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Josef Zweimuller and Rudolf Winter-Ebmer

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Author:
Zweimuller, Joseph, University of Linz, Austria
Winter-Ebmer, Rudolf, University of California, Berkeley

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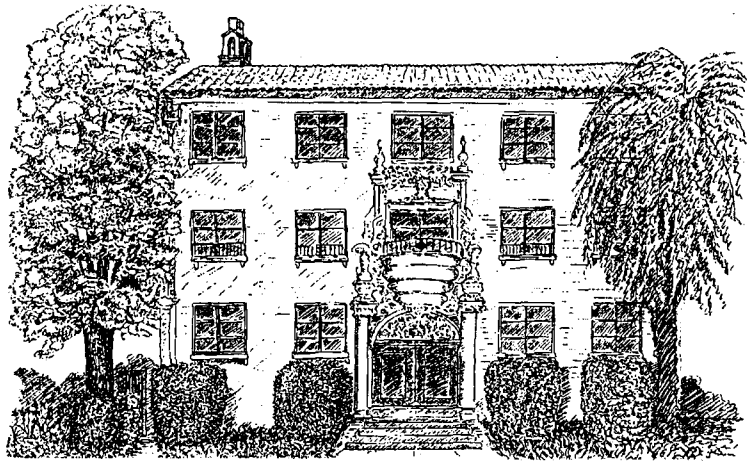
IMMIGRATION, TRADE AND AUSTRIAN UNEMPLOYMENT

JOSEPH ZWEIMÜLLER
Institute for Advanced Studies, Vienna
University of Linz, Austria

RUDOLF WINTER-EBMER
University of California, Berkeley
University of Linz, Austria
Centre for Economic Policy Research, London



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Abstract

In this paper we look at unemployment effects of immigration and trade with Eastern Europe in Austria. Using individual data over the period 1989 to 1992 of male blue-collar workers employed in the Austrian manufacturing sector, we decompose possible detrimental impacts in unemployment entry effects and unemployment duration effects. Unemployment entry does not seem to be strongly effected by the recent increase in the flow of immigrants. This is different from the immigration effect on unemployment duration. Within almost all subgroups there is a significant increase in the lenght of unemployment spells as a result of larger immigration. Increases in trade with Central and Eastern European Countries (CEECs) seem to have increased the risk of unemployment entry, and to a lesser extent also the duration of unemployment. This is different from trade with the rest of the world where export increases have an unemployment reducing effect.

Keywords: trade, immigration, labour market, unemployment

JEL Classification: F14, J64, J61

1. Introduction

Austria experienced a dramatic shift in its international economic relations with the fall of the iron curtain. Prior to that event, almost half of Austria's borders were "dead borders": almost closed for visitors, certainly closed for immigrants, and the trade regime was a mixture of administered trade with serious trade restrictions. In the first years afterwards, Austria has been exposed to a rapidly changing economy in these countries which led to dramatic changes in economic relations. On the one hand, immigration increased strongly, starting from an immigrant share in total dependent employment of somewhat more than 5 % in 1988 to about 9 % in 1991. A considerable part - though not the majority - of the immigrants came from the post-communist economies. On the other hand, Austria experienced a large change in trade relations. Due to its geographical situation and its strong historical ties, especially with former Czecho-Slovakia, Hungary and Poland, Austria's export and import flows with these countries reacted more strongly than those of other Western economies. Already in 1989, Austria had the largest export volume to the Central and Eastern European Countries (CEECs) all over Europe, except for Germany and Italy. Furthermore, Baldwin (1994, p. 90) estimated a very high future export potential into those countries using a gravitation model, matched only by Germany, Italy and France.

Both immigration and trade creation have led to fears - not only in Austria - that jobs for native workers were endangered. In this paper we take a look at the consequences of this trade creation and increased immigration for the Austrian labour market. Unlike previous studies, we focus explicitely on the unemployment experiences of workers. This can be modeled in two different ways: the risk of unemployment entry and the expected duration of an unemployment spell. Following this dichotomy, we look at the immediate displacement effect of immigration and trade, i.e. unemployment entry and afterwards at the impediments foreign competition might have on job search of unemployed natives.

The paper is organised as follows. Section 2 reviews the existing literature on trade, immigration and unemployment. Section 3 discusses the data, whereas in Sections 4 and 5 econometric evidence for unemployment entry and unemployment duration is presented. Section 6 concludes.

2. Trade, immigration and unemployment

Naive political commentators sometimes assume that incoming immigrants displace natives on a one-to-one basis. This may be the case under three conditions only (Borjas, 1991, p. 81). The first is a limited number of jobs in the domestic economy, i.e. the entrance of new workers (and consumers) leaves economic growth unchanged. The second and third condition assert that natives and foreigners are perfectly interchangeable and wages for foreign labour are lower than those for natives.

