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Wage and Mobility Effects of Trade and Migration

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ABSTRACT

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The paper investigates the relative importance of trade and immigration for earnings and job mobility of male German workers. Using panel data, changes of workplace within a firm and between firms are separated from occupational changes. Various subgroups are investigated, differentiating between blue and white collar workers according to job level and work experience. The general finding is that trade matters more than migration, which is contrary to the public attention both determinants receive, at least in Germany. While wages are affected negatively by a relative increase in imports, immigration exhibits a positive effect. Trade seems to depress occupational mobility and internal movement, but stimulates inter-firm changes. Immigration affects intra-firm changes negatively, but is largely unrelated to other aspects of labour mobility.

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NON-TECHNICAL SUMMARY

The persistently high level of unemployment in Europe and the increased share of the working poor have received substantial concern in industrialized economies. There is also the observation that the relative wages of skilled workers have increased. While there is considerable debate, there is no agreement on the major causes. Recently, labour migration and trade have found attention. Labour economists have examined the hypothesis that immigration causes a decline in wages and an increase in unemployment among natives, affecting low-skilled workers harder. There is little strong evidence in support of this hypothesis, however. One of the hottest debates centres on trade and labour markets. While some economists strongly support the idea that trade can have negative consequences for labour markets, especially trade with the developing world, other authors disagree, claiming that labour market problems are caused by technical progress, among other factors.

This paper combines trade and migration, merging the two strands of literature. For our investigation we use the West German Socio-Economic Panel (GSOEP), a large micro data set provided by the DIW in Berlin, on employed male earnings and labour mobility. A novel feature here is that we are able to differentiate job changes by occupation, inter-firm and intra-firm movements. Further, earnings and mobility of various subgroups of the male labour force are studied, namely blue and white collar workers, and low- and high-skilled workers defined by work experience and job status. This way we obtain a detailed pattern of the effects of trade and migration on the labour market. Germany is an excellent case for such a study since: (i) it provides a good data base in the German Socio-Economic Panel; (ii) it is very involved in international trade; and (iii) it has experienced a large inflow of migrants.

To study the effects of migration and trade, macro level data was merged into the micro data set. The share of foreigners by industry, state and year is taken from published statistical sources. Specifically, it is the share of workers with nationalities other than German covered by the federal mandatory social insurance programme. Thus, depending on the individual micro level indicators for industry, state and year, the macro data have been appropriately merged into the micro data at the GSOEP two-digit level. Similarly, the real Deutschmark value of exports, imports and output (gross value added) by industry and year are used. The 'Trade Deficit Ratio' is calculated as (imports − exports)/output.

In estimating wage equations, we use the random effects panel estimator, such that each individual is identified over time, and attributed a specific error term. We find, overall, a complementary effect from the share of foreigners in the labour force. A larger share has a positive impact on wages, at least in the full sample. This general finding occurs because migrants seem to be complements to high-skilled individuals, while there is no effect on low-skilled wages. Migrants affect the wages of white collar workers little, but have a positive impact on high-skilled blue collar workers. Our earnings regressions suggest that male wages are negatively affected by the trade deficit ratio. If the trade deficit ratio (net imports divided by output) of the sector increases, this will lead to wage losses. Perhaps somewhat surprisingly, this affects skilled workers at least as much as unskilled workers. In contrast, immigration has no effect on low-skilled workers, but a positive effect on the wages of the highly-skilled.

What are the effects of trade and migration on mobility? Mobility is measured in terms of occupational changes of a more aggregated one-digit ISCO code (International Standard Classification of Occupations from the International Labour Organization) and the largely disaggregated three-digit level, intra-firm and inter-firm changes. Here, the probit model, appropriate when the dependent variable is binary in nature (change/no-change), is employed in the estimation, such that individual mobility outcomes are estimated. The trade deficit ratio indicates that increasing competition reduces occupational mobility and intra-firm flexibility, but supports inter-firm flexibility. The inter-firm mobility effect shows up across all skill groups. The negative effect on intra-firm mobility appears only for poorly-experienced workers. Occupational mobility is affected more negatively for lower job levels and greater experience. The impacts of immigrants are less pronounced. Intra-firm mobility is affected negatively in the full sample, and this seems to be driven by individuals with a low job level and/or low experience. All other impacts are negligible.

