# The Beveridge Curve and the Matching Function: Indicators of Normalization in the Latvian Labour Market[1]

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**Abstract**

The extent to which stability or "normalization" has prevailed in the Latvian labour market is assessed. By introducing the concept of the Beveridge curve to Latvian data it is shown that the Latvian economy during the Russian crisis responded textbook-wise. Estimation of a matching function yields a robust result displaying a secular increase in matching efficiency, which is interpreted as one piece of normalization: In Soviet times matching was largely characterized by assignment of jobs, whereas in the market economy matching is related to search. The former regime was not immediately substituted by the latter. The interim period, transition, has seen a gradual movement towards a market economy labour market. The data reveals increased efficiency of that emerged search process. This is evidence of normalization of the Latvian labour market.

Keywords: Transition, Beveridge curve, Phillips curve, Matching Function
*JEL* Classification: P20, J64, J41, J44

## 1. Introduction[4]

Anyone who has worked with transition economies will have realized the problems of finding stable macroeconomic relationships and often of obtaining data to estimate such relationships. Both of these issues are at the core of this paper.

The transition of Latvia from a planned economy, politically and economically deeply integrated into the Soviet Union, to an independent country and a market economy has now lasted for more than ten years.

A question which the authors find of serious importance is to which extent the Latvian economy has "normalized", i.e. to which extent certain macroeconomic relationships have become stable. No general definition is offered, neither of normalization nor of how to test for it. But the paper leads to several specific pieces of evidence of normalization as well as one test; the result of which may be taken as an indicator of normalization.

We have chosen to look at the labour market since it is – and certainly should be - of major interest to Latvian policy makers (The Long Term Strategy for Latvia, Ministry of Economy

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(2001) addresses unemployment – but far from all aspects of it). Whereas even official unemployment rates remain stubbornly high (at 7-8%), unemployment rates from the biannual labour force surveys seem approximately twice as high. This, together with severe regional disparities, creates enormous problems for the Latvian economy. Whereas high unemployment implies a big loss of output, the regional disparities cause problems of severe poverty (see e.g. the World Bank study on poverty assessment (2000), the Macroeconomic Portrait of Latvia's Regions (2001) and the study on Living Conditions in Latvia (2001) from the Central Statistical Bureau). Latvia is, with 29% of the EU average GDP per capita at PPP, the poorest of the three Baltic countries (see e.g. the European Commission's Strategy paper (2001)). The regional disparities are underlined by the fact that of the approximately 20 regions in the Baltics, Riga is the 2nd richest (at 37% of the EU average) whereas Latvia also occupies no less than the last three spots. The poorest region in the Baltics, Latgale, in Latvia's far east stands at a mere 16% of the EU average – and also displays, by far, the country's biggest unemployment rate (see section 3). It is also far from clear, which are the main factors behind unemployment here. One may guess at severe structural unemployment and casual observation of data may suggest this to be true. Much needs to be done, however (see e.g. the survey of very interesting labour market issues by the IMF (2001)).

The World Bank and the European Bank for Reconstruction and Development often attempt (see e.g. the latter's transition reports) to assess the degree of normalization via transition indicators. This paper aims at going deeper. Using an analysis of the macroeconomic effects of the impact of the Russian crisis of 1998 on the Latvian economy as a starting point we provide information on three different layers of depth of a normalization.

First, "at the surface" we describe how the Latvian economy responded to the Russian crisis. Second, a bit deeper, we look specifically at the Beveridge curve for Latvia in order to assess whether this relationship has any meaningful interpretation here. Third, we estimate a matching function for Latvia and find some encouraging results. Besides providing information at the aggregate level, we also shed light on the impact at the regional level and among fields of occupation. The latter, as well as point 2 and 3, have, as far as we know, never been done for Latvia. In addition, we would like to stress that some of the data used has never been published before, indeed, some of it needed to be constructed from raw data.

The paper is arranged as follows: Section 2 discusses the Russian financial crisis of 1998 and its impact on the Latvian economy. Section 3 introduces the matching function concept and the related Beveridge curve. The latter and how it looked for Latvia before, during and after the Russian crisis is presented in section 3.1 at the aggregate level as well as for regions and selected occupations in section 3.2. Section 4 returns to the matching function with additional concepts related to this as well as specification and estimation. Section 5 summarizes and suggests some directions for future research.

## 2. A short overview of the Russian financial crisis of 1998 and its macroeconomic impact on Latvia

This section "scratches the surface" and shows that data at the most aggregate level responded as could be expected to the Russian financial crisis.

On August 17 1998 Russia devalued the rouble, defaulted on treasury bills (GKO) and on interest payments to several Paris Club creditors. A more detailed description of the crisis may be found in Pancs and Trapeznikova (2000). Within a year the rouble price of Latvian lats (LVL) had risen more than four-fold (see Figure 1), a massive devaluation by any standards.

The devaluation also led to a vehement but predictable impact on Latvian exports to Russia[5]. In fact, the Russian crisis may be said to have heralded the end of Russia as Latvia's most important trading partner. Whereas Latvian exports to Russia accounted for 21% of total exports in 1997, this figure had declined to only 7% in 1999 and 4.2% in 2001 (see e.g. Macroeconomic Indicators from the Central Statistical Bureau of Latvia). In fact, Russia is now only the 6th most important destination for Latvian exports after Germany, United Kingdom, Sweden, Lithuania and Denmark, a remarkable reorientation of exports towards Western Europe. And fast: As Figure 2 shows the significant decline in Russia's share of exports from Latvia produces only a glitch in total exports. Within approximately 18 months the level of exports had recovered to its pre-crisis level.

Figure 3 provides year on year growth rates of Latvian real GDP, based on quarterly data[6]. As it may be seen Latvia enjoyed very high growth rates throughout 1997 and into 1998. Why 2nd quarter growth is substantially lower than 1st quarter growth is not immediately apparent whereas the slowdown in growth in the 3rd quarter of 1998 may be attributed to the effects of the Russian crisis. The 4th quarter of 1998 and the two first quarters of 1999 see negative growth, then positive growth resumes. From 2000 growth rates are again high, albeit slightly more subdued than in 1997. Later in 2000 the growth rates are again sizeable, suggesting that the effects of the Russian crisis are essentially over.

The GDP development seems to suggest at least two things: 1) That the Latvian economy was enjoying very strong economic growth prior to the Russian crisis and 2) That the Russian crisis, although from an exchange rate and exports point of view seemingly very strong, was relatively easily overcome[7].

Figure 4 portrays the official unemployment rate (Macroeconomic Indicators, Central Statistical Bureau of Latvia). Having hovered around 6-7% from 1995 through second quarter of 1998 it increases 10 months in a row (starting from July 1998[8] and ending in April 1999). Hereafter unemployment slowly reverts; the following 20 months (until and including December 2000) sees unemployment rates decrease (or at least not increase). The unemployment rate has not fully returned to the pre-crisis level. The exact reasons for this are so far not explored.

From the unemployment development one may conclude the following: 1) Unemployment responded as should be expected to the Russian crisis. 2) The increase (from app. 7% to app. 10% within less than one year) was severe, reflecting, most likely, very well the severe drop in exports but it was not very long-lasting. 3) Seen together with the GDP development the Latvian economy is obviously enjoying strong productivity gains. Even at increasing unemployment (e.g. in early 1999) the economy was growing quite fast again.

[5] Personal experience of one of the authors may stress the vehemence of the situation. Virtually all trade into and from Russia stopped for more than two weeks. Several foreign transportation companies stopped their business in Latvia and Russia as a result of the crisis.

[6] This should provide a better picture of the GDP development. GDP development in Latvia is extremely seasonal with the first quarter often slipping by 5 – 10% compared with the previous 4th quarter.