The extreme opposite view would be to assume a segmented labour market (Piore, 1979), where immigrants only hold jobs that natives refuse to take. In this case no substitution of native workers would take place; on the contrary, if those jobs are complementary, new employment opportunities for natives could become available in the primary sector.

Both extreme views are unrealistic for the economy at large. In a conventional labour-market diagram a rise in immigration shifts the labour supply curve to the right. Domestic employment and wage levels would be unaffected by immigrants if market demand for these labour services were perfectly elastic at the going wage rate. The same would be true if domestic labour supply were perfectly inelastic.[1] Greenwood and McDowell (1986) survey empirical elasticity estimates and conclude that "these findings are compatible with a highly inelastic supply of domestic low-skilled labour and a relatively elastic demand for such labour" (p. 1754). This would imply small negative employment impacts of immigration.

Direct estimates of the impact of foreign competition usually find very small unemployment effects for the U.S. LaLonde and Topel (1991) and Altonji and Card (1991) use U.S.-Census data and compare local labour markets with differing immigration rates.[2] Winegarden and Khor (1991) use aggregate data on unemployment rates and undocumented aliens for U.S. states and find no detrimental impact of the latter on the former in a system of simultaneous equations. Instead, a sizable reverse effect was found: Undocumented immigrants tend to concentrate in states with favorable labour market conditions.

This possible simultaneity bias is circumvented in historical case studies of an exogenous influx of immigrants such as the "Mariel boatlift" of Cubans to

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[1]See Grossman (1982) or Borjas (1987) for empirical studies using a production function framework.

[2]See also Simon et al (1993). Freeman and Katz (1991) find a positive, though insignificant, association between the share of immigrants and the change in annual hours worked in an estimation for a panel of 428 U.S. industries.

Miami in 1980 (Card, 1990) or the repatriation of French citizens from Algeria in 1962 to southern France (Hunt, 1992). Both studies find only minor transitory adaptation problems on these labour markets. More severe negative impacts are found by Carrington and De Lima (forthcoming) for Portuguese "Retornados" from Africa.

Further European research has concentrated on Germany and Austria. Winkelmann and Zimmermann (1993) using panel data for Germany find highly detrimental effects of immigration in the 1970s on the frequency of unemployment spells, whereas no negative impact for the 1980s could be detected in a different study (Mühleisen, Zimmermann, 1994). This is explained by higher wage flexibility. Pischke and Velling (1993) use aggregate data for German counties and find no negative impact once the mean reversion process of unemployment rates is accounted for. Hatzius (1994) uses a two-stage approach to study immigration effects in Germany. In a first stage he regresses individual unemployment on a set of region-by-period dummies and individual characteristics. He then uses the estimated coefficients in a second regression: Differentiating between foreigners, East Germans and ethnic Germans he finds no significant effect of the presence of any of these immigrant groups on unemployment probabilities of natives.

In contrast to these studies Brandel et. al. (1994) conclude that the recent surge of new immigrants into Austria led to a significant displacement of guest-workers of earlier generations, but also of natives: 60% of all firms in their sample with shrinking employment of natives enlarged the engagement of foreigners in the period 1989 to 1991. However, the latter study uses descriptive techniques rather than regression analysis. Moreover, there measure of shrinking firms does not correspond exactly to the notion of displacement, because firm size can change for a variety of reasons: retirement, voluntary quits, etc. In a preliminary study, investigating only unemployment risk for young native workers (Winter-Ebmer and Zweimüller, 1994) we conclude that increased immigration did not result in higher unemployment entry for young native workers in Austria.[3]

Assessing the impact of international trade on the labour market - in line with the equilibrium character of trade theory - would ideally call for the use of a computable general equilibrium model. See e.g. Kohler (1991) for an application to trade liberalisation in Austria.[4] These studies typically analyse these effects *ex ante* rather than ex post. They are, however, not particularly

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[3]Complementary evidence for wage effects on young natives are reported in Winter-Ebmer and Zweimüller (forthcoming).

[4]See Brown (1992) for a survey of CGE models applied to the consequences of NAFTA.

well suited for our purpose because we want to consider the labour market effects in more detail than is usually done. Furthermore, the equilibrium character makes it difficult to explicitely consider unemployment risk.

Some recent studies in the U.S. use simulation techniques to infer wage effects from trade (Borjas, Freeman and Katz, 1991, Murphy and Welch, 1991).[5] Wood (1995) takes a very critical position concerning factor content studies of trade. After making substantial corrections in terms of labor input coefficients and induced technical progress he concludes that import penetrations from developing countries is the main culprit for the fall in demand for less-skilled workers in advanced industrial economies.

