

The effect of foreign affiliate employment on wages, employment, and the wage share in Austria

Onaran, Özlem

DOI:
[10.57938/1035d798-8618-4e8a-a920-068103d998cf](https://doi.org/10.57938/1035d798-8618-4e8a-a920-068103d998cf)

Published: 01/01/2008

Document Version:
Publisher's PDF, also known as Version of record

Document License:
Unspecified

[Link to publication](#)

Citation for published version (APA):
Onaran, Ö. (2008). *The effect of foreign affiliate employment on wages, employment, and the wage share in Austria*. (March 2008 ed.) Inst. für Volkswirtschaftstheorie und -politik, WU Vienna University of Economics and Business. Department of Economics Working Paper Series No. 118 <https://doi.org/10.57938/1035d798-8618-4e8a-a920-068103d998cf>

The Effect of Foreign Affiliate Employment on Wages, Employment, and the Wage Share in Austria *

Özlem Onaran[†]

Working Paper No. 118, March 2008

Abstract — This paper estimates the effects of outward Foreign Direct Investment (employment in the affiliates abroad) on employment, wages, and the wage share in Austria using panel data for the period of 1996-2005. There is evidence of significant negative effects of FDI on both employment and wages, and consequently on the wage share. The results are not limited to workers in low skilled sectors or blue collar workers. The negative employment effect is primarily due to the rise in the employment in the foreign affiliates in Eastern Europe. The negative wage effects are originating from affiliate employment in both the East and the developed countries in industry, but no effect is found in the total economy.

Keywords: *Austria, FDI, wage, employment, labor share*

JEL-Classification: *F16, J23, J30, O52*

* This study has benefited from research funding by the Vienna Chamber of Labor. The author is grateful to Paul Ramskogler for the excellent research assistance, to Werner Raza, Sepp Zuckerstaetter, Engelbert Stockhammer, Wilfried Altzinger, Christian Bellak, Thomas Grandner, Herbert Walther, Markus Leibrecht, Mehtap Hisarciklioğlu for fruitful discussions, and to Ursula Havel, Franz Granner, René Dell'mour, Karl Klein, Henriette Killian, and Andreas Buzek for their valuable support about data. All remaining errors are mine.

[†] Vienna University of Economics and B.A, Address: Institute of Labor Economics, Nordbergst. 15, UZA4 1090 Vienna e-mail: ozlem.onaran@wu-wien.ac.at

I. Introduction

The aim of this paper is to empirically analyze the impact of Foreign Direct Investment (FDI) outflows on the labor market outcomes in Austria. In the last fifteen years there has been a significant increase in the globalization of the Austrian economy through an increase in exports, final imports, offshoring (intermediate imports), and outward FDI. The integration of the Central and Eastern Europe (CEECs) to the European economic sphere, added a new dimension to the globalization of the Austrian economy, although Austrian FDI towards Western Europe also increased significantly during this period. Austria is one of the relatively most integrated Western high wage-country to the low-wage East. Its geographical proximity as well as historical ties and its small size played a role in this fast integration.

The globalization of the economy has coincided with adverse developments in the labor markets, raising doubts about a causal link. Since the 1980s industrial employment is decreasing, and total employment is stagnant in spite of the jobs created in services. In the meantime real wages have stagnated in the total economy particularly since the mid 1990s. The service wages are even slightly declining in the last five years on average. This development is in striking contrast to the strong improvement in labor productivity, which has always exceeded real wage increases since the 1980s with few exceptions.

As a combination of these developments (in employment, wages, and productivity), the wage share (labor compensation/gross value added in non-agricultural sector) declined from a level of 72% in 1978 to 54.9% as of 2005¹. The deterioration continued in the past years in spite of the profitability gains due to enlargement (Altzinger, 2006). The decline in labor share is not specific to Austria, albeit it has experienced one of the steepest declines in the EU. The general declining trend in labor's share in many OECD countries since the mid-1970s and early 1980s is addressed recently by the OECD (2007) and the IMF (2007) in addition to some earlier studies (Harrison, 2002; Diwan, 2001; Epstein, 2000, Stockhammer

et al, 2007). Breuss (2007) finds that increased trade with the East and FDI in general causes a decline in the labor share in the developed EU countries.

Austria is an interesting case to investigate the effects of FDI on labor market outcomes, being a small economy, which is highly integrated to the other high wage as well as low wage countries. In this paper first we estimate the effects on employment and wages, and then combining the effects on both wages and employment we calculate the cumulative effects on functional income distribution, i.e. wage share. The estimations are made for a panel of sectors for the period of 1996-2005. The effects are separately estimated for low and high skilled sectors, industry vs. services, and blue vs. white collar workers. We pay particular attention to the possible different effects of FDI in the developed countries vs. the CEECs and the other low wage countries. The contribution of this study is to combine the effects on wages and employment to address the effect of FDI on functional income distribution using detailed sectoral analysis.

The rest of the paper is organized as follows. Section two reviews the theoretical expectations and empirical findings about the FDI effects on labor market outcomes. Section three presents the model. Section four discusses the data and methodological issues. Section five presents the stylized facts of FDI and labor market outcomes in Austria. Section six present the estimation results. Section seven concludes.

II. The literature on the home country effects of FDI

FDI will generate two different channels of effects on the labor market outcomes through changing the magnitudes of trade and changing the allocation of types of production within the firm. Regarding both effects, it is important whether FDI has a vertical (cost seeking) vs. horizontal (market seeking) character. The labor market effects are expected to be the strongest for cost-saving vertical FDI.

With respect to the effects through the mechanism of trade, while vertical FDI will lead to more intermediate imports, which may substitute certain types of domestic labor, it may however also create more exports (to the foreign affiliate through intermediate exports and elsewhere if there is a cost advantage obtained through FDI) and more output through scale effects as mentioned above, which can offset or can be offset by the labor replacement effects.

Horizontal FDI on the other hand replaces the exports of the country, and may generate negative employment effects in tradable sectors, but in services these effects are less likely to take place. In the extreme case, if the affiliates replicate all activities, then employment at home can decrease (Head and Ries, 2002). But if affiliates produce only the final goods of the company and use intermediate inputs from the parent firm, this will generate a skill upgrading effect.

Vertical FDI is particularly expected to change the factor composition of production at home. As certain jobs are relocated abroad, others may be created at home. Thus foreign labor might substitute some factors of productions, but complement others. In a capital abundant country, it could be expected that there will be some increase in the use of capital and less demand for labor. In a skilled labor abundant country the demand for skilled labor's employment is also expected to increase relative to unskilled labor as headquarter services increase (Helpman and Krugman, 1985). So initially employment at the parent company may fall due to substitution effects, but then there may be additional production of skill-intensive products to be exported to the foreign affiliates (scope effects), and a general increase in market share and output due to cost saving effects (scale effects), which may increase also overall employment (Hanson et al., 2003). Thus the overall effect depends on the negative substitution vs. positive scope and scale effects. The argument then follows that if labor markets are flexible, there will be negligible effect on total employment. The net effect on employment would then depend on the net of jobs destroyed and created. But skilled labor

might also be substituted by foreign labor through an overall increase of capital intensity at home. Horizontal FDI will have less effect on the composition of factor demand, since it does not particularly change the international division of labor, but it can still create more demand for factors, e.g. skilled labor, that are used more intensively at the headquarters of the multinational firm.

In the literature the effects of FDI on home country labor markets are tested by estimating the effects of affiliate sales or employment or labor costs on parent employment and wages. The estimations usually include a control variable for the scale of production at home. Therefore these regressions are more likely to capture the effects of vertical FDI rather than horizontal FDI (Molnar et al, 2007). To decrease this bias, we will use value added instead of output as a control variable; but nevertheless part of the scale effect will still be captured by the value added effect in the case of the horizontal FDI. Regarding the direction of the employment effect, again the question is whether foreign labor is a substitute or complementary to domestic labor, and in the former case to what extent scale vs. labor replacement effects dominate. The effects are expected to be also larger for small home country relative to the location of the affiliates (Molnar et al., 2007).

Regarding the wage effect, for a given capital/labor ratio the effect would be positive if foreign labor is complementary, and negative if it is a competitor. But particularly efficiency seeking FDI may generate negative effects through the so called threat effects as pointed out by the political economists (Onaran, 2009; Harrison, 2002; Diwan, 2001; Burke and Epstein, 2001; Rodrik, 1997; Crotty et al, 1998). The increase in international capital mobility and offshoring and the asymmetry between the fall back options of capital vs. labor may lead to labor disciplining effects and downward pressure on wage demands. The source of the effect is the threat of relocation, which leads to a defensive race to the bottom of the wages at home. This may particularly be the case if the destination of FDI is low wage countries, However even among high wage countries capital mobility may generate certain

labor disciplining effects. The effect may take place even in the absence of relocation. An increasing number of studies emphasize that labor disciplining and threat effects of capital mobility may not be directly reflected in the actual volumes of capital flows, and call for direct qualitative evidence on these effects (Burke and Epstein, 2001). In this paper such threat effects without an actual relocation of production taking place will show up in the time effects in our estimations.

In the empirical literature regarding the home country effects of FDI, there are rather mixed results (Molnar, et al, 2007; Lipsey, 2002). Blomström et al. (1997) analyze the relation between employment in the parent firm and foreign production based on firm level data for the US and Sweden, and find some negative relationship in the US, but a robust positive relation in Sweden. Lipsey (2002) however finds positive relation in the machinery sector in the US, and negative effect in the transport equipment sector. Braconier and Ekholm (2001) show that Swedish firms' expansion in the CEE leads to job loss in mostly low wage EU countries than in high wage countries. Lipsey et al (2000) find for Japan a positive effect of foreign output on domestic employment. For the case of US, Brainard and Riker (1997) also find that there is substitution between labor at home and abroad, however the substitution is greater between affiliates in different countries. Different from these previous studies Desai et al (2005) and Hanson et al (2003) find a positive effect of affiliate activity on employment in manufacturing in the US. Desai et al (2005) also find a positive association between wages between foreign affiliates and parent companies. Molnar et al (2007) find that outward investment has a significant positive effect on employment growth in the US, but a negative effect in Japan, and no effect in Germany; additionally they find that in manufacturing industries in the OECD with strong links to non-OECD countries, outward investment makes labor demand curve more elastic at home and increases the speed of adjustment; but in services outward FDI has a positive effect on employment. In the case of multinationals in the EU, Konings and Murphy (2003) finds substitution effect between parent

employment and its affiliates in the EU15, but no effect with respect to the low wage regions in the EU and the CEECs. Regarding the effect of the affiliate labor costs in the CEECs on employment European Commission (2005) finds negative effects in France and Belgium, and Becker et al (2005) find negative effects in Germany and Sweden, albeit higher substitution effects are found with respect to EU15 in the latter study. Lipsey (2002) also points out that there may be a difference between firm and industry level studies: Substitution among types of activities may take place not only between home and foreign operations of a firm, but also between parent firms and non-multinational firms in the same industry at home.