[7] Though a bit besides the point of this paper it may nevertheless be pointed out that financial market effects were mild, too. Latvian interest rates certainly went up but at no point indicating serious devaluation risk. As with GDP growth, interest rates soon returned to pre-crisis levels. Neither did it, with one exception, however, lead to a serious banking crisis. And even the exception was sorted out in the end with a restructuring.

[8] Unemployment is much less seasonal than GDP but July typically sees slightly higher unemployment than August. The increase in unemployment in July may thus be attributed to seasonal factors whereas the increase in August and afterwards may be attributed to the effects of the Russian crisis.

## 3. Digging deeper: The Beveridge curve, the Phillips curve and the matching function

From the previous section we have that GDP and unemployment responded textbook-wise to the negative economic shock of the Russian crisis. This is not surprising given the very aggregate nature of these indicators. Of interest is, however, whether other key relationships have responded equivalently. This section attempts to dig a bit deeper by investigating briefly two relationships involving the unemployment rate, namely the Beveridge curve (which is the issue of major interest in this section) and the Phillips curve (which is not dealt with in major detail but is included, partly for reference, partly to suggest future research orientation and partly because of its links to the Beveridge curve.)

The Phillips curve has been the centrepiece of numerous theoretical developments (see e.g. Cross (1995) for an overview) as well as applied research, not least on the estimation of the NAIRU (see e.g Fabiani and Mestre (2000) and Gordon (1998) for estimations for the EU countries and for the US respectively, or Galbraith (1997) for a critical view on NAIRU). Some attempts have been made in Latvia to estimate Phillips curves (Bitans, Slakota and Tillers (2001)) and the NAIRU (Stankus (2002)).

Whereas the Phillips curve hardly needs any special introduction it may be fruitful to delve a bit at the Beveridge curve. Although not exactly neglected it has been somewhat overlooked due to heavy emphasis on the Phillips curve. Blanchard and Diamond (1989), in their seminal paper, consider this wrong and to quote: "The Beveridge relation comes conceptually first and contains essential information about the functioning of the labor market and the shocks that affect it" (p. 1). It is the centrepiece of several studies, of course. Elmeskov (1993), Elmeskov and MacFarlan (1993), and Wall and Zoega (2001), to name a few which have provided insights for this piece of research. Petrongolo and Pissarides (2001) provide an overview of different attempts to assess the matching function.

The Beveridge curve is the equilibrium relationship between contemporaneous job vacancies and unemployment, reflecting the segmentation of the labour market. Due to skills differences excess demand for one type of labour may coexist with excess supply of another type of labour. The huge lack of geographical mobility in Latvia (see section 3) produces another important source of mismatch between demand for and supply of labour. In addition, lack of information or an inefficient spread of information concerning available jobs may make job vacancies coexist alongside unemployment. Labour markets are characterized by usually big gross flows into and out of employment – the Beveridge curve, the joint movement of job vacancies and the unemployment rate may reveal interesting information about the matching process, i.e. how demand for labour may or may not meet supply of labour.

What follows develops the Beveridge curve from the matching function and a description of the properties and features relevant to this paper of the latter is provided. A much deeper and more technical presentation can be found in e.g. Pissarides (2000) and in Yashiv (2000). This presentation owes more to Petrongolo and Pissarides (2001).

The matching function is a convenient tool for modeling frictions in the labour market – a simple representation is:

(1) $$M = m(U , V)$$

where M are matches (new hires from unemployment[9]), U the number of unemployed and V the number of vacancies. Usual assumptions are:

$m_U > 0$, $m_V > 0$, $m_{UU} < 0$, $m_{VV} < 0$, $m(0 , V) = m(U , 0) = 0$

More unemployment and more vacancies lead to more matches but with diminishing returns. Often homogeneity of order 1 is assumed but this is still an issue of controversy (see e.g. Petrongolo and Pissarides (2001) and Petrongolo (2001)).

The analogy to a description of technology in microeconomics is evident: Given equilibrium, where job creation equals job destruction, the matching function displays a downward sloping curve (isoquant) in (U , V) space. Such a set of combinations of unemployment and vacancies producing a certain number of matches constitute the Beveridge curve.

Following Blanchard and Diamond (1989), two types of shocks affecting this relationship may be mentioned: 1) Shocks to economic activity when the rate of job destruction differs from the rate of job creation cause shifts in the Beveridge curve with counterclockwise movements in (U , V) space while 2) Reallocation shocks, changes in the intensity of reallocation of labour from one sector to another, should see outward moves in (U , V) space as both job destruction and job creation increase, thus causing parallel shifts in the Beveridge curve. Shifts in the Beveridge curve are not inconsistent with formulation (1) – it just says that other factors affecting matching may be at work, too. The literature has e.g. consistently found, for Western Europe and North America, an increasing mismatch (outward shifts in the Beveridge curve) over time, i.e. a secular deterioration of matching technology/matching efficiency, a point we shall return to.

The Russian crisis constituted a negative activity shock to the Latvian economy. But perhaps a reallocation shock has followed/will follow: Exports to Russia are different than exports to Western Europe[10] - as such a reorientation of production, perhaps consistent with a reallocation shock, may be expected although the short run impact should be entirely from the activity shock.

### 3.1 The aggregate Beveridge curve for Latvia

Figure 5[11] displays the aggregate Latvian Beveridge curve for 1996-II through 2001-II. With GDP growth increasing during 1997 (see the previous section) the rate of vacancies went up due to higher demand for labour but with minimal impact downwards on the unemployment rate, an observation worthy of further studies. The rate of vacancies top in August 1998, just before the Russian crisis. Then, as the crisis hits, the unemployment rate increases rather sharply while the rate of vacancies drops, i.e. fully consistent with what should be expected from a negative economic shock. As unemployment tops in April of 1999 it seems that vacancies are more easily filled. As the unemployment rate subsequently drops again, reflecting the rather quick reversion to high economic growth, the demand for labour obviously is high again, reflected in a higher rate of vacancies. Currently, the Latvian Beveridge relation seems to have reverted to where it was before the Russian crisis.

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[9] This is the content of the variable for our purpose which is consistent with unemployment as one of the explanatory variables. The literature sees various specifications of M, typically dependent on which data is collected.

[10] As examples can be mentioned that Latvian food products have, dating back to Soviet times, enjoyed rather high status in Russia. Latvia's main export article is wood which for obvious reasons does not go to Russia.

[11] The unemployment rate, calculated by the Central Statistical Bureau of Latvia is official unemployment, end of period, as a percentage of the labour force whereas the vacancy rate is number of vacancies, end or period, as a percentage of the labour force. Vacancies are collected by the Latvian State Employment Service.

Thus, not only did GDP development and unemployment respond to the Russian crisis as expected, but also on a deeper level the Latvian economy also responded "normally", in this case via easily interpretable movements in the Beveridge curve.

As a starting point for macroeconomic analysis of the unemployment rate vis-à-vis economic activity we thus feel that the Beveridge curve offers more potential than e.g. the Phillips curve. To support this point of view we offer, in Figure 6, the Phillips curve for Latvia as a whole. A casual glimpse offers no apparent relationship between inflation and unemployment around the Russian crisis (Estonia e.g. may see its inflation rate affected by activity shocks, see Baltic Economic Trends (2001)).

### 3.2 Beveridge curves by regions and occupations

In order to assess in more detail how the shock impacted on Latvia we try to track the Beveridge curve developments by regions and by occupations. Similar and synchronous impact provides evidence in favour of the shock being, indeed, an activity shock whereas regional and/or occupational differences with respect to the impact indicate possible future reallocation effects.