Regression analyses either use trade flows or prices as explanatory variables. Using trade flows, Freeman and Katz (1991) distinguish between union and non-union sectors in the U.S. economy.[6] They find highly negative impacts of import volumes on industry employment. If international prices are used to predict domestic wages or employment, Grossman (1986, 1987) finds less significant evidence for U.S. manufacturing. In a similar study Revenga (1992) employs instrumental variables techniques and concludes that wages react to a smaller extent to import prices as employment levels do. Caves and Krepps (1993) argue that rising imports caused a major reduction in non-production employment in U.W. manufacturing after 1982 - thus reducing productive inefficiencies. The use of a panel of aggregate industry figures, however, cannot grasp individual unemployment experience; although at the aggregate level industry jobs were lost, individual workers may have easily found jobs elsewhere. On the other hand, permanent layoffs may cause enduring periods of unemployment which can only be studied by using individual data. Kletzer (1995) conducts a study similar to our own. She looks at a panel of industries and combines aggregated household displacement data to reach the conclusion that imports caused minor displacement effects. On the other hand, Kruse (1988), who links individual unemployment spell durations to aggregate trade volumes, finds that workers displaced from trade endangered industries in fact face a more difficult job search.

For Europe only a few studies on employment effects of trade with Eastern Europe exist. Cadot and de Melo (1994) provide simulation results for the regional distribution of possible job creation and destruction caused by CEEC-trade with France. Looking only at emerging trade patterns with the CEECs, no general problems for EU markets as a whole as well as for specific industries,

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[5] See Baldwin (1995) for a recent survey of trade effects on employment and wages.

[6] Gaston and Trefler (1994) are unable to find significant effects of import or export flows on Canadian employment as well as wage changes. This may be due to multicollinearity, because they also include tariffs and the exchange rate in those regressions.

like metals or textiles, are found by a recent study edited by Faini and Portes (1995) - mainly because the level of EU-CEEC trade is still very low. The Austrian Institute of Economic Research (Aiginger, 1993) calculates a positive employment balance of Austrian trade with the CEECs. This is mainly due to higher exports as well as cheaper inputs for manufacturing firms. Aiginger, Winter-Ebmer and Zweimüller (1995) look at a panel of Austrian workers in manufacturing and conclude that individual unemployment rates over a period of three years react significantly negative to increased export volumes and (only insignificantly) positive to import volumes. However, significant positive import impacts are found for subgroups of blue-collar workers, the elderly, and low-income earners. By calculating the labour content of trade flows using industry-specific productivity data, Altzinger (1995) finds that the increased net exports to CEEC-countries has lead to positive employment effects on the Austrian labour market.

3. Data

Table 1 summarizes the main developments in Austrian employment and trade between 1988 and 1991. Austrian employment rose by 6.4%, and two thirds of this increase were comprised of immigration. At the same time, there was a slight increase in unemployment, which was more pronounced for foreign workers. As a result, the share of immigrants in the labour force almost doubled, from 5.4% in 1988 to 9.0% in 1991. That is why we concentrate on the period 1988 - 1991 in the analysis below. Trade, on the other hand, expanded rapidly with the CEECs - although starting from a moderate level. Between 1988 and 1991 Austria's exports expanded by 105%, imports by 47%, resulting in a surplus of 6.6 bn ATS in 1991. The development continued since then. This positive export development should be a first hint, that the increase in net exports should in principle have positive effects on jobs, notwithstanding special problem groups.

Table 1

For the empirical analysis we use a 2% sample of blue-collar workers employed in the Austrian manufacturing industry. To avoid problems with early retirement we concentrate on male workers below the age of 57. This subsample is part of a bigger representative sample of workers from social security records. For these persons, official information is available on all

economic aspects - relevant for the calculation of old age pensions - for the period 1972 to 1991. As the data have been collected mainly for social security purposes, several drawbacks exist. First, there is no information on family affiliation. Second, the level of schooling can only be calculated for a subset of persons. The information on work experience and tenure with the actual firm relates only to the period after 1972. For the period 1972-1991 we can observe the labour market status of the individuals on each single day, including unemployment entry, job changes or the move into another industry.

As indicators for job competition by immigration we use the change in the share of immigrants per industry. To assess the impact of trade with the CEECs we impute additional data from trade statistics. As CEECs we define former CSFR, Hungary and Poland; these countries account for the bulk of trade with Eastern Europe. For the industries in the manufacturing sector we construct two trade variables: growth of exports (imports) Austria-CEECs as a percentage of output in the respective industry in the base year.[7] Furthermore we include analogous variables for RoW-trade. Finally, domestic demand growth (domestic demand growth = output growth - export growth + import growth) completes the decomposition of growth of total demand.