Regarding the effects of FDI on labor market outcomes in Austria, Bellak and Altzinger (2001) find a negative effect of affiliate sales on parent employment. Based on firm level survey results, Marin (2004) predicts that 22.000 jobs were lost in Austria due to outward FDI towards the East during 1990-2001, most of which were skilled jobs. However she finds no statistically significant effect of affiliate wages on parent company's employment (Marin, 2004). Pfaffermayr (2001) finds that employment in the foreign affiliates of Austria in developed countries are substitutes for domestic labor, whereas foreign employment in the East is complementary, since domestic employment does not respond to wage differences with respect to the East. Falk and Wolfmayr (2007) find mixed evidence based on static vs. dynamic estimations: according to the static results, they find a significant negative effect of foreign affiliate employment in the five New Member States in the East on domestic industrial employment, and a positive effect on services employment. However the dynamic estimation results point at no significant impact on industrial employment, but a negative effect on services due to both affiliate employment in developed countries and the East. At firm level data, they find no effect.

III. The model

The model exists of a pair of equations for labor demand and wage bargaining, which then is solved simultaneously and inserted into a wage share equation to calculate labor's share in value added.

The industry's derived demand for labor is given as follows:

$$\ln(l_{i,t}) = \beta_i + \beta_t + \beta_w \ln(w_{it}) + \beta_q \ln(q)_{i,t} + \beta_k \ln(k)_{i,t} + \beta_{kict} \ln(ict)_{i,t} + \beta_f \ln(f_{i,t}) + \sigma_{t,i} \quad (1)$$

where $\ln(l_i)$, $\ln(w_i)$, $\ln(q_i)$, $\ln(k_i)$, $\ln(ict_i)$, and $\ln(f_i)$ are the employment, real wage (labor compensation, deflated by sectoral producers price index), real value added, real non-ICT capital stock, real ICT capital stock, and employment in foreign affiliates in sector i respectively, and all are in logarithms. The focus of the paper is the effect of employment in foreign affiliates as a demand shifter, f , as we will discuss in more detail below. The other variables are the control variables. Capital stock is disaggregated as normal and ICT capital to differentiate the technology effects from extensive investment. The labor demand is based on a production function with a quasi-fixed capital constraint in the short run². Theoretically a positive labor demand effect of output is expected. The demand for labor is expected to be negatively affected by the real wages from a classical point of view; however this is an empirical issue for this study to be tested. Non-ICT capital may be substituting or complementing labor; the latter would be the case if the firm has excess capacity. But a negative substitution effect of ICT capital may be expected at least for less skilled workers. β_i is a sector specific coefficient. β_t is the time dummy, capturing time specific shocks such as exogenous technology shocks not captured by the ICT capital stock, or policy changes and other institutional factors such as employment taxes, employment legislation that may affect labor demand.³

The wage bargaining model is given as follows:

$$\ln(w_{i,t}) = \alpha_i + \alpha_t + \alpha_l \ln(l_{i,t}) + \alpha_k \ln(k_{i,t}) + \alpha_{kict} \ln(ict_{i,t}) + \alpha_f \ln(f_{i,t}) + \varepsilon_{t,i} \quad (2)$$

where all variables are as defined above. This model is consistent with union bargaining and efficiency wage models (Konings and Vandebussche, 1995; Greenaway et al, 1999b) In order to avoid the complications of modeling the formation of price expectations, an ex post bargained wage model is used. We thus look at the outcome of bargaining, i.e. the (ex post) real wage. Furthermore to be parallel to the labor demand equation, we are estimating real wages deflated by producers' prices rather than consumer prices⁴. Again the focus is on employment in foreign affiliates, f , which capture the effects of relocation on the bargaining power of domestic labor, and shift the bargaining curve as we will discuss in more detail below. The other variables are control variables. The capital/labor ratio, thus $\ln(k)+\ln(ict)-\ln(l)$, determines the productivity of labor and worker's aspirations and will have a positive effect on wages, but the degree at which they can index wages to productivity improvements will depend on their bargaining power. Also in more capital intensive sectors with a higher capital/output ratio the organizational strength and the bargaining power of the workers will be higher, and firms would be more willing to accommodate wage demands since labor costs are constituting a smaller part of their total costs. In the case of ICT-capital, however, the positive effect may be reversed with a technological replacement effect, particularly in the case of less skilled workers, who may be substituted with ICT-capital. This effect will disappear if capital and labor are complementary. The employment in the sector captures the insider power and the demand effect, and will affect workers bargaining power positively and lead to higher real wage. However the responsiveness of wages to employment will also depend on the strategy of the labor unions, i.e. the trade off between wages and employment for the unions during a recession. Unions may choose to bargain for job protection and accept stagnant wages, in which case the positive effect of employment on wages will disappear. Moreover in our model employment and capital stock are used both in logarithms, as opposed to a model with employment and capital/labor ratio. Thus the negative

denominator effect of employment in the capital/labor ratio will also be incorporated to the coefficient of employment in our model, making the interpretation of the sign of the coefficient hard. We nevertheless prefer this model because it is parallel to the employment model, which will have a computational advantage when deriving the wage share below. α_i is a sector specific coefficient. α_t is the time dummy, accounting for the economy wide labor market conditions that affect workers' outside options⁵, an alternative economy wide wage⁶, and the institutional factors that may affect the bargaining power like union density, collective bargaining coverage⁷, and structural change in the composition of the workers.

Finally the wage share, the share of wage bill⁸/gross value added of the sector (ws) is by definition actual real wage (bargained wage deflated by producer's price index, w) over productivity (real value added/employee)⁹:

$$ws_t = w_t / (q/l)_t \quad (3)$$

Taking logarithms, $\ln(ws)$ is defined as

$$\ln(ws) = \ln(w) + \ln(l) - \ln(q) \quad (4)$$

Substituting $\ln(l)$ equation (1) in $\ln(w)$ (equation 2) we get $\ln(w)$ expressed only in terms of the explanatory variables, x, which is the vector of $\ln(q)$, $\ln(k)$, $\ln(ict)$, and $\ln(f)$ as defined above:

$$\ln(w_{i,t}) = \frac{\alpha_i + \alpha_t + \alpha_l \beta_l + (\alpha_x + \alpha_l \beta_x) x_{i,t} + \varepsilon_{t,i}}{1 - \beta_w \alpha_l} \quad (5)$$

Similarly substituting $\ln(w)$ (equation 2) in $\ln(l)$ (equation 1), we get $\ln(l)$ expressed only in terms x as above:

$$\ln(l_{i,t}) = \frac{\beta_i + \beta_t + \alpha_w \beta_w + (\beta_x + \beta_w \alpha_x) x_{i,t} + \sigma_{t,i}}{1 - \beta_w \alpha_l} \quad (6)$$

Then substituting both equation 5 & 6 in $\ln(ws)$ (equation 4) we get:

$$\ln(ws_{i,t}) = \frac{\beta_i + \alpha_i + \beta_l + \alpha_l + \alpha_w \beta_w + \alpha_l \beta_l + (\alpha_x(1 + \beta_w) + \beta_x(1 + \alpha_l))x_{i,t} + \varepsilon_{t,i} + \sigma_{t,i}}{1 - \beta_w \alpha_l} - \ln(q)$$

(7)

Taking the derivative of $\ln(ws)$ with respect to the components of x , e.g. foreign affiliate employment, $\ln(f)$, which is our interest in this paper, we calculate the effect on ws for a given value added (q)¹⁰:

$$\frac{\partial \ln(ws)}{\partial \ln f} = \frac{\alpha_f(1 + \beta_w) + \beta_f(1 + \alpha_l)}{1 - \beta_w \alpha_l} \quad (8)$$

This expression incorporates the effect of foreign affiliate employment on wages discounted by the effect of wages on employment (if wages have a negative effect on employment) and the effect of foreign affiliate employment on employment amplified by the effect of employment on wages (if employment has a negative effect on employment), both discounted by a common factor $(1 - \beta_w \alpha_l)$ ¹¹. If neither wages nor employment affect each other ($\beta_w = \alpha_l = 0$), then the effect of foreign affiliate employment on the wage share is simply the summation of its effects on wages and employment.

IV. Data, estimation methodology and specification of the equations

The empirical analysis is based on the panel data of the sub-sectors of industry and services. Appendix A reports the data sources. The panel data technique addresses the research questions based on variations both over time and across sectors. The other advantage of panel data is that it makes empirical tests possible with a database of relatively short time dimension.

The effects of outward FDI on the labor market outcomes at home is measured by the effects of employment in the foreign affiliates of Austria (weighted by the share of the Austrian firm) in each sector disaggregated as affiliates in developed countries with relatively

higher wages and the East¹². FDI to other countries is not included as a third category since their share in total outward FDI is negligible. The sectors are defined according to the sector of the foreign affiliate. FDI data at this detail is available only at the level of 1-digit NACE classification and for the period of 1993-2004. Capital stock is also only available at 1-digit level.

In order to account for different impacts on skilled vs. less skilled labor, two methods will be used: first separate estimations are made for low and high skilled sector groups (Appendix B reports the list of the sectors and Appendix C reports the skill taxonomy); second the estimations are repeated for white-collar workers, who are assumed to represent skilled labor, vs. blue-collar workers, who are assumed to represent less skilled labor. Nevertheless, we need to be careful in assuming that all white collar workers are skilled workers, and all blue collar workers are low skilled workers. While white collar workers in both high skilled manufacturing and services industries can be skilled workers, they may well be low skilled workers in low skilled services sectors. Similarly blue collar workers in high skilled industries can be skilled workers.

In all equations lags of the explanatory variables and the dependent variable will be used to account for short vs. longer run effects¹³. The lagged employment accounts for the adjustment process due to costs of hiring and firing. The lagged wage accounts for sticky wage adjustment through time. Furthermore, the capital stock and foreign affiliate data ends in 2004; in order to be able to estimate the effects including 2005, we will use the first and second lags of these variables. By doing so we do not lose observations overall. Since the effect of both capital accumulation and FDI on labor markets may require a long adjustment process using deeper lags makes also economically sense.

Thus the equations (1) and (2) to be estimated for FDI effects on employment and wages take the following form respectively:

$$\begin{aligned} \ln(l_{i,t}) = & \beta_i + \beta_t + \beta_l \ln(l_{i,t-1}) + \sum_{j=0}^1 \beta_{w_j} \ln(w_{i,t-j}) + \sum_{j=0}^1 \beta_{q_j} \ln(q_{i,t-j}) + \sum_{j=1}^2 \beta_{k_j} \ln(k_{i,t-j}) + \sum_{j=1}^2 \beta_{kict_j} \ln(ict_{i,t-j}) \\ & + \sum_c \sum_{j=1}^2 \beta_{fcnj} \ln(f_{c_{i,t-j}}) + \varepsilon_{t,i} \end{aligned} \quad (1a)$$

and

$$\begin{aligned} \ln(w_{i,t}) = & \alpha_i + \alpha_t + \alpha_w \ln(w_{i,t-1}) + \sum_{j=0}^1 \alpha_{lj} \ln(l_{i,t-j}) + \sum_{j=1}^2 \alpha_{kj} \ln(k_{i,t-j}) + \sum_{j=1}^2 \alpha_{kict_j} \ln(ict_{i,t-j}) + \\ & \sum_c \sum_{j=1}^2 \alpha_{fcnj} \ln(f_{c_{i,t-j}}) + \varepsilon_{t,i} \end{aligned} \quad (2a)$$

The sector index $i=1, \dots, 12$ for industry¹⁴ $i=13, \dots, 20$ for services, $i=1, \dots, 20$ for total economy, and $t=1996-2005$. c is the affiliate country index corresponding to affiliates in developed countries vs. the East. We also estimate a pool for economy wide total high and low skilled sectors including both manufacturing and service sectors¹⁵. Both equations are also repeated for blue and white collar workers for the period of 1997-2005 since data for blue vs. white collar workers start in 1995 in NACE level classification.

