Interlinkages of the Czech Regional Labour Markets

*Vít POŠTA**

Abstract

The key issue of the structural policy are the specifics of the respective regions which comprise the whole economy. This paper focuses on the possible interlinkages of the regional labour markets of the Czech economy. The analysis rests on the key variables of the search model, which are probability of finding a job, separation rate and labour market tightness. The possible interlinkages are detected via multivariate GARCH models between the particular regional labour market and the whole economy. The results show that by no means can it be expected that there are any stable links between the markets. The interlinkages are many times absent at all and also significant asymmetry with respect to the variable in question arises. The results point to significant structural specificities of the respective regional labour market.

Keywords: *multivariate GARCH, probability of finding a job, regional analysis, search model, separation rate*

JEL Classification: E32, J63, J64

Introduction

With the growing availability of the data and methods, more and more focus is placed on the regional specifics of the economies. The reason is that the estimates of various economic relationships on the level of the whole economies may indeed say very little regarding their regions. Evaluating the differences between the respective regions of an economy is a necessary step towards an efficient structural policy.

This paper focuses on the regional aspects of labour markets in the case of the Czech economy. Unlike some papers referred to further below, it makes use of a tool which is not typically employed in the context of labour market analysis –

* Vít POŠTA, Czech Technical University in Prague, School of Business and Interdisciplinary Studies, Kolejní 2637/2a, 160 00 Prague, Czech Republic; e-mail: vit.posta@cvut.cz

multivariate GARCH (Generalized autoregressive conditional heteroskedasticity) model. The reason for this is that the analysis presented in this paper makes use of monthly data, which in turn makes it possible to uncover possible linkages between the regional labour markets in this way.

Departing from the search model of the labour market detailed by Pissarides (2000), the characteristics of the labour markets will be captured by three variables: probability of finding a job, labour market tightness and separation rate.

Probability of finding a job is defined as the ratio of the number of newly employed and the number of unemployed. Labour market tightness is set by the ratio of the number of vacancies and the number of unemployed. Finally, the separation rate is given by the ratio of the number of newly lost jobs relative to the labour force.

From the point of view of the search model of the labour market, the relationship between the probability of finding a job and the labour market tightness constitutes the so-called matching function.

The hypothesis is such that increasing labour market tightness, the number of vacancies relative to the unemployed, should translate into an increasing probability of finding a job. Adding a relationship describing the dynamics of the unemployed, which also rests on the separation rate, leads to a function defining the stationary unemployment known as the Beveridge curve. The variables by which the regional labour markets are captured in this paper therefore represent the core of the search model.

However, the empirical analysis presented below has a much more technical nature in the sense that it is not focused on the estimation of either of the two mentioned functions: matching function or the Beveridge curve. I refer to some key findings regarding the matching function in the case of the Czech economy below, as far as the traditional work with the concept of the Beveridge curve is concerned, I refer to Pissarides (2009) who argues that the typical analysis resting on the Beveridge curve with the aim of disentangling structural and cyclical unemployment is flawed.

The aim of the empirical analysis with respect to the variables introduced above is to detect possible relationships between the evolution of the probability of finding a job, the labour market tightness and the separation rate on the level of the Czech economy and on the level of its respective regions.

The paper is structured as follows: the first part gives an overview of the key findings which should be taken into account regarding the results presented later, the second part introduces the econometrical model and the data, the third part presents the results, which are summed up in the conclusion.

1. Overview of the Key Results

As far as the Czech economy and the investigation of the matching process in the labour market are concerned, Galuščák and Munich (2007) use regional data with the aim to make a panel estimation, which might be explained by the relatively short series they had to use, with the most interesting of their results being the procyclicality of the sensitivity of the number of newly employed to the stock of unemployed and the inflow of unemployed.

Panel data is used also by Pedraza (2008) who focuses on the examination of the efficiency of the matching process with respect to other variables. He finds that the matching efficiency is positively influenced by the level of education of the labour force.

Most recent and relevant paper by Němec (2015) also makes use of the MLSA (Ministry of Labour and Social Affairs of the Czech Republic) data, however, as in the case of the already mentioned studies, he resorts to panel analysis. He finds that the matching efficiency is negatively influenced by the number of the unemployed of 50 years and older and by the number of the long--term unemployed.

Some very important results are presented by Arpaia, Kiss and Turrini (2014) although their focus is put on the whole economy. They argue that the key drivers of the matching efficiency are the duration of unemployment and sectoral and skill mismatch. In the case of the Czech economy they conclude that there is a rising trend of the matching efficiency based on a declining trend of the skill mismatch throughout the sample and declining regional mismatch since 2008. Sectoral mismatch increased temporarily with the onset of the recession which began in 2008 and then between the years 2012 and 2013.

Moving on to the regional context, Burda and Profit (1996) point to the key role of labour mobility. They detected external effects of both vacancies and unemployed on the local labour markets. After a more detailed estimates they find out that a positive external effect of the unemployed on the local conditions is present when considering nearby or, on the other hand, far away districts, while a negative external effect is detected at intermediate distances. In the case of vacancies the effects are generally weaker, more specifically, a positive external effect was detected at intermediate distances.