4. Unemployment entry

As an indicator for displacement risk, we use the probability of unemployment entry within one year. We look at male blue-collar workers employed in manufacturing on May 31 of each of these years and follow these persons for twelve months to see if they became unemployed. Doing this we can construct three cross-sections for the periods 1989/1990, 1990/1991 and 1991/1992. In this sample 18.8 % of the cases entered unemployment. This indicator should yield a good picture of first-round effects of immigration on employment stability. If there is at least some flexibility of wages, or if workers react by moving to other regions or industries, long-term employment effects will be smaller. Focusing on actual unemployment entry, U_i, we have a dichotomous empirical model:

[7]Since trade data use the SITC nomenclature, while the labor data apply the ISIC code, we had to use a bridge which was developed at the Austrian Institute of Economic Research (WIFO), this bridge defines which ISIC code is nearest to an SITC code (at the three digit level).

$$(1)\quad \begin{array}{ll} U_i = 1 & \text{for } U_i^* = X_i\beta + S_i\alpha + \varepsilon_i > 0 \\ U_i = 0 & \text{for } U_i^* \le 0 \end{array}$$

where U_i^* denotes an unobservable, continuous index of unemployment risk. Assuming $\varepsilon \sim N(0,1)$ we receive the ordinary probit model with X_i as further explanatory variables and β as a coefficient vector. Competition by immigrants and increased trade is included by the vector $S_{i.}$, the trade and immigration indicators in an industry. Equation (1) is a pure cross-sectional analysis. It might be argued that the results from a point-in-time analysis are misleading. For instance, assume that foreign shares within a labour market segment are correlated with turnover rates. Then the coefficient for migration mixes up the impact of immigration and turnover. As a result, α will be a biased estimate. In order to deal with this problem, we pooled the 3 cross-sections to a pseudo-panel by including dummies for all industries, so that (1) becomes:

$$(1')\quad \begin{array}{ll} U_{it} = 1 & \\ U_{it} = 0 & \text{for} \end{array} \quad \begin{array}{l} U_{it}^* = X_{it}\beta + S_{it}\alpha + D_{it}\delta + \varepsilon_{it} > 0 \\ U_{it}^* \le 0 \end{array}$$

Note that both the dependent and independent variables, as well as the error term, are now time-indexed. D_{it} is a vector of dummies indicating the industry where individual i was employed at time t.

Table 2

The results are presented in Table 2. Whereas in Column 1 no industry dummies are included in the regression, we followed the specification (1') in Column 2 to include 22 industry dummies. With no dummies present, the immigration variable has a significant positive coefficient. However, these detrimental impacts for unemployment risk are unstable. In our preferred specification, where we control for fixed industry effects in turnover, the coefficient looses significance. The industry dummies are jointly highly significant and should capture idiosyncratic industry effects unrelated to trade and immigration.[8]

[8] These results are in line with those of Winter-Ebmer and Zweimüller (1994) who studied unemployment entry of younger workers in more detail.

Indicators for the change in imports and exports enter separately for CEEC-trade and trade with the rest-of-the-world (RoW).[9] Whereas import from the east raise unemployment risk (at a marginal level of significance only), a rise in exports seems to *increase* the risk of becoming unemployed - a result which is highly stable across different specifications. This is counterintuitive. It could be the result of temporary adjustment processes: in order to gain access to new markets, exporting firms try hard to streamline production processes and cut costs to get first mover advantages in emerging market. We will come back to this issue below.

In contrast to this picture, the impact of trade with the RoW follows prior expectations more closely. Changes in imports increase displacement risk marginally - the coefficient of RoW-trade changes is much lower than the corresponding coefficents for CEEC-trade. Changes in exports reduce unemployment risk significantly. The effect of RoW exports is twice as large as the impact of a rise in domestic demand.

The quantitative effects of the interesting variables are as follows: Taking all variables at mean value, a one-standard-deviation increase in the immigrant share (+0.018 percentage points) raises unemployment risk from 18.8 % to 19.7 %. As far as CEEC-trade is concerned, an industry with a CEEC-export increase one stardard deviation above the average (0.009 percentage points) raises unemployment risk to 20.5 %. The corresponding value for imports (+0.003 percentage points) is 19.5 %. Note the different size of the standard deviation applying to these calculations.

Table 3 reports regression results for specific subgroups: for three age groups, for low- and high-income earners and for a subsample of industries which have been particularly hit by import raises from Eastern Europe.[10]

In the case of foreign shares we receive significant coefficients for prime-age males (ages 31-45) and for those with below-median incomes in the last job. For all other groups no significant impacts emerge. The picture is similar for the change in exports to the east. All coefficients are positive, pointing to the necessity of cost-cutting in order to gain new export markets. The effects are largest for blue-collar workers in what we call "problem industries": those with the highest increase in import shares. In the more established markets with the RoW export changes turn out to have a consistent and significantly negative impact on the unemployment risk.