For the reader unfamiliar with the geography of Latvia we refer to the map in appendix I as well as to the list of regions in appendix II. In short, Latvia administratively consists of seven cities and twenty-six districts which together form four regions, Kurzeme to the west, Zemgale to the mid-south, Vidzeme to the mid-north and Latgale to the east. Riga (and Riga district and Jurmala, which in many ways may be seen as a suburb to Riga) belong to Vidzeme but are treated separately here due to the big differences between Riga, the capital, and the rest. The sheer size of Riga in itself warrants this distinction.

Appendix III describes the official classification of occupations in Latvia as used in the biannual labour force surveys.

Figure 7 offers an overview of the striking differences in unemployment rates over time between the regions whereas figure 9 in a similar fashion shows differences in unemployment rates for different occupations.

As is easily seen, the Riga region has consistently had much lower unemployment than other districts whereas Latgale's unemployment rate is significantly above any other region's and has always been.

Unemployment rates for different occupations are also different albeit of little surprise. They broadly fall in three categories indicating, with the exception of agriculture[12], higher unemployment given less educational background.

One may again look at the response in unemployment, regionally as well as by occupation, to the Russian crisis. Figure 7 shows that unemployment rose simultaneously in all regions, indicating that the Russian crisis was indeed a broad shock affecting the whole country. It is seen that Kurzeme was hit harder than other regions, rising from second lowest unemployment rate to a shared second place from the top. Closer inspection (Figure 8) reveals why. The two main cities in Kurzeme are the important port cities of Liepaja and Ventspils and it is seen that these two were exceptionally hard hit, suggesting a severe downturn in e.g. cargo handled. From this one

[12] Unemployment among farmers is said to be low due to lack of incentive to register as unemployed more than the true rate being low.

should expect more future reallocation of labour in these cities than elsewhere. Otherwise the impact on regional unemployment looks very synchronized and similar indeed.

By profession the shock is also largely synchronized although significant differences appear. Occupations less associated with international trade (professionals provide the best example) are virtually unhurt whereas low- and medium skilled labour all see unemployment rise[13]. Again, using the term, we may label this a possible reallocation shock.

Figures 10a through 10f offer Beveridge relationships for the country as a whole and for the five regions. June 1998 (last quarter before the crisis) is indicated in the figures together with the quarter seeing the highest unemployment rate. Casual observation may indicate that Riga seems to behave like the country as a whole (but perhaps mainly because it is such a significant part of the country as a whole) whereas regional differences certainly are observed although not offering new insight. The main use may be to say that the end (or the reversal) of the crisis is also highly synchronized – but the relationship of unemployment vs. vacancies does not seem to offer much.

Figures 11a through 11f offer, similarly, Beveridge relationships for 7 of the occupations (the remainder having too few vacancies). Again, the relationships are generally different, except with the timing of maximum unemployment but bold conclusions do not spring to mind. The evidence is clearly mixed. As an example, elementary (i.e. unskilled) workers, who face the highest unemployment rate together with the lowest rate of vacancies, that this is consistent with a Beveridge curve (at its flat end, i.e. at minimum vacancies). But stronger conclusions are not called for at this moment.

All in all even this casual observation provides quite valuable insight: The whole country was hit by the shock, all regions and professions were hit at the same time and the reversal started at the same time, stating that the shock may indeed be labeled a negative activity shock. But since some regions and professions were hit harder, there are elements pertaining to reallocation, too.

## 4. Estimation of a matching function for Latvia

Our third and deepest level of analysis concerns actual estimation of a matching function for Latvia. Here a more rigorous description of the data sets used is appropriate. Unemployment is registered unemployment, end of quarter. Vacancies are, likewise, end of quarter unfilled vacancies. Matches constitute a variable hitherto not available here in Latvia – it was put together from raw data at our request. It measures the number of new hires from unemployment during a quarter. We thus run into the (potential) problem of misspecification often encountered in the literature. Unemployment and vacancies are both stock variables while matches is a flow variable. The pool of unemployed should be the right variable for measuring job seekers[14] but total vacancies over a quarter would be a more appropriate variable than end of quarter vacancies[15]. At least reporting of vacancies is mandatory[16] in Latvia and thus should more accurately reflect the true number of vacancies. The data period employed is 1994-I – 2001-IV. Data before 1994 are notoriously unreliable (see e.g. Fig. 4 – unemployment in the early days of transition was severely understated). We thus have 32 observations at our disposal.

[13] A short but remarkable increase is seen for managers. The result of bankruptcies?

[14] We are simply lucky to have data on unemployment and on matches from unemployment. Other studies use e.g. total matches i.e. from unemployment, from employment and from out of the labour force. This data does not exist here.

[15] The Latvian State Employment Service has started collecting the series of total vacancies but did not do so until 2000.

[16] Unlike, for instance, USA and Western Europe.

Quarterly data on *M*, *U* and *V* are provided in Figures 12a – c .

The literature typically[17] uses a Cobb-Douglas specification for the matching function and estimates this in its log-linear form:

(2) $$\ln M_t = \alpha + \beta \ln U_{t-1} + \gamma \ln V_{t-1} + \lambda T + \delta Z_t + \varepsilon_t \quad t = 2, \ldots, 32$$

Since *U* and *V* are measured at end-of-quarter matches in period t should be a function of lagged *U* and *V*. *T* is a time trend which may capture secular changes in the matching relationship while Z is a vector of possible other relevant variables[18].

A simple OLS regression of (2) (with Z = 0) yields the following results:

| | **Coefficient** | | | | |
|---|---|---|---|---|---|
| | **Constant** | **$\ln U_{t-1}$** | **$\ln V_{t-1}$** | **T** | $R^2 = 0.75$ |
| Estimate | - 14.78*** | 1.69*** | 0.35 | 0.024*** | F(3,27) = |
| t-value | - 2.55 | 3.49 | 1.63 | 3.62 | 27.24*** |

*Note:* *** indicates significance at 1%, ** at 5%, * at 10%.

This is a rather minimalist model; we have employed several other specifications: A squared time trend, seasonal dummies (vacancies seem quite seasonal, see Fig. 12c), structural breaks (matches seem to have risen permanently from around early 1997) and real wages[19]. These other specifications do not alter dramatically the result above. Namely, the coefficient for unemployment is consistently significant and big, for vacancies it insignificant, whereas the coefficient for the time trend is consistently strongly significant and positive.

Here, signs for unemployment as well as for vacancies are correct. The elasticity for unemployment is very high (although not significantly higher than 1) compared to previous studies for Western Europe and North America where, depending on the specification of matches the elasticity, β, is typically between 0.3 and 0.7. β - 1 is a measure of the negative externality caused by unemployed persons on other unemployed persons (congestion). Here, if we believe the results, we cannot reject that there is zero congestion (i.e. the unemployed "do not step on each other's toes" to get a job). Likewise γ, the elasticity for vacancies, is associated with the positive externality of firms on unemployed persons (thick-market effect; more vacancies represent a positive externality for the unemployed and a negative externality for other firms searching for workers). Here, there seems to be no thick market-effect. In short, unemployment seems to be what creates matches while new vacancies have no significant impact on hiring. In the words of Fahr and Sunde (2001) there is a relative supply shortage in the labour market.

[17] But not exclusively – see again Petrongolo and Pissarides (2001).
[18] The literature, depending on the purpose of the paper, has seen e.g. demographic variables, real wages, the level of unemployment benefits etc. It is obvious that our limited data set does not allow much role for this variable.
[19] An interesting variable would be the level of unemployment benefits to see if it is adversely related to matches. Unfortunately unemployment benefits are highly individual in Latvia (based on previous earnings) and no good variable exists to be used in the specification.

