J01, J61, F22

Keywords: emigration, labour market flows, labour market, EU enlargement

1

Introduction

This paper describes effects of emigration on Polish labour market. It refers to henceforth much unexplored data on the temporary emigration. The data are collected in the household survey conducted quarterly concurrently with the LFS survey. They are used by Polish Statistical Office to correct estimates of the LFS population data. As a matter of fact, temporary emigrants (emigrants who do not register their departure by an administrative unit) account for the lion's share of the total Polish emigration. The data on permanent emigration flows (Figure 1) indicate that the outflow of permanent emigrants was low and stable throughout last decade ranging from 20 to 25 thousands per year. In particular, there was no noticeable change in the magnitude of migration outflows from Poland in the years following the EU enlargement. It is clearly at odds with both anecdotal evidence and data on Polish immigrants from receiving countries.

There are certain shortcomings of the data on temporary emigrants which are discussed in the paper. Most importantly, the data cover mainly short-term emigrants. Long-term emigrants, namely those who remained abroad for more than one year, are undercounted. Hence, the study focuses on emigration flows not stocks because there are less likely to be severely biased due to the undercounting problem. Consequently, labour market and migration gross flows analysis establishes the framework of the analysis.

Empirical and theoretical underpinnings of labour market flows analysis were set by Blanchard and Diamond (1990, 1992), Davis and Haltiwanger (1992). The interest in the labour market flows was as well stimulated by development of search and matching models of labour markets (Pissarides, 2000). The original enthusiasm expressed by Blanchard in 1990: "When data on gross flows are available, looking at them is clearly more instructive than looking at the stocks", was partly shadowed by diagnosed significant biases present in labour market flows data. Abowd and Zellner (1985) and Poterba and Summers (1986) pointed out that missing observation and classification errors in surveys on economic activity, even if they leave stocks relatively intact, may have pronounced impact on flows. Multiple flows correction methods were developed that base on some statistical assumptions (raking) or use other information sources (follow-up labour activity surveys).

To augment conventional labour market flows analysis, records from the LFS survey had to be merged with the information on emigrants from the household survey. Next, flows between the temporary emigration, employment, unemployment and non-participation could have been calculated. These flows were adjusted for missing observations in the emigrants sample on the basis of Population Survey 2002 information. However, no other adjustment accounting for LFS missing observations and reporting errors were undertaken. The merged data constituted the platform to calculate the corresponding transition probabilities and describe trends in outmigration and in the return migration.

One of the contributions of the paper is estimation of emigration propensity of workers conditional on their current home labour market state. I found that the propensity to emigrate of unemployed is significantly higher than the propensity to emigrate of employed or workers out of the labour market. According to a report on objective and subjective quality of life in Poland (Social Diagnosis 2005) in 2005 significant share of unemployed (over 20%) were interested in working abroad. The findings of the paper validate that result. High propensity to emigrate of unemployed may shed some light on the positive correlation between the aggregate unemployment rates and the magnitude of

emigration flows found in earlier studies (for instance Boeri, Bruecker (2000), Blanchflower (2007), Mayda (2007)).

Eventually, the transition probabilities between the distinguished labour market states and emigration are employed in the steady-state analysis of Polish labour market. Whereas earlier studies of Polish labour market referring to the approach (see e.g. Góra and Lehman, 1992, Góra and Walewski, 2002) ignored migration movements. Here, emigration is treated comparably to the labour market states. Because temporary emigrants are counted as a part of the total population of Poland the applied approach can be interpreted as the study of flows within the total population (between the labour market states and between the home country labour market and emigration jointly).

The steady-state framework enabled to approximate the number of temporary emigrants throughout the period under consideration (the end of 1993 to 2006) and offered some insight into the emigration dynamics. Moreover, a bundle of policy-relevant questions could have been answered. First, the paper delivers no strong support for the hypothesis that intensified emigration flows after the EU accession led to significant biases in the labour market figures. Second, it questions the accurateness of estimates of the LFS population data, mostly in the period after 2003. If, the LFS population data do not fully account for the sharp increase in the number of temporary emigrants, the labour productivity data could be materially biased. This in turn might explain why the high growth rates of unit labour cost calculated on the base of the LFS data did not as yet lead to significant acceleration of inflation.

The paper is structured as follows. Section 2 summarizes the data employed in the analysis. Section 3 presents the methodology applied to calculate the migration flows and necessary data adjustments. Consecutive sections present the results and the last section concludes.

2

Data

2.1. Polish Labour Force Survey (LFS)

The Polish Labour Force Survey (LFS) is conducted with quarterly frequency since May 1992. A rotation scheme was introduced in the second quarter of 1993 and four rotation groups have replaced former fixed sample scheme. A continuous survey design has been in use since the fourth quarter of 1999. Each week of the quarter only 1/13th of households in the sample are interviewed (previously all interviews took place during the middle week of the quarter). From the date on, survey quarters correspond with calendar not seasonal quarters. In two middle quarters of 1999 the survey was not conducted introducing a break in the data. Each quarter, the sample covers between 18 and 22 thousand of households with exclusion of the institutional households (army dwellings, hospitals, prisons, dormitories etc.). Participation in the survey is voluntary and the target population covers all persons 15 years and older with usual residence in Poland. The design of the rotation scheme enables to calculate either yearly or quarterly flows. The changes in the sampling procedure and changes in the sample structure in 1999 may hinder the comparability of the LFS data before and after that date.

The Polish LFS consists of two questionnaires. Questionnaire I (a household questionnaire) is recorded for each household in the surveyed dwelling. For each household, the questionnaire I includes information on the number of persons in the household and their basic characteristics such as date of birth, gender, relation to the head of household and education. Individuals in a household are classified into one of three (separate) groups: those present in the household or absent for no more than 2 months (residents), those absent from the household for more than two months and resident in a institutional household and those absent from the household for more than two months and staying abroad (temporary emigrants). It is this latter group which is of the main interest in the paper. In contrast, questionnaire II is completed every quarter for individuals aged 15 years or over either present in the household or absent for no longer than 2 months (a current economic activity questionnaire). Individuals filling questionnaire II are a subgroup of household residents covered by questionnaire I.

The period of the analysis was constrained to the period from the last quarter of 1993 to the last quarter of 2006 (the period in which the Polish Statistical Office already employed rotational scheme). As the main objective of the paper is calculation of labour market flows with inclusion of migration flows, the key challenge was to merge information across questionnaires. A number of identification issues occurred. The format in which the data is made available by the Polish Statistical Office allows for the complete identification of households but (before 2006) only for partial identification of individuals who are covered by the questionnaire II and not by questionnaire I. Households can be unambiguously identified by Voivodship and statistical region, unique number of the dwelling in the Voivodship and the region, household number. However, individuals in a household classified to different subgroups in questionnaire I have no unique identifier. The methodology of merging the data across the LFS sample and emigrants sample is described in the next section.