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[9] CEEC-trade and RoW-trade have statisticially distinguishable effects. We get a Likelihood ratio test statistic of 8.0 (2 degrees of freedom) once we compace our model in Table 2 with an alternative which lumps together world trade.

[10] These industries are: Apparel, Shoes, Lumber, Furniture, Primary Metals, Electrical Machinery, and Instruments.

Imports on the other hand have lower effects. Although the point estimates for CEEC-import changes are sometimes very large, only those for younger workers (marginally) and those for higher income employees are significant. Changes in RoW-import don't seem to influence employment stability significantly.

Table 3

All other variables show the expected influence. Schooling reduces unemployment entry considerably. The same is true for a stable past working career: high levels of work experience and especially high tenure with the current firm lowers the probability that an individual becomes unemployed. As work experience and tenure are only observed back to 1972, we included also age as a regressor. Older persons face a higher risk of becoming unemployed - holding experience and tenure constant.[11]

Similarly, we find that the probability of unemployment entry is significantly higher for individuals who have experienced considerable periods of joblessness in the past. While these observations certainly point to the importance of state dependence effects[12] in unemployment, these effects are far from being self perpetuating in the sense of hysteresis: the effect of unemployment days two years ago is only one third of those one year ago; the scars of unemployment are decaying rapidly over time.

Foreign citizens are not more endangered by unemployment entry than natives. Workers in larger firms have more stable job opportunities, whereas those working in larger agglomerations face higher job risks.

5. Unemployment Duration

We could find no important impact upon the probability of entering unemployment neither of the emerging trade with the former communist countries, nor of increased immigration. This does not mean, however, that we can conclude that those events had no impact on Austrian unemployment. It means that *employed* workers were not heavily concerned. There may well be an impact on the *unemployed* who might find it more difficult to get back to

[11] This may possibly be only a countervailing effect for the dummy-variable "schooling unknown" which is equal to 1 for most of the elderly and has a negative influence on unemployment entry.

[12] For similar results for repeat unemployment with an other Austrian data set see Zweimüller and Winter-Ebmer (forthcoming).

work. In other words, the duration of unemployment might be significantly affected by immigration and trade.

In order to test this hypothesis we looked at those unemployment spells which started during the period 1989 - 1991. The sample was constructed from the same data source as in the case of unemployment entry discussed above. Moreover, the selection of the analyzed spells followed similar criteria: only unemployment spells suffered by males under the age of 57 who entered unemployment from a blue collar job in the manufacturing sector.

From an econometric point of view, we use a duration model to study the impact of immigration and CEEC-trade on the length of unemployment spells. Let T be the duration of a spell that starts at time 0, then we may write for the probability that the spell ends within the interval [t, t + dt]:

$$(2)\quad \Pr(t < T < t + dt) = \frac{f(t)}{1 - F(t)} dt = h(t)dt .$$

where *h(t)* is the hazard rate. *F(t)* is the cumulative density function for the completed unemployment spell, so 1-*F(t)* is the probability that a given spell is still in progress at time t. *f(t)* is the corresponding density function.

The hazard rate is assumed to vary with time for two reasons. The first is that for given exogenous factors determining the exit process, the probability of leaving unemployment may increase or decrease with the length of a spell in progress. In other words, the transition out of unemployment may be duration dependent. The second reason for a time varying hazard rate refers to the possibility that exogenous variables may themselves change over time. The model of time-varying covariates which is adopted below assumes that changes in exogenous determinants lead to a corresponding shift in the hazard rate. In this study, the time-variing covariates are the interesting industry variables: the change in the immigrant share, the changes in the import and in the export shares, as well as the rate of growth of domestic demand. These variables may change along the duration of a given unemployment spell.

Assuming that the unobserved factors follow a Weibull distribution we can parameterize the hazard rate as

$$(3)\quad h(X,S,t) = \alpha t^{\alpha-1} \exp(-X_{it}b - S_{it}a - D_{it}c)$$

where α is a distribution parameter. As is evident from (3), if $\alpha>1$ ($\alpha<1$) the hazard rate is an increasing (decreasing) function of time as long as X_{it} and S_{it} stay constant. X_{it} and S_{it} are exogenous determinants of the transition

process. The expected duration of unemployment, conditional on t, X_{it} and S_{it} is equal to $\exp(X_{it}b + S_{it}a + D_{it}c)$. X_{it} is a vector which consists of the same set of variables as above. Similarly, the vector S_{it} contains the change in the immigrant share, as well as the change in the export and import share of the industry in which individual i was employed prior to the unemployment episode under consideration. In order to single out the "pure" impact of the trade and immigration variables we again include industry fixed effects, D_{it}. a, b and c are the corresponding parameter vectors.