In addition, although the estimated sum $\beta + \gamma$ exceeds one, this is not significant, i.e. the hypothesis of constant returns to scale cannot be rejected[20].

While interpreting the estimated parameters for unemployment and vacancies, caution should be taken. We prefer to conclude that it seems that matches rely on the pool of unemployed while vacancies yet have to prove their relevance for the matching process in Latvia. If vacancies really are insignificant for matches one might speculate about lack of normalization in this context for the labour market – that the labour market still fails to use this important variable to generate matches at a significant level.

The time trend is, no matter which specification we have employed, consistently highly significant – and positive – which, as stated earlier contrasts all evidence from Western Europe and North America. A positive coefficient for the time trend indicates a secular increase in matching efficiency over time. We propose the following reason for why this result actually should be different from evidence from Western European/North American, i.e. established, market economies.

Transition may in itself be seen as an enormous reallocation shock. Reorientation of production on a massive scale takes place, leading to a similar reorientation in demand for labour with respect to different skills. It is easy to imagine, in the early days of transition, a labour market where firms may have been very uncertain with respect to which sort of labour they would need, where people may have been similarly uncertain with respect to which sort of labour they could actually supply and where, not least, the institutional framework for how labour seeking work could meet firms seeking employees changed fundamentally. Or, in the context of this paper: One should expect the matching process to be in serious disarray as a consequence of the collapse of central planning.

The finding is then that this disarray has been reversed, that matching efficiency is rising which is what should be expected from a normalization of the labour market. We thus propose that the positive coefficient for the time trend, the rising matching efficiency over time is indeed a test of normalization of the labour market – and that Latvia seemingly passes this test.

While this result should be encouraging for transition economists as well as for policy makers another word of caution should be raised. The result is based on 32 observations – transition still puts a limit on the amount of data for time series analysis. While we put faith in the matching efficiency result, the last word is certainly not said with respect to the Latvian matching function. Data on matches exist only as aggregate data for the whole country – regional disaggregation like e.g Wall and Zoega (2001) or occupational disaggregation e.g. like Fahr and Sunde (2001) still has to rely on casual observation of the Beveridge curves.

## 5. Conclusions

The conveniently vaguely defined term "normalization" was used to address aspects of the Latvian labour market. Has the Latvian labour market, more than ten years into transition, showed signs of normalization.

Three layers of analysis provided a qualified "yes" to this question:

[20] Which, as mentioned earlier, is in accordance with many though not all studies. Fahr and Sunde (2001) report many cases of decreasing returns from the German labour market while Munich, Svejnar and Terrell (1999) report increasing returns from the Czech and Slovak republics.

- Data at the most aggregate level showed the Latvian economy reacting according to textbook expectations when hit by the Russian crisis of 1998.
- Movements in the aggregate Beveridge curve were interpretable according to theory. Latvia was indeed hit by a negative activity shock and we could use regional and occupational data to point at possible reallocation effects.
- Our estimation of a matching function for Latvia may be the first here – but should not be the last. Caution should be taken but the significantly positive time trend, robust in the light of several different specifications, indicates a secular increase in matching efficiency – a test we use as an indicator of normalization: As transition continues the labour market should have transformed, making job seekers and employers more likely to have the proper knowledge and institutions through which to meet each other.

We take this tentative evidence as an encouragement for economists working with transition economies as well as for policy makers. Both should see more fruitful results of their work from normalization.

Another indicator of normalization is the amount, variety, reliability and availability of data. In this respect the new series, starting from 2000 and collecting total vacancies per period, is welcome.