2.2. Population Census 2002 (PC2002)

The information from the Polish Census (PC2002) was employed in the analysis mainly to correct the estimates based on the quarterly LFS and emigrants data. PC2002 was conducted between May and June 2002 having been the first Population Census after 1989. What was relevant for the analysis presented in the paper, it captured permanent residents of Poland at the time of an inquiry irrelevant whether they were actually staying in Poland or abroad. Secondly, an additional questionnaire on long term migration accompanied the Population Census. It covered migrants (1989–2002) who became permanent residents of Poland or returned to Poland after at least 12 months of having been abroad.

2.3. UK Labour Force Survey

The British Labour Force Survey (LFS) is a useful source of information about Polish immigrants which let evaluate and cross-check the results based on Polish data. The LFS is a quarterly sample survey of households living at private addresses in Great Britain and is based on a random sample design. Every quarter around 60 thousand private households are sampled. The sample comprises of five waves or subgroups, each of approximately 12 thousand households. Each wave is interviewed in 5 successive quarters. As a result, there is an 80% overlap in the samples for consecutive quarters. For the propose of this paper I refer to the information on Polish immigrants from the May release 1998 to 2006.

3

Temporary Emigrants Data

In the household questionnaire the temporary emigrants category corresponds with persons who are abroad for more than 2 months, who used to be a member of a household and are still related to a household. Some descriptive statistics based on the emigrants' data are reported in the Table 1a together with the respective figures for persons who filled the labour market activity questionnaire (actual households residents). The table also presents test statistics corresponding with the null hypothesis that distributions of separate characteristics are equal in both populations.[1]

The emigrants' data suggest that temporary emigrants are generally younger, more often men than women and better educated then the rest of population. However, to a certain degree trends in the structure of emigration reflect trends observed in the structure of the total population. The share of emigrants with higher education was increasing throughout the sample period corresponding with similar changes in the distribution of education level among surveyed residents.

An issue of concern in the paper is the fact that the household survey significantly underestimates the number of temporary emigrants. It may be confirmed by plotting some other characteristics (Table 1b).

First, workers who left abroad with family or were single before the emigration occurred (one-person households) are likely to be missing in the survey data as plausibly no member of household could have been interviewed. Consistently, person who were described as a head of household constitute less than 1% of the emigrants in the sample. The emigrants captured by the questionnaire I most frequently were either a spouse of a head of household (over 28%) or a child (child-in-law) (52%).

Second, the percentage of long-term emigrants in the sample is low (around 50%). It is partly the result of the imprecise classification criteria. The longer a duration of emigration of a household member, the weaker becomes the relation between an emigrant and her original household. Consequently, long-term emigrants are less likely to be reported by other household members than short-term emigrants. The other factor which may explain the outcome is undercounting of emigrants who left together with other household members. If return migration is more costly for families than individuals these emigrants are more likely to stay longer abroad. Consequently, if families' emigration is underrepresented in the survey results, the average duration of emigration (the share of long-term emigrants) shall be biased downward.

[1] Two non-parametric tests were used: Pearson chi-square test and G-test. The latter statistic was additionally applied because the Pearson statistics is not necessarily well approximated by chi-square distribution once the expected frequencies are low. Similarity of distributions was tested for each quarter separately and joint p-values for two subsamples were reported.

4

Methodology

4.1. Labour Market Gross Flows

A central intention of the paper was to augment standard labour market flows analysis with migration flows. This required merging information contained in the LFS and household questionnaires. In order to merge information across different questionnaires and in the absence of a unique person identifier the "fuzzy matching" method was employed. In particular, a couple of variables were used to match individuals across the two information sources: gender and date of birth (as far as available day, month and year, otherwise year) together with identifying information about household the individuals belonged to. In other words, it has been assumed that there may be only one person who lives (or is related to) in the same household, was born on a certain date and is of the same gender. The error contained in the procedure (incidence of spurious matching) was approximated by the percentage of non-unique individuals fulfilling the criteria mentioned above and being residents of households at the moment the survey was conducted (for whom the full identification has been possible). For each quarter of the sample the error was significantly less than 1%. Then the sample was constrained to emigrants and these household residents who filled questionnaire II (for whom information about their labour market status was available).

Four ,,labour market" states were distinguished: employment (E), unemployment (U), non-participation (N) and emigration (M). Compared to the standard labour market flows analysis the emigration state was added. Based on the merged data sample quarter-to-quarter gross flows between four states were calculated for the periods from the third quarter of 1993 to the end of 1998 and from the firs quarter of 2000 to the end of 2006. A flow from state i to j where $i, j \in \{E,U,N,M\}$ between periods t–1 and t is signed $F_{ij,t}$. The respective flows matrix is illustrated below:

$$\begin{bmatrix} F_{EE,t} & F_{EU,t} & F_{EN,t} & F_{EM,t} \\ F_{UE,t} & F_{UU,t} & F_{UN,t} & F_{UM,t} \\ F_{NE,t} & F_{NU,t} & F_{NN,t} & F_{NM,t} \\ F_{ME,t} & F_{MU,t} & F_{MN,t} & F_{MM,t} \end{bmatrix} \quad (1)$$

Observations were weighted with population weights from the earlier period t–1. The LFS consistent population weights were imputed to emigrants observations. In further analysis the gross flows were normalized (by the number of resident workers) so that their magnitude became comparable between the two sub-samples.[2]

4.2. Seasonal Correction and Adjustment for Missing Observations

The labour market flows reflected seasonal quarterly variation. Therefore, each of the flows was separately seasonally corrected using TRAMO/SEATS method (TRAMO – Time Series Regression with ARIMA Noise, Missing Values, and Outliers, SEATS – Signal Extraction in ARIMA Time Series). Each TRAMO/SEATS regression was augmented with dummy variables

[2] Weighting of observations with the LFS weights which are established by the Polish Statistical Office on the base of its estimates of the population structure excluding temporary emigrants might have introduced a bias in the calculated flows. Therefore, estimates presented in further sections were rerun on the unweighted observations as well as on the observations weighted with weights from later period t. It introduced no significant differences in the results.

that control the procedure for shifts tied to changes in the definitions in the LFS (in the period under observation there were few changes in definitions of employed, unemployed and non-participant introduced). The additional correction let remove spurious jumps in transition probabilities not connected to any economic phenomena. TRAMO/SEATS procedure allowed imputing missing observations for four quarters in 1999.[3]

Due to low number of observations in the return migration flows for some periods which introduced high volatility in the time series the data were pooled across whole sample period. Next, for each quarter the Pearson chi-square and G test were implemented to test the null hypothesis that the shares of return migrants who were employed, unemployed, inactive in the period after the return and the share of emigrants who stayed abroad matched the "pooled" distribution. The probability which allows rejecting the hypothesis that the distribution was constant for all periods in the sample according to the G-test was 13% (Table 2). Finally, the corrected flows were calculated as a product of the seasonally adjusted and extrapolated for missing observations in 1999 time series of the number of emigrants and return migrants jointly and the "pooled" probabilities.

