

The Impact of EU Eastward Enlargement on Wages in the Current Member States with Special Reference to Austria

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I Introduction

The upcoming eastward enlargement of the European Union will increase the trade in goods between the prospective new EU Member States among the Central and Eastern European countries (CEECs) and the EU and will enhance migration. These developments will undoubtedly also have an impact on the labor markets of the current EU members.

Austria's geographical proximity and its historically strong ties to Central and Eastern Europe as well as the developments it has undergone since the opening up of the former Eastern Bloc make it an excellent model for assessing the possible effects of EU enlargement on the current Member States' labor markets. The Austrian economy was massively affected by the breakdown of communism and the fall of the Iron Curtain. Trade with CEECs boomed and the number of foreign workers registered in Austria increased.

Experts agree that Austria has benefited from the opening up of Eastern Europe. Growing employment demand triggered by the boom in exports more than offset job losses which had resulted from rising imports. However, the transition in Eastern Europe also encouraged migration to Austria. Approximately a quarter of the additional 115,000 foreign workers who took up jobs in Austria between 1989 and 1991 came from Central and Eastern Europe. The increase in the foreign labor pool in turn affected workers' chances of employment. There are strong indications that especially earlier immigrants and Austrians in low-income jobs (in particular men and older workers) were partially replaced by the newcomers.

Two studies commissioned by the European Commission analyze the effects of enlargement on employment, wages and distribution of income (see Boeri and Brücker, 2001; Mayerhofer and Palme, 2002). These studies use econometric methods to examine to what extent trade and migration impacted on wages, employment, sectoral mobility and unemployment in Austria (see also Hofer and Huber, 1999; Huber and Hofer, 2001), Germany (Brücker et al., 2000) and Sweden (Edin et al., 1999).

This study presents the most important findings about the empirical relationship between trade and migration on the one hand and wage growth and labor mobility on the other hand and looks at the existing results for Austria, also analyzing distributional aspects. Chapter 2 discusses the relationship between wages and external trade as well as migration by means of a simple theoretical model. Chapter 3 summarizes the available results relevant to the field of labor market, migration and external trade for Austria derived from micro-data studies. Our own estimates for Austria are presented in chapter 4. Chapter 5 comprises a summary of the most important results and conclusions from an economic policy perspective.

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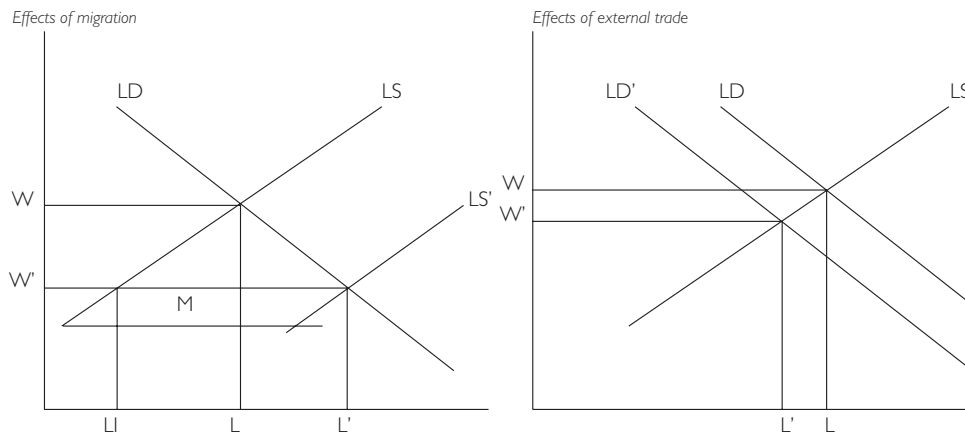
2 Theoretical Aspects

Studies on wages and migration usually implicitly or explicitly rely on a basic supply/demand model of the labor market, not taking into account mobility between sectors and/or regions. These studies impute a fixed and a variable factor and assume that the variable factor migrates. In such a model, labor demand and real wages which employers are willing to pay to a given amount of labor force are determined solely by the ratio of the variable factor to the fixed factor. Chart 1 illustrates this model, with the LS curve displaying labor supply and the LD curve labor demand. The point of intersection of the two curves (L, W) marks the original labor market equilibrium. The arrival of M migrants causes an outward parallel shift in the labor supply curve. In every income bracket, more jobs are now available. The new full employment equilibrium is at the point at which L' and W' intersect. At this wage rate, the employment of domestic workers is L_I .

Chart 1

Effects of Migration and an Increase in Imports

on the Labor Market



Note: LD: labor demand, LS: labor supply, M: migration, L: labor market equilibrium, W: wage rate equilibrium, L_I : employment equilibrium for domestic workers.