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## Figures

**Figure 1.** Nominal and real rouble to lat exchange rates

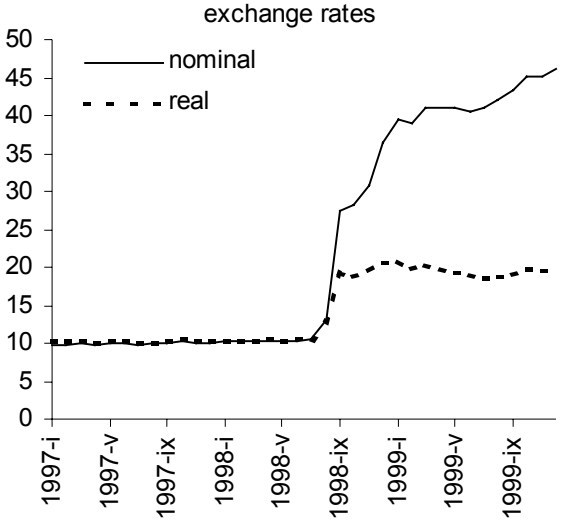



**Figure 2.** Latvian monthly exports and imports at 2001xii prices, mill. lats

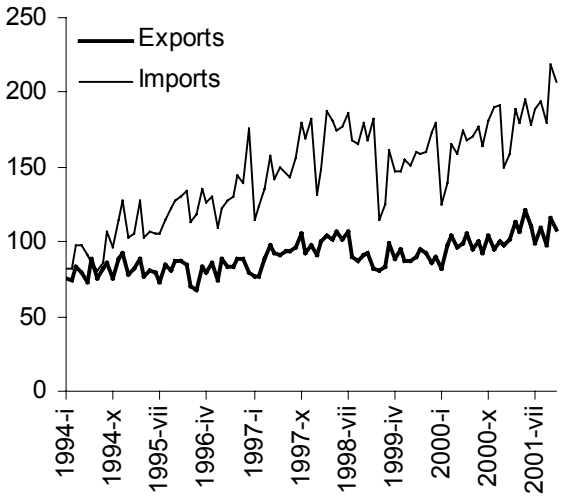



**Figure 3.** GDP, year-on-year growth rate, %

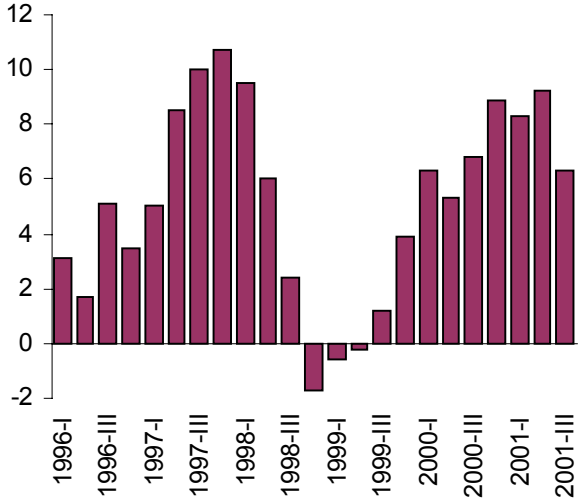



**Figure 4.** Unemployment rate, %

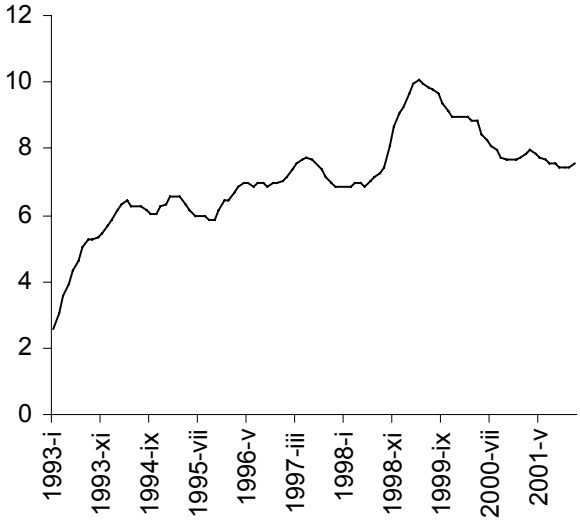



**Figure 5.** Aggregate Beveridge curve June 1996 - June 2001

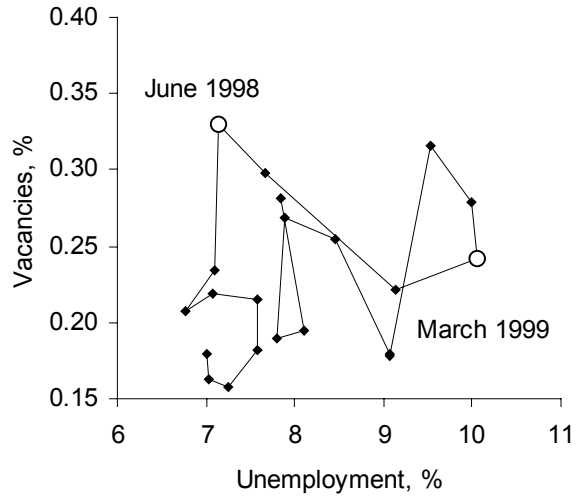



**Figure 6.** Phillips curve: Jan 1996 - Dec 2001

**Figure 7.** Regional unemployment, 1995-2001

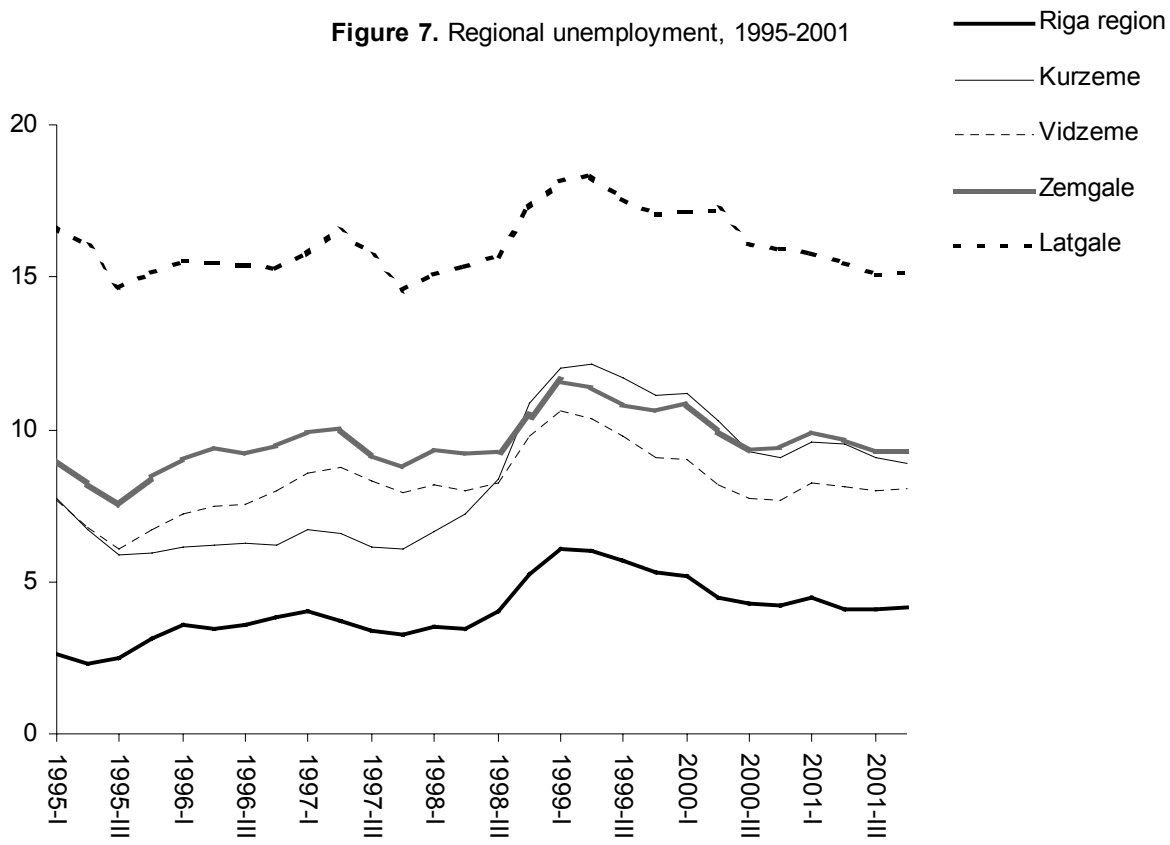



**Figure 8.** Unemployment by districts in Kurzeme, 1995-2001

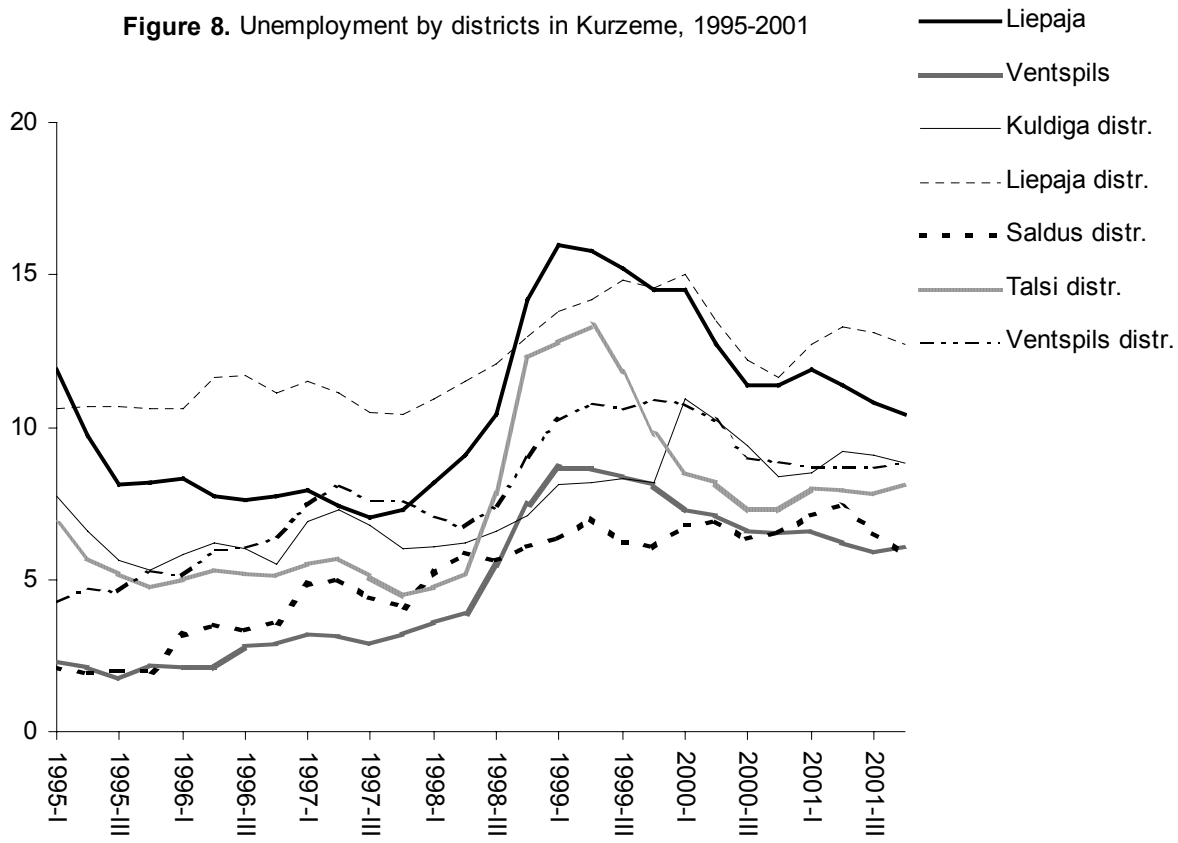


**Figure 9.** Unemployment by occupations, May 1996 - May 2001

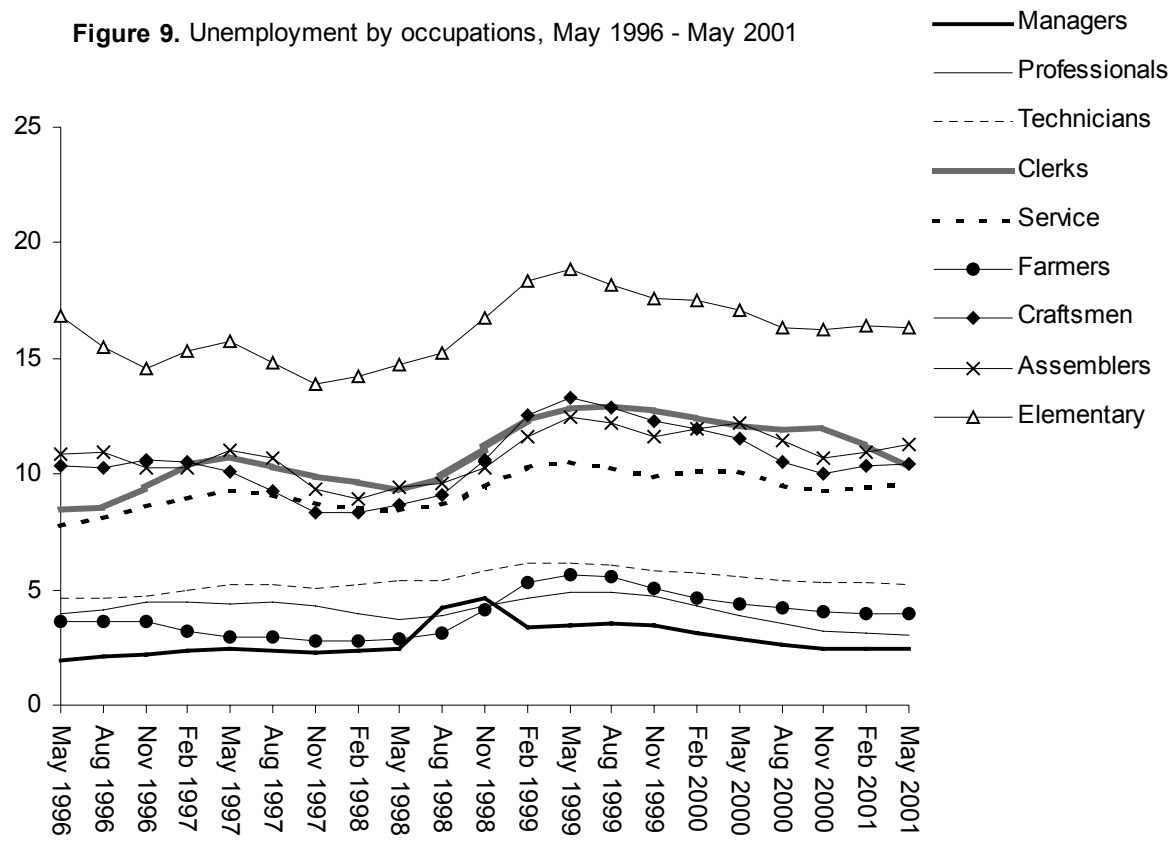