We estimate the dynamic equation in first difference form in order to transfer out the fixed effects, and use a generalized method of moments technique as in Arrelano and Bond (1991) to overcome the bias that will result in the coefficient of the lagged dependent variable due to differencing. Differencing also helps to overcome the possible problems associated with unit roots.¹⁶ We also compute standard errors that are robust to the existence of sector specific serial correlation. Additionally, the real wage is endogenous and therefore instrumented in the employment equation. In the wage equation employment, capital stock, and foreign employment are endogenous and instrumented. In the employment equation the instruments are employment dated $t-2$ and earlier, the second and third lags of real wage¹⁷, and the first differences of the exogenous variables, i.e. output, capital stock, foreign employment and their lags. In the wage equation the instruments are wages dated $t-2$ and

earlier, the second and third lags of employment, the third and fourth lags of the capital stock, foreign employment.

Based on these estimation results we then calculate the long run coefficients using the contemporaneous and lagged effects and the speed of adjustment for the vector of explanatory variables, x , for employment equation as

$$\beta_x = \frac{\sum_{j=0}^1 \beta_{xt-j}}{(1 - \beta_l)} \quad (9)$$

and for the wage equation as

$$\alpha_x = \frac{\sum_{j=0}^1 \alpha_{xt-j}}{(1 - \alpha_w)} \quad (10)$$

The wage share effects in equation 8 are then calculated based on these long run coefficients.

V. Stylized facts

From early 1990s onwards Austrian FDI to both the developed countries and the East are increasing, with the increase towards the latter being higher. Austria's total FDI stock in the East as of 2004 is 38.0% of its total FDI stock. Austrian FDI is predominantly in services, but the ten biggest Austrian investors in the NMS represent a mix of financial and industrial capital. Regarding FDI outflow the banking sector makes up 30% of the total (Havlik et al., 2005).

Table 1 shows the cumulative % change in foreign affiliate employment during 1995-2004. The share of the employment in the foreign affiliates of Austria in the East in the total employment in foreign affiliates is 71.9% as of 2004, and is much higher than that of the

affiliates in the developed countries (24.4%). Particularly in the high skilled services sectors the share of the East increases to 91.9%. Employment in the affiliates of Austria in the East increased 190.9% in industry and 302.8% in services during 1995-2004. The increase in the high skilled industry has been 252%, exceeding that in low skilled sectors significantly. However the increase in the employment in the foreign affiliates of Austria in the East in the high skilled services has been phenomenal with a rate of 824%. Employment in the affiliates of Austria in the developed countries also increased remarkably, albeit with lower rates: 87.3% in industry and 161.5% in services during 1995-2004. In the services the increase has been more important in the low skilled sectors, mainly construction and trade.

Please insert Table 1 approximately here

The increase in Austrian FDI goes along with the increase in Austrian exports as well as intermediate imports from the East. Austria's international trade with the East is dominated by intra-firm trade. Almost 70% of Austria's imports from the East and 22% of exports are trade within a multinational enterprise (Marin, 2004).

Table 2 portrays the performance of labor markets during this period of internationalization based on the average annual change (compound average) of wages, employment, the wage share as well as value added and productivity for the sub-periods during 1976-2005 (and for the cumulative of 1990-2005).

Please insert Table 2 approximately here

The growth in value added has been strong during the period of internationalization, albeit slower than in the 1970s, however since the 1980s industrial employment is decreasing, whereas total (non-agricultural) employment is stagnant (a mere increase of 0.7% per year during 1990-2005). Employment is increasing in high skilled services, but low skilled services employment is stagnating. Within industry, the decline in low skilled industrial employment is stronger than that in high skilled industrial employment. The decline in manufacturing jobs is an ongoing process of structural change that started in the 1980s, but

the decline did not decelerate after 1990 compared to 1980-1990 period. The opposite trend in domestic employment compared with the increasing foreign affiliate jobs is also striking.

In parallel to the unfavorable developments in employment, real wages (per employee, deflated by CPI) stagnate in the total economy (non-agricultural) since 1990s. In the last five years (2000-05) there has been even a slight decline (-0.2% per year). This trend is similar in industry although less dramatic. The low skilled industry sectors have experienced a more remarkable wage moderation than high skilled. The service wages have been even declining in the last five years on average (-0.4% per year), and the decline starts even earlier in the high skilled services, which have declined 0.4% per year during the last 10 years (1995-2005). Although the integration of Austria to the global economy seems to have affected employment much more than real wages and although the changes across sectors in wages are much more similar than in employment, the degree of wage moderation points at significant changes in labor's bargaining power in the 1980s and then further since the second half of the 1990s. In the aggregate economy as well as in manufacturing real wage increases have lagged behind productivity since 1980s with few exceptions.

These developments have led to a significant erosion in the share of labor as a whole in value added in the aggregate economy as well as its sub-sectors since the late 1970s with a further acceleration since mid-1990s. The decline in the wage share in the last ten years has been highest in the high skilled industry, followed by low skilled industry and low skilled services, and even high skilled services took their share of the loss with a decline in the wage share.

Regarding the relative wage and employment of skilled labor¹⁸, in industry both blue and white collar employment declined, with the decline in the former being more remarkable. In high skilled services both types of jobs increased, whereas in low skilled services blue collar employment declined and white collar employment increased slightly. During the period of 1995-2005 the relative employment of white to blue collar workers increased in

industry and low skilled services, while their relative wage decreased, whereas both relative employment and wages of the white collar workers increased in high skilled services. Indeed the relative movements in the high skilled services point at a rather flexible response.

VI. Estimation results

VI.1 Employment

Table 3a reports the estimation results for employment modeled as in equation 1a. The respective columns of the Table are for total industry, total economy, low and high skilled sectors (including industry and services), and services. The respective long run coefficients for the estimation results are in Table 4a. We will base our discussion of the regression results on the long-run effects, rather than separately discussing the current or lagged effects.

Please insert Table 3 and 4 approximately here

In spite of the advantages of the dynamic estimation method as discussed above, there is a disadvantage due to the small number of cross-sections in our case. The Sargan test (from the homoskedastic estimator, which is reported at the end of the result tables) can not reject the null hypothesis that the overidentifying restrictions are valid, however the test is weakened by the use of many instruments. However given the low number of cross-sections we could not avoid this problem. We at least tried to choose the specifications, where there is no second order autocorrelation in the first differenced residuals, which is an important condition for the validity of the estimations. Since the lagged dependent variable was significant in all specifications, estimating a static model would also have its weaknesses. Furthermore the existence of stochastic trend in the variables requires differencing to avoid spurious results, but then we lose information.

We first start with the estimation results about the effects of foreign affiliate employment, and later discuss the effects of the control variables, i.e. output, wages, and

technology. In total manufacturing an increase in foreign affiliate employment in the East has a significant negative long run effect on employment in the same sector in Austria. The same effect takes place in the total economy and in both the low and high skilled sectors.

The effects are economically significant as well. Table 5a shows the cumulative effect of each explanatory variable on employment, calculated as the long run coefficients multiplied by the actual change in the explanatory variable. A memo item in the last line reports the actual change in employment. These results indicate that in industry the 190% increase in affiliate employment in the East (82406 new jobs) over the period of 1995-2004 has resulted in a decline of 7.7% in employment, which means a loss of 48145 jobs in industry in Austria during 1996-2005. Similarly the cumulative number of jobs that were lost in the total economy are estimated to be 123179 over 10 years (a decline of 4.7% in 2005 compared to 1995) corresponding to an increase of 241% (188207 new jobs) in employment in the affiliates in the East in all sectors. To put it differently each job that has been created additionally over this period in the Eastern affiliates of Austria has substituted 0.58 jobs in net terms in industry, and 0.46 jobs in the total economy (as a ratio to jobs created in the Eastern affiliates in all sectors). These are the net effects showing the net of the jobs lost due to substitution and jobs created due to complementary and scale effects. These numbers are overestimating the actual change in employment, which has declined 4.9% in industry, and increased 7.3% in total economy. But they indicate that for a given positive effect of growth and a negative effect of technical change, employment would have declined 7.7% less in industry if there were no Austrian foreign investment in the East in this period.

Please insert Table 5 approximately here

Regarding the employment in the foreign affiliates of Austria in developed countries while no effect can be detected in industry (at the aggregate level), there seems to be a significant negative effect in services (both white and blue collar). In the total economy affiliate employment in the developed countries seem to be substituting blue collar workers at

home, but there is no effect at the aggregate level¹⁹. The results indicate that for each job that was generated in the services industry in the developed countries 4.5 jobs were lost at home (a loss of 123148 service jobs in Austria per 27546 new jobs created in the developed countries). However these results need to be interpreted with care for estimations covering only few sectors (thereby few observations), and while the direction of the effects is indicative, the magnitudes can be misleading.

Regarding skill differentials, estimation results for blue and white collar workers for the total economy and manufacturing are in the Appendix D Table 1. At the level of the total economy, the employment of blue collar workers seems to be more affected by the rise of employment in the Austrian foreign affiliates relative to the white collar workers, although both types of workers experience a decline in employment. But interestingly the workers working in the higher skilled sectors are more affected than those working in the lower skilled sectors; once again however employment declines in both sector groups due to capital outflow.

We checked the robustness of these results by using an alternative dynamic estimation technique (Arellano–Bover/Blundell–Bond system estimator)²⁰, and these effects are robust in the specification using the lags for the industry, but not for total economy. The estimation results are in the Appendix D Table 2. However when current values are used instead of lagged values, the results are not significant. Nevertheless, since it takes a while for domestic production and employment to adjust to the changes in the international division of labor and the possibility of new production locations abroad, lagged effects are important, and should not be disregarded. Also the shift from substitution to scope and scale effect can also be only observed through a longer time horizon. The results of the alternative specification indicate even a larger effect of the employment in Eastern affiliates: a cumulative decline of 10.4%, which correspond to a loss of 64760 jobs, i.e. 0.79 jobs per job created in the East.

Regarding the control variables, while growth of value added as well as non-ICT capital has a positive effect on employment, the growth of ICT capital has a negative effect on employment growth in industry reflecting the effects of labor saving technical change. The effect is highly significant in spite of the existence of time dummies. In the total economy the effect ICT capital as well as non-ICT capital is insignificant, whereas growth remains to be significant. The technical change in this case is only captured by the time dummies. The negative technological change effect of ICT capital is evident for the employment of blue collar workers economy-wide, but not for white collar workers. Non-ICT capital also has a negative effect on total blue-collar employment. In industry while blue-collar employment is responsive to changes in production, white collar wages are not; the demand for white collar workers are also less responsive to wage changes. At the total economy level only the demand for blue collar workers is sensitive to wages.

Time dummies remain significant despite the presence of capital stock as an explanatory variable. This not only captures the ongoing structural change but also other exogenous technical change effects that are not captured by the capital stock.

If we compare our results with the previous research results, the negative effects of Eastern affiliate employment is consistent with the findings in Bellak and Altzinger (2001), and the survey evidence in Marin (2004), but she finds no negative effect of affiliate wages. Regarding Falk & Wolfmayr (2007), while the negative effect of affiliate employment in services is consistent with their dynamic estimation results, we find no effect of Eastern affiliate employment in services, whereas they do. Furthermore for industry they find no significant effects both at sectoral and firm level. One difference is that they cover only the Eastern employment in the five NMS. The more important difference is the use of lags. While they do not use lagged effects, we find that this makes a difference in the results. They use the Arellano–Bover/Blundell–Bond system estimator, but our results using the same estimator with lagged effects also indicate a negative effect of affiliate employment in the East.