As documented earlier two groups of emigrants are presumably underrepresented in the household questionnaire: emigrants whose emigration led to disappearance of a household and long-term emigrants. Missing emigrants' observation could have caused biases both in the outflows and inflows of migrants. To alleviate these biases the migration flows were adjusted on the base of the PC2002 and the long-term emigrants' survey conducted jointly with the Population Census. Two assumptions were common for corrections of outflow and return migration. First, the PC2002 reflects the structure of temporary emigration in 2002. However, as no other information was available for years preceding and commencing the Population Census it was assumed that the character and magnitude of biases was similar between the end of 1993 and 2006 (constant rescaling factors). Second, biases were homogenous for employed, unemployed and inactive workers who emigrated and for those who returned in each period. This assumption is consistent with the belief that the data properly reflect the relative shares of employed, unemployed and inactive workers in the emigration flows. Besides the data delivers sound estimates of shares of employed, unemployed and inactive workers who returned and emigrants who stayed in the population of emigrants a period earlier.

The return migration probability was revised downward under assumption that the emigrants' data deliver consistent estimate of the return migration probability given the average emigration duration of emigrants in the sample. The idea of the correction came down to re-weighting earlier calibrated short-term and long-term emigrants return probabilities so that they yielded the return migration probability which could have been observed once the emigrants' data would carry information of comparable quality on both short- and long-term emigrants. More thorough description of the adjustment procedure is given in Appendix A.

Emigration flows were adjusted upward with the scalar proportional to the inverse of the share of emigrants who are related to some household in the country in the total number of short-term emigrants. The ratio was approximated by the number of emigrants who were neither single before the departure nor did they left with all other household members to the stock of short-term emigrants according to the PC2002. Appendix B describes the adjustment in more details.

The corrected gross flows matrix (1) for each period t had a form:

[3] The method of seasonal correction of the time series had to assure that transition probabilities from each state sum up to one. That was a reason why the seasonal correction was applied on flows and not later on the calculated transition probabilities.

$$\begin{bmatrix} F_{EE,t} & F_{EU,t} & F_{EN,t} & F_{EM,t}k \\ F_{UE,t} & F_{UU,t} & F_{UN,t} & F_{UM,t}k \\ F_{NE,t} & F_{NU,t} & F_{NN,t} & F_{NM,t}k \\ F_{ME,t}l & F_{MU,t}l & F_{MN,t}l & F_{MM,t} \end{bmatrix} \quad (2)$$

where k was equal to around 1.31 and l to 0.65.

4.3. Transition Probability Matrix

The corresponding transition probability matrix were calculated for each period t based on the corrected gross flows data:

$$\begin{bmatrix} p_{EE,t} & p_{EU,t} & p_{EN,t} & p_{EM,t} \\ p_{UE,t} & p_{UU,t} & p_{UN,t} & p_{UM,t} \\ p_{NE,t} & p_{NU,t} & p_{NN,t} & p_{NM,t} \\ p_{ME,t} & p_{MU,t} & p_{MN,t} & p_{MM,t} \end{bmatrix} \quad (3)$$

where $p_{ij,t}=F_{ij,t}/\sum_j F_{ij,t}$. The first element of the matrix is the inverse of an average duration of employment between periods t–1 and t. Consecutive elements of the first row represent probability of employed person becoming unemployed, leaving the labour market or the country in period t.

4.4. Steady-State Solution

Further, to analyze labour market impact of migration flows the steady-state framework is used. The transition probabilities were affected both by institutional and cyclical changes throughout the period 1994 and 2006. Steady-state values of key labour market figures should therefore well reflect changes in the actual variables. The variables of interest in were unemployment rate $u=\frac{U}{U+E}$, employment rate $e=\frac{E}{E+U+N}$ and activity rate $a=\frac{E+U}{E+U+N}$. Moreover, the temporary emigration rate (or emigration rate) is defined as the ratio of the temporary emigrants to the total population, $m=\frac{M}{E+U+N+M}$.

To get the steady-state values of the above variables the system of four equations was solved for u^{SS}, e^{SS}, a^{SS}, m^{SS}. In the steady-state inflows and outflows to and from each of the labour market states are equal:

$$\begin{bmatrix} p_{UE}U^{SS}+p_{NE}N^{SS}+p_{ME}M^{SS}=(p_{EU}+p_{EN}+p_{EM})E^{SS} \\ p_{EU}E^{SS}+p_{NU}N^{SS}+p_{MU}M^{SS}=(p_{UE}+p_{UN}+p_{UM})U^{SS} \\ p_{EN}E^{SS}+p_{UN}U^{SS}+p_{MN}M^{SS}=(p_{NE}+p_{NU}+p_{NM})N^{SS} \\ p_{EM}E^{SS}+p_{UM}U^{SS}+p_{NM}N^{SS}=(p_{ME}+p_{MU}+p_{MN})M^{SS} \end{bmatrix} \quad (4)$$

where

$$\frac{E^{SS}}{E^{SS}+U^{SS}+N^{SS}+M^{SS}}+\frac{U^{SS}}{E^{SS}+U^{SS}+N^{SS}+M^{SS}}+\frac{N^{SS}}{E^{SS}+U^{SS}+N^{SS}+M^{SS}}+\frac{M^{SS}}{E^{SS}+U^{SS}+N^{SS}+M^{SS}}=1. \quad (5)$$

The rates in this paper are merely an analytical result and here no attempt is taken to explain the factors driving certain flow probabilities.