**Figure 10a.** Aggregate Beveridge curve
June 1996 - June 2001

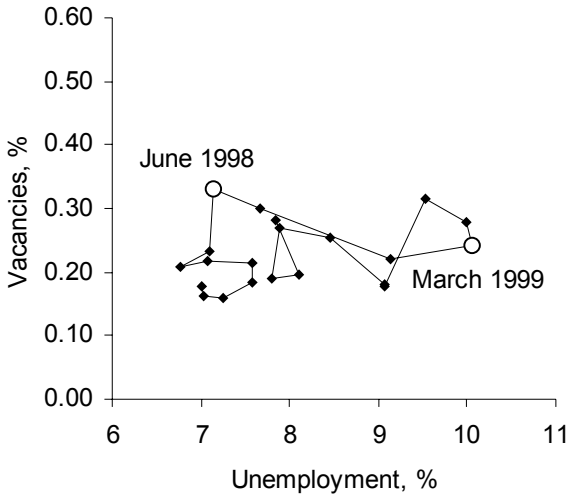



**Figure 10b.** Beveridge curve: Riga region, June 1996 - June 2001

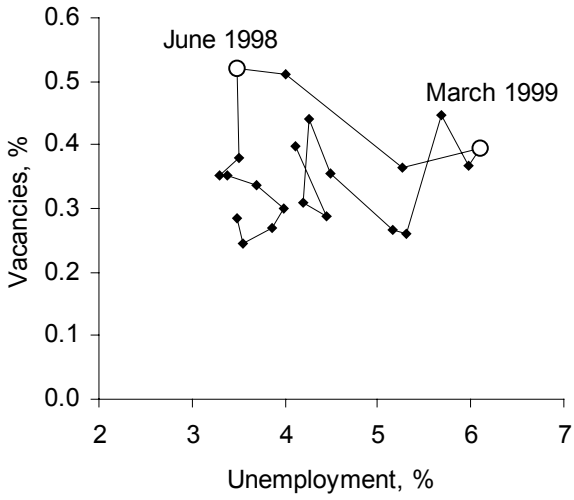



**Figure 10c.** Beveridge curve:
Kurzeme
June 1996 - June 2001


**Figure 10d.** Beveridge curve:
Vidzeme
June 1996 - June 2001

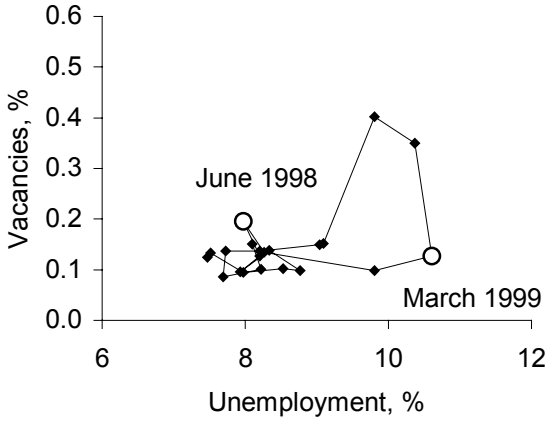



**Figure 10e.** Beveridge curve:
Zemgale
June 1996 - June 2001

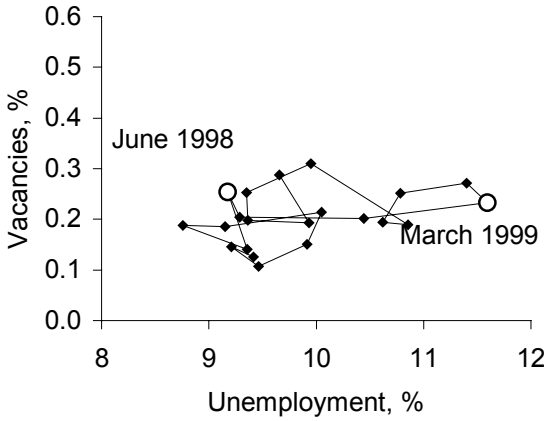



**Figure 10f.** Beveridge curve: Latgale
June 1996 - June 2001

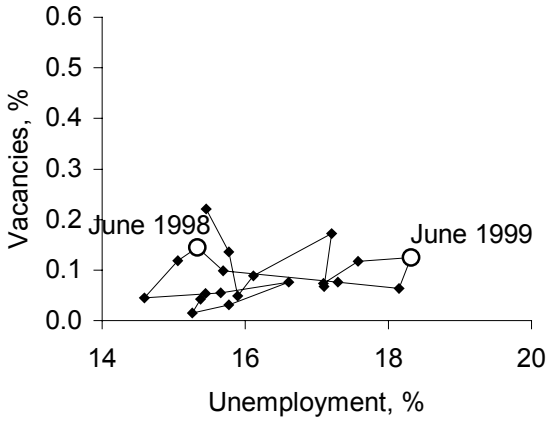


**Figure 11a.** Beveridge curve:
Managers
May 1996 - May 2001

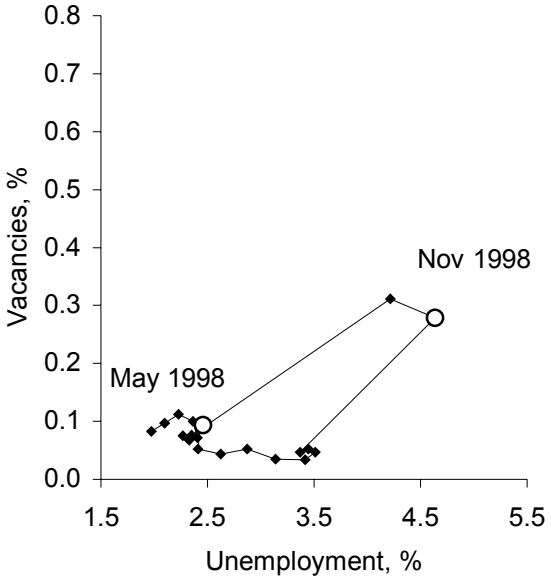



**Figure 11b.** Beveridge curve:
Professionals, May 1996 - May 2001

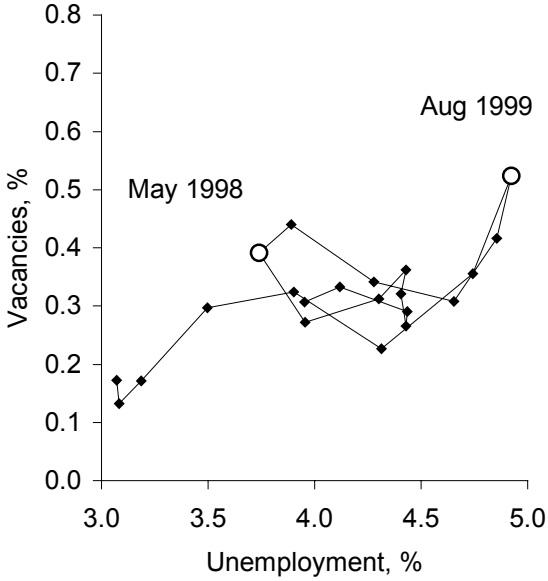



**Figure 11c.** Beveridge curve:
Technicians, May 1996 - May 2001

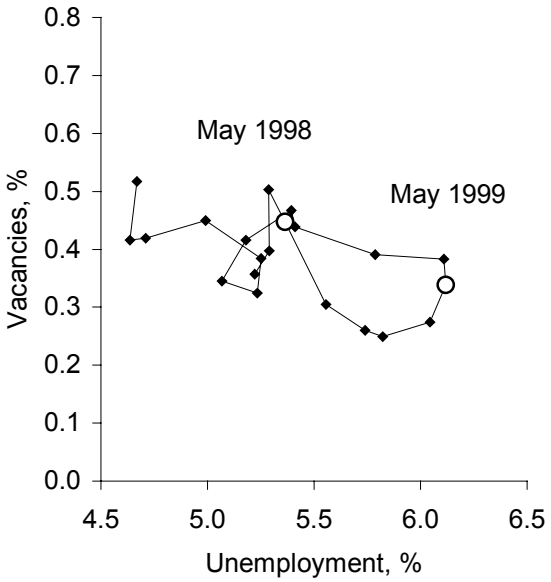