However, Falk & Wolfmayr (2007) also mention that aggregate studies might be hiding important firm level adjustment processes, which we also agree. Based on firm level data they find no significant effect.

VI.2 Real wages

Table 6a reports the estimation results for real wages modeled as in equation 2a. The respective columns of the table are for total industry, total economy, low and high skilled sectors (including industry and services), and services. The Sargan test unfortunately is again hinting at a problem with the use of too many instrumental variables, however there is also not a better way of dealing with the problem given data limitations as discussed above. The respective long run coefficients for the estimation results are in Table 4b. We first start with the estimation results about the effects of foreign affiliate employment, and later discuss the effects of the control variables, i.e. employment and technology.

Please insert Table 6 approximately here

According to the long-run coefficients, employment in the foreign affiliates in the East as well as developed countries have a significant negative effect on wages in industry, but no effect in total economy. In the industry the negative effect of Eastern affiliate employment is valid for both blue and white collar workers but the negative effect of affiliate employment in the developed countries is only valid for the white collar workers in the industry. In the total economy only the wages of workers working in low skilled sectors (including both low skilled industry and service sectors) are negatively affected from the increase in both type of affiliate employment, whereas there seems to be no effect on the wages of workers working in high skilled sectors. There is evidence of some positive effect of affiliate employment in the East on wages in services sectors (for both blue and white collar workers).

Table 5b shows the cumulative effect of each explanatory variable on wages, calculated as the long run coefficients multiplied by the actual change in the explanatory variable. In terms of economic significance, the increase in the affiliate employment in the East and developed countries resulted in a 17.9% and 7.2% cumulative decline in real wages in the industry during the period of 1996-2005 respectively. Thus altogether real wages would have increased 25.1% more in industry if there were no Austrian foreign investment in this period. When the low skilled sectors of industry and services are analyzed together there is still a negative cumulative effect of 5.8% and 4.8% of affiliate employment in the East and the developed countries respectively.

At the level of total economy there seems to be no differential wage response for blue and white collar workers (See estimation results for blue and white collar workers for the total economy and manufacturing in the Appendix D Table 3). But the workers working in low skilled sectors have experienced downward wage pressures due to capital mobility, whereas there seems to be no wage effect in high skilled sectors (Table 5b).

Regarding the control variables, in industry while employment has a negative effect on wages, non-ICT capital stock has a positive effect, reflecting an increase in wages together with the capital intensity of the sector. The same is true also for the total economy as well as the low and high skilled sectors of the total economy.

Again the time dummies remain significant and are mostly negative, indicating the significance of institutional factors as well as possible negative effects of capital mobility that is not necessarily reflected in the volume of actual transactions.

VI.3 Wage share

Combining the long run effects on employment and wages as defined in equation (8), we get the joint effect of the changes in capital stock (ICT and non-ICT) and the employment

in foreign affiliates of Austria. Table 4c reports the calculated long run coefficients for the wage share for total industry, total economy, low and high skilled sectors (including industry and services), and services. Table 5c report the cumulative %-points effect²¹ of the actual change in the explanatory variable. These effects are partial effects for a given level of value added.

Based on the estimation results, in industry the increase in employment in the foreign affiliates of Austria in the East and the developed countries has resulted in a cumulative decline of 13.3%-points and 4.7%-points in the wage share respectively during 1996-2005 (thus a total of -18.1). These results overestimate the 8.2%-points actual decline in the wage share, however the direction is suggestive. In industry, during 1996-2005 capital mobility affects both the employment and wages, thus also the wage share of the high skilled workers more. A possible explanation for that might be that the low skilled sectors were already on the decline before foreign direct investment Austria increased substantially. Again in the services a 3.1%-points negative effect of the rise in affiliate employment in the developed countries is found. Overall in the total economy the increase in the Eastern affiliate employment has resulted in a 1%-point decline in the wage share. The results are estimated to be much larger for the sub-groups of low and high skilled sectors (industry and services together), but the magnitudes between sectors do not differ. However these large numbers are unreliable since estimated coefficients tend to be larger due to the low number of observations, when the sample is split.

Technological change (the increase in ICT capital) also results in a decline of 9.2%-points in the industry wage share. A minor positive effect comes from the growth in non-ICT capital stock. In the total economy there is evidence of ICT effect only at the sub-sector level. ICT capital leads to a cumulative erosion of the wage share by 4.4%-points in the high skilled sectors of the total economy.

VII. Conclusion

This paper estimates the employment and wage effects of outward FDI on employment, wages, and the wage share in Austria. There is evidence of significant negative effects of FDI on both employment and wages.

The negative employment effect of Austria's investment abroad is primarily due to the rise in the employment in the foreign affiliates in the East. The employment in foreign affiliates in developed countries seems to have a negative effect in services only, which could be interpreted as the horizontal FDI effect. The negative wage effects are originating from affiliate employment in both the East and the developed countries in industry, but no effect is found in the total economy. There is evidence of some positive wage effect of affiliate employment in the East in the services. Bringing together these effects we find that the increase in employment in the foreign affiliates of Austria has resulted in a deterioration of wage share with the effect originating from both country groups in industry, and only from the East in the total economy.

The results are not limited to workers in low skilled sectors. There are also negative effects on white collar workers, although less than blue collar workers. This provides some evidence of relocation of skilled white collared jobs in both the industry and the services. At a sectoral level in the total economy interestingly employment in the higher skilled sectors are affected more than those working in the lower skilled industries, whereas only the wages in low skilled sectors are negatively affected. This can be thought as an evidence of negative substitution effect on lower skilled workers in the high skilled sectors associated with skill upgrading and thereby positive scope effects on wages.

Technological change also results in a decline in the industry wage share. Time dummies remain significant and are mostly negative. In the employment estimation this not only captures the ongoing structural change but also other exogenous technical change effects

that are not captured by the capital stock. In the wage equation this shows the importance of institutional factors that are changing at the expense of labor's bargaining power and the possibility of threat effects of potential capital mobility, which has not been realized yet.

It could be said that these results are nevertheless reflecting a relatively short period of 10-15 years, and thus only incorporating the substitution effects, and the stages where scope and scale effects are expected has not arrived yet. However labor market outcomes have persistence. Negative employment effects generate long term unemployment problems as well as a decline in labor's bargaining power. Additionally job losses lead to a negative popular perception of European Integration, leading to political tensions. But this discontent as well as the negative effects of openness are not an unavoidable destiny. On the contrary the European Integration could be seen as an advantage to institutionalize the coordination of labor market policy and wage bargaining incorporating productivity-led wage increases to facilitate wage convergence along with a systematic EU policy on regional development and social cohesion, thus an economically relevant EU budget. This also defines new tasks for the trade unions in old member states in terms of communicating with the trade unions in the East, particularly if they are organized in different affiliates of the same multinational company.

References

- Aiginger, K., Winter-Ebmer, R., Zweimüller, J. (1996) Eastern European Trade and the Austrian Labour Market, *Weltwirtschaftliches Archiv*, (1996), 132(3): 476-500.
- Altzinger, W. (2006) On the profitability of Austrian firms in the new EU member states, Vienna Institute for International Economic Studies, Monthly Report, 3/06, 4-10.
- Becker, S.O., Ekholm, K., Jaeckle, R., Muendler, M.A. (2005) Location choice and Employment Decisions: A Comparison of German and Swedish Multinationals. CESIFO Working Paper no.1374.
- Bellak, C., Altzinger, W. (2001) The impact of direct and indirect FDI in Eastern Europe on Austrian trade and employment, in: Narula, R. (ed.): *Trade and Investment in a Globalising World: Essays in Honour of H. Peter Gray.*, Pergamon Press, Kidlington, 86-112.
- Braconier, H., Ekholm, K. (2000) Swedish Multinationals and Competition From High and Low Wage Locations, *Review of International Economics*, vol. 1, 448-461.
- Brainard, S. L., Riker D.A. (1997) Are U.S. Multinationals Exporting U.S. Jobs? NBER Working Paper 5958.
- Bruss F. (2007) Globalization, EU Enlargement and Income Distribution, WIFO Working Papers, No. 296.
- Burke J, Epstein G. (2001) Threat effects and the internationalization of production, Political Economy Research Institute Working Papers; 15
- Crotty, J., Epstein. G., Kelly, P. (1998) Multinational corporations in the neoliberal regime, in Baker D., Epstein G., Pollin R. (Eds), *Globalization and Progressive Economic Policy*, 117-143, (Cambridge: Cambridge University Press).
- Desai, M.A., Foley, C.F., Hines, J.R. (2005) Foreign Direct Investment and Domestic Economic Activity., NBER Working Paper Series No. 11717.
- Diwan, I. (2001) Debt as sweat: Labor, financial crises, and the globalization of capital, Mimeo, The World Bank.
- Epstein, G. (2000) Threat effects and the impact of capital mobility on wages and public finances: developing a research agenda, Political Economy Research Institute Working Papers; 7.
- European Commission (2005) *The Adjustment Challenge in the Labour Market.*, in *The EU Economy 2005 Review*, Commission of the European Communities, Brussels.
- Falk, M., Wolfmayr, Y. (2007) Austrian FDI in Central-Eastern Europe and Employment in the Home Market, WIFO, mimeo
- Greenaway, D., Hine, R., and Wright, P. (1999a) An empirical assessment of the impact of trade on employment in the United Kingdom, *European Journal of Political Economy* 15: 485-500.
- Greenaway, D., Hine, R., and Wright, P. (1999b) Further evidence on the effect of foreign competition on industry level wages, Centre for Research on Globalisation and Labor Markets, Research Paper 99/11
- Guger, A., Marterbauer, M. (2004) Die langfristige Entwicklung der Einkommensverteilung in Österreich, Austrian Institute of Economic Research, December.
- Hanson, G.H., Mataloni R.J., Slaughter, M.J. (2003) Expansion Abroad and the Domestic Operations of U.S. Multinational Firms., mimeo.
- Head, K., Ries, J. (2002) Offshore Production and Skill Upgrading by Japanese Manufacturing Firms., *Journal of International Economics*, 58:81-105.
- Helpman, E., Krugman P. (1985) *Market Structure and Foreign Trade*, MIT Press
- Hine, R., Wright, P. (1997) Trade and manufacturing employment in UK manufacturing, in: Borkakoti, J. and Milner, C. (Eds.) *International Trade and Labour Markets*, 118-139, (London, Macmillan)

- Harrison, A.E., (2002) Has globalization eroded labor's share? Some cross-country evidence, Mimeo, UC Berkeley.
- Havlik, P., Landesmann, M., Römisch, R., Vidovic, H., Wörz, J. (2005) The New Member States and Austria: economic developments in the first year of accession, Vienna Institute for International Economic Studies, Research Reports, 318.
- IMF (2007) World Economic Outlook April 2007: Spillovers and Cycles in the Global Economy, World Economic and Financial Surveys, International Monetary Fund: Washington, D.C.
- Konings, J., Murphy, A.P. (2003) Do Multinational Enterprises Relocate Employment to Low Wage Regions? Evidence from European Multinationals., Centre for Transition Economics University of Leuven Discussion Paper no.13103.
- Konings J, Vandebussche H (1995) The effect of foreign competition on UK employment and wages: evidence from a firm level panel. *Weltwirtschaftliches Archiv*, Vol. 131: 655-73.
- Lipsey R. (2002) Home and host country effects of FDI. NBER Working Paper, 9293
- Lipsey R., Ramstetter, E., Blomström, M. (2000) Outward FDI and Parent Exports and Employment: Japan, the United States, and Sweden, *Global Economic Quarterly*, 1(4):285-302.
- Marin, D. (2004) A nation of poets and thinkers: Less so with Eastern enlargement? Austria and Germany, Center for Economic Policy Research Discussion Paper No. 4358, London.
- Molnar, M., Pain N., Taglioni D. (2007) The Internationalisation of Production, International Outsourcing and Employment in the OECD, Economic Department Working paper, 561.
- OECD (2007) Employment Outlook, Paris.
- Onaran, Ö. (2009) Wage Share, Globalization, and Crisis: The case of manufacturing industry in Korea, Mexico, and Turkey, *International Review of Applied Economics*, forthcoming 2009 March
- Pfaffermayr, M. (2001). Employment in domestic plants and foreign affiliates: a note on the elasticity of substitution, *Weltwirtschaftliches Archiv* 137(2):347-364.
- Rodrik, D. (1997) Has globalization gone too far? Institute for International Economics, Washington DC.
- Stockhammer, E., Onaran, Ö., Ederer, S. (2007) Functional income distribution and aggregate demand in the Euro-area , Vienna University of Economics & Business Administration, Department of Economics Working Paper Series: No: 102.