Trade and migration are related. There is evidence that those sectors that compete most with imports also employ a larger share of immigrant workers. Strong export sectors also hire fewer immigrants. This correlation suggests that regressions concentrating on only one of these variables may suffer from misspecification. Similarly, labour mobility is much more affected by trade than by immigration. Mobility is measured by occupational changes and intra- and inter-firm workplace changes. A larger share of immigrants in the workplace reduces intra-firm flexibility only. A relative increase in imports has a negative effect on occupational mobility and intra-firm flexibility, but encourages inter-firm flexibility.

Our findings imply that trade is the more relevant variable for the German labour market, and also, potentially, the more dangerous threat. Trade has not caused wage pressure and reduced labour market flexibility in West Germany. Due to unification, output-weighted net imports have declined in West Germany. This was caused by the increase in demand from East Germany. The mechanism confirmed in this analysis was tested in a period (1985–91) with no pronounced trend in trade, however. It may be that, seen in a longer time perspective, trade has caused labour market problems.

1. Introduction

The persistently high level of unemployment in Europe and the increased share of the working poor have received substantial concern in industrialized economies. There is also the observation that the relative wages of skilled workers have increased. While there is considerable debate, there is no agreement on the major causes. Recently, two potential determinants have found attention that involve international economic relations, namely labor migration and trade. Burtless (1995) and Zimmermann (1995b) provide an overview of relevant aspects of both debates.

Labor economists have examined the hypothesis that immigration is causing a decline in wages and increases in unemployment among natives, and affect low-skilled workers harder. As reviewed by Borjas (1994) for the US and Zimmermann (1995a) for Europe, there is not much evidence that supports this conjecture. De New and Zimmermann (1994) found the strongest negative wage effects (for Germany) in the European context, but even they conclude that the response remains in an acceptable range. While Winkelmann and Zimmermann (1993) obtained in their analysis that a larger share of foreign labor had increased the frequency of unemployment of Germans in the 1970s, Mühleisen and Zimmermann (1994) have found no effects for the 1980s.

One of the hottest debates is on trade and the labor markets. While economists like Wood (1991, 1994), Revenga (1992), Sachs and Shatz (1994), and Minford, Riley and Nowell (1995) strongly support the negative labor market consequences of trade especially from the third world, other authors like Lawrence and Slaughter (1993), Bhagwati (1994, 1995), Baldwin (1995) and Berman Bound and Griliches (1994) are opposed to this idea and claim that the labor market problems were caused by technical progress, among other factors.

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There are few studies like the early papers by Freeman and Katz (1991) and Borjas, Freeman and Katz (1992) that combine both trade and migration. It is the objective of this paper to follow this line of reasoning and to merge the two strands of literature. It uses west German micro panel data on employed male earnings and labor mobility for investigation. A novel feature here is that we are able to differentiate job changes by occupation, inter-firm and intra-firm movements. We further study earnings and mobility of various subgroups of the male labor force, namely blue and white collar workers, and low-skilled and high-skilled workers defined by work experience and job status. This way we obtain a detailed pattern of the effects of trade and migration on the labor market. Section 2 discusses general trends in German trade and migration. Section 3 explains the data. Section 4 reports the empirical findings. Section 5 concludes.

2. Trade and Immigration

This section discusses the relevance of trade and immigration. International trade is of substantial importance for Germany. In 1960, the share of real exports of gross national product of west Germany was 19 percent (import share 16.5 percent), in 1993 it was already 31.9 percent (import share 24.4 percent). While the trade balance was always positive, its size varied largely with the business cycle. Figure 1 demonstrates this for the real trade balance in percent of gross national product for period 1965 - 1994. Unification in 1990 changed this picture significantly in that a large part of the exports was absorbed by east Germany. Figure 1 shows a declining trade balance for unified Germany, becoming even negative, while the trade balance for west Germany is growing higher than ever. This implied increased demand for goods produced by west German firms. A "quick and dirty" conclusion from this is that trade cannot be responsible for recent problems on the west German labor market.