The labour migration within the Czech economy is examined by Fidrmuc and Huber (2007). They find that generally the migration is low and it is especially influenced by two factors: ownership of a family house, which significantly reduces the willingness to migrate, and income. The conditions of the regional labour markets per se do not have much influence on the willingness to migrate.

Jurajda and Terrell (2009) examine the reasons behind the variance in regional unemployment rates in the Czech economy, which also relates to internal migration. They discover that the migration of high-end labour force contribute significantly to the divergence of regional unemployment and wage rates as well. In other words, one part of the internal migration is related to high-end labour force moving to regions with already higher capital endowments and higher level of education of the labour force.

Moving further on to the European level, Marelli, Patuelli and Signorelli (2012) examine the reactions of the regions to the Great Recession. First they find that the reactions of the unemployment do not cluster solely on national base but also on regional base. Developing this point further, they show that before the Great Recession there was a reduction in between-country disparities rather than with-in-country disparities. According to their estimates the reaction of the regions to the Great Recession was dependent on spatial effects as well as long-term unemployment and sectoral specialization.

Looking at some findings from other European economies, in the case of Poland, Cizkowicz, Kowalczuk and Rzonca (2016) analyse the unemployment from the local perspective and find out that the large disparities between the regions regarding unemployment are due to demographics, and educational and sectoral employment composition of the regions. They go to show that in the regions with higher income per capita the unemployment does not depend on the share of relatively older working-age population while in the regions with low income per capita the unemployment is independent of the level of education of the labour force.

Antczak, Galecka-Burdziak and Pater (2016) examine the matching process from the local perspective. They discover that there are significant spatial effects, more precisely the number of unemployed has a negative external effect on the matching process in a given local labour market while the number of vacancies has a positive effect.

Kahanec and Mýtna Kureková (2016) analyse labour mobility in Slovakia with respect to foreign countries. They especially focus on the situation before and after the Great Recession and show that the profile of the migrants changed significantly. The profile changed in such a way that after the Great Recession the share of people migrating abroad for work with university education decreased and, on the other hand, the share of migrants in the position of breadwinner increased. Overall they conclude that the key determinants of migration are the conditions in the region of origin and the unemployment status.

In the case of Spain, Fonseca (2003) shows that changes in unemployment benefits between the regions and changes in the costs of posting vacancies may influence the flows of internal migration. This means that they also influence and partially explain the regional unemployment discrepancies.

Kosfeld (2006) confirms the role of spatial externalities in the local matching process in Germany. He shows that the matching process on the local level is related to the overall business cycle, but it is also true that the business cycle does not explain any significant portion of the local matching. He also points to a higher internal mobility in East Germany.

2. Econometrical Framework and Data

To evaluate the possible interlinkages between the regions and the whole economy, bivariate GARCH models will be used. The core idea behind this is to estimate the time-varying covariance terms in a bi-dimensional setting. The bivariate GARCH framework accompanied by the BEKK model for the variance--covariance matrix (see Engle and Kroner, 1995) is utilized in this analysis. The mean and variance equations take the form:

$$\boldsymbol{x}_{t+1} = \mu + \boldsymbol{B}_1 \boldsymbol{x}_t + \boldsymbol{B}_2 \boldsymbol{x}_{t-1} + \boldsymbol{B}_3 \boldsymbol{x}_{t-2} + \boldsymbol{\varepsilon}_{t+1} \tag{1}$$

$$\boldsymbol{\varepsilon}_{t+1} \,/\, \boldsymbol{I}_t \sim \mathrm{N}\left(0, \boldsymbol{H}_{t+1}\right) \tag{2}$$

$$\boldsymbol{H}_{t+1} = \Omega'\Omega + \gamma'\boldsymbol{\varepsilon}_t\boldsymbol{\varepsilon}_t'\gamma + \delta'\boldsymbol{H}_t\delta + \theta'\boldsymbol{H}_{t-1}\theta \tag{3}$$

where

- **x** – a vector of endogenous variables,
- **μ** – a vector of constants,
- **B** – a diagonal matrix,
- **ε** – a vector of residuals which follow the bi-dimensional normal distribution with time-variant variance-covariance matrix **H**,
- **Ω** – a diagonal matrix containing elements ω,
- **Γ** – a diagonal matrix containing elements γ,
- **Δ** – a diagonal matrix containing elements δ, and
- **Θ** – a diagonal matrix containing elements θ.

The formulation given above assumes autoregression in equation (1) of order 3 and autoregression in equation (3) of order 2. This is based on the actual estimates presented further below. Thus the formulation of the bivariate GARCH model fully corresponds with the presentation of the results.

Vector **x** includes two economic variables in each estimate: one for the whole economy and then its counterpart for the region in question.

Theoretically, it might be possible to assume a multivariate GARCH for all the regions at once. Practically, such a representation would not be feasible because the multivariate GARCH models assume estimation of a large number of coefficients as it is obvious from the presentation of the bivariate GARCH model.

As a preliminary step, individual GARCH models for all the series were estimated to verify the presents of ARCH/GARCH effects. The estimates of this preliminary part are not presented in the paper because they themselves do not present any interesting results. The presence of ARCH/GARCH effects may be clearly deduced from the presentation of the bivariate GARCH models below. The estimation was carried out in Eviews.