Table 1. Cumulative % change in the Foreign Affiliate Employment, 1995-2004							
	Industry			Services			Total Economy
Employment in the foreign affiliates of Austria	Low skilled	High skilled	Total	Low skilled	High skilled	Total	
Developed	63.70	96.35	83.03	208.15	47.52	161.50	117.79
East	81.88	252.55	177.01	86.56	824.46	302.85	241.01

Table 2 Annual % change in labor market outcomes (compound average)

	Wage share	Real value added	Employment	Real Wage	Real Wage blue collar*	Real wage white collar*	Employment blue collar*	Employment white collar*
TOTAL ECONOMY								
1976-1980	-0.03	2.80	1.45	2.09				
1980-1985	-0.62	1.26	-0.31	0.33				
1985-1990	-0.20	3.22	1.37	2.08				
1990-1995	-0.21	2.29	0.78	1.11				
1995-2000	-0.54	3.19	1.05	0.28	0.60	2.16	-0.23	1.03
2000-2005	-0.49	1.74	0.33	-0.19	0.13	-0.53	-0.39	0.63
1990-2005	-0.47	2.40	0.72	0.40	0.37	0.81	-0.31	0.83
TOTAL INDUSTRY								
1976-1980	0.51	2.93	0.49	2.49				
1980-1985	-1.11	0.78	-2.57	0.73				
1985-1990	-0.02	2.86	-0.50	2.68				
1990-1995	-0.11	0.93	-2.03	1.74				
1995-2000	-1.57	4.31	-0.93	1.08	1.32	1.06	-1.30	0.34
2000-2005	-0.09	1.62	-0.62	0.58	0.70	0.15	-1.69	-1.77
1990-2005	-0.66	2.28	-1.19	1.13	1.01	0.61	-1.49	-0.72
TOTAL HIGH INDUSTRY								
1976-1980	0.74	6.70	1.80	2.86				
1980-1985	-0.74	1.23	-2.00	1.10				
1985-1990	-0.35	4.92	0.87	2.80				
1990-1995	-0.34	2.29	-1.70	1.94				
1995-2000	-1.76	5.17	-0.02	1.15	1.14	0.77	-0.50	1.73
2000-2005	0.28	2.35	0.14	0.39	0.60	0.12	-1.31	-2.70
1990-2005	-0.68	3.26	-0.53	1.16	0.87	0.44	-0.91	-0.51
TOTAL LOW INDUSTRY								
1976-1980	0.31	0.21	-0.48	2.07				
1980-1985	-1.43	0.39	-3.01	0.33				
1985-1990	0.21	0.88	-1.69	2.33				
1990-1995	0.13	-0.61	-2.35	1.45				
1995-2000	-1.32	3.20	-1.83	0.78	1.41	1.16	-1.90	-1.42
2000-2005	-0.58	0.59	-1.45	0.64	0.77	0.44	-2.00	-0.52
1990-2005	-0.67	1.05	-1.88	0.96	1.09	0.80	-1.95	-0.97
TOTAL SERVICE								
1976-1980	-0.19	2.75	1.98	1.89				
1980-1985	-0.36	1.42	0.81	0.19				
1985-1990	-0.20	3.34	2.17	1.89				
1990-1995	-0.15	2.71	1.81	0.99				
1995-2000	-0.23	2.85	1.66	0.11	0.30	2.45	0.31	1.14
2000-2005	-0.60	1.77	0.59	-0.39	-0.03	-0.53	0.21	0.96
1990-2005	-0.37	2.44	1.35	0.23	0.14	0.95	0.26	1.05
TOTAL HIGH SERVICE								
1976-1980	-0.51	3.40	2.48	1.74				
1980-1985	-0.73	2.36	2.19	-0.07				
1985-1990	-0.44	3.26	2.37	1.65				
1990-1995	-0.53	2.83	1.79	0.86				
1995-2000	0.03	2.85	2.52	-0.34	0.52	3.47	1.51	1.48
2000-2005	-0.64	2.03	0.94	-0.43	0.41	-0.61	0.99	1.10
1990-2005	-0.42	2.57	1.75	0.03	0.47	1.41	1.25	1.29
TOTAL LOW SERVICES								
1976-1980	0.09	1.88	1.52	1.91				
1980-1985	0.05	0.04	-0.55	0.07				
1985-1990	0.14	3.46	1.96	2.15				
1990-1995	0.48	2.53	1.84	1.18				
1995-2000	-0.68	2.84	0.68	0.50	0.32	-0.12	-0.46	0.33
2000-2005	-0.51	1.36	0.18	-0.43	-0.22	-0.35	-0.35	0.61
1990-2005	-0.27	2.24	0.90	0.42	0.05	-0.23	-0.41	0.47

*1995-2005

**1993-1994

Table 3. Estimation results: $\Delta \ln$ Employment vs. Foreign affiliate employment (1996-2005)

Variable	Industry	Total Economy	Total low skilled	Total high skilled	Services
$\Delta \ln$ Employment t-1	0.703	0.745	0.706	0.768	0.584
	<i>0.000</i>	<i>0.000</i>	<i>0.000</i>	<i>0.000</i>	<i>0.000</i>
$\Delta \ln$ Real wage t	-0.082	-0.090	-0.141	-0.015	-0.474
	<i>0.523</i>	<i>0.432</i>	<i>0.377</i>	<i>0.840</i>	<i>0.027</i>
$\Delta \ln$ Real wage t-1	-0.072	-0.040	0.280	-0.233	-0.057
	<i>0.683</i>	<i>0.789</i>	<i>0.124</i>	<i>0.066</i>	<i>0.745</i>
$\Delta \ln$ Real value added t	0.382	0.294	0.461	0.195	0.241
	<i>0.000</i>	<i>0.000</i>	<i>0.000</i>	<i>0.001</i>	<i>0.110</i>
$\Delta \ln$ Real value added t-1	-0.202	-0.178	-0.353	-0.077	0.065
	<i>0.007</i>	<i>0.021</i>	<i>0.003</i>	<i>0.095</i>	<i>0.375</i>
$\Delta \ln$ Non-ICT capital t-1	-0.260	-0.076	0.257	-0.496	-0.056
	<i>0.251</i>	<i>0.684</i>	<i>0.460</i>	<i>0.000</i>	<i>0.910</i>
$\Delta \ln$ Non-ICT capital t-2	0.331	0.234	0.028	0.568	0.278
	<i>0.093</i>	<i>0.126</i>	<i>0.926</i>	<i>0.000</i>	<i>0.478</i>
$\Delta \ln$ ICT capital t-1	0.132	0.047	0.132	0.084	0.040
	<i>0.014</i>	<i>0.256</i>	<i>0.133</i>	<i>0.041</i>	<i>0.388</i>
$\Delta \ln$ ICT capital t-2	-0.153	-0.041	-0.113	-0.093	-0.034
	<i>0.011</i>	<i>0.348</i>	<i>0.236</i>	<i>0.020</i>	<i>0.568</i>
$\Delta \ln$ foreign Employment developed t-1	0.000	0.001	0.014	-0.012	0.000
	<i>0.998</i>	<i>0.801</i>	<i>0.036</i>	<i>0.041</i>	<i>0.962</i>
$\Delta \ln$ foreign Employment developed t-2	-0.012	-0.007	-0.022	0.009	-0.016
	<i>0.318</i>	<i>0.222</i>	<i>0.022</i>	<i>0.178</i>	<i>0.001</i>
$\Delta \ln$ foreign Employment eastern t-1	0.019	0.012	0.038	0.006	0.003
	<i>0.040</i>	<i>0.037</i>	<i>0.000</i>	<i>0.308</i>	<i>0.584</i>
$\Delta \ln$ foreign Employment eastern t-2	-0.031	-0.017	-0.043	-0.013	0.005
	<i>0.000</i>	<i>0.019</i>	<i>0.000</i>	<i>0.072</i>	<i>0.184</i>
Constant	0.003	-0.002	-0.008	0.004	-0.005
	<i>0.555</i>	<i>0.416</i>	<i>0.090</i>	<i>0.011</i>	<i>0.202</i>
Number of observations	105	170	73	97	65
Number of groups	12	20	9	11	8
AR (2) p-value	0.947	0.486	0.101	0.232	0.112
Joint sign. of time dummies (p-value)	0.000	0.002	0.000	0.000	0.000
Sargan test (p-value)	1.000	1.000	1.000	1.000	1.000

p-values under coefficients (in italics)

Table 4. Long run coefficients (1996-2005):

a. Employment					
	Industry	Total economy			Services
	Total	Total	Low	High	Total
Real wage	0.000	0.000	0.000	-0.991	-1.000
Real value added	0.606	0.455	0.367	0.509	0.000
Non-ICT capital	1.114	0.000	0.000	0.310	0.000
ICT capital	-0.071	0.000	0.000	-0.039	0.000
Foreign affiliate employment-developed countries	0.000	0.000	0.027	-0.052	-0.038
Foreign affiliate employment-east	-0.040	-0.020	0.017	-0.056	0.000
b. Wage					
	Industry	Total economy			Services
	Total	Total	Low	High	Total
Employment	-0.685	-0.631	0.366	-0.726	-0.347
Non-ICT capital	1.448	0.000	2.022	0.810	0.000
ICT capital	0.000	0.000	0.000	0.000	0.036
Foreign affiliate employment-developed countries	-0.083	0.000	0.035	0.000	0.000
Foreign affiliate employment-east	-0.094	0.000	0.049	0.000	0.034
c. Wage share					
	Industry	Total economy			Services
	Total	Total	Low	High	Total
Non-ICT capital	1.798	0.000	2.022	0.328	0.000
ICT capital	-0.022	0.000	0.000	-0.038	0.000
Foreign affiliate employment-developed countries	-0.083	0.000	0.052	-0.051	-0.038
Foreign affiliate employment-east	-0.107	-0.007	0.060	-0.055	0.000