**Figure 11d.** Beveridge curve: Service
Workers, May 1996 - May 2001

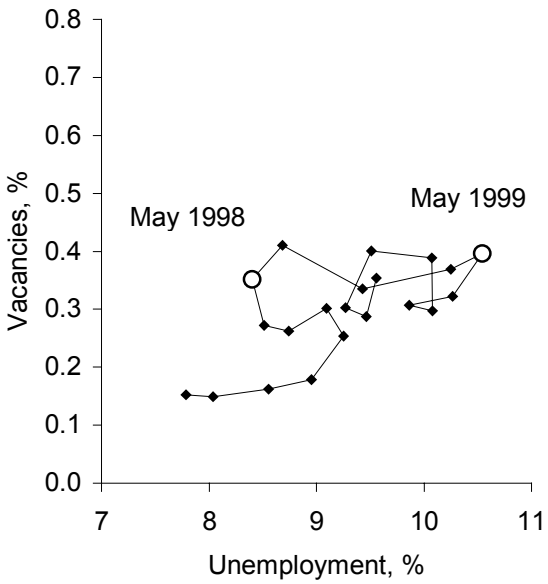


**Figure 11e.** Beveridge curve: Craftsmen, May 1996 - May 2001

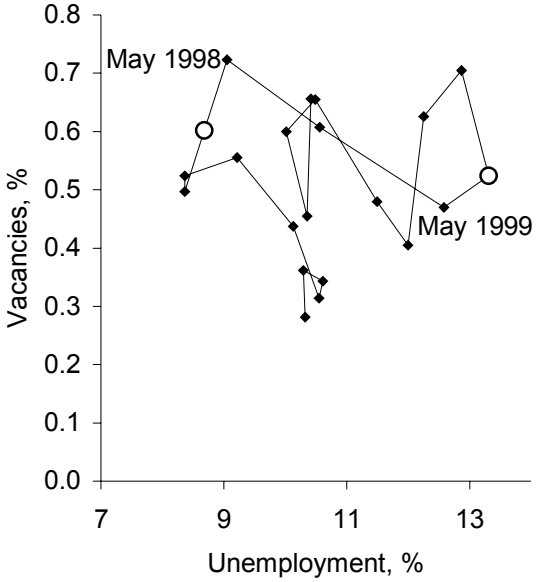



**Figure 11f.** Beveridge curve: Plant Operators, May 1996 - May 2001

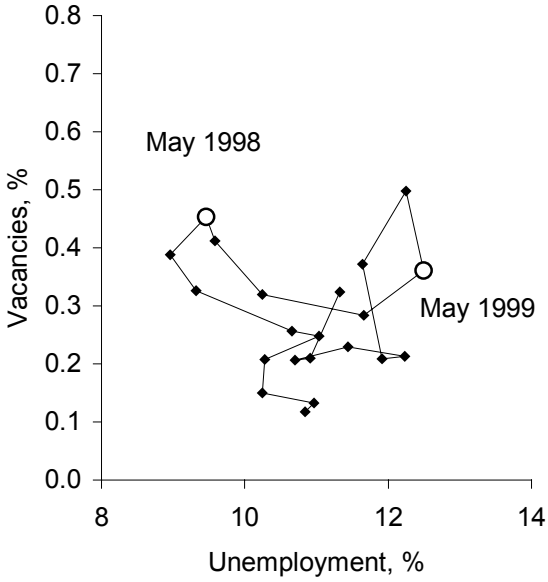



**Figure 11g.** Beveridge curve: Elementary, May 1996 - May 2001

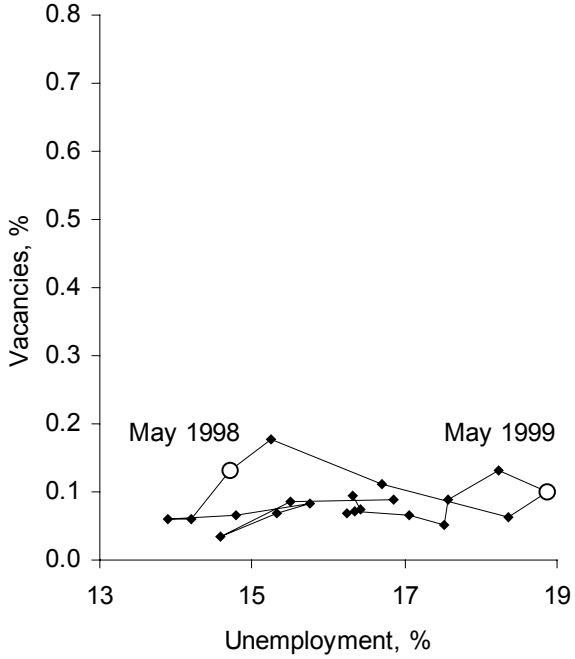


**Figure 12a.** Matches (hires from unemployment), 1994-2001


**Figure 12b.** Registered unemployment, 1994-2001

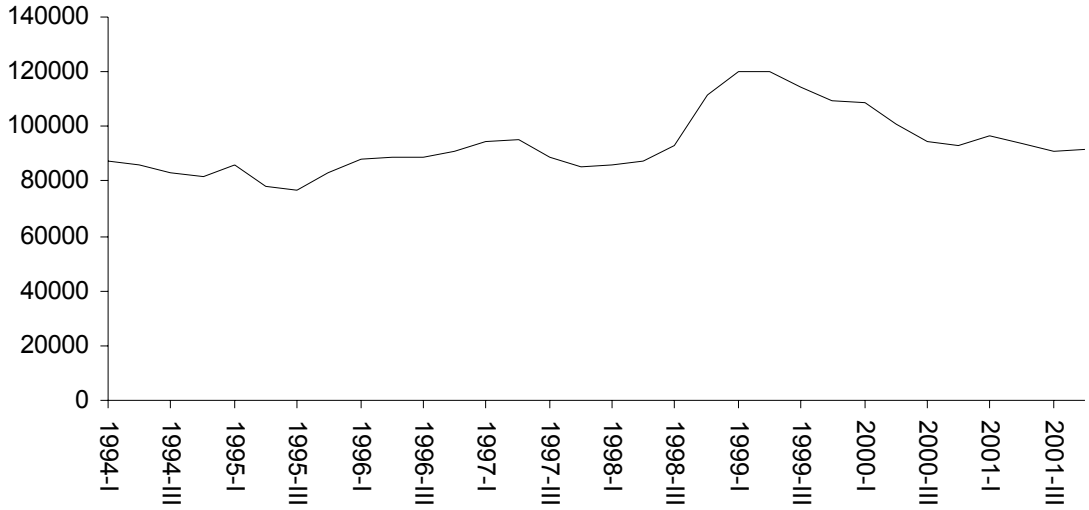
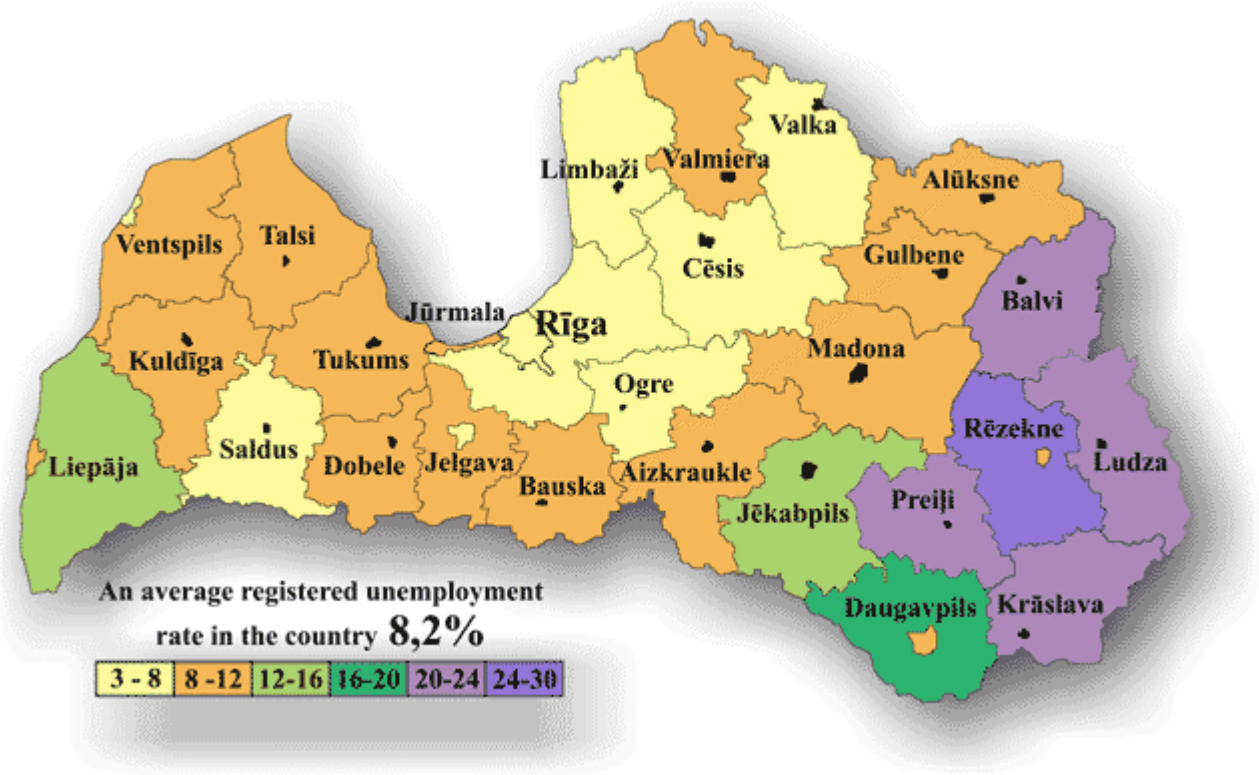



**Figure 12c.** Reported vacancies, 1994-2001

## Appendix I

**Registered unemployment rates in Latvian districts on April 1, 2002.**




**Source: State Employment Service, www.nvd.gov.lv**

## Appendix II

## Regions of Latvia

**Riga region:**
Jurmala, Riga, Riga district

**Kurzeme:**
Kuldiga district, Liepaja, Liepaja district, Saldus district, Talsi district, Ventspils, Ventspils district

**Vidzeme:**
Aluksne district, Cesis district, Gulbene district, Limbazi district, Madona district, Ogre district, Valka district, Valmiera district

**Zemgale:**
Bauska district, Dobele district, Aizkraukle district, Jekabpils district, Jelgava, Jelgava district, Tukums district

**Latgale:**
Balvi district, Daugavpils, Daugavpils district, Kraslava district, Ludza district, Preile district, Rezekne, Rezekne district

## Appendix III

# Classification of occupations

| | |
|---|---|
| 00 | Unspecified |
| 0 | Armed forces |
| 1 | Legislators, senior officials and managers |
| 2 | Professionals |
| 3 | Technicians and associate professionals |
| 4 | Clerks |
| 5 | Service workers |
| 6 | Skilled agriculture and fishery workers |
| 7 | Craft and related trade workers |
| 8 | Plant and machine operators and assemblers |
| 9 | Elementary occupations |