Source: Austrian Institute of Economic Research (WIFO), Institute for Advanced Studies (IHS).

Despite the simplicity of this model and the abstraction of significant effects, it allows some crucial predictions about the schematic effects of migration: Immigration reduces the employment of domestic workers from L to L_I . This crowding-out effect happens on a smaller scale than the original migration wave. The extent of replacement depends on the slope of the demand and supply curves: the flatter (more elastic) the labor supply curve and the steeper (more inelastic) the labor demand curve is, the larger the crowding-out effect is. Migration also has a dampening effect on wages. The extent to which wages decline is also determined by the slope of the demand and supply curves: the steeper (more inelastic) the labor supply curve and the steeper (more inelastic) the labor demand curve, the larger the wage effect.

Analogous to the effects of migration, the impact of external trade can also be analyzed using this model. Increasing imports with exports and domestic consumption remaining unchanged in the same sector imply that domestic output shrinks. Consequently, a smaller labor force is required to satisfy the

smaller demand for domestically manufactured goods. The derived factor demand for labor shifts from LD to LD'. When domestic consumer demand and exports remain constant, more imports in one sector mean that at any wage rate, less labor is sought after than under the original conditions. Therefore, wages and employment decline (from W to W' and from L to L', respectively).¹⁾ Similarly, increasing exports (under otherwise unchanged conditions) heighten labor demand, thus pushing up wages and employment. Again, the scale of the wage and employment effects depends on the relative increase (elasticity) of labor supply and demand; therefore, measuring the latter two is the main empirical task.

Allowing for unemployment by imputing rigid wages which respond to changes in unemployment at least marginally, an unemployment effect emerges next to the wage and crowding-out effects; its extent depends on how strongly wage policies respond to changes in the jobless rate. Thus, the labor market model confirms that immigration and increased imports tend to drive up unemployment and reduce wages and the labor participation rate. The relative scale of these three effects is determined by the following three critical parameters: real wage flexibility as well as the elasticity of labor demand and of labor supply.

One of the numerous important assumptions of the model which are not given in practice is the homogeneity of the factor labor. It is imputed that residents and migrants share the same characteristics and are therefore perfect substitutes. In reality, however, workers differ in many ways, especially in education and training. There is not only one labor market, there is a number of labor markets for workers with certain skills. In such a labor market, predictions derived from the model described above can be put into perspective if domestic and foreign workers are complements. If foreigners complement resident workers, the immigration of foreign workers will spur demand for domestic labor. Such a scenario would be conceivable, if residents were highly qualified and migrants were less qualified. If the employment of low-skilled workers requires a larger number of high-skilled workers to cope with the increased amount of management tasks, or if the larger number of less qualified labor enhances the productivity of highly qualified workers because they are able to delegate jobs, the immigration of low-skilled workers will push up wages and employment among highly qualified residents (Zimmermann, 1998).

Freeman and Katz (1991) show that the reduced form of the model shown in chart 1 can be written as:

$$\begin{aligned} \Delta w_{ij,t} = & \gamma' Z_{ij,t} + \delta_1(\omega_{1,j}\Delta D_{j,t}) + \delta_2(\omega_{2,j}\Delta E_{j,t}) - \\ & \delta_3(\omega_{3,j}\Delta MSHR_{j,t}) + \delta_4\Delta IMS_{j,t} + \varepsilon_{ij,t} \end{aligned} \quad (1)$$

where $\Delta w_{ij,t}$ is the log change in earnings for individual i in industry j at time t . $\Delta D_{j,t}$, $\Delta E_{j,t}$, $\Delta MSHR_{j,t}$ and $\Delta IMS_{j,t}$ denote the log changes in domestic demand, exports, the imports-to-GDP ratio and the share of migrants in

¹ Trade theory approaches are based on small, open economies. Unlike labor market models, these approaches impute given world market prices and frictionless labor markets. For an overview of the literature, see Huber and Wolfmayr-Schnitzer (2000).

industry j in the year t . $Z_{ij,t}$ is a vector of personal and industry characteristics which, apart from external trade, may also impact on wage growth. δ_1 to δ_4 are estimates, $\omega_{1,j}$ to $\omega_{3,j}$ are weights (the share of domestic demand, the exports-to-GDP ratio and the share of domestic production).