Table 5. Cumulative % change effects (1996-2005)

a. Employment: Cumulative % change during 1996-2005 due to:					
	Industry	Total economy			Services
	Total	Total	Low	High	Total
Real wage	0.00	0.00	0.00	-2.89	-1.59
Real value added	18.90	11.21	7.06	14.38	0.00
Non-ICT Capital	0.71	0.00	0.00	8.81	0.00
ICT Capital	-44.77	0.00	0.00	-8.22	0.00
Foreign affiliate employment-developed countries	0.00	0.00	-4.02	-4.34	-6.21
Foreign affiliate employment-east	-7.72	-4.73	-1.68	-23.77	0.00
Foreign employment total cumulative %change effect	-7.72	-4.73	-5.70	-28.11	-6.21
Memo item: Actual cumulative % change in employment	-4.89	7.32	0.12	14.05	11.16
b. Wage: Cumulative % change during 1996-2005 due to:					
	Industry	Total economy			Services
	Total	Total	Low	High	Total
Employment	3.35	-4.61	-0.04	-10.20	-3.87
Non-ICT Capital	0.93	0.00	3.91	22.98	0.00
ICT Capital	0.00	0.00	0.00	0.00	8.10
Foreign affiliate employment-developed countries	-7.23	0.00	-5.20	0.00	0.00
Foreign affiliate employment-east	-17.93	0.00	-4.82	0.00	10.30
Foreign employment total cumulative %change effect	-25.17	0.00	-10.02	0.00	10.30
Memo item: Actual cumulative % change in wages	12.86	3.91	2.83	2.91	1.59
c. Wage share: Cumulative %-point change during 1996-2005 due to:					
	Industry	Total economy			Services
	Total	Total	Low	High	Total
Non-ICT Capital t-1	0.75	0.00	26.90	4.37	0.00
ICT Capital t	-9.23	0.00	0.00	-5.42	0.00
Foreign affiliate employment-developed countries	-4.74	0.00	-3.44	-3.32	-3.07
Foreign affiliate employment-east	-13.34	-0.97	-8.00	-7.35	0.00
Foreign employment total cumulative %-point change effect of foreign affiliate employment	-18.08	-0.97	-11.44	-10.67	-3.07
Memo item: Actual cumulative %-point change in wage share	-8.24	-4.80	-6.73	-3.44	-3.76

Table 6. Estimation results: $\Delta \ln$ Real wage vs. Foreign affiliate employment (1996-2005)

Variable	Industry	Total Economy	Total low skilled	Total high skilled	Services
$\Delta \ln$ Real wage t-1	0.819	0.759	0.631	0.821	0.559
	<i>0.000</i>	<i>0.000</i>	<i>0.000</i>	<i>0.000</i>	<i>0.000</i>
$\Delta \ln$ Employment	-0.045	-0.014	-0.039	0.020	-0.153
	<i>0.414</i>	<i>0.813</i>	<i>0.556</i>	<i>0.652</i>	<i>0.037</i>
$\Delta \ln$ Employment t-1	-0.124	-0.152	-0.135	-0.130	0.011
	<i>0.045</i>	<i>0.012</i>	<i>0.067</i>	<i>0.055</i>	<i>0.923</i>
$\Delta \ln$ Non-ICT capital t-1	0.262	0.213	-0.704	0.344	0.371
	<i>0.030</i>	<i>0.117</i>	<i>0.143</i>	<i>0.005</i>	<i>0.202</i>
$\Delta \ln$ Non-ICT capital t-2	-0.019	-0.045	0.746	-0.199	-0.363
	<i>0.877</i>	<i>0.742</i>	<i>0.050</i>	<i>0.087</i>	<i>0.257</i>
$\Delta \ln$ ICT capital t-1	-0.037	0.039	-0.037	0.027	0.100
	<i>0.362</i>	<i>0.217</i>	<i>0.752</i>	<i>0.378</i>	<i>0.002</i>
$\Delta \ln$ ICT capital t-2	0.052	-0.016	0.098	-0.007	-0.084
	<i>0.255</i>	<i>0.644</i>	<i>0.404</i>	<i>0.843</i>	<i>0.003</i>
$\Delta \ln$ foreign Employment developed t-1	-0.015	0.001	-0.013	0.009	-0.001
	<i>0.001</i>	<i>0.873</i>	<i>0.015</i>	<i>0.131</i>	<i>0.902</i>
$\Delta \ln$ foreign Employment developed t-2	0.000	0.001	0.000	-0.006	-0.004
	<i>0.976</i>	<i>0.877</i>	<i>0.957</i>	<i>0.426</i>	<i>0.513</i>
$\Delta \ln$ foreign Employment eastern t-1	0.002	0.000	0.014	-0.004	-0.002
	<i>0.771</i>	<i>0.921</i>	<i>0.109</i>	<i>0.272</i>	<i>0.646</i>
$\Delta \ln$ foreign Employment eastern t-2	-0.017	0.001	-0.018	0.006	0.015
	<i>0.004</i>	<i>0.808</i>	<i>0.001</i>	<i>0.203</i>	<i>0.000</i>
Constant	0.000	-0.004	-0.011	-0.004	-0.002
	<i>0.969</i>	<i>0.005</i>	<i>0.007</i>	<i>0.040</i>	<i>0.144</i>
Number of observations	105	170	73	97	65
Number of groups	12	20	9	11	8
AR (2) p-value	0.197	0.125	0.376	0.227	0.740
Joint sign. of time dummies (p-value)	0.000	0.000	0.000	0.000	0.000
Sargan test (p-value)	1.000	1.000	0.414	1.000	1.000

p-values below the coefficients (in italics)

Appendix A

Data sources

Statistics Austria, Panel data of industries, 1976 onwards, NACE 2-digit

FDI-database of Austrian National Bank, 1993 onwards, NACE 1-digit (At 2 digit level even total FDI data is hidden or does not exist in many sectors (15, 23, 25, 30, 33, 34, 35, 36) for all years or most years).

Association of Austrian Social Insurance, employment and median wage for white and blue collar workers, only 1995 onwards at a comparable classification, NACE 1-digit for wages and NACE 2-digit for employment.

EU KLEMS Database, March 2007, <http://www.euklems.net> for the capital stock, 1976-2004, NACE 1-digit

Appendix B Sectoral classification at 1-digit NACE level

1-Digit

10-14 Mining and quarrying

MANUFACTURING

15-16 Food products, beverages and tobacco

17-19 Textiles, textile products, leather and footwear

20 Wood and products of wood and cork

21-22 Pulp, paper, paper products, printing and publishing

23-25 Chemical, rubber, plastics and fuel products

26 Other non-metallic mineral products

27-28 Basic metals and fabricated metal products

29 Machinery and equipment, n.e.c.

30-33 Electrical and optical equipment

34-35 Transport equipment

36-37 Manufacturing nec

40-41 Electricity, gas and water supply

45 Construction

Wholesale and retail trade; repair of motor vehicles, motorcycles and personal and household goods

50-52

55 Hotels and restaurants

60-64 Transport, storage and communications

65-67 Financial intermediation

70-74 Real estate, renting and business activities

85-93 Health and social work, Other community, social and personal service activities

Appendix C: Skill taxonomy for manufacturing industries

Skill groups	1-Digit
Low Skill	15-16 17-19 26 27-28 36-37
High Skill	20 21-22 23-25 29 30-33 34-35

Service

Skill groups	1-Digit
Low Skill	45 50-52 55
High Skill	40-41 60-64 65-67 70-74 85-93

Total economy and industry: Includes also mining and quarrying (classified as low skilled)

Note: Classification is based on Peneder (1999). The medium skilled/blue collar industries are classified as medium skilled, whereas medium skilled/white collar industries sectors that are also technology driven are classified as high skilled; the other medium skilled/white industries are classified as medium skilled.

Appendix D Table 1 Estimation results: $\Delta \ln$ Employment vs. Foreign affiliate emp

Variable	Industry		Total economy	
	Blue	White	Blue	White
$\Delta \ln$ Employment t-1	0.873	0.811	0.940	0.847
	<i>0.000</i>	<i>0.000</i>	<i>0.000</i>	<i>0.000</i>
$\Delta \ln$ Real wage	-0.445	-0.295	0.116	-0.126
	<i>0.088</i>	<i>0.039</i>	<i>0.521</i>	<i>0.110</i>
$\Delta \ln$ Real wage t-1	-0.175	0.102	-0.267	0.100
	<i>0.536</i>	<i>0.555</i>	<i>0.087</i>	<i>0.375</i>
$\Delta \ln$ Real value added	0.111	0.041	0.082	0.058
	<i>0.006</i>	<i>0.342</i>	<i>0.054</i>	<i>0.135</i>
$\Delta \ln$ Real value added t-1	-0.006	-0.005	0.033	0.004
	<i>0.914</i>	<i>0.868</i>	<i>0.527</i>	<i>0.903</i>
$\Delta \ln$ Non-ICT capital t-1	-0.572	-0.303	-0.899	-0.449
	<i>0.074</i>	<i>0.393</i>	<i>0.001</i>	<i>0.023</i>
$\Delta \ln$ Non-ICT capital t-2	0.660	0.474	0.849	0.544
	<i>0.015</i>	<i>0.065</i>	<i>0.000</i>	<i>0.000</i>
$\Delta \ln$ ICT capital t-1	0.132	0.030	0.132	0.061
	<i>0.027</i>	<i>0.678</i>	<i>0.101</i>	<i>0.228</i>
$\Delta \ln$ ICT capital t-2	-0.141	-0.075	-0.156	-0.068
	<i>0.018</i>	<i>0.247</i>	<i>0.063</i>	<i>0.228</i>
$\Delta \ln$ foreign Employment developed t-1	-0.016	-0.014	-0.012	0.002
	<i>0.154</i>	<i>0.024</i>	<i>0.030</i>	<i>0.549</i>
$\Delta \ln$ foreign Employment developed t-2	-0.008	0.008	-0.008	-0.001
	<i>0.492</i>	<i>0.431</i>	<i>0.059</i>	<i>0.874</i>
$\Delta \ln$ foreign Employment eastern t-1	-0.011	-0.015	-0.005	-0.015
	<i>0.312</i>	<i>0.020</i>	<i>0.590</i>	<i>0.050</i>
$\Delta \ln$ foreign Employment eastern t-2	-0.009	0.001	0.006	0.000
	<i>0.348</i>	<i>0.909</i>	<i>0.391</i>	<i>0.998</i>
Constant	0.011	0.013	0.008	0.003
	<i>0.393</i>	<i>0.081</i>	<i>0.097</i>	<i>0.4364</i>
Number of observations	96	95	154	153
Number of groups	12	12	20	20
AR (2) p-value	0.115	0.139	0.119	0.042
Joint sign. of time dummies (p-value)	0.000	0.000	0.000	0.000
Sargan test (p-value)	0.174	0.632	0.006	0.629

*1997-2005 for Blue and White Collar data

p-values below the coefficients (in italics)

Appendix D Table 2 Estimation results: In Employment vs. Foreign affiliate employment, Methodology: Arellano–Bover/Blundell–Bond system estimator (1996-2005)