Figure 2 provides a sectoral breakdown of the trade deficit ratio (imports minus exports

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in percent of the output of the sector, all measured in real terms; this is minus the trade balance ratio used in Figure 1) and its evolution over time from 1984 -1992. In many industries, this ratio is largely stable. (This confirms the message provided by Figure 1 for the period 1984 - 1992.) Only a few industries (mining, textiles, food, and banking) have experienced a positive trend in the trade ratio, indicating an increased pressure on the labor market. Some had adjustment problems after unification (food, railway), and some were unstable (education/sport, public sector). These pictures may suggest that no major problems were caused by trade. However, this is not the right way to evaluate the potential threat of trade for the labor market. If there is enough variation in the data, one may infer from a regression analysis what will happen if imports receive a larger weight holding other relevant factors constant. It is also clear that the real issue are the major changes in the labor market, say from the late 1960s to the 1970s/80s and then to the 1990s. However, for such an analysis we would need a larger time-series of micro data, which is not available.

Trade flows induce demand effects for production of goods and affect native wages and employment. A relative increase in the import pressure may cause raising unemployment and declining (relative) wages. A new trade debate associates especially the large increase in the unemployment of unskilled workers (predominantly in Europe) and their declining relative wages (predominantly in the U. S.) to the increased competition from developing countries´ imports. Since trade with developing countries is limited, its relative contribution must be limited. But this ignores the additional impacts of defensive labor-saving innovations, substitution effects in favor of high-qualified labor, and the displacement of labor in services and nontraded-goods sectors that provide goods and services that are needed in manufacturing industries. So far, we know of no emprical study that evaluates the labor market effects of trade for Germany.

Let us now turn to the migration issue. After World War II, West Germany became a *de facto* country of immigration. (See Zimmermann (1995a, 1995b) for a more detailed analysis.) First, this was due to the large inflow of ethnic Germans, mainly as a consequence of forced resettlements caused by the war. Second, in the Manpower Recruitment Phase from 1961-1973, a shortage of labor, which since the construction of the Berlin Wall in 1961 was no longer compensated by the inflow of people of German origin, induced a search for foreign workers. A "Guest Worker System" was established by means of recruitment treaties with Italy (1955), Spain and Greece (1960), Turkey (1961), Morocco (1963), Portugal (1964), Tunisia (1965) and Yugoslavia (1968). Whereas the offered engagements were thought to be of short-term nature, they in fact became largely long-term committments. This process stabilized even after 1973, when in the face of the first oil crisis and a recession, active recruitment policies ended. With this in mind, it is no surprise that the share of foreign labor has typically been about 8% in West Germany in recent years.

There have always been concerns about the labor market consequences of immigration. However, most economists support the position, that for allocative reasons, free international movements of labor are beneficial, as is the free movement of capital and goods, at least for the economy as a whole. Labor may suffer, but its relevance is an empirical issue. The key issue for the evaluation of the wage effects of immigrant labor is whether foreigners are substitutes or complements to natives. A reasonable simplification is that high-qualified and low-qualified workers are complements and immigrants tend to be substitutes for low-qualified natives and complements to high-qualified natives. Hence, increased immigration may depress wages and increase unemployment of low-income workers and may induce the reverse effects for the high-qualified. Winkelmann and Zimmermann (1993) find that a larger share of foreign labor increases the frequency of unemployment of Germans in the 1970s, while Mühleisen and Zimmermann

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(1994) find no effects for the 1980s.

We wish to investigate how migration and trade is related to wages and labor mobility. Our particular approach is to employ a micro-econometric excercise using a large - scale panel data set for west Germany on wages and labor mobility which we merge with sector- and region-specific variables measuring trade and migration. Identifying various sub-groups in the labor market, we are investigating the relative effects of trade and migration indicators while controlling for other relevant variables. The next section will detail the data issues.