The statistical model is applied for all the NUTS (nomenclature of units for territorial statistics) regions of the Czech Republic: Prague (PRA), Středočeský region (STR), Jihočeský region (JIH), Plzeňský region (PLZ), Karlovarský region (KAR), Ústecký region (UST), Liberecký region (LIB), Královéhradecký region (KRA), Pardubický region (PAR), region Vysočina (VYS), Jihomoravský region (JIM), Olomoucký region (OLO), Zlínský region (ZLI), Moravskoslezský region (MOR).

Monthly data collected by the Ministry of Labour and Social Affairs (MLSA) of the CR are employed to make the estimations. The labour force series, which is not published by MLSA at monthly frequency, is not needed to compute probability of finding a job (*pfj*) and labour market tightness (*lmt*). However, it is indispensable for the computation of the separation rate (*sr*).

The labour force data used for this come from the Labour Force Survey statistics carried out by the Czech Statistical Office. While they are available at the required regional level, they come as quarterly data. I assume that during the months in a given quarter the labour force did not change. This way the monthly series of the labour force are obtained. While this is acceptable for the computations of the ratios, specifically a ratio of newly registered at the Labour Office in the given month and labour force, it would not make sense to use such series to capture changes in the labour force at the monthly frequency.

Probability of finding a job is computed as a ratio of newly placed candidates in the given month and the number of registered candidates in the same period. Labour market tightness is computed as a ratio of vacancies and the number of registered candidates.

Tables 1A and 1B present the key statistical features of the data. Three series are needed for each region: separation rate, labour market tightness and probability of finding a job. The sample runs from 2000 up to 2015. The end was limited by the availability of the Labour Force Survey data from which the data on labour force was retreived and not by the availability of the MLSA data.

While it is not the goal of this section to analyse the data from the economic perspective, of course, the information included in Tables 1A and 1B draws an informative picture of the state of the labour markets in the respective regions.

T a b l e 1A

Statistical Properties of the Data

Region	Variable	Mean	St. deviation	Jarque-Bera	ADF level	ADF 1st diff.
PRA	*sr*	0.006	0.001	6.719**	–2.54	–4.94***
PRA	*lmt*	0.491	0.408	182.103***	–2.49	–4.35***
PRA	*pfj*	0.082	0.020	30.013***	–1.66	–18.45***
STR	*sr*	0.009	0.001	1.781	–2.34	–4.81***
STR	*lmt*	0.221	0.165	96.546***	–1.79	–3.507***
STR	*pfj*	0.088	0.018	40.489***	–2.45	–17.19***
JIH	*sr*	0.010	0.001	25.048***	–2.25	–4.83***
JIH	*lmt*	0.195	0.131	63.534***	–0.51	–2.89**
JIH	*pfj*	0.109	0.022	20.842***	–1.96	–13.96***
PLZ	*sr*	0.010	0.001	131.729***	–2.51	–5.75***
PLZ	*lmt*	0.284	0.252	128.708***	–2.14	–3.15**
PLZ	*pfj*	0.092	0.017	21.156***	–1.38	–13.45***
KAR	*sr*	0.011	0.001	211.975***	–2.05	–5.64***
KAR	*lmt*	0.120	0.075	64.879***	–1.40	–2.91**
KAR	*pfj*	0.070	0.016	5.259*	–2.23	–14.14***
UST	*sr*	0.014	0.001	8.785**	–2.16	–6.01***
UST	*lmt*	0.063	0.039	77.338***	–0.77	–2.80*
UST	*pfj*	0.058	0.011	14.641***	–2.05	–18.99***
LIB	*sr*	0.011	0.001	192.745***	–2.46	–5.39***
LIB	*lmt*	0.165	0.092	20.674***	–1.58	–3.62***
LIB	*pfj*	0.084	0.019	4.401	–2.29	–13.42***

Notes: Sample: 2000 – 2016, monthly data. Variables: separation rate (*sr*), labour market tightness (*lmt*), probability of finding a job (*pfj*). Jarque-Bera statistic under the null of normal distribution. ADF: augmented Dickey-Fuller statistic under the null of unit root. *, **, *** means rejection of the null at 10%, 5%, 1% level of statistical significance, respectively.
Source: Own estimates.