Variable	Industry	Total Economy
In Employment t-1	0.908	0.847
	<i>0.000</i>	<i>0.000</i>
In Real wage t	-0.057	-0.138
	<i>0.217</i>	<i>0.086</i>
In Real value added t	0.142	0.217
	<i>0.013</i>	<i>0.007</i>
In Non-ICT capital t-1	-0.014	-0.043
	<i>0.177</i>	<i>0.056</i>
In ICT capital t-1	-0.007	-0.007
	<i>0.162</i>	<i>0.320</i>
In foreign Employment developed t-1	-0.003	-0.008
	<i>0.522</i>	<i>0.198</i>
In foreign Employment eastern t-1	-0.005	-0.003
	<i>0.026</i>	<i>0.462</i>
Number of observations	132	215
Number of groups	12	20
Sargan test (p-value)	0.156	0.287
Hansen test (p-value)	1	0.979
AR (2) p-value	0.710	0.310

p-values below the coefficients (in italics)

Appendix D Table 3 Estimation results: $\Delta \ln$ Wages vs. foreign affiliate employment

Variable	Industry		Total economy	
	Blue	White	Blue	White
$\Delta \ln$ Real wage t-1	0.447	0.412	0.845	0.530
	<i>0.000</i>	<i>0.004</i>	<i>0.000</i>	<i>0.000</i>
$\Delta \ln$ Employment	-0.135	-0.287	0.158	-0.097
	<i>0.002</i>	<i>0.000</i>	<i>0.437</i>	<i>0.262</i>
$\Delta \ln$ Employment t-1	-0.007	0.094	-0.217	-0.117
	<i>0.866</i>	<i>0.049</i>	<i>0.265</i>	<i>0.228</i>
$\Delta \ln$ Non-ICT capital	0.020	0.094	0.004	0.433
	<i>0.898</i>	<i>0.602</i>	<i>0.987</i>	<i>0.047</i>
$\Delta \ln$ Non-ICT capital t-1	0.337	0.292	0.128	-0.072
	<i>0.037</i>	<i>0.102</i>	<i>0.530</i>	<i>0.694</i>
$\Delta \ln$ ICT capital t-1	0.016	-0.018	0.113	0.049
	<i>0.691</i>	<i>0.560</i>	<i>0.169</i>	<i>0.318</i>
$\Delta \ln$ ICT capital t-2	-0.008	-0.003	-0.106	-0.015
	<i>0.864</i>	<i>0.937</i>	<i>0.226</i>	<i>0.767</i>
$\Delta \ln$ foreign Employment developed t-1	-0.007	-0.011	0.000	-0.002
	<i>0.253</i>	<i>0.086</i>	<i>0.991</i>	<i>0.787</i>
$\Delta \ln$ foreign Employment developed t-2	0.001	-0.002	-0.005	-0.004
	<i>0.939</i>	<i>0.830</i>	<i>0.468</i>	<i>0.306</i>
$\Delta \ln$ foreign Employment eastern t-1	-0.015	-0.016	-0.005	0.000
	<i>0.027</i>	<i>0.003</i>	<i>0.305</i>	<i>0.962</i>
$\Delta \ln$ foreign Employment eastern t-2	-0.014	-0.007	0.010	0.003
	<i>0.016</i>	<i>0.223</i>	<i>0.246</i>	<i>0.525</i>
Constant	0.003	0.011	-0.004	-0.006
	<i>0.552</i>	<i>0.028</i>	<i>0.065</i>	<i>0.198</i>
Number of observations	96	95	154	153
Number of groups	12	12	20	20
AR (2) p-value	0.041	0.555	0.094	0.310
Joint sign. of time dummies (p-value)	0.000	0.000	0.484	0.000
Sargan test (p-value)	1.000	1.000	0.610	0.925

*1' p-values below the coefficients (in italics)

Endnotes

¹ The wage share index adjusted for the employment structure (basis year of 1970) and calculated as a ratio to net national income decreased even more sharply (Guger and Marterbauer, 2004).

² See Greenaway et al. (1999a) and Hine and Wright (1998) for a model with wage/capital cost as the explanatory variable in a model for trade effects. Since it is hard to measure the capital costs the authors then rely on time dummies to reflect this effect, assuming perfect capital markets. However if we assume that capital is quasi-fixed, then we obtain instead a capital constrained labor demand model. OECD (2007) estimates a similar labor demand function to estimate the effects of imports.

³ The analysis of these effects, albeit interesting, are outside the scope of this paper.

⁴ Although the workers bargain for a targeted purchasing power based on expected CPI inflation, for the firms it is their producers' prices (determined by the wage costs and non-labor costs and their mark-up power) which also is a binding constraint for the wage demands of workers. So one could estimate the real wage equation either deflated by consumer or producers' prices and account for these price differentials by adding the wedge, the ratio of CPI/PPI. But since it is not a core variable, we will drop it at the estimation stage to gain degrees of freedom.

⁵ Economy wide unemployment to account for general labor market conditions is not added since this also requires dropping the time dummies; also in a panel context economy wide variables are less useful.

⁶ In Austria wage determination is a result of industry-wide collective bargaining, but pattern bargaining makes it highly centralized. But Aiginger et al. (1996) also mention that subsequent negotiations at the firm level are possible, particularly in large firms, which are exposed to higher international competition. Nevertheless regarding the effects of alternative wage as well as pattern bargaining, a reference wage like the average wage rate of the

economy could be included. While this would make sense, if one were only interested in wage differentials, it is defeating in our context, since the average wage needs to be explained and not taken as given. Furthermore it would require dropping the time dummies.

⁷ There is no collective bargaining coverage or union density data compatible with NACE classification.

⁸ We use labor compensation rather than wage and salaries to account for the non-wage payments to labor such as social security contributions of the employers as well. A correction of the wage share to account for the labor income of the self-employed was not possible due to lack of detailed sectoral data.

⁹ This is a simplification in order to explain the changes in the wage share, assuming that the change in the producers' price index and value added price index are the same, which in reality is different.

¹⁰ Also a given and PPI/value added deflator is assumed.

¹¹ $(1 - \beta_w \alpha_l)$ needs to be positive to have a meaningful solution.

¹² 20 countries including the 10 Eastern European new member states, five non-member South Eastern European countries, and four European countries of the Community of Independent States (Russia, Ukraine, White Russia, Moldavia).

¹³ Further lags are not used due to the limited sample size. They were also not significant.

¹⁴ Industry includes 11 manufacturing sectors and mining and quarrying. Mining is added to the pool to increase the sample size; however the results are qualitatively robust to the exclusion of mining.

¹⁵ The total economy excludes agriculture, since labor market dynamics in agriculture has a rather different character.

¹⁶ Real wage, real value added, employment, capital stock, foreign employment, all suffer from unit root problems. Unit root tests are available upon request.

¹⁷ The instrument set in the case of the lags of employment is expanded as the panel progresses and the number of potential lags increases. This method is efficient; however it was not possible in the case of the other endogenous variable due to the limited matrix size of the estimation software (STATA).

¹⁸ The source of blue and white collar employment and wages is the Social Security records and wages are median wages, whereas aggregate employment and wages are based on national accounts and wages are mean wages. Therefore there are some differences in their changes.

¹⁹ Although there are negative effects for both low and high skilled sectors at the level of the total economy, these results are less reliable due to the low number of observations, and wherever they are not consistent with the total finding, we will not emphasize them.

²⁰ Arellano–Bover/Blundell–Bond estimator is based on a system of equations: the difference equation as described above according to Arellano–Bond, adding the original equation in levels to the system, where variables in levels are instrumented with suitable lags of their own first differences. This method is particularly suitable for the employment equation which behaves like random walk. In the case of the real wage equation, this is less of a problem. In this estimation we used orthogonal transformation instead of differencing to maximize the sample size in the presence of missing observations.

²¹ Based on the long run elasticities for the wage share, we calculate the % change effect and finally express these effects in %-points, which makes more sense in the case of wage share.

Bisher sind in dieser Reihe erschienen:

- Eigl R., Experimentielle Methoden in der Mikroökonomik, No. 1, Mai 1991.
- Dockner E., Long N.V., International Pollution Control: Cooperative versus Non-Cooperative Strategies, No. 2, September 1991.
- Andraea C.A., Eigl R., Der öffentliche Sektor aus ordnungspolitischer Sicht, No. 3, Oktober 1991.
- Dockner E., A Dynamic Theory of Conjectural Variations, No. 4, Oktober 1991.
- Feichtinger G., Dockner E., Cyclical Consumption Pattern and Rational Addictions, No. 5, Oktober 1991.
- Marterbauer M., Die Rolle der Fiskalpolitik im Schwedischen Wohlfahrtsstaat, No. 6, Dezember 1991.
- Pichler E., Cost-Sharing of General and Specific Training with Depreciation of Human Capital, No. 7, Dezember 1991.
- Pichler E., Union Wage Bargaining and Status, No. 8, Dezember 1991.
- Pichler E., Costs of Negotiations and the Structure of Bargaining - a Note, No. 9, Dezember 1991.
- Nowotny E., The Austrian Social Partnership and Democracy, No. 10, Dezember 1991.
- Pichler E., Walther H., The Economics of Sabbath, No. 11, April 1992.
- Klatzer E., Unger B., Will Internationalization Lead to a Convergence of National Economic Policies?, No. 12, June 1992.
- Bellak C., Towards a Flexible Concept of Competitiveness, No. 13, May 1992.
- Koren St., Stiassny A., The Temporal Causality between Government Taxes and Spending, No. 14, August 1992.
- Altzinger W., Ost-West-Migration ohne Steuerungsmöglichkeiten?, No. 15, September 1992.
- Bellack Ch., Outsiders' Response to Europe 1992, Case of Austria, No. 16, December 1992.
- Guger A., Marterbauer M., Europäische Währungsunion und Konsequenzen für die Kollektiv-vertragspolitik, No. 17, January 1993.
- Unger B., van Waarden F., Characteristics, Governance, Performance and Future Perspectives, No. 18, January 1993.
- Scharmer F., The Validity Issue in Applied General Equilibrium Tax Models, No. 19, May 1993.
- Ragacs Ch., Minimum Wages in Austria: Estimation of Employment Functions, No. 20, June 1993.
- Ragacs Ch., Employment, Productivity, Output and Minimum Wages in Austria: A Time Series Analysis, No. 21, September 1993.
- Stiassny A., TVP - Ein Programm zur Schätzung von Modellen mit zeitvariierenden Parametern, No. 22, December 1993.
- Gstach D., Scale Efficiency: Where Data Envelopment Analysis Outperforms Stochastic Production Function Estimation, No. 23, December 1993.
- Gstach D., Comparing Structural Efficiency of Unbalanced Subsamples: A Resampling Adaptation of Data Envelopment Analysis, No. 24, December 1993.
- Klausinger H., Die Klassische Ökonomie und die Keynesianische Alternative. Revision ein Mythos?, No. 25, December 1993.
- Grandner T., Gewerkschaften in einem Cournot-Duopol. Sequentielle versus simultane Lohnverhandlungen, No. 26, April 1994.
- Stiassny A., A Note on Frequency Domain Properties of Estimated VARs, No. 27, June 1994.
- Koren St., Stiassny A., Tax and Spend or Spend and Tax ? An International Study, No. 28, August 1994.
- Gstach D., Data Envelopment Analysis in a Stochastic Setting: The right answer from the wrong model?, No. 29, August 1994.
- Cantwell J., Bellak Ch., Measuring the Importance of International Production: The Re-Estimation of Foreign Direct Investment at Current Values, No. 30, January 1995.
- Klausinger H., Pigou's Macroeconomics of Unemployment (1933). A Simple Model, No. 31, February 1995.
- Häfke Ch., Helmenstein Ch., Neural Networks in Capital Markets: An Application to Index Forecasting, No. 32, January 1995.
- Hamberger K., Katzmair H., Arithmetische Politik und ökonomische Moral, Zur Genologie der Sozialwissenschaften in England, No. 33, May 1995.
- Altzinger W., Beschäftigungseffekte des österreichischen Osthandels, No. 34, July 1995.
- Bellak Ch., Austrian Manufacturing Firms Abroad - The last 100 Years, No. 35, November 1995.
- Stiassny A., Wage Setting, Unemployment and the Phillips Curve, No. 36, January 1996.
- Zagler M., Long-Run Monetary Non-Neutrality in a Model of Endogenous Growth, No. 37, June 1996.
- Traxler F., Bohmann G., Ragacs C., Schreckeneder B., Labour Market Regulation in Austria, No. 38, January, 1996.
- Gstach D., A new approach to stochastic frontier estimation: DEA+, No. 39, August 1996.
- Bellak Ch., Clement W., Hofer R., Wettbewerbs- und Strukturpolitik: Theoretische Begründung und neuere Entwicklungen in Österreich, No. 40, June 1996.
- Nowotny E., Dritter Sektor, Öffentliche Hand und Gemeinwirtschaft, No. 41, August 1996.
- Grandner T., Is Wage-Leadership an Instrument to Coordinate Union's Wage-Policy? The Case of Imperfect Product Markets, No. 42, November 1996.