5

Labour Market and Migration Transition Probabilities

5.1. Polish Labour Market and Emigration

The escape probabilities from all labour market states were in a downward trend from 1994 to 2000 corresponding with a gradual fading of the transitional changes. In the period under consideration, persistency of all labour market states increased reflecting reduced mobility of workers. In particular, high outflows from employment to unemployment and non-participation in the second half of the 90ties tied to restructuring of enterprises and reinforced by introduction of a range of programs encouraging withdrawal from the labour market were significantly reduced already before the economic slowdown in 2000. The rate of quits from employment decreased before 2000 in line with curtailed generosity of existing programs of unemployment or disability benefits. The intensity of flows from non-participation back at the labour market lessened as well in the second half of the sample period as compared with the earlier years.

The emigration transition probability, after the period of relatively low magnitude and variation between 1994 and 2002, moved noticeably up after 2003. Within three years after the EU accession in May 2004 it almost tripled. The transition probability from the home labour market to emigration was around 0.1% before the accession date and approximately 0.3% in 2006.

Some interesting emigration patterns emerge from closer examination of emigration transition probabilities. Unemployed workers were most likely to leave the country. The transition probability from unemployment to emigration was on average five times throughout the period from 1994 to 2006 higher than respective transition probabilities from employment or non-participation. Still, the major focus should be placed on the trends in the emigration transition probabilities not their magnitudes, as these results may be subject to significant biases tied to missing observation and classification errors in the data. After the EU accession increases in the propensity to emigrate were most meaningful for employed and unemployed. The transition probability from employment and unemployment to emigration jumped threefold to around 0.3% and 1.5% respectively. The transition probability from non-participation to emigration after the EU enlargement increased roughly twofold. Introduction of the open door policy by several EU countries (UK, Ireland and Sweden from 2004, Spain, Greece, Portugal, Finland and Italy from 2006) could have relatively strongly encouraged the emigration of employed as well as unemployed persons. One plausible interpretation is that the opportunity of legal employment abroad could have made jobs at home labour market and at the EU labour markets better substitutable.

The probability of return emigration remained more or less constant over the sample period. It did not statistically significantly change after the EU enlargement.[4] The return migrants had around three times higher probability of finding the job after a return to the source country than unemployed or non-participants. This fact is especially interesting as it may shed some new light on the role of emigration. If the return migrants were positively selected or they were

[4] The theory of the return migration neither the empirical evidence do not give a definite answer to how the return migration may be affected by changes in the immigration law in the receiving countries. The real income theory suggests that the lower the costs of emigration the shorter the average emigration spell. In contrast, the savings theory predicts that the average emigration spell may shorten after liberalization of migration movements because emigrants have on average worse information about conditions at the host labour market before emigration occurs.

able to accumulate a job relevant human capital abroad, an increase of emigration after 2004 might be seen as a factor reinforcing labour market activity foremost of those who would otherwise find it hard to enter employment. The exact role of the emigration, including verification of the results described above, may be fruitful avenue for future research.

Clearly, the surge in the emigration propensity around 2003 combined with the constant return probability implied that the stocks of emigrants noticeably increased after the EU accession. The methodology employed in the article do not however allow distinguishing secular and cyclical changes in the emigration trends.

5.2. Comparison with UK Immigrants Data

One persistent shortcoming in migration research is lack of data which enables the study of migrant cohorts both in the sending and receiving country. Usually information is either available for immigrants or emigrants but rarely for both. Here some of the results based on Polish LFS data are compared with the UK evidence on immigration from Poland to state whether both data sources indicate at similar trends in migration movements between the two countries.

Immigration inflows from Poland to the UK are plotted in Figure 4 against emigration outflows from Poland to the UK. Migration inflows were calculated as the number of Polish residents who came to the UK within a preceding one and a half year (weighted with the appropriate population weights) based on the UK LFS survey. The data were available only for May each year and the arrival period of immigrants covered for each observation the preceding year and a few earlier months of the reference year. Migration outflows were calculated as the number of individuals in the Polish LFS emigration data (weighted with the LFS consistent population weights) who left the country within a year preceding the second calendar quarter of the reference year. Due to the differences in the calculation method and possible biases in population weights used to weight observations for the UK and Polish LFS surveys the magnitude of migration flows is not comparable. However, both time series reflect similar upward trend in emigration from Poland to the UK from 2004 on. Moreover, when the total emigration flows are added into the picture, it becomes apparent, that the UK emigration contributed significantly to an increase in the total emigration from Poland after 2004.

Next, the available information on the labour market activity of Polish workers before the emigration was compared to the corresponding information from the UK LFS. This provided me with a convenient way of establishing the robustness of the earlier results on outflow probability conditional on previous labour market state. Table 4 reports the distribution of labour market activities of Polish emigrants prior leaving the country for the UK and the distribution of self-reported labour market activities of Polish immigrants according to the UK LFS. The former distribution was established on the base of the calculated emigration flows from Poland. The latter distribution was calculated based on the subsample of Polish immigrants who come to the UK within a year preceding the UK LFS survey and who declared their labour market activity 12 months ago.

Both sources indicate that around one third of Polish UK immigrants were employed in Poland year earlier. The statistics are less informative for groups of previously unemployed and non-participants. Non-employed workers are differently defined in the Polish LFS survey and in the UK survey. Non-employed workers in the first source are defined as those unemployed or non-active. In the latter source the former labour market state is ex post reported by a respondent and the LFS survey distinguishes more detailed categories of non-employment.[5]

[5] The category of non-employment encompasses self-reported status twelve months ago of a kind: laid off or on short time at firm, unemployed actively seeking job, on special government scheme, doing unpaid job for yourself or relative, a full-time student or pupil, looking after the family home, temporarily sick or injured, long-term sick or disabled, retired from paid work or other.

6

Equilibrium Analysis

This section tries to answer two questions. First, what are the steady-state values of the unemployment rate, the employment rate and the activity rate at the labour market when emigration is included into analysis as a separate state? Is the information on labour market conditions referring only to the labour market flows in any way biased? Second, how strongly did an increase in the propensity to emigrate around the EU accession date affect the Polish labour market?

6.1. Results

After 2003, in line with an improvement at the labour market, the steady-state unemployment rate fell sharply to around 10% in 2006. The main driving forces behind the result was a steady increase from 2003 in the transition probability from unemployment to employment and a concurrent reduction in the transition probability in from employment to unemployment. A significant downward correction of the unemployment rate in 2006 was in part tied to an intensification of outflows from unemployment to non-participation.

There was a continuing downward trend in the activity rate coupled both with transitional changes in the economy as well as with the presence of relatively generous retirement, disability and social assistance programs in the period under consideration. These trends were partly reversed around 2002. However, after two years of gradual improvement in the employment and activity rates between 2003 and 2005, higher outflows from unemployment and employment to non participation in 2006 resulted in a sharp reduction of the employment rate and the activity rate by around 1 ppt. and over 3 ppt. respectively.