T a b l e 1B

Statistical Properties of the Data

Region	Variable	Mean	St. deviation	Jarque-Bera	ADF level	ADF 1st diff.
KRA	*sr*	0.010	0.001	88.403***	–2.46	–5.26***
KRA	*lmt*	0.184	0.123	37.977***	–1.47	–2.94**
KRA	*pfj*	0.095	0.021	12.389***	–1.88	–15.62***
PAR	*sr*	0.011	0.001	12.677***	–2.49	–4.97***
PAR	*lmt*	0.220	0.188	93.471***	–1.64	–2.73*
PAR	*pfj*	0.094	0.019	11.612***	–2.36	–16.11***
VYS	*sr*	0.010	0.001	123.934***	–2.36	–5.26***
VYS	*lmt*	0.132	0.095	36.263***	–1.64	–2.87**
VYS	*pfj*	0.092	0.019	16.406***	–2.37	–16.95***
JIM	*sr*	0.010	0.001	22.377***	–2.27	–5.34***
JIM	*lmt*	0.113	0.091	126.076***	–1.72	–3.52***
JIM	*pfj*	0.075	0.012	14.944***	–2.48	–17.30***
OLO	*sr*	0.012	0.002	66.033***	–2.11	–5.61***
OLO	*lmt*	0.103	0.072	39.609***	–2.09	–3.25**
OLO	*pfj*	0.075	0.014	13.813***	–1.96	–14.11***
ZLI	*sr*	0.010	0.001	107.076***	–2.38	–5.06***
ZLI	*lmt*	0.128	0.108	63.247***	–1.87	–3.25**
ZLI	*pfj*	0.079	0.015	8.242**	–2.48	–17.16***
MOR	*sr*	0.012	0.001	15.557***	–2.50	–5.98***
MOR	*lmt*	0.071	0.058	70.270***	–1.91	–3.13**
MOR	*pfj*	0.058	0.011	9.379***	–2.50	–15.37***
CZE	*sr*	0.010	0.001	35.220***	–2.39	–5.44***
CZE	*lmt*	0.150	0.108	88.471***	–1.40	–3.49***
CZE	*pfj*	0.076	0.013	46.578***	–2.54	–3.73***

Notes: Sample: 2000 – 2016, monthly data. Variables: separation rate (*sr*), labour market tightness (*lmt*), probability of finding a job (*pfj*). Jarque-Bera statistic under the null of normal distribution. ADF: augmented Dickey-Fuller statistic under the null of unit root. *, **, *** means rejection of the null at 10%, 5%, 1% level of statistical significance, respectively.
Source: Own estimates.

The mean of the separation rates is relativelly higher in the Ústecký, Olomoucký and Moravskoslezský regions. The mean of the probability of finding a job falls below 6% only in Ústecký and Moravskoslezský region. In the Czech Republic as a whole the labour market tightness fluctuated, with the exception of the crisis years, around 10%. It was generally higher in Moravskoslezský region and significantly lower in Ústecký region, Královéhradecký region, Jihomoravský region, Vysočina and Olomoucký region. The data were found nonstationary at their levels but stationary at their first differences.

3. Results

The estimates given in Tables 2 and 3 reveal that interlinkages between the movements in the labour market variables on the level of the whole economy and regions were detected only in the cases of probability of finding a job, Table 2, and, especially, separation rate, Table 3.

T a b l e 2

Multivariate GARCH Estimates for Probability of Finding a Job

	PRA	**UST**
obs.	203	203
μ_1	0.000***	0.001***
β_1	2.168***	2.130***
β_2	–1.746***	–1.726***
β_3	0.510***	0.578***
μ_2	0.000***	0.000
β_4	2.150***	2.192***
β_5	–1.710***	–1.812***
β_6	0.506***	0.590***
ω_1	0.000	0.000
ω_2	0.000	0.000
γ_{11}	0.455***	0.391***
γ_{22}	0.442***	0.386***
δ_{11}	0.673***	0.735***
δ_{22}	0.667*	0.738*
θ_{11}	0.585**	0.564*
θ_{22}	0.618*	0.563*
log l	2 840.895	2 878.578
Remaining autocorrelation		
lag(1)	1.153	2.475
lag(2)	3.906	6.532
lag(3)	7.365	14.366
Remaining ARCH		
lag(1)	0.001	0.213
lag(2)	0.033	0.521
lag(3)	1.370	0.817

Notes: Sample: 2000 – 2016, monthly data. Coefficients correspond to their description given above. Evaluation of the null of the coefficient being zero is given with the estimates. Log l stands for the log likelihood function. Remaining autocorrelation presents Ljung-Box statistics under the null of no autocorrelation in residuals for the first 3 lags. Remaining ARCH presents Q statistics under the null of no ARCH in residuals for the first 3 lags. *, **, *** means rejection of the null at 10%, 5%, 1% level of statistical significance, respectively.
Source: Own estimates.