3 Investigation into the Effects of Migration and External Trade

Studies seeking to estimate the labor market effects of migration in Austria by applying econometric methods usually use the regional or sectoral variance of the share of foreign workers to ascertain the wage effect generated by an increase in the share of migrants. In many cases they find that migration has only small, but significant effects on the labor market, especially distributional effects. The following points can be summarized as a common denominator:

In general, high-skilled workers benefit from the arrival of low-skilled workers in that their wages rise. Less qualified workers, however, come under increasing pressure as other low-skilled workers enter the labor market and, as a consequence, their wages decline. The impact of migration varies from period to period. During large waves of migration, the effects (per migrant) are much stronger than in times of slow migration. Immobile workers (“stayers”), who cannot respond to increased competition by moving to another industry and/or region, are more exposed to the impact of migration than others. Thus, migration to one particular region or industry has geographically or industrially differentiated effects on stayers.

Table 1

Studies on the Effects of Migration on the Labor Market

(1988 to 1991)

Authors	Findings
Winter-Ebmer, Zweimüller (1996a)	Migration raises the wages of the high-skilled and reduces the wages of the low-skilled; it drives up unemployment and reduces the chances of employment, especially for men.
Winter-Ebmer, Zweimüller (1999)	At industry level, migration generated significant effects only from 1988 to 1989.
Winter-Ebmer, Zweimüller (1996b)	Changes in the share of migrants have a negative impact on the growth of young workers' wages and a positive impact on the wage level.
Winter-Ebmer, Zimmermann (1999)	Migration slows down employment growth.
Winter-Ebmer, Zweimüller (2000)	Migration increases the risk of unemployment only in industrial control variables, but considerably prolongs the duration of regional unemployment.

There are some studies that arrive at differing findings on the labor market effects of foreign trade in Austria:

Aiginger, Winter-Ebmer and Zweimüller (1996) examine the relationship between trade with the CEECs and the development of wages and unemployment between 1989 and 1991 using an individual data set. They find that the change in the ratio of exports to the CEECs to GDP had significant effects. An increase of this ratio reduces the average individual unemployment rate, and the effect of the ratio of imports from the CEECs to GDP is insignificant. An increase of the ratio of exports to the CEECs to GDP by 1 percentage point augments the wages of workers who did not move to another industry in the period under review (stayers) by 0.4% and the wages of industry changers (movers) by 0.9%. If the ratio of imports from the CEECs to GDP in a sector

grows by 1 percentage point, wage growth for stayers will drop by 2.9% and by 1.8% for movers.

Winter-Ebmer and Zimmermann (1999) look into employment growth and wage developments at the industrial level in Germany and in Austria (for the 1987 to 1994 period). They measure the ratios of exports and imports from and to the CEECs to GDP and the corresponding ratios for the rest of the world separately. An increase in the ratio of imports from the CEECs dampens employment growth, if only slightly. For instance, if the import ratio grows by 1%, employment growth will slow down by merely 0.03%. In low-income sectors and industries with high shares of foreign workers, the effect of imports from the CEECs is somewhat stronger. In these industries, an increase in the ratio of imports from other countries also has a significant (negative) impact on employment. By contrast, the export ratio does not notably affect employment growth. Wage growth shows the inverse picture: If the ratio of exports to the rest of the world increases by 1%, wage growth climbs by 0.2%. This effect is even more pronounced in industries with a large share of migrants.

Hofer and Huber (1999) investigate the relationship between foreign trade and wages (from 1991 to 1994) using individual data. Like Winter-Ebmer and Zimmermann (1999), they find that increasing imports in one industry by 1% does not significantly reduce wage growth, whereas increasing exports by 1% leads to additional wage growth of 0.2%. Furthermore, industry stayers are more strongly affected by changes in external trade than industry movers. In particular, stayers in sectors with high import growth rates see significantly smaller wage growth rates. In this case, elasticity comes to -0.1 .

4 Empirical Analysis

Owing to the limited availability of external trade data in the services sector, our analysis focuses on persons (men and women) employed in manufacturing. Also, we limited our investigations to 19- to 56-year olds, thus not taking into account apprentices and early retirees. Employees earning less than ATS 6,000 and those whose pay rose by 70% are also not represented in the sample, since such wage rates and wage hikes are usually attributable to part-time work or changes in working hours.

Since equation (1) is given in first differences, an econometric estimate should take into account only individual characteristics affecting wage growth

Table 2

Statistics on Individual Employees (Men)				
	Total Sample		Employees 1994	
	Mean	Standard deviation	Mean	Standard deviation
Age	34.310	9.150	33.710	8.580
Share of blue-collar workers	0.758	0.429	0.711	0.453
Log monthly wages 1991	9.890	0.268	9.900	0.256
Log monthly wages 1994			10.040	0.276
Log change in monthly wages 1991 to 1994			0.142	0.167
Share of industry stayers	0.567		0.706	
Share of industry movers	0.236			
Transition to nonemployment	0.198			
Number of observations	11,149		8,945	

Source: Association of Austrian Social Security Institutions, Austrian Institute of Economic Research (WIFO).