Material intensification of migration outflows observed from 2003 on led to an increase in the steady-state emigration rate from over 2% in 2003 to around 6% within four years. It corresponded with approximately 6% of Polish permanent residents in a working age having stayed abroad in 2006 as compared to 2.1% in 2002 (calculated on the base of PC2002).[6] The steady-state share of the population over 15 years who were employed in the home country, fell from 2002 to 2006 by around 0.5 ppt. (which may approximate for changes in the dependency ratio). In total, around 1.9 M of the permanent residents of Poland over 15 years stayed temporary abroad in 2006, roughly 0.9 M more than at the beginning of 2004.

6.2. Effects of Emigration on the Labour Market Figures

Given the documented sharp increase in the number of temporary emigrants from 2003, the relevant question is to how great a degree migration flows impacted the labour market figures and how high is the risk associated with missing the information of migration flows when conducting an analysis of the labour market conditions. Here, the steady-state solution was used to evaluate the effect of intensified emigration flows on the labour

[6] The average steady-state emigration rate in 2002 was 1.8% which was close to 2.1% calculated on the base of the PC data. It constitutes some additional validation of migration flows adjustment procedure described in the earlier section.

market. In order to estimate the potential information bias, the steady-state values were calculated with and without taking into account migration flows (compare Table 5). Although, the exercise should shed some light on the impact of migration flows on the steady-state labour market variables, it is purely statistical result and does not deal with plausible economic interdependencies between the intensity of migration flows and magnitudes of the distinguished labour market flows.

The unemployment rate was higher in the post-accession years once the migration flows were accounted for in the steady-state solution. However, the bias is rather small of around 0.4 ppt. on average in 2005 and 2006. The employment and activity steady-states rates were in turn slightly lower than the respective figures calculated without the migration flows. In 2005-2006 the steady-state employment rate adjusted for the migration flows was roughly 0.5 ppt. higher than the employment rate without the correction. The activity rate bias, within the same period, was less significant and stayed around 0.3 ppt.

These results suggest that the intensification of migration movements after the EU accession had only minor distortionary effect on the estimates of the steady-state shares of unemployed, employed and non-participants in the actually resident population. As far as direction of the bias is considered, the analysis indicates that absence of migration flows in the labour market flows analysis might have led to overvaluation of economic forces bringing the unemployment rate down and underestimation of factors that led to a reduction of the employment and activity rates.

7

Comment on Recent Labour Productivity Trends

How a moderate inflation rate accompanied by strong growth of the unit labour cost could be explained in the light of the earlier results? The answer to the puzzle put forward in the paper is that the LFS population might not be properly adjusted for changes in the emigration intensity. Therefore, a part of an increase in the unit labour cost could have been only economically spurious statistical result.

The LFS employment can be thought of as a product of the employment rate (derived on the base of the LFS quarterly sample) and of an estimate of the LFS population. The latter should cover actual residents of individual households in Poland. Hence, even if the survey delivers a right estimate of the employment rate, when temporary emigration is not appropriately accounted for in the LFS population, the employment level can be biased. The ratio of the LFS population as assessed by the Polish Statistical Office to the individual household population[7] remained amazingly stable after the EU accession. Both time series indicated some divergence in 2005 and 2006 but the scale of the effect seem negligible, especially when taking into consideration the documented high increase in the propensity to emigrate. Even more surprisingly, throughout last years, the LFS employment data strongly departed from the trends observed in the employment data for the national economy reported by enterprises.[8] The employment in national economy was plotted against the LFS employment in Figure 5. Clearly, when the former variable indicates that employment level, even if actually raised at the end of the sample period, in 2006 remained at the levels roughly 8% lower than in 1995, the LFS data in turn suggests that it was actually 2% higher.

When the steady-state LFS employment (calculated as the household population corrected by the steady-state emigration rate and multiplied by the steady-state employment rate) is added into the picture it echoes the trends observed in the national employment time series. Certainly, the LFS population and steady-state LFS population may divert in the short time intervals. Labour market phenomena which influence labour market flows, or the LFS survey errors, have much stronger impact on the steady-state values than on the actual values. Therefore, variability of both time series shall be different. Anyhow, strong divergence in the trends reflected in these time series in recent years raises some concern.

As long as dynamics of the number of employed in the LFS is overestimated the TFP growth calculations are likely to be biased downward. The higher the differences in trends the stronger the impact on the reliability of the TFP growth measures based on the LFS employment. In the effect, the spurious slowdown in the TFP growth could overstate the actual inflation pressure in the economy.

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[7] The population data were available for the end of each semi-year. The data were transformed into quarter frequency with use of Cubic extrapolation method. The data for the end 2006 which was not available at the time were forecasted with TRAMO/SEATS procedure. To ascertain comparability of the LFS population and this way calculated population only persons over 14 years and residents of non-institutional households have been included into the constructed variable. The ratio of population resident in institutional households has been calculated for 2002 based on the PC2002 data. For consecutive years it has been taken from households forecast of Polish Statistical Office. For earlier years it was extrapolated on the base of the data from PC2002 in the way that allowed accounting for changes in the age structure of the population within the period.

[8] There are methodological differences between both sources of the employment data. In contrast to the LFS employment, employment in the national economy data time series reflects the level of employment at the end of each reference quarter, does not cover individual farmers, those employed in establishments with less then 9 persons employed and those employed in the national defence sector.

8

Conclusions

While it is understandable that the focus of migration research has been biased towards receiving countries, sustained high numbers of Polish migrants to Western Europe have raised concerns in Poland. Yet, little is known about the impact of emigration and the return migration on the Polish labour market. This paper attempted to fill this gap by extending the usual labour market flow analysis and introducing temporary migration flows.

First, the paper delivers estimates of the number of the temporary emigrants (those registered as permanent residents of Poland but remaining abroad for more than two months). In 2006 roughly 6% of permanent residents of Poland aged over 15 remained abroad which totals 1.9 M. The share of emigrants in the total population has increased by 4 ppt. from the last PC2002 and by around 0.9 M from the EU accession year 2004.

Second, it shows that the overall effect of the intensified emigration on the unemployment rate or the activity rate was moderate even if the effects might be larger for different sub-labour markets. The estimated magnitude of the possible biases in the unemployment or the activity figures tied to missing information on migration movements was negligible. The forces reducing the unemployment rate might be underestimated and the importance of factors that lead to a decline in the employment and activity rate overestimated.