- Pirker R., The Constitution of Working Time, No. 43, Januar 1997.
- Nowotny E., Konsequenzen einer Globalisierung der Weltwirtschaft für unsere Gesellschaft, No. 44, Januar 1997.
- Grandner T., Territoriale Evolution von Kooperation in einem Gefangenendilemma, No. 45, February 1997.
- Häfke Ch., Sögner L., Asset Pricing under Asymmetric Information, No. 46, February 1997.
- Stiassny A., Die Relevanz von Effizienzlöhnen im Rahmen von Gewerkschaftsverhandlungsmodellen, No. 47, May 1997.
- Stiassny A., Unsicherheit bezüglich der Preiselastizität der Güternachfrage als reale Rigidität, No. 48, May 1997.
- Klausinger H., Die Alternativen zur Deflationspolitik Brünings im Lichte zeitgenössischer Kritik, No. 49, June 1997.
- Wehinger G.D., Exchange Rate-Based Stabilization: Pleasant Monetary Dynamics?, No. 50, August 1997.
- Wehinger G.D., Are Exchange Rate-Based Stabilizations Expansionary? Theoretical Considerations and the Brazilian Case, No. 51, August 1997.
- Huber C., Sögner L., Stern A., Selbstselektierendes Strompreisregulierungsmodell, No. 52, August 1997.
- Ragacs Ch., Zagler M., Economic Policy in a Model of Endogenous Growth, No. 53, October 1997.
- Mahlberg B., Url T., Effects of the Single Market on the Austrian Insurance Industry, No. 54, February 1998.
- Gstach D., Grandner T., Restricted Immigration In a Two-Sector Economy, No. 55, March 1998.
- Sögner L., Regulation of a Complementary Imputed Good in a Competitive Environment, No. 56, March 1998.
- Altzinger W., Austria's Foreign Direct Investment in Central and Eastern Europe: 'Supply Based' or Market Driven?, No. 57, April 1998.
- Gstach D., Small Sample Performance of Two Approaches to Technical Efficiency Estimation in Noisy Multiple Output Environments, No. 58, June 1998.
- Gstach D., Technical Efficiency in Noisy Multi-Output Settings, No. 59, June 1998.
- Ragacs Ch., Zagler M., Growth Theories and the Persistence of Output Fluctuations: The Case of Austria, No. 60, October 1998.
- Grandner T., Market Shares of Price Setting Firms and Trade Unions, No. 61, October 1998.
- Bellak Ch., Explaining Foreign Ownership by Comparative and Competitive Advantage: Empirical Evidence, No. 62, March 1999.
- Klausinger H., The Stability of Full Employment. A Reconstruction of Chapter 19-Keynesianism, No. 63, April 1999.
- Katzmair H., Der Modellbegriff in den Sozialwissenschaften. Zum Programm einer kritischen Sozio-Logik, No. 64, June 1999.
- Rumler F., Computable General Equilibrium Modeling, Numerical Simulations in a 2-Country Monetary General Equilibrium Model, No. 65, June 1999.
- Zagler M., Endogenous Growth, Efficiency Wages and Persistent Unemployment, No. 66, September 1999.
- Stockhammer E., Robinsonian and Kaleckian Growth. An Update on Post-Keynesian Growth Theories, No. 67, October 1999.
- Stockhammer E., Explaining European Unemployment: Testing the NAIRU Theory and a Keynesian Approach, No. 68, February 2000.
- Klausinger H., Walras's Law and the IS-LM Model. A Tale of Progress and Regress, No. 69, May 2000.
- Grandner T., A Note on Unionized Firms' Incentive to Integrate Vertically, No. 70, May 2000.
- Grandner T., Optimal Contracts for Vertically Connected, Unionized Duopolies, No. 71, July 2000.
- Heise, A., Postkeynesianische Beschäftigungstheorie, Einige prinzipielle Überlegungen, No. 72, August 2000.
- Heise, A., Theorie optimaler Lohnräume, Zur Lohnpolitik in der Europäischen Währungsunion, No. 73, August 2000.
- Unger B., Zagler M., Institutional and Organizational Determinants of Product Innovations. No. 74, August 2000.
- Bellak, Ch., The Investment Development Path of Austria, No. 75, November 2000.
- Heise, A., Das Konzept einer nachhaltigen Finanzpolitik aus heterodoxer Sicht – ein Diskussionsbeitrag, No. 76, April 2001.
- Kocher M., Luptacik M., Sutter M., Measuring Productivity of Research in Economics. A Cross-Country Study Using DEA, No. 77, August 2001.
- Munduch, G., Pfister A., Sögner L., Stiassny A., Estimating Marginal Costs for the Austrian Railway System, No. 78, February 2002.
- Stückler M., Überprüfung von Gültigkeit und Annahmen der Friedman-These für Rohstoffmärkte, No. 79, July 2002.
- Stückler M., Handel auf Terminkontraktmärkten, No. 80, July 2002.
- Ragacs Ch., Minimum Wages, Human Capital, Employment and Growth, No. 81, August 2002.
- Klausinger H., Walras' Law in Stochastic Macro Models: The Example of the Optimal Monetary Instrument, No. 82, November 2002.
- Gstach D., A Statistical Framework for Estimating Output-Specific Efficiencies, No. 83, February 2003.

Gstach D., Somers A., Warning S., Output specific efficiencies: The case of UK private secondary schools, No. 84, February 2003.

Kubin I., The dynamics of wages and employment in a model of monopolistic competition and efficient bargaining, No. 85, May 2003.

Bellak Ch., The Impact of Enlargement on the Race For FDI. No. 86 Jan. 2004

Bellak Ch., How Domestic and Foreign Firms Differ and Why Does it Matter?. No. 87 Jan. 2004

Grandner T., Gstach D., Joint Adjustment of house prices, stock prices and output towards short run equilibrium, No. 88, January 2004

Currie M., Kubin I., Fixed Price Dynamics versus Flexible Price Dynamics, No. 89, January 2005

Schönfeld S., Reinstaller A., The effects of gallery and artist reputation on prices in the primary market for art: A note, No. 90, May 2005

Böheim, R. and Muehlberger, U., Dependent Forms of Self-employment in the UK: Identifying Workers on the Border between Employment and Self-employment. No. 91, Feb. 2006

Hammerschmidt, A., A strategic investment game with endogenous absorptive capacity. No. 92, April 2006

Onaran, Ö., Speculation-led growth and fragility in Turkey: Does EU make a difference or “can it happen again”? No. 93, May 2006

Onaran, Ö., Stockhammer, E., The effect of FDI and foreign trade on wages in the Central and Eastern European Countries in the post-transition era: A sectoral analysis. No. 94, June 2006

Burger, A., Reasons for the U.S. growth period in the nineties: non-keynesian effects, asset wealth and productivity. No. 95, July 2006

Stockhammer, E., Is the NAIRU theory a Monetarist, New Keynesian, Post Keynesian or a Marxist theory? No. 96, March 2006

Onaran, Ö., Aydiner-Avsar, N., The controversy over employment policy: Low labor costs and openness, or demand policy? A sectoral analysis for Turkey. No. 97, August 2006

Klausinger, H., Oskar Morgenstern als wirtschaftspolitischer Berater in den 1930er-Jahren. No. 98, July 2006

Rocha-Akis, S., Labour tax policies and strategic offshoring under unionised oligopoly. No. 99, November 2006

Stockhammer, E., Onaran, Ö., National and sectoral factors in wage formation in Central and Eastern Europe. No. 100, December 2006

Badinger, H., Kubin, I., Vom kurzfristigen zum mittelfristigen Gleichgewicht in einer offenen Volkswirtschaft unter fixen und flexiblen Wechselkursen. No. 101, January 2007

Stockhammer, E., Onaran, Ö., Ederer, S., Functional income distribution and aggregate demand in the Euro-area. No. 102, February 2007

Onaran, Ö., Jobless growth in the Central and Eastern European Countries: A country specific panel data analysis for the manufacturing industry. No. 103, March 2007

Stockhammer, E., Ramskogler, P., Uncertainty and exploitation in history. No. 104, April 2007

Ramskogler, P., Uncertainty, market power and credit rationing. No. 105, August 2007

Stockhammer, E., Ederer, S., Demand effects of the falling wage share in Austria. No. 106, August 2007

Steidl, A., Stockhammer, E., Coming and leaving. Internal mobility in late Imperial Austria. No. 107, August 2007.

Onaran, Ö., International financial markets and fragility in the Eastern Europe: “can it happen” here? No. 108, September 2007.

Grandner, T., Product differentiation in a linear city and wage bargaining. No 109, September 2007.

Hein, E., Stockhammer, E., Macroeconomic policy mix, employment and inflation in a Post-Keynesian alternative to the New Consensus Model. No. 110, October 2007

Commendatore, P., Kubin, I., Petraglia, C., Footloose capital and productive public services. No. 111, October 2007

Riedl, A., Rocha-Akis, S., Testing the tax competition theory: How elastic are national tax bases in western Europe? No. 112, November 2007

Pufahl, A., Weiss, C., Evaluating the effects of farm programs: Results from propensity score. No. 113, November 2007

Stockhammer, E., Hein, E., Grafl, L. Globalization and the effects of changes in functional income distribution on aggregate demand in Germany. No. 114, December 2007

Smet, K. Stuck in the middle? The structure of trade between South Africa and its major trading partners. No. 115, December 2007

Fellner, G., Sutter, M. Causes, consequences, and cures of myopic loss aversion – An experimental investigation. No. 116, January 2008

Riedl, A. Contrasting the dynamic patterns of manufacturing and service FDI: Evidence from transition economies. No. 117, January 2008

Onaran, Ö., The effect of foreign affiliate employment on wages, employment, and the wage share in Austria. No. 118, March 2008