(but not the wage level). Therefore we include the age squared, a variable taking the value 1 for stayers and another variable taking the value 1 for industry movers and an interaction variable for working status and age. This has become necessary because the life income patterns of white- and blue-collar workers differ owing to the existing seniority rules and the wage growth for persons who have moved from one industry to another tends to be approximately a third lower (see Hofer et al., 2001). It should be noted that neither external trade nor the inflow of migrants is exogenous. Therefore, German external trade, immigration between 1988 and 1991 and the level of the share of foreign workers in the industry in 1991 were used as instruments.

In a first step, we use our data to estimate equation (1) for men and women as well as for white- and blue-collar workers (tables 4 and 5) separately. For men (table 3, column 1), we find a significant relationship between wage growth and external trade. Stronger domestic demand and export activity accelerate wage growth, whereas migration and increasing imports have the opposite effect. Overall, however, the effects are minor. If weighted domestic demand increased by 1%, wage growth would accelerate by 0.15%. Exports rising by the same amount would drive up wages by an additional 0.27%. Conversely, weighted import growth of 1% would dampen wage growth by 0.18%. If the share of migrant workers increased by 1 percentage point, wage growth, as a result, would drop by some 0.20%; however, this coefficient is not significant.

Compared to international studies, our coefficients are high, in particular for the external trade variables.¹⁾ Since Austria is a small, open economy, external trade plays a more important role in wage setting. Using a comparable method for the U.S.A., Freeman and Katz (1991) obtained a coefficient of 0.029 for domestic demand, 0.008 for exports and -0.011 for imports. Equally small values - 0.0133, 0.004 and -0.001, respectively - have been calculated

Table 3

**Effects of Changes in External Trade and Migration on Wage Growth
for Men between 1991 and 1994**

	Men				
	Total number of employees (1)	Blue-collar workers (2)	White-collar workers (3)	Industry movers (4)	Industry stayers (5)
Weighted change in domestic demand	+0.147*** (0.043)	+0.144*** (0.045)	-0.077 (0.119)	0.15 (0.10)	+0.10** (0.03)
Weighted change in exports	+0.273** (0.107)	+0.228** (0.114)	0.133 (0.288)	0.41 (0.33)	+0.21** (0.09)
Weighted change in imports	-0.182** (0.092)	-0.268*** (0.099)	0.108 (0.203)	-0.35 (0.27)	-0.05 (0.07)
Change in the share of migrants	-0.191 (0.169)	-0.290* (0.182)	0.254 (0.463)	-0.92 (0.50)	-0.03 (0.13)

Source: Association of Austrian Social Security Institutions, Austrian Institute of Economic Research (WIFO).

Note: Foreign trade variables as well as migration were instrumented by German external trade, lagged trade growth and the share of migrant workers in 1991. The specification contains not only the reported variables but also control variables for age squared, sectoral and interregional mobility as well as an intercept. The figures in parentheses show the standard deviation of the coefficient, *** (**) [*] stands for significance at the 1% (5%) [10%] level.

1) However, it should be noted that the individual coefficients are of limited international comparability, since they are subject to the number of industry categories used.

for Germany (see also Brücker et al., 2000). By contrast, Edin et al. (1999) find coefficients of 0.049, 0.055 and -0.060 for Sweden. The conclusion that wages respond to external trade developments more strongly in Austria is also in line with earlier findings. Furthermore, Aiginger et al. (1996) reported significantly higher coefficients for trade with the CEECs. Hofer and Huber (1999) arrive at somewhat smaller coefficients (0.1 to 0.2), and Winter-Ebmer and Zimmermann (1999) calculated similar coefficients, which, however, remain statistically insignificant.

We have made our results subject to a few additional stress tests by including further control and sector variables for resource- and technology-intensive sectors and the average productivity of these sectors. The results proved robust to such changes. Depending on the specification, we obtained coefficients from 0.15 to 0.10 for domestic demand. The coefficient for exports ranged from 0.37 to 0.19, for imports from 0.20 to -0.01 and for the change in the share of migrants in the workforce from -0.42 and -0.19 .

We found considerable differences between blue- and white-collar workers (table 3, columns 2 and 3). Apparently, white-collar workers' salaries in Austria respond to changes in labor supply or demand only weakly. Neither the external trade variables nor the migrants' share in the workforce are significant. Changes in domestic demand also hardly have an impact on the growth of white-collar workers' pay.