T a b l e 3

Multivariate GARCH Estimates for Separation Rate

	JIH	PLZ	KAR	LIB	PAR	OLO	ZLI
obs.	191	191	191	191	191	191	191
μ_1	0.000**	0.000**	0.000*	0.000	0.000***	0.000***	0.000
β_1	1.956***	1.900***	1.876***	1.896***	1.959***	1.942***	2.009***
β_2	–1.428***	–1.278***	–1.283***	–1.310***	–1.445***	–1.373***	–1.440***
β_3	0.384***	0.271***	0.298***	0.303***	0.394***	0.326***	0.340**
μ_2	0.000***	0.000**	0.000***	0.000***	0.000***	0.000**	0.000
β_4	1.878***	1.858***	1.900***	1.913***	1.915***	1.918***	1.928***
β_5	–1.268***	–1.237***	–1.314***	–1.324***	–1.340***	–1.328***	–1.329***
β_6	0.295***	0.255***	0.297***	0.315***	0.316***	0.303***	0.298*
ω_1	0.000**	0.000*	0.000**	0.000	0.000	0.000	0.000*
ω_2	0.000**	0.000**	0.000**	0.000**	0.000*	0.000	0.000**
γ_{11}	0.868***	0.593***	0.748***	0.708***	0.868***	0.562***	0.645***
γ_{22}	0.775***	0.718***	0.873***	0.851***	0.858***	0.545***	0.859***
δ_{11}	0.647***	0.826***	0.701***	0.794***	0.696***	0.875***	0.609*
δ_{22}	0.687***	0.731***	0.593***	0.702***	0.702***	0.870***	0.501*
θ_{11}	0.001	0.001	0.001	0.001	0.001	0.001	0.001*
θ_{22}	0.001*	0.001	0.000*	0.001	0.001*	0.001	0.001*
log l	3 458.090	3 429.144	3 365.079	3 448.625	3 458.067	3 431.401	3 329.958
Remaining autocorrelation							
lag(1)	6.640	6.464	9.723	1.413	5.449	6.069	1.118
lag(2)	12.192	12.840	13.857	13.192	9.778	12.283	8.265
lag(3)	17.952	19.940	19.854	17.843	17.532	18.064	16.711
Remaining ARCH							
lag(1)	0.019	0.575	0.334	0.113	1.105	0.146	0.880
lag(2)	1.175	0.584	0.348	0.135	1.273	0.163	1.145
lag(3)	2.887	2.040	1.856	0.806	5.467	0.212	1.611

Notes: Sample: 2000 – 2016, monthly data. Coefficients correspond to their description given above. Evaluation of the null of the coefficient being zero is given with the estimates. Remaining autocorrelation presents Ljung-Box statistics under the null of no autocorrelation in residuals for the first 3 lags. Remaining ARCH presents Q statistics under the null of no ARCH in residuals for the first 3 lags. *, **, *** means rejection of the null at 10%, 5%, 1% level of statistical significance, respectively.

Source: Own estimates.

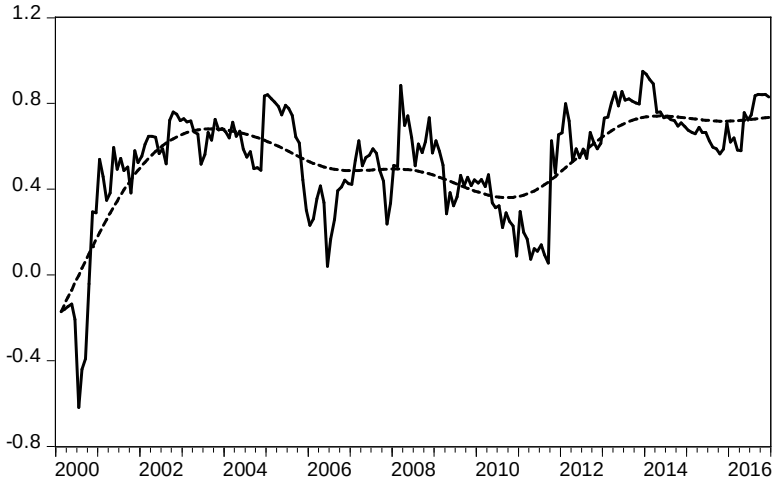
Tables 2 and 3 present only relevant estimates in the sense that statistically invalid results are not included. The key question to resolve in the set-up of the bivariate GARCH models was related to autocorrelation in the residuals. As it was already indicated above, three lags of autoregression were needed in equation (1) and two in equation (3), although, as far as the latter is concerned, the second lag gained significantly lower statistical significance. However, the second lag in equation (3) was needed for the models to converge. Despite the autoregression, in many cases a highly significant autocorrelation in the residuals remained. These models were, of course, considered invalid and are not presented in the tables. In both estimations, Tables 2 and 3, the intercepts in the mean and variance equations are zero and many times statistically insignificant. This fact has no economic interpretation.

Only in the cases of Praha and Ústecký region were estimated statistically relevant GARCH models, which served to extract the time-varying correlation

between the two variables. Figures 1 and 2 show these time-varying correlations, indicating that the interdependence between the whole economy and Ústecký region, as far as probability of finding a job is concerned, is higher than in the case of the Czech economy and Praha.

F i g u r e 1

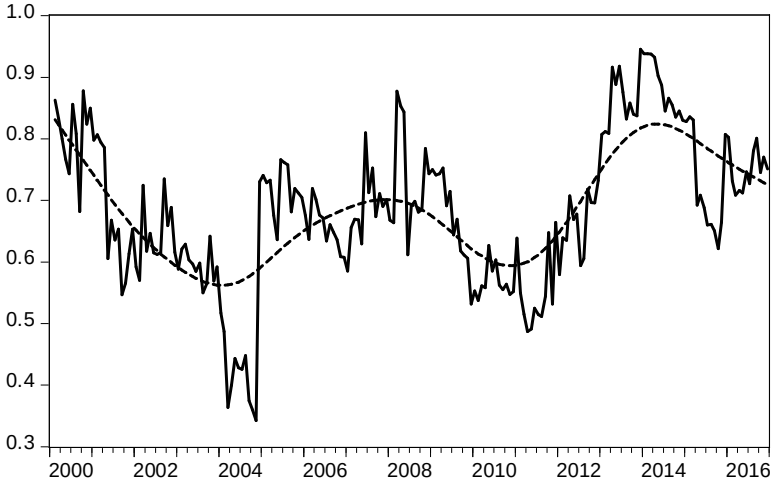
Estimate of Time-varying Correlation of Probability of Finding a Job and Prague Region (Hodrick-Prescott trend depicted by the dashed line)



Source: Own estimates.