3. The Data

In the sequel, we will concentrate on west Germany. This decision is driven by our data situation. The micro data we are using is primarily from the 1980s, and most periods are before unification. Furthermore, even today the German statistical office does not provide complete detailed statistics on unified Germany. This study further uses data of the first 9 waves (for 1984-1992) of the German Socio-economic Panel (SOEP) for west Germany. The data is a large household survey produced by Deutsches Institut für Wirtschaftsforschung (DIW), Berlin. The international public - use file is explained in Wagner, Burkhauser and Behringer (1993).

The SOEP is a rich and unique data source in various ways. It is the longest time-series of cross-sections available in Europe and provides a large number of questions. For instance, it explicitly asks employed individuals whether they have changed the employer or changed their position inside the firm. It also requests the respondents to describe their job in detail. Based on this description, two occupational variables are created by the DIW which follow the 1- and 3-digit level of the International Standard Classification of Occupations of the International Labor Office, the so-called ISCO code. We have cleaned this data and followed the individuals up

through the years to study occupational changes. We also combine the information on changes of position between firms and within firms with the occupational changes on the 1-digit and 3-digit level. The SOEP also provides data on monthly gross labor earnings.

A more detailed description of the variables is given in the Appendix. Here we provide an overview only. Labor earnings is used as log real earnings, and the change variables are coded as (0,1)-dummies. Real monthly earnings, in contrast to real hourly wages, is used here to avoid potential complications in calculating an hourly wage with "dirty" data on hours worked. This decision seems not too problematic since we concentrate on males only. The full sample size for the earnings regressions is 17,137 and for the mobility analysis is 12,855. The different number of observations are the result of different data requirements and data availability in both cases. For instance, the earnings regressions cover period 1985-1992, while the labor mobility regressions only period 1985-1991.

The following variables are used as regressors: Individual characteristics, including a dummy for foreigner, marriage, union membership, age, age squared, education, education squared, tenure, tenure squared, percentage handicapped, size of the community, firm size, unemployment experience, and number of previous jobs. Regional or industry level information like industry dummies, regional unemployment, sectoral growth, union density, a trade deficit ratio, and the regionally and sectorally differentiated foreigner share in the labor force. This semi-aggregated data was merged by us from official sources with the micro data.

Since the number of observations available is large, we are able to split the data in various subsamples. A possible differentiation is between blue and white collar workers. While such a split is straightforwardly executed, it is not necessarily the most convincing strategy. Both groups

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contain skilled and unskilled workers. Since the proposition is that trade and migration is a major threat to low-skilled workers, one better combines the skilled and unskilled individuals in both groups. We, however, also keep the subgroups separated. This leaves us with seven regressions: (i) the total sample, (ii) four regressions for skilled and unskilled blue collar and skilled and unskilled white collar workers, and (iii) two regressions for skilled (blue and white collar) workers and unskilled (blue and white collar) workers. The definition of "skilled" is up for debate. We chose two types of analysis. Following De New and Zimmermann (1994), we defined a person to be skilled, if he has 25 or more years of work experience. A different concept used here for the first time has been to define somebody as skilled if he has a "qualified" job. The analysis was carried out for both approaches. The result is 13 different regressions for wages and 52 regressions for labor mobility.

There are various econometric problems we need to deal with. The panel nature in the earnings regression is exploited by applying a random effects panel model. The mobility variables are (0,1)-dummies. We, therefore, use probit estimates with time-specific fixed effects using Pseudo-R^2's suggested by Veall and Zimmermann (1992). Both the trade deficit ratio as the foreigner share variable are potentially endogenous. We, therefore, have instrumented these variables using growth of industry value added, industry dummies, time dummies and industry-specific time-trends as instruments. The R^2 for the migration regression is 0.4, for the trade regression 0.8. A standard argument against simple merging of group-specific variables with continious micro data derived from Moulton (1990) is that under certain conditions t-ratios are upward biased, if the group structure is not appropriately specified. Note, however, that due to the panel structure we are able to deal with this problem by employing industry-specific fixed effects.