This has a number of reasons. First, white-collar workers are usually better qualified; thus, they tend not to come under severe pressure from the new migrants, who usually work in low-qualified jobs. On the contrary, they may be complements to migrant workers, which would explain the insignificant, but positive effect of migration on wages. Also, imports from countries with relative advantages in sectors with a high share of less qualified jobs are thought to affect white-collar employees less strongly. Finally, the institutional setting of wage bargaining and the larger role of the principle of seniority in white-collar working environment are also reasons for wage growth not to respond strongly to fluctuations in labor supply and demand.

Blue-collar workers feel the impact of foreign trade developments and migration much more vigorously. Increasing weighted exports by 1% boosts wage growth by 0.23%, increasing weighted imports dampens wage growth by 0.27%. Unlike their white-collar colleagues, blue-collar workers must expect negative effects on wage growth from a rise in the share of migrants in a sector. If the share of migrants augments by 1 percentage point, the wage growth for blue-collar worker decelerates by approximately $\frac{1}{4}\%$. If blue-collar wage growth were 2% without migration, it would drop to 1.75% factoring in immigrants. In other words, the effects of both migration and external trade on wage growth are fairly small.

The separate observation of movers and stayers can yield large differences in the results (Aiginger et al., 1996). Mobility can help reduce wage pressure on workers in sectors that supply highly competitive import markets or attract a particularly large number of migrants. They can move to sectors offering better chances of employment. This option, however, is subject to prevailing economic conditions. During an upswing, high labor demand makes it easier to change sectors than during a recession, when the number of jobs tends to be scarcer

and it is harder to escape wage pressures. Aiginger et al. (1996) show that the increase of imports between 1988 and 1991 affected movers less severely than stayers.

The 1991 to 1994 period was marked by significantly different economic conditions than the 1988 to 1991 period. Results deviating from Aiginger et al. (1996) are attributable to slower employment growth. Between 1991 and 1994, both industry movers and industry stayers were subject to moderate wage growth while imports and migration were on the rise. It is noteworthy that the effects remained insignificant for both subgroups and, second, that the effects were larger but showed a higher standard deviation for industry movers. During economic slowdowns, the heterogeneity of movers' wages is higher than during upswings. In this group, persons in the peripheral workforce of an enterprise who successfully fended off wage losses and unemployment by moving from one sector to another mix with people who did not do so well. It can be concluded that during downturns, mobility across sectors is no guarantee that workers can evade income losses.

The labor market behavior of women differs sharply from that of their male counterparts. Women tend to be less mobile and to work in part-time jobs. Therefore it seems appropriate to analyze the impact of migration and trade on women in the labor force separately. However, owing to the lack of information on working hours in our data set, we encountered problems caused by data on women switching between full-time and part-time jobs and between economic sectors. Our results reflect these difficulties (table 4). The inclusion of all women in our sample yields unexpected results (table 4, column 1). If we leave aside all women whose wages changed by more than 20% to remove those who switch between part- and full-time jobs (column 2), we obtain insignificant effects of exports and imports on female employees' wages. The only significant impact we detect is related to the change in the share of migrant workers.

Table 4

**Effects of Changes in External Trade and Migration on Wage Growth
for Women Between 1991 and 1994**

	Women					
	Total number of employees		Blue-collar workers	White-collar workers	Industry movers	Industry stayers
	(1)	(2)	(3)	(4)	(5)	(6)
Weighted change in domestic demand	+0.004 (0.07)	+0.0003 (0.04)	-0.08 (0.10)	+0.12 (0.12)	+0.16 (0.22)	-0.04 (0.07)
Weighted change in exports	-0.60*** (0.14)	-0.10 (0.08)	-0.76*** (0.18)	-0.07 (0.27)	-1.98*** (0.38)	-0.02 (0.12)
Weighted change in imports	+0.12* (0.07)	-0.01 (0.04)	+0.27 (0.08)	-0.20* (0.11)	+0.41*** (0.14)	-0.13*** (0.05)
Change in the share of migrants	-0.26 (0.26)	-0.32** (0.15)	-0.07 (0.34)	-0.67 (0.41)	-0.14 (0.77)	-0.52*** (0.23)

Source: Association of Austrian Social Security Institutions, Austrian Institute of Economic Research (WIFO).

Note: Foreign trade variables as well as migration were instrumented by German external trade, lagged trade growth and the share of migrant workers in 1991. The specification contains not only the reported variables but also control variables for age squared, sectoral and interregional mobility as well as an intercept. The figures in parentheses show the standard deviation of the coefficient, *** (***) [*] stands for significance at the 1% (5%) [10%] level. Column (2) does not take into account women whose wages declined by more than 20% in the period under review. All other columns include all female employees.