F i g u r e 2

Estimate of Time-varying Correlation of Probability of Finding a Job and Ústecký Region (Hodrick-Prescott trend depicted by the dashed line)



Source: Own estimates.

It is also worth noting that, given the Hodrick-Prescott time-varying trend of the estimated covariance terms (Hodrick-Prescott filter obtaines time-varying trend of a time series by minimizing an objective function composed of the cyclical component and the variability of the trend component. The weight of the variability of the trend component in the objective function translates directly into the variability of the estimated trend component of the time series.), in both cases the interdependence increased around the year 2012, where a new recession in the Czech economy started and which hit the labour market especially hard (harder than the recession directly connected with the world financial crisis). In the case of Ústecký region the interdependence increased also in the years of expansion, i.e. 2006 and 2007.

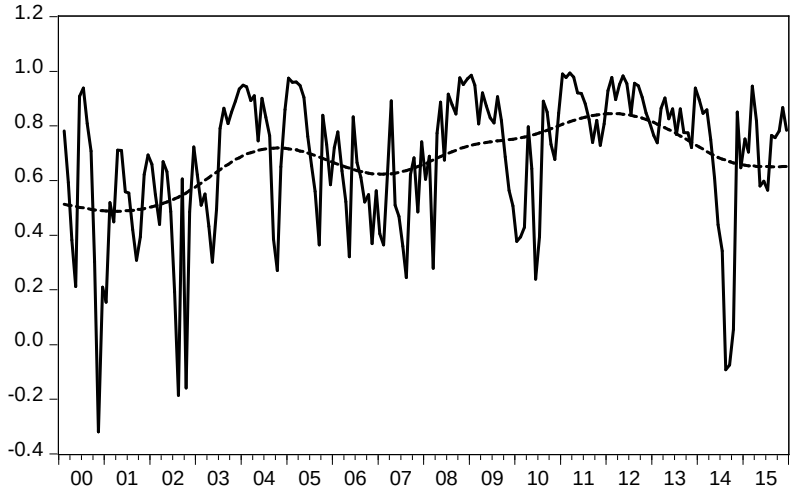
Looking at Table 3, it is obvious that from the point of view of separation rate there are much more interrelations between the economy as a whole and some regions and possibly between the regions.

Looking at Figures 3 – 9 the interdependence is the strongest in case of Olomoucký region and the weakest in case of Zlínský region, however, still statistically significant and present.

The evolution of the interdependence is not so clear as in the two cases of probability of finding a job, but in most cases an increase may be observed around the two recessions of the Czech economy, which took place over the analysed course of time.

F i g u r e 3

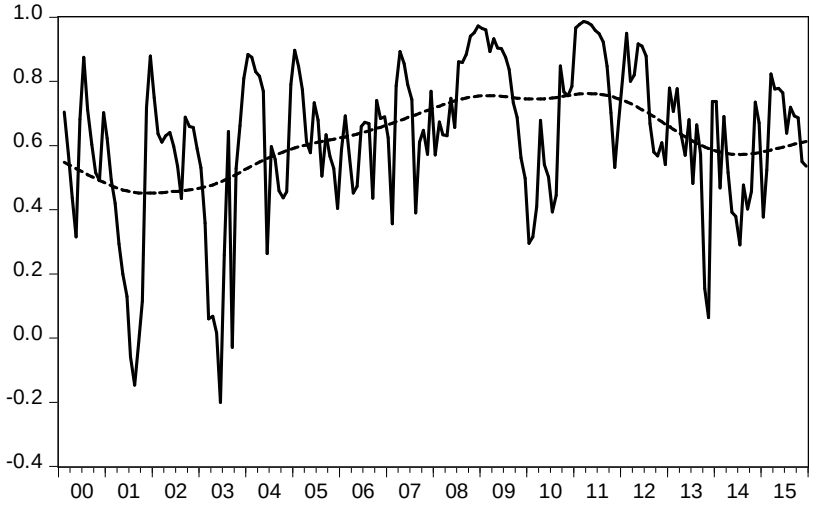
Estimate of Time-varying Correlation of Separation Rate and Jihočeský Region
(Hodrick-Prescott trend depicted by the dashed line)



Source: Own estimates.