Unlike many other data sets the present sample includes information on the state of destination after the individual has left the unemployment register. We will test for aggregation bias by studying the transition process of unemployment to employment, and respectively, from unemployment to a job in the same industry as prior to the unemployment spell. This procedure should yield more reliable estimates of how industry specific variables affect the unemployment exit process. The dynamics of trade and immigration in the industry of origin will be less important for unemployed people who search in a different segment of the labour market or leave the labour force altogether. Therefore, the results for unemployment exit into the same industry as before the spell should give a precise estimate of migration and trade effects.

In Table 4 the results from the estimation of the Weibull-model are presented. The first column shows the estimates of a and b, when the usual exit process is considered irrespective of the state of destination. The second and the third column consider exit into employment and exit into reemployment in the same industry as the relevant states of exit.[13] In all cases, the inclusion of the industry dummies turned out to be important, and improved the fit of the models significantly.

Table 4

The increase in the flow of immigrants lead to a significant increase in the duration of unemployment. This is irrespective of the state of exit. The estimated coefficient suggests that an increase in the immigrant share by 1 percentage point increases the duration of unemployment between 4.4 and 6.3 percent. With an average duration in the sample of 87.6 days this amounts to 4 to 6 days. Therefore, although the effect is statistically significant, it is quantitatively not very large.

Just like unemployment entry, the duration of unemployment does not react to CEEC-trade changes in a way in line with a priori reasoning. On the

[13] As in the analyses of competing risks, the spells which do not end with employment (Column 2) or reemployment in the same industry (Column 3) are treated as censored spells in the estimation procedure.

one hand, the point estimate of the change in the CEEC-export share is always positive, and casually significant (see also Table 5). The corresponding import effect, on the other hand, has the expected sign, but is always insignificant. As far as the former result is concerned the same reasons as mentioned above might be at work: exports to CEEC-countries were predominantly in low-tech consumer goods, which might not have been competitive in international markets. Higher competition on CEEC-markets over time might have lead to adverse employment consequences.

In contrast, the trade effects with the RoW shows the picture one would expect.[14] Exports reduce the expected duration of unemployment significantly. In fact, aside from the change in immigration, this variable is the most important aggregate determinant of individual unemployment duration. While all RoW-import show the expected positive sign, they are not statistically significant. Only in the case of younger and higher income workers RoW-imports have a significant effect on unemployment duration (see Table 5). Similarly, domestic demand growth - as the last component of the rate of growth of domestic demand - has the expected negative impact.

Table 5

As far as the remaining covariates are concerned, the estimates are in line with expectations (Table 4). The duration of unemployment is significantly larger for older workers. The better educated do not seem to have a significantly lower duration of unemployment. This is certainly due to measurement errors (see the discussion in Section 3). Higher experience results in a significant reduction of the expected duration. Interestingly, the "better" the previous job, the longer the individual unemployment spell: both higher tenure, and a larger firm size result in higher individual unemployment. Also a higher wage in the previous job leads to a longer duration of unemployment (Columns 1 and 2 of Table 4). This effect, however, reverses and becomes strongly negative once only exit into the former sector is considered. As education variables are incomplete, wages might be considered as a proxy for education. Longer unemployment in the recent past leads to a longer expected duration today. Finally, foreign workers leave the register significantly earlier (columns 1 and 2), but they are equally likely to exit to the same industry as natives (column 3). Finally, there are significant

[14] Just like with respect to unemployment entry, it is important to distinguish CEEC-trade changes from RoW-trade changes. The Likelihood ratio test statistics (with 2 degrees of freedom) are 7.9, 16.1, and 1.6, for the first, second, and third column in Table 4.

differences in unemployment duration between regions and with respect to city size.

6. Conclusions

In this paper we looked at the impact of immigration and eastern trade on unemployment patterns in Austria. Unemployment entry is marginally raised by immigration flows, with significant impacts for prime-age males and low-income workers. Expected unemployment duration is increased by immigration for almost all groups. While the resulting quantitative effects are small, so was the rise in Austrian unemployment during that period. This means that a significant part of that (small) increase in unemployment can be explained by immigration flows.

The effects of trade with CEECs point to transitional adaptation processes. In the case of unemployment duration almost no effect of eastern trade can be detected. For the risk of unemployment entry, both changes in CEEC-exports as well as in CEEC-imports turn out to be risk increasing. This is in contrast to the effects of trade with the rest of the world. Here, the most robust result is the unemployment reducing effect of RoW-export increases, both with respect to entry into as well as the duration of unemployment.