Since women tend to be less mobile, the results for female industry stayers seem to be less distorted (table 4, columns 5 and 6). Corresponding to our original assumptions, rising imports have negative implications for immobile women workers. If import growth accelerates by 1%, wage growth for women will decline by 0.13%, which corresponds approximately to the value obtained for men. However, increasing migration affects the wage growth of women more severely than that of men. If the share of migrant workers rises by 1 percentage point, wage growth for female stayers shrinks by 0.5 percentage point.

Our next step involves an investigation into the impact of external trade and migration on the distribution of income. Over the past few years, a lot of research has been dedicated to this issue. We focus on the differences in the effects of globalization on wage growth at different levels of qualification. To identify these differences, we regress the wage level 1991 on age and age squared. Thus we adjust the wage level for differences in seniority and obtain age-adjusted wages. Differences in wages are to reflect first and foremost differences in workers' (observable and nonobservable) qualifications. In our next step we estimate equation (1) for the quartile of the age-adjusted distribution of income of 1991.

Table 5

Effects of Changes in Trade and Migration				
on Various Income Quartiles for Men and Women				
	1 st quartile	2 nd quartile	3 rd quartile	4 th quartile
<i>Men</i>				
Weighted change in domestic demand	+0.12** (0.07)	-0.01 (0.08)	+0.08 (0.09)	+0.11 (0.09)
Weighted change in exports	+0.56** (0.24)	-0.15 (0.18)	+0.14 (0.20)	+0.21 (0.22)
Weighted change in imports	-0.12 (0.21)	-0.13 (0.15)	-0.08 (0.15)	-0.75** (0.15)
Change in the share of migrants	+0.82 (0.48)	+0.15 (0.30)	-0.14 (0.31)	-0.24 (0.29)
<i>Women</i>				
Weighted change in domestic demand	-0.16 (0.15)	+0.18 (0.14)	+0.11 (0.15)	+0.09 (0.18)
Weighted change in exports	-0.08 (0.28)	+0.47 (0.31)	+0.11 (0.31)	+0.41 (0.33)
Weighted change in imports	+0.13 (0.09)	+0.03 (0.12)	-0.06 (0.15)	-0.31** (0.14)
Change in the share of migrants	+0.84 (0.68)	-0.74 (0.56)	-0.79 (0.49)	-0.61 (0.48)

Source: Association of Austrian Social Security Institutions, Austrian Institute of Economic Research (WIFO).
Note: Foreign trade variables as well as migration were instrumented by German external trade, lagged trade growth and the share of migrant workers in 1991. The specification contains not only the reported variables but also control variables for age squared, sectoral and interregional mobility as well as an intercept. The figures in parentheses show the standard deviation of the coefficient. *** (***) [*] stands for significance at the 1% (5%) [10%] level.

The highly qualified workforce, especially men, benefit particularly from higher export growth (table 5, column 1). If weighted export growth accelerates by 1%, wage growth for men in the first quartile of the age-adjusted wage distribution increases by 0.5 percentage point. For women, this effect is insignificant, because, first, the income level of women is generally lower, and, second, women's share in the manufacturing sector with its highly qualified jobs and high export growth rates is generally small. The results confirm our earlier deliberations. Austria's comparative advantages lie with the production of

human capital-intensive goods; therefore, the relevant sectors should post the highest export growth rates and, consequently, highly skilled workers should benefit from the increase in exports more than any other group.

While increasing exports do not considerably boost wage growth for low-skilled workers, a rise in imports, by contrast, has a clearly negative effect, which is larger for men than for women. Wage growth for men in the lowest income quartile of the wage distribution (adjusted for age) will slow down by 0.75 percentage point if the weighted import ratio climbs by 1%, whereas the same impetus reduces wage growth for women by only 0.31 percentage point.

Although the overall effects of migration on wage distribution are insignificant, our results show that the estimated coefficient for more highly qualified workers is positive and the coefficient for less qualified workers is negative. In other words, the highly qualified labor force (both men and women) tends to benefit from migration. At the same time the less qualified are exposed to increased competitive pressure and have to cope with slower wage growth. This effect hits women harder than men. Migration generates competitive pressures especially on less qualified labor, since the bulk of migrants lack good qualifications. Highly skilled workers, by contrast, gain advantages from migration as they are complements to the – usually less qualified – foreign workers.

If a country's wage structure does not respond sufficiently flexibly to changes in demand or supply, quantity adjustments can be alternative adjustment mechanisms. Migration or additional imports could force workers into unemployment or to move to another industry. The question that remains to be investigated is how close, in fact, is the relationship between mobility, external trade and migration? We analyze this question by dividing the workforce into three groups: those who were employed in one and the same sector throughout the 1991 to 1994 period, those who moved to other sectors and those who moved into nonemployment (unemployment or other nonemployment) in 1994.