This paper has some relationships with previous studies. However, while De New and Zimmermann (1994) have examined the wage effects of immigration and Zimmermann (1995c) has dealt with labor mobility as discussed in this paper, they both do not address the trade issue. Also, De New and Zimmermann (1994) use a substantially different sample by including fewer waves and creating different sub-samples. They also concentrate on natives only, employ different specifications and use wages instead of earnings. The migration data used in this paper is far more detailed, containing the region-specific foreigner share by industry, provided by the Bundesanstalt für Arbeit. In this data set, some smaller states are grouped (with neighbouring larger ones) by the Bundesanstalt für Arbeit: (i) Schleswig-Holstein and Hamburg, (ii) Niedersachsen and Bremen, and (iii) Rheinland-Pfalz and Saarland. The net effect is an 8 times increase in detail.

4. Results

How are the earnings of the various groups affected by trade and migration? We study this question in the well-established framework of an earnings regression. The model specification is given in Table A1 in the Appendix. Foreigners receive lower earnings. Among the standard human capital variables, tenure receives the lowest support. Married men earn more, large firms pay more, and individuals living in smaller cities receive lower payment. Union membership does not pay, previous job flexibility has a positive impact, previous unemployment experience a negative effect on earnings. Regional unemployment also depresses wages. This all confirms earlier studies in the literature, and is fairly stable across the subsamples. Therefore, the more detailed findings are not listed to conserve space.

The trade deficit ratio exhibits a negative (and statistically significant) effect on wages in all model specifications of Table A1. However, the estimated coefficients are not larger (in

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absolute terms) for low-skilled workers than for high-skilled workers as one may wish to expect. This is true for both approaches to measure skills. These findings are also listed in Table 1 and compared with the results of the more detailed sample specifications. If one separates blue and white collar workers, the same message prevails: Blue and white low-skilled workers do not have stronger wage effects than the comparable high-skilled workers. In contrast, high-skilled workers seem often to experience stronger effects. This seems also to be true if we compare blue collar workers to white collar workers. White collar workers seem to be affected stronger.

Table 1 contains also all estimates concerning the effects of the foreigner share in the labor force. Overall, the finding is that foreigners exhibit a complementarity effect. A larger share has a positive effect on wages, at least in the full sample. The general finding occurs because migrants seem to be complements to high-skilled individuals while there is no effect on low-skilled wages. Migrants do not affect wages of white collar workers much, but have a positive impact on high-skilled blue collar workers.

Table A2 shows the model specification for the mobility probit estimates. Mobility is measured in terms of occupational changes of a more aggregated (ISCO1) or largely disaggregated (ISCO3) level, intra-firm and inter-firm changes. Foreigners are less flexible, age has a negative effect on occupational and inter-firm mobility, and education exhibits an U-shaped relationship. Handicapped people are more mobile within a firm, and union members have lower inter-firm flexibility. Regional unemployment and industry growth are hardly important, but union density has a negative impact on occupational flexibility and inter-firm changes.

What are the effects of trade and migration on mobility? A detailed summary can be found in Table 2. We do not report the results differentiated for white collar and blue collar

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workers since these findings do not add much additional information. The trade deficit ratio indicates that increasing competition reduces occupational mobility and intra-firm flexibility but supports inter-firm flexibility. The inter-firm mobility effect shows up across all skill-groups. The negative effect on intra-firm mobility appears only for low-experienced workers. Occupational mobility is affected more negatively for lower job levels and larger experience. The impacts of immigrants are less pronounced. Intra-firm mobility is affected negatively in the full sample, and this seems to be driven by individuals with a low job level and /or low experience. All other impacts are negligible.

5. Conclusions

The paper has used micro panel data for Germany to study the effects of migration and trade on the labor market. Germany is an excellent case for such a study since (i) it provides a good data base, the German Socio-economic Panel, (ii) it is substantially involved in international trade, and (iii) it has experienced a large inflow of immigrants. Trade and migration are related. There is evidence that those sectors that compete mostly with imports also employ a larger share of immigrant workers. Strong export sectors also hire fewer migrants. This correlation suggests that regressions concentrating on one of both variables only may suffer from misspecification.

Our findings imply that trade is the more relevant variable for the German labor market, and also the more dangerous threat. Our earnings regressions suggest that male wages are negatively affected by the trade deficit ratio. If the trade deficit ratio, net imports devided by output, of the sector increases, this will cost jobs. Perhaps somewhat surprising, this affects skilled workers at least as much as unskilled workers. In contrast, immigration has no effect on low-skilled workers, but a positive effect on the wages of the high-skilled.