Moreover, I showed that the actual LFS employment level may be lower than official figures indicate which could have led to overestimation of the inflation pressure especially in the years after the accession. Stronger than henceforth calculated based on the LFS data, TFP growth could have partly mitigated prices growth rate and the negative impact of the shrinking population on the potential product of the economy. However, the analysis does not deliver information whether these positive trends are to be continued in the future.

Last but not least, the paper explores unique source of data which enables to tie labour market characteristics of workers to their migration behavior. It gives some more general insight into labour market dynamics when migration flows become significant in terms of the number of emigrants compared to the population. Unemployed workers are most probable to leave the country. However, the data suggest as well that changes immigration policy in receiving countries can have different impact on incentives to emigrate for employed, unemployed and non-participants. In particular, open door policy might relatively strongly encourage emigration of workers previously employed in the home country. If confirmed by further research, these facts might have interesting implications for host and source countries.

Appendix A

Adjustment of Return Migration Flows

The return probability depends on the array of factors: age at the entry of a host country, changes in relative income and economic situation in host and home country, education and the length of stay abroad (Klinthaell (1999)). The share of long-term emigrants in the emigrants' sample is much lower than the corresponding share in the population of emigrants according to the Population Census 2002 (see the table below). Short-term emigrants usually have higher return probability. Hence, it was expected that the return probabilities calculated on the base of the return migration flows might have been heavily biased upward.

Table A.1.
Shares of short- and long-term emigrants in the emigrants' sample and PC2002

Sample	Share of short-term emigrants	Share of long-term emigrants	p-value (Chi-square test)
LFS sample	52.1%	47.9%	0.00
PC2002 (age 15+)	20.7%	79.3%	

The idea behind adjustment of the return migration flows was to correct the flows by so that the implied return probability would be closer to some probability p which would be observed if the structure of emigrants' sample was similar to the structure of PC2002. The intuition behind the approach is simple. The observed return probability $\hat{p}$ is a weighted average of the return probabilities of the short- p^S and long-term p^L emigrants:

$$\hat{p}=p^S\hat{\theta}^S+p^L\hat{\theta}^L, \tag{6}$$

where weights are given by shares of short- $\hat{\theta}^S$ and long-term $\hat{\theta}^S$ emigrants in the emigrants' sample. If the weights were consistent with the "true" structure of emigrants (and in practice with PC2002 based emigrants' structure given by θ^S and θ^L then the observed probability would be equal to:

$$p=p^S\theta^S+p^L\theta^L. \tag{7}$$

where p remained unknown.

To correct the return migration flows first the ratio of p^S to p^L was approximated based on information from PC 2002 and from the additional survey conducted concurrently with the Population Census which covered ex post emigrants. The number of return emigrants who returned after a certain time spent abroad (based on the emigrations survey) was compared with estimates of the number of emigrants who stayed for similar time abroad in 2001 (based on the PC2002 data). Still, some methodological problems occurred when matching information from these two sources. The surveys covered different populations: PC 2002 ranged over those emigrants who were permanent residents of Poland but remained abroad and the migration survey concerned actual residents of Poland. Moreover, in the long-term migrations questionnaire only last migration experience was described. According to these estimates probability of return of an emigrant who stayed abroad for more than a year was roughly four times lower than probability of return of an emigrant who left less than year earlier.

Next, p^S and p^L were calibrated in accordance with the calculated ratio and with (6). The last step was to calculate p as in (7). p appeared to be around 50% lower than $\hat{p}$. Accordingly the rescaling parameter adjusting the return migration flows was set to 0.65.

Appendix B

Adjustment of Emigration Flows

In the emigrants' data based on the household questionnaire emigrants are undercounted due to problems with conducting an interview on a household's members when they all left abroad. Hence, the emigration flows were rescaled upward under assumption that the emigrants' data do not cover members of households who emigrated if before their departure they lived in one-person household or if they are abroad with all other household members. Information about shares of these emigrants' groups in the total number of emigrants (in 2002) stemmed from the PC2002 data.

Table B.1.
Shares of emigrants who left abroad with all household members

	Number (in thousands)	Share	Implied rescaling factor
Emigrants in households with not all members abroad	205.0	46.0%	1.70
Emigrants of households with all members abroad	240.5	54.0%	
Total	445.4		
Short-term emigrants in households with not all members abroad	76.0	76.3%	1.31
Short-term emigrants in households with all members abroad	35.8	23.7%	
Total	111.9		

Table 1a
Emigrants' characteristics

		Emigrants' average 1993q4-1998q4	Emigrants' average 1999q4-2006q4	Emigrants' average 2000
Emigration duration	Short-term	44.8%	55.2%	52.7%
	Long-term	57.2%	42.8%	47.3%
p-value (Chi-square test)*		0.00	0.01	
p-value (G test)		0.00	0.01	
Status in the family	Head of household or spouse	31.4%	28.1%	26.4%
	Children	53.6%	60.5%	62.1%
	Parents, grandparents, grandchildren	9.7%	8.1%	7.4%
	Siblings and others	5.3%	3.4%	4.2%
p-value (Chi-square test)		0.00	0.07	
p-value (G test)		0.02	0.07	
N		6681	12,513	1,356

* Chi-square test and G test are used to test a hypothesis that distributions of characteristics in both sub-samples (before and after 1999) were equal to the distribution in 2002 (in the last column).

The date enabled not only to derive rescaling factor for the whole population of emigrants but also separately for short-term emigrants. Clearly, long-term emigrants were more likely to be abroad with all other household members. The latter rescaling factor was chosen because the calculated emigration flows based on a sub-sample of short-term emigrants in the emigrants' data.