We use a multinomial logit model (see Greene, 1997). This model estimates the relative probabilities (relative to an arbitrarily chosen reference state) that an individual is in one of several possible states. As reference category we define employment in the same industry in May 1991 and May 1994. The selection of individual i for one of these categories is determined by a vector of industry- and individual-specific variables (\tilde{Z}_i). The multinomial logit specifies the probability P_{ik} that individual i is found in state k ; P_{ik} is given by

$$P_{ik} = \frac{\exp(b'_k \tilde{Z}_i)}{1 + \sum_k \exp(b'_k \tilde{Z}_i)} \quad (2)$$

with b'_k ($k=1, 2$) being a series of coefficients to be estimated.

The results obtained from the model described in equation (2) require a different interpretation from those reached by means of the linear regression model. The coefficients show the change in the relative probability of finding an individual in this state relative to the original state, which resulted from the change of this variable. A positive coefficient increases the likelihood of being found in this state relative to the likelihood of being in the original state.

Nonlinearity is another specific contained in the model described in equation (2). The coefficients cannot be interpreted as marginal effect.

In addition to the variables migration, external trade and domestic demand, the vector \tilde{Z}_i contains the following control variables: age and its square, one dummy for blue-collar worker, two dummies for firm size (20 to 100 employees; more than 100 employees), two regional variables (Vienna; other cities with more than 100,000 inhabitants), number of years with the company, number of jobs until 1991, and the sector's interindustry wage differential.

Table 6

Multinomial Logit Model: Sectoral Mobility, Nonemployment and Migration and Trade						
	Industry movers vs. industry stayers			Nonemployment vs. industry stayers		
	Total	Blue-collar workers	White-collar workers	Total	Blue-collar workers	White-collar workers
<i>Men</i>						
Weighted change in exports	-1'10 (1'76)	-1'35 (2'02)	- 1'16 (3'90)	-10'60*** (2'26)	-8'65*** (2'44)	-14'66*** (5'46)
Weighted change in imports	-9'29** (1'81)	-5'28*** (1'90)	-15'14*** (5'21)	+ 5'06 (2'71)	+5'18* (2'59)	+ 4'03 (7'47)
Weighted change in domestic demand	+2'52** (0'78)	+2'48 (0'84)	+ 3'57 (2'52)	+ 0'76 (0'96)	+1'22 (1'05)	+ 0'77 (3'15)
Change in the share of migrants	-8'79*** (2'10)	-6'53*** (2'12)	-19'86*** (8'39)	+ 5'78*** (2'64)	+4'51*** (2'53)	+ 4'05 (11'31)
<i>Women</i>						
Weighted change in exports	-5'66*** (2'14)	-5'68*** (2'70)	- 6'53** (3'45)	- 2'08 (2'08)	+1'61 (2'52)	- 9'29*** (2'66)
Weighted change in imports	+1'38 (1'47)	+1'72 (1'51)	+ 3'16 (2'54)	+ 1'08 (1'45)	-0'07 (1'46)	+ 5'57** (2'60)
Weighted change in domestic demand	+4'81 (3'57)	+1'76 (4'73)	+ 4'39 (3'80)	+ 1'06 (3'41)	+2'01 (4'33)	- 2'39 (3'72)
Change in the share of migrants	-8'44 (11'77)	+5'95 (15'02)	-10'85 (14'36)	- 0'84 (11'46)	+4'48 (14'00)	+ 2'02 (14'54)

Source: Association of Austrian Social Security Institutions, Austrian Institute of Economic Research (WIFO).
Note: Foreign trade variables as well as migration were instrumented by German external trade, lagged trade growth and the share of migrant workers in 1991. ***(**) [*] stands for significance at the 1% (5%) [10%] level. The estimation takes into account not only migration, external trade and domestic demand, but also the following additional variables: age and age squared, one variable for blue-collar workers, two for firm size (20 to 100 employees; more than 100 employees), two regional variables (Vienna; city with more than 100,000 inhabitants), number of years with the company, number of previous jobs up to 1991, and the interindustry wage differential.

Our results for men suggest that their chances of employment improve when export growth is on the rise. In this case, the relative likelihood of moving into unemployment declines significantly for both blue-collar workers and male white-collar workers. A similar effect can be observed for female white-collar workers.