Quite similarly, labor mobility is much more affected by trade than by immigration. Mobility is measured by occupational changes and intra- and inter-firm changes of the workplace. A larger share of immigrant workers reduces intra-firm flexibility only. A relative increase in imports has a negative effect on occupational mobility and intra-firm flexibility but encourages inter-firm flexibility.

Has trade caused wage pressure and reduced labor market flexibility in west Germany? Not recently. Due to unification, output-weighted net imports have declined in west Germany. This was caused by the increase in demand from east Germany. However, the mechanism confirmed in this analysis was tested in a period with (1985-1991) with no pronounced trend in trade. It may also well be that seen in a longer time-perspective, trade had caused labor market problems. These implications are worthy of further study.

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Table 1: Wage Effects of Trade and Migration[a]

	Trade Deficit Ratio	Foreigner Share	R²/Observations
Full sample	-0.111	0.613	0.37
	(5.1)	(2.8)	17,137
Job level			
Low - all	-0.118	0.203	0.28
	(-5.1)	(0.8)	8,682
High - all	-0.131	1.260	0.41
	(-3.2)	(3.4)	8,398
Blue - low	-0.040	0.738	0.17
	(-1.9)	(1.8)	5,602
Blue - high	-0.093	1.442	0.15
	(-2.3)	(3.9)	5,916
White - low	-0.351	0.995	0.43
	(-3.4)	(1.2)	3,080
White - high	-0.355	0.330	0.27
	(-5.0)	(0.5)	2,482
Experience level			
Low - all	-0.065	0.207	0.48
	(-1.7)	(0.6)	8,155
High - all	-0.095	0.511	0.29
	(-3.5)	(1.8)	8,982
Blue - low	-0.049	0.663	0.25
	(-1.0)	(1.5)	5,154
Blue - high	-0.046	0.851	0.10
	(-1.5)	(2.4)	6,364
White - low	-0.052	-0.559	0.49
	(-1.4)	(-1.7)	3,001
White - high	-0.242	0.114	0.20
	(-7.4)	(0.4)	2,618

[a] Random effects panel models. t-values in parentheses. Full specification of variables is contained in Table A1. Precise definitions of variables are given in the Appendix. Both variables are instrumented.

Table 2: Mobility Effects of Trade and Migration[a]

	Trade Deficit Ratio	Foreigner Share	R^2_{MZ}/R^2_{VZ}	Observations
Full sample				**12,855**
Occupation				
ISCO 1	-3.357	-0.029	0.19	
	(-4.3)	(-0.2)	0.18	
ISCO 3	0.726	-0.147	0.22	
	(1.0)	(-1.5)	0.22	
Intra-firm	-2.091	-0.597	0.12	
	(-1.7)	(-2.8)	0.08	
Inter-firm	3.214	0.168	0.18	
	(3.3)	(1.3)	0.14	
Job level				
Low - all				**6,565**
Occupation				
ISCO 1	-2.923	0.073	0.20	
	(-2.8)	(0.5)	0.18	
ISCO 3	0.756	-0.077	0.24	
	(0.8)	(-0.6)	0.23	
Intra-firm	-0.975	-0.732	0.11	
	(-0.6)	(-2.5)	0.08	
Inter-firm	3.205	0.123	0.26	
	(2.2)	(0.6)	0.19	
High - all				**6,266**
ISCO 1	1.849	0.181	0.32	
	(1.4)	(0.9)	0.30	
ISCO 2	2.068	-0.234	0.23	
	(1.8)	(-1.4)	0.23	
Intra-firm	-1.653	-0.348	0.22	
	(-0.9)	(1.1)	0.12	
Inter-firm	3.308	0.280	0.15	
	(2.3)	(1.5)	0.11	

[a] Probit estimates. t-values in parentheses. Full specification of variables is contained in Table A2. Precise definitions of variables are given in the Appendix. Both variables are instrumented.

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Table 2: cont.

	Trade Deficit Ratio	Foreigner Share	R^2_