Table 1b
Emigrants' characteristics

		Emigrants' average 1993q4-1998q4	Resident population average 1993q4-1998q4	Emigrants' average 1999q4-2006q4	Resident population average 1999q4-2006q4	Emigrants' average 1999q4-2006q4
Gender	Male	58.2%	58.1%	47.5%	47.4%	52.7%
	Female	41.8%	41.9%	52.5%	52.6%	47.3%
p-value (Chi-square test)		0.00		0.00		
p-value (G test)		0.00		0.00		
Age	15-24	22.5%	23.7%	20.1%	19.5%	26.4%
	25-34	30.9%	37.0%	15.6%	15.6%	62.1%
	35-64	44.4%	37.3%	48.6%	47.4%	7.4%
	65+	2.2%	2.0%	15.8%	17.4%	4.2%
p-value (Chi-square test)		0.00		0.00		
p-value (G test)		0.00		0.00		
Education*	Higher (MSc and PhD)	9.5%	11.3%	6.8%	9.6%	
	Other post-secondary	29.9%	29.2%	20.2%	21.8%	
	Secondary	13.0%	13.1%	7.0%	8.5%	
	Vocational secondary	32.8%	36.3%	26.2%	26.8%	
	Primary or lower	14.7%	10.1%	39.8%	33.3%	
p-value (Chi-square test)		0.00		0.00		
p-value (G test)		0.00		0.00		
Place of origin	Over 100T	24.5%	17.5%	25.9%	24.7%	
	Other towns	36.2%	34.2%	31.7%	31.9%	
	Rural areas	39.3%	48.3%	42.5%	43.4%	
p-value (Chi-square test)		0.01		0.00		
p-value (G test)		0.01		0.00		
N		6,681	1,158,597	12,513	1,361,620	

* Data cover period 1994q2-1998q4 and 1999q4-2006q4.

Table 2
Return migration transition probabilities and stability test results

Data	Return to employment (E)	Return to unemployment (U)	Return to non-participation (N)	No return	p-value (Chi-square test)	p-value (G-test)
Raw	2.7%	2.2%	2.3%	92.7%	0.09	0.13
Adjusted	1.7%	1.5%	1.5%	95.4%		
N	8,076					

Table 3
Average transition probabilities 2000–2006

	Employment (E)	Unemployment (U)	Non-participation (N)	Emigration (M)
Employment (E)	97.2%	1.3%	1.4%	0.1%
Unemployment (U)	9.1%	85.1%	5.3%	0.5%
Non-participation (N)	1.1%	1.3%	97.5%	0.1%
Emigration (M)	1.7%	1.5%	1.5%	95.4%

Table 4
Previous labour market state of Polish emigrants

	Polish emigrants (Polish LFS)		Polish emigrants to the UK (Polish LFS)	Polish emigrants to the UK (UK LFS)
	Pre accession average	Post accession average	Post accession average	Post accession average
Employment	36%	42%	41%	32%
Non-employment	64%	59%	59%	68%
Unemployment	33%	30%	31%	
Non-participation	31%	29%	28%	
N	350	423	128	90

Table 5
Steady-state with and without migration

	Average steady-state unemployment rate		Average steady-state employment rate		Average steady-state activity rate	
Period	No migration	Including migration	No migration	Including migration	No migration	Including migration
2000–2002	16.5%	16.6%	46.5%	46.4%	55.6%	55.6%
2003	18.2%	18.2%	43.9%	44.1%	53.7%	53.9%
2004	16.2%	16.3%	44.5%	44.5%	53.1%	53.2%
2005	13.5%	14.0%	48.0%	47.5%	55.6%	55.2%
2006	9.9%	10.3%	47.1%	46.6%	52.3%	52.0%