By contrast, migration affects only parts of the employees in question. In particular, the risk of unemployment changes for certain groups. Increased migration significantly heightens the risk of unemployment solely for blue-collar workers. Owing to the high heterogeneity among movers, all other groups do not show significant effects. The relationship, however, is positive also in these groups. Higher import growth also significantly increases the risk of unemployment for blue-collar workers and female white-collar workers. These effects are not significant for female blue-collar workers and male white-collar workers.

Hence, higher export growth rates reduce the risk of unemployment for all groups on the labor market, except for female blue-collar workers, whereas greater competition is the underlying cause for migration to raise the risk of unemployment especially for blue-collar workers, and export growth helps

keep in particular blue-collar workers and female white-collar workers in employment.

The relative likelihood of female white- and blue-collar workers moving to other sectors decreases as the export ratio rises. Women employed in sectors with higher export growth rates enjoy good job security and are more rarely forced to switch industries. A higher import ratio, on the other hand, increases the probability that these women move to other sectors; however, like migration and changes in domestic demand, this effect remains insignificant.

For men, however, the coefficients are partly significant and carry the “wrong” signs. Both migration and higher imports increase the likelihood of employees switching sectors, while more rapid growth of domestic demand encourages interindustry mobility. We had expected the three factors to produce the opposite effects. However, the wrong signs can be attributed to the economic conditions prevailing in the period under review. When the economy is down, the majority of industry movers switch sectors involuntarily, which makes it difficult to observe voluntary mobility.

5 Conclusions

This paper examines the relationship between changes in external trade and migration on the one hand and wages and the mobility of the Austrian workforce on the other hand. Our results showed significant differences in the impact of changes in external trade and migration on different groups of labor. For men, migration and higher import growth imply decelerating wage growth in the blue-collar group whereas no such changes were recorded in the white-collar group. Furthermore, men in the upper income quartile gain significantly from increasing exports. By contrast, men in the lower income quartile are faced with slower wage growth. In accordance with other studies, we found that rising migration speeded up wage growth for men in the upper income quartile but led to slower wage growth for male workers in the lower income quartile. However, these effects are not statistically significant.

External trade and migration also affect the risk of unemployment for men. Blue-collar workers are more likely to be forced into unemployment when migration and imports are on the rise. All other groups are too heterogeneous as regards the risk of unemployment to allow statistically well-founded conclusions.

Among the female workforce, industry stayers are the group most affected by wage losses as a result of higher imports. The effects are similar, but owing to women’s generally lower wages, less significant in the upper income quartile. Yet our results indicate that there are fundamental differences in female workers’ adjustment to changes in labor supply and demand (especially in respect of sectoral mobility and working time), which we are able to analyze only inadequately. Future studies should look into these adjustment mechanisms, which are particularly relevant to the female workforce, in more detail.

What are the implications of our results for EU eastward enlargement? Experts widely agree (Boeri and Brücker, 2001, for the entire EU; Egger, 2000, for Austria) that the upcoming round of enlargement will generate only minor external trade effects. In particular, the expected import growth rates will most likely match the export growth rates. Therefore, aggregate data show

that employees will hardly experience wage losses and nor will they be at risk of unemployment.

Enlargement may have an impact on the distribution of income if policy-makers fail to take the necessary economic measures. Taking into consideration Egger's (2000) findings, according to which both exports and imports will grow by an additional 0.5% after enlargement, we suggest that wage growth will pick up (for men and women) in the upper income quartile. At the same time, the lower income quartile would be faced with a slowdown in wage growth.

Migration following enlargement, by contrast, will generate larger effects. Our results suggest that migration would dampen wage growth for blue-collar workers and female industry stayers and at the same time increase the risk of unemployment for men (blue- and white-collar workers). Assuming that some 35,000 migrants a year arrive in Austria (i.e. a 1 percentage point increase in the share of migrants), wage growth for male blue-collar workers would be dampened by 0.3 percentage point (and amount to only 1.7% instead of 2%) and wage growth for women would be 0.5 percentage point lower.

Our results do not question the results of macroeconomic simulation studies which suggest that the overall economic effects of integration will be positive and that Austria will be one of the big winners of the upcoming round of enlargement (Baldwin et al., 1997, for Europe; Breuss, 2001, and Keuschnigg and Kohler, 1999, for Austria). Economic policymakers face the challenge of securing the positive overall effects of enlargement and of taking the necessary distributional measures to ensure that all sectors benefit from these gains.

Efforts to counter the risks of slower wage growth and higher unemployment among less qualified workers and low income earners should be given the top priority. Such measures could include better training for those entering the labor market and further education for the active workforce. Cuts in taxes and nonwage labor costs can contribute to maintaining net incomes at a stable level and to reducing the cost of labor for businesses; thus, the government would be able to ease the adjustment pressures on the workforce.

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