F i g u r e 4

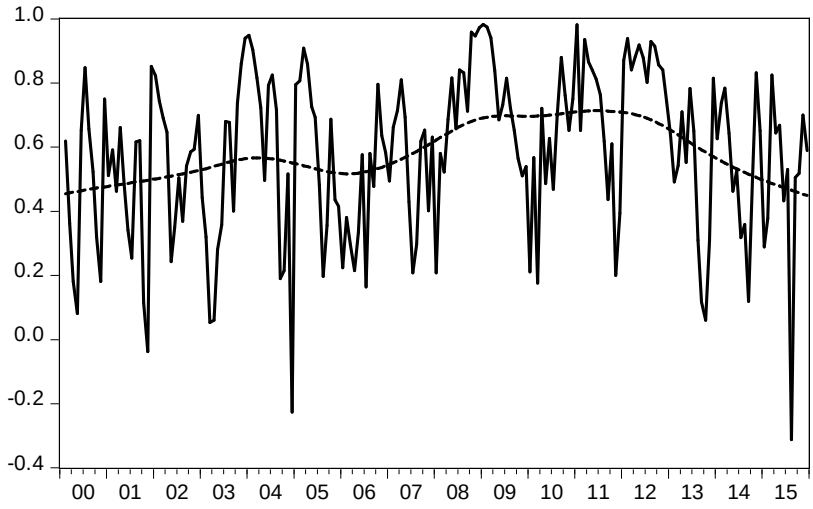
Estimate of Time-varying Correlation of Separation Rate and Plzeňský Region
(Hodrick-Prescott trend depicted by the dashed line



Source: Own estimates.

F i g u r e 5

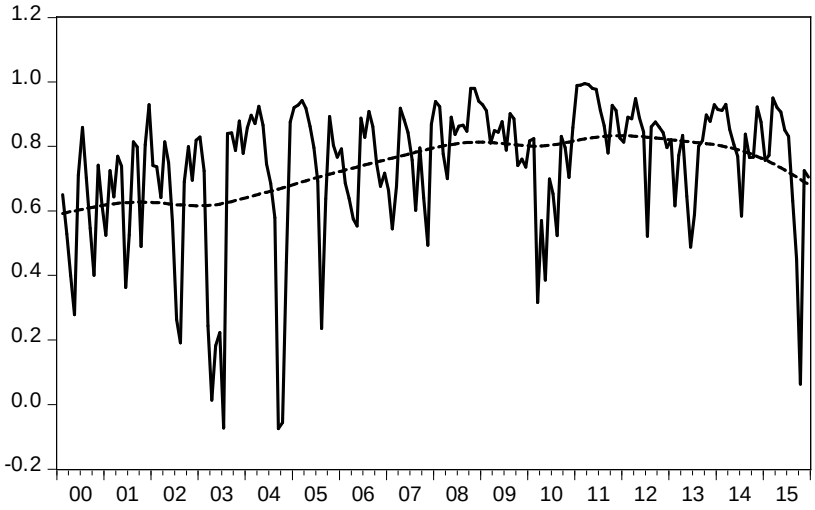
Estimate of Time-varying Correlation of Separation Rate and Karlovarský Region
(Hodrick-Prescott trend depicted by the dashed line)



Source: Own estimates.

F i g u r e 6

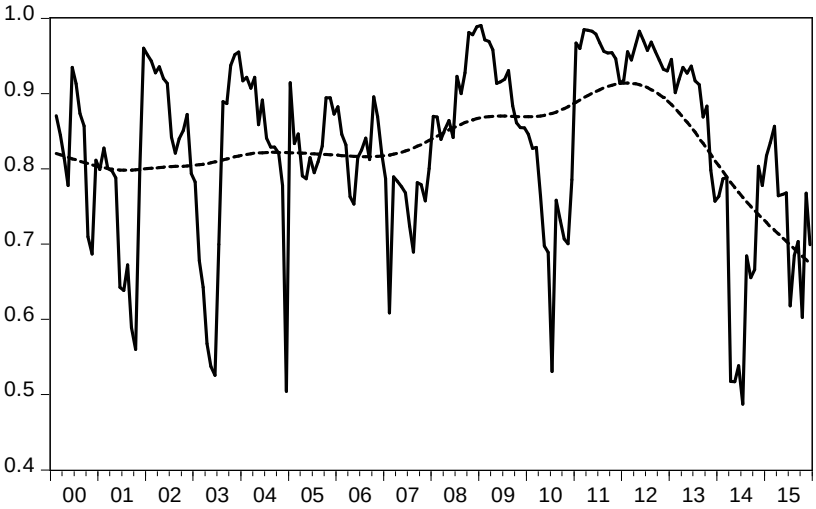
Estimate of Time-varying Correlation of Separation Rate and Liberecký Region (Hodrick-Prescott trend depicted by the dashed line)



Source: Own estimates.