Figure 1
Permanent migration flows

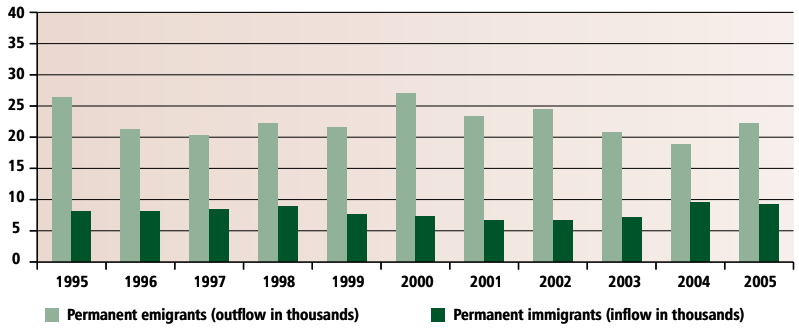


Figure 2
Labour market transition probabilities

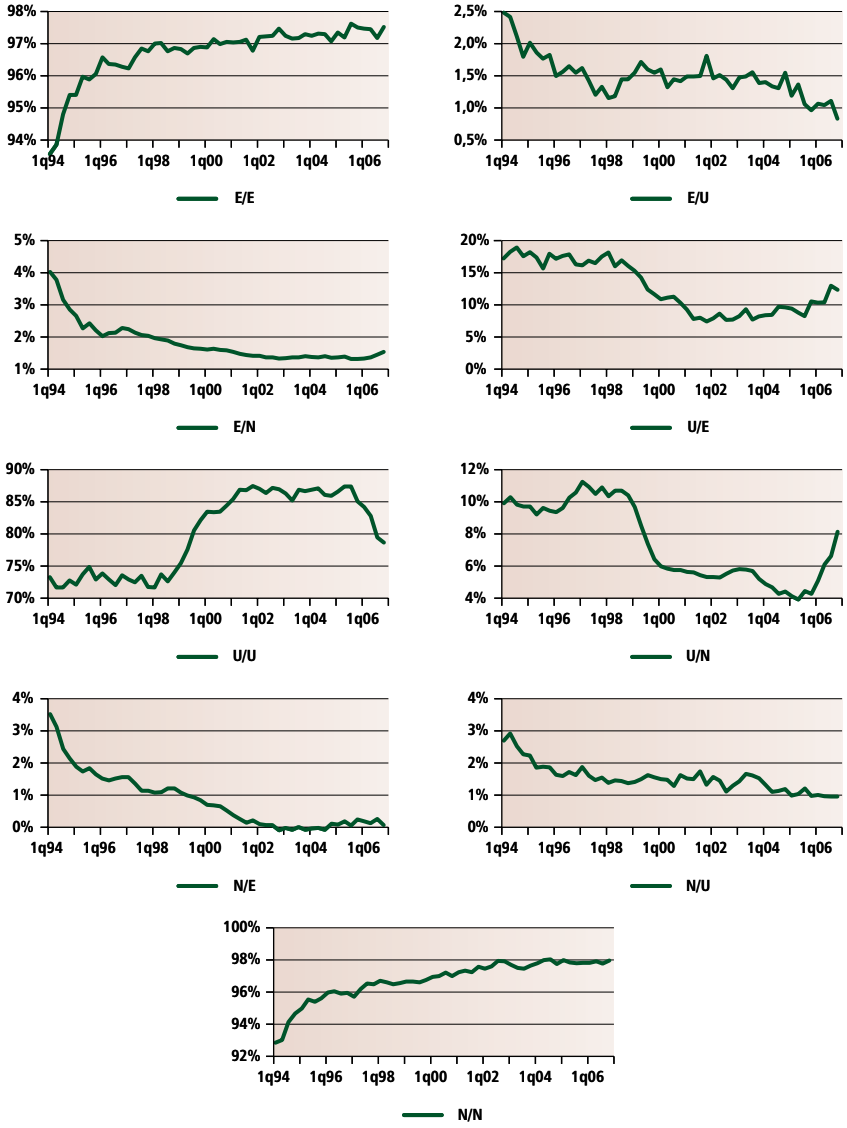


Figure 3
Emigration transition probabilities

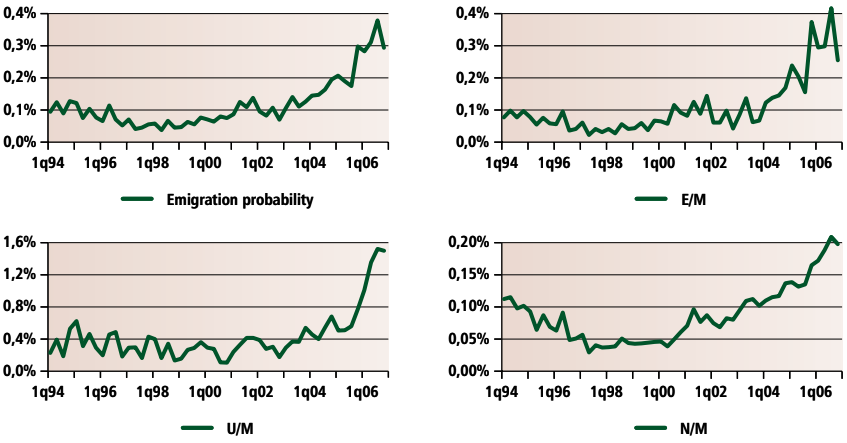


Figure 4
Polish vs. UK LFS migration flows

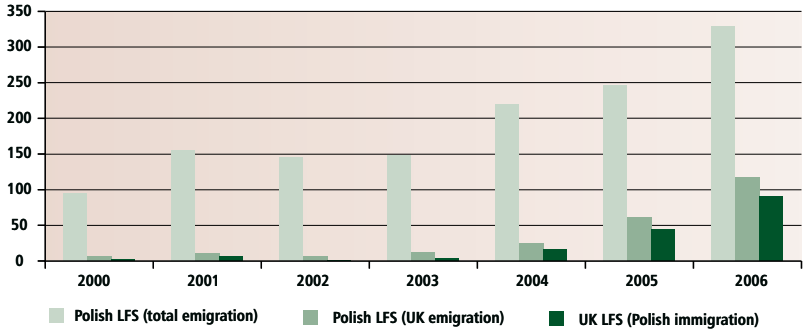


Figure 5
Steady-state unemployment, employment, activity and emigration rate

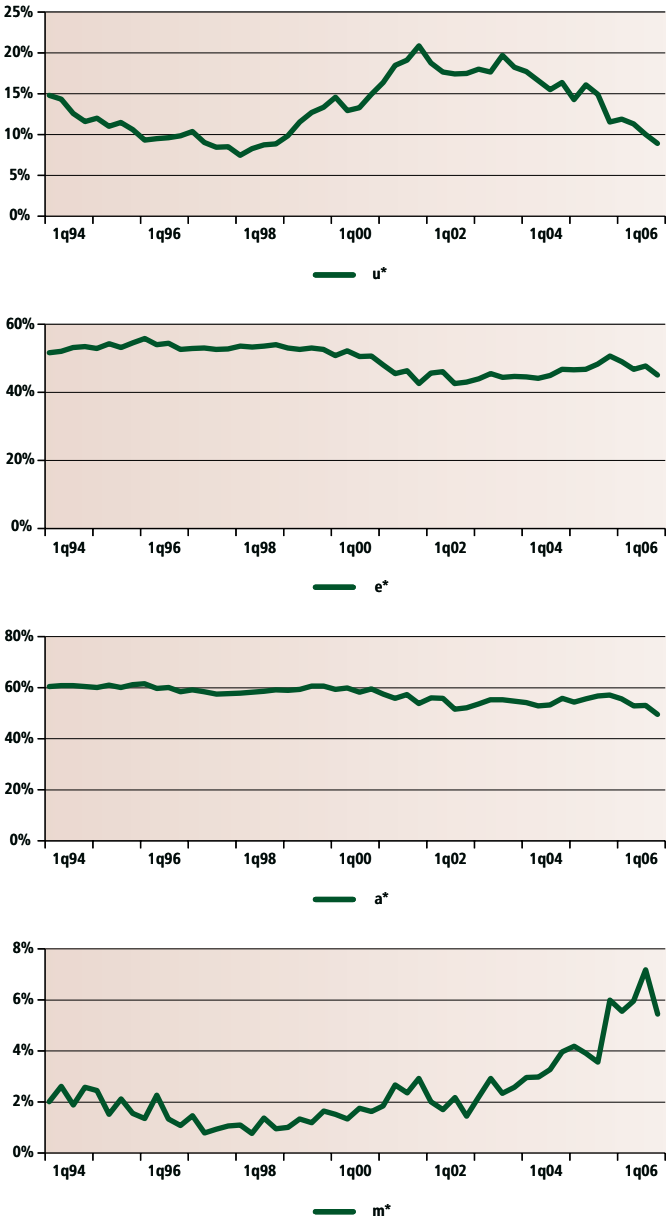
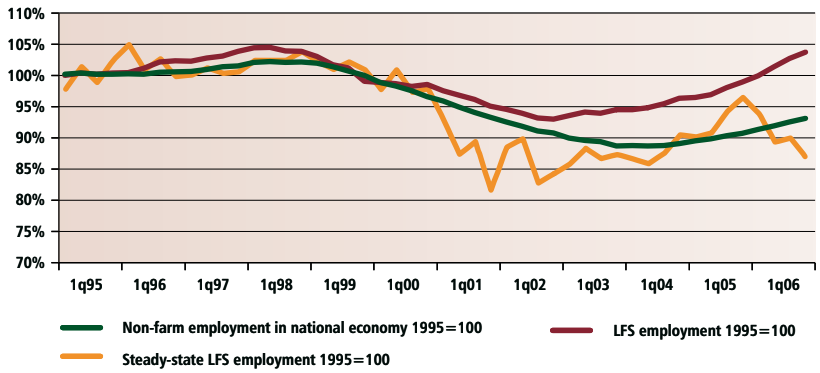


Figure 6
Employment according to the LFS and steady-state employment (with explicit treatment of migration)



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