Our analysis exclusively dealt with *unemployment* impacts of immigration and trade. Several questions remain open and need to be addressed in further research. To what extent are the first years of trade with the new market economies in Eastern Europe a purely transitional and exceptional period, where trade relations were highly out of equilibrium and are only slowly approaching to normality? And what consequences arise from these observations for the Austrian employment record? The second difficulty comes from the fact that much of the publicly debated competition by immigrants could be caused by more illegal entrants rather by more regularly employed foreign workers. Whereas there is hardly a good answer to the first problem, some speculations concerning illegal immigration can be fruitfully made. Illegal immigrants are likely to enter sectors offering jobs with skill and communication requirements suitable for foreign workers. If this is true, the sectoral distribution of a increased flow of illegal immigrants should resemble the distribution of additional legals. If both distributions match exactly, the result would be an upward bias of our estimated coefficients. The real effects of increased immigrations would then in fact be smaller.

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Table 1: Migration, Eastern Trade and Employment in Austria

	1988	*1989*	*1990*	*1991*
Employment ('000)	2,779	2,830	2,897	2,956
Unemployment rate natives (%)	5.3	5.0	5.4	5.8
Unemployment rate foreigners (%)	6.2	5.9	7.8	7.1
Foreign share of employment (%)	5.4	5.9	7.5	9.0
Exports to CEECs (bn ATS)	15.2	18.9	23.5	31.2
Imports to CCECs (bn ATS)	16.7	18.9	20.2	24.6
Trade balance	-1.4	0.0	3.3	6.6

Source: Statistisches Taschenbuch der Arbeiterkammer, Vienna, various years, Wirtschaftsforschungsinstitut.

Table 2: Unemployment entry (Probit regressions, t-values in par.)

	without industry dummies	*with industry dummies*	*Mean (std. dev.)*
Δ foreign share in industry	3.214 (4.06)	2.011 (1.68)	0.011 (0.018)
Δ CEEC-export share in industry	2.706 (2.01)	5.012 (2.64)	0.005 (0.009)
Δ CEEC-import share in industry	5.236 (1.65)	8.387 (1.60)	0.002 (0.003)
Δ RoW-export share in industry	-2.757 (6.39)	-2.814 (5.64)	0.010 (0.029)
Δ RoW-import share in industry	0.847 (3.55)	0.783 (1.67)	0.019 (0.058)
growth of domestic demand in industry	-1.623 (8.63)	-1.449 (5.62)	0.05 (0.06)
age (yrs)	0.009 (5.31)	0.009 (4.60)	34.07 (9.16)
schooling (yrs)	-0.019 (3.84)	-0.019 (3.92)	9.09 2.01)
schooling unknown (0,1)	-0.152 (4.67)	-0.159 (4.84)	0.58
experience (yrs)	-0.039 (11.53)	-0.038 (11.30)	10.39 (5.79)
tenure (yrs)	-0.061 (17.50)	-0.059 (16.79)	3.56 (4.28)
previous wage in '000 ATS	-0.025 (10.95)	-0.026 (10.66)	18.49 (4.76)
% unemployed days last year	1.843 (23.80)	1.809 (23.29)	0.047 (0.12)
% unemployed days 2 years ago	0.681 (11.62)	0.664 (11.29)	0.069 (0.16)
foreign citizen (0,1)	0.002 (0.05)	-0.001 (0.03)	0.089
firm size (in '000)	-0.069 (6.69)	-0.052 (4.23)	0.450
eastern region (0,1)	0.097 (2.61)	0.106 (2.79)	0.381

middle region (0,1)	0.012 (0.42)	0.040 (1.19)	0.513
city size>100,000 & <1,000,000 (0,1)	0.128 (3.00)	0.146 (3.33)	0.061
city size > 999,999 (0,1)	0.028 (0.88)	0.076 (2.30)	0.164
constant	-0.253	-0.292	
N	26337	26337	
Log L	-10855	-10747	
LRT	3749.7	3965.3	
LRT for inclusion of industry dummies	-	216.0	

Table 3: Unemployment entry: Results for subgroups (t-values in par.)

	Coefficient for Δ Immigrant share	*Coefficient for Δ CEEC-export share*	*Coefficient for Δ CEEC-import share*	*Coefficient for Δ RoW- export share*	*Coefficient for Δ RoW-import share*
age under 31	1.523	4.947	15.093	-2.428	0.369
	(1.18)	(1.84)	(1.84)	(3.35)	(0.54)
ages 31-45	4.218	4.988	2.186	-2.362	1.264
	(3.01)	(1.60)	(0.28)	(2.92)	(1.71)
age above 45	2.017	8.429	11.262	-5.491	1.193
	(0.71)	(1.42)	(0.72)	(3.77)	(0.81)
income below median	3.512	5.443	0.753	-2.648	0.864
	(2.61)	(2.16)	(0.12)	(4.01)	(1.42)
income above median	1.841	4.001	20.148	-2.923	0.709
	(1.62)	(1.34)	(2.15)	(3.74)	(0.96)
*employed in problem industry***	2.412	12.725	-2.99	-3.657	1.855
	(1.19)	(3.44)	(0.39)	(4.60)	(1.56)

** Problem industries are defined by a disproportionately high rise in imports from the CEECs

Table 4: Unemployment Duration. Weibull Hazard Rate Models with time-varying covariates (t-value in par.)