F i g u r e 7

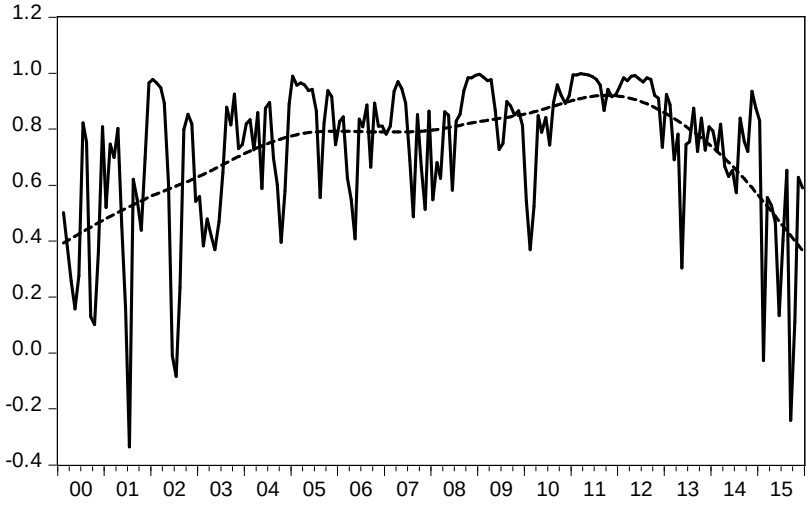
Estimate of Time-varying Correlation of Separation Rate and Pardubický Region (Hodrick-Prescott trend depicted by the dashed line)



Source: Own estimates.

F i g u r e 8

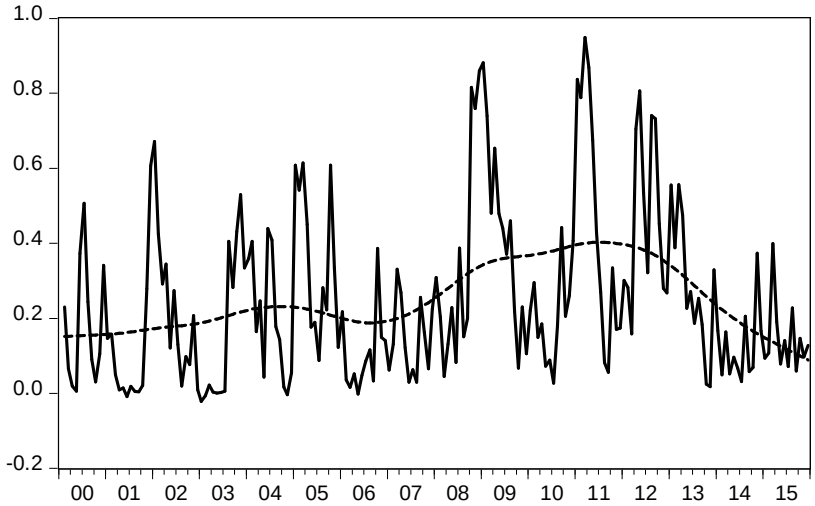
Estimate of Time-varying Correlation of Separation Rate and Olomoucký Region
(Hodrick-Prescott trend depicted by the dashed line)



Source: Own estimates.

F i g u r e 9

Estimate of Time-varying Correlation of Separation Rate and Zlínský Region
(Hodrick-Prescott trend depicted by the dashed line)



Source: Own estimates.

With the exceptions of Olomoucký region and Zlínský region, Figures 8 and 9, the trends of the estimated time-varying correlations lie typically between 0,4 – 0,8 with observable decline towards the end of the sample.

The intensification of the interrelationships between the regional labour markets and the whole economy during the periods of strong increases or declines of economic performance are attributable to strong cyclical spillovers in the economy. The estimates, however, indicate that when the economy comes closer to its potential level, and it does not matter whether from above or from below, and the overwhelming cyclical effects disappear, the persisting structural differences among the regional labour markets kick in and their evolutions become much less interconnected. The exact relationship between economic cycle and time-varying correlations among the regional labour markets will, however, be fully testable when more data on the economy during economic cycle will be at hand. It is necessary to point out that the crisis which covers a good part of the sample is, for good reasons, considered a rather exceptional one. This means that although the sample is long enough to carry out this type of technical analysis, from the point of view of a more economical analysis it is rather biased due to the presence of the years of the exceptionally strong crisis.

Conclusions

This rather purely statistical analysis revealed that significant interactions between the whole economy and its regions and between these regions themselves should be expected as far as separation rate is concerned and to a much lesser extent in case of probability of finding a job. No statistically relevant results were obtained when analysing the labour market tightness of the Czech economy and that of the particular regions.

The interdependence captured by time-varying correlation shows that by no means should the relationships be expected stable over time. Most of the relevant estimates show that the interdependencies intensified during the two recessions through which the Czech economy passed given the sample in question. In this respect, the results show that after these turning points in many regions the relationships tend to decline.

The separation rate is a key variable behind the determination of the evolution of the unemployment rate. On the other hand, unemployment is of course equally determined by the probability of finding a job, which, however, did not show much potential for existing interdependencies between the economy as a whole and its regions. This goes to say that it cannot be deduced that in about half of the sample, one might expect a strong relation between the development

of the unemployment rate on the level of the economy, on one hand, and on the level of the regions, on the other one.

As far as the development of employment is concerned, the relations must be even weaker given the weak estimates in the case of probability of finding a job.

From the technical point of view the results of the paper are impossible to compare with results of other papers because GARCH models were not used to analyse interlinkages among regional labour markets, which was partly due to short data series.

From the point of view of economic policy the results show that the regions are marked by various specific problems stemming from their industrial specialization and also quality of the labour force. It does not seem probable that in such an environment much might be achieved by policy oriented especially on the cost of labour, taxes and social benefits. More varied, region-focused structural policy is what is needed.

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