	EXIT into			
	Employment and Out-of-Labor Force	*Employment*	*Employment in the same sector*	*Mean (std. dev.)*
Time-varying covariates				
Δ foreign share in industry	4.362 (3.21)	6.263 (4.26)	5.573 (2.08)	0.011 (0.012)
Δ CEEC-export share in industry	4.464 (1.91)	8.720 (3.44)	1.359 (0.23)	0.005 (0.008)
Δ CEEC-import share in industry	5.767 (1.17)	-1.984 (0.36)	-8.680 (0.86)	0.002 (0.003)
Δ RoW-export share in industry	-1.716 (3.81)	-1.827 (3.78)	-1.701 (1.80)	0.010 (0.029)
Δ RoW-import share in industry	0.296 (0.41)	1.271 (1.68)	1.456 (0.92)	0.019 (0.058)
growth of domestic demand in industry	-0.869 (2.14)	-1.058 (2.38)	-0.704 (0.78)	0.063 (0.06)
Time-constant covariates				
age (yrs)	0.039 (8.34)	0.045 (8.77)	0.051 (5.04)	32.636 (9.36)
schooling (yrs)	-0.008 (1.79)	-0.006 (1.08)	-0.014 (1.43)	12.839 (6.41)
schooling unknown (0,1)	-0.035 (0.82)	-0.015 (0.34)	0.087 (1.07)	0.36
experience (yrs)	-0.022 (4.27)	-0.037 (6.62)	-0.080 (7.93)	8.031 (5.35)
tenure (yrs)	0.064 (10.77)	0.072 (10.97)	0.048 (4.62)	1.312 (2.65)
previous wage in '000 ATS	0.004 (1.45)	0.005 (1.48)	-0.034 (7.12)	15.590 (4.50)
% unemployed days last year	0.458 (6.46)	0.532 (6.93)	0.449 (2.86)	0.143 (0.19)
% unemployed days 2 years ago	0.441 (7.44)	0.402 (6.30)	0.224 (1.86)	0.168 (0.23)

foreign citizen (0,1)	-0.333 (6.94)	-0.367 (7.20)	0.055 (0.47)	0.090
firm size (in '000)	0.091 (6.20)	0.098 (6.08)	0.310 (9.01)	0.300
eastern region (0,1)	0.276 (5.34)	0.291 (5.27)	0.413 (4.02)	0.433
middle region (0,1)	0.217 (4.65)	0.220 (4.41)	0.080 (0.87)	0.473
city size >100,000 & <1,000,000 (0,1)	-0.006 (0.12)	-0.018 (0.35)	0.358 (3.36)	0.084
city size > 999,999 (0,1)	0.272 (6.80)	0.265 (6.16)	0.303 (3.45)	0.187
constant	2.903	2.869	4.782	
$1/\alpha$	1.049 *	1.059 *	1.031	
N	7405	7405	7405	
Log L	-39562	-36035	-12263	
LRT	1148	1142	870	
LRT (industry dummies)	76	64	44	

* significantly different from unity

Table 5: Unemployment Duration (Exit to Employment). Results for Subgroups (t-values in par.).

	Coefficient Δ Immigr. share	*Coefficient Δ CEEC-export share*	*Coefficient Δ CEEC-import share*	*Coefficient Δ RoW-export share*	*Coefficient Δ RoW-import share*	*1/α*
age under 31	7.284 (3.64)	5.007 (1.43)	3.257 (0.41)	-1.670 (2.62)	1.942 (1.87)	1.022
ages 31-45	4.614 (1.94)	9.758 (2.47)	-2.439 (0.26)	-1.509 (1.79)	1.945 (1.54)	1.040 *
age above 45	8.601 (1.61)	17.782 (1.74)	-22.780 (1.11)	-2.672 (1.43)	0.900 (0.34)	1.155 *
income below median	5.339 (2.88)	5.230 (1.55)	1.416 (0.21)	-0.893 (1.52)	0.265 (0.26)	1.039 *
income above median	7.503 (2.96)	14.292 (3.57)	-13.492 (1.30)	-3.942 (4.53)	2.814 (2.30)	1.062 *
*employed in problem industry***	1.559 (0.48)	6.772 (1.14)	-5.118 (0.54)	-1.062 (1.21)	1.502 (1.13)	1.081 *

* significantly different from unity
** Problem industries are defined by a disproportionately high rise in imports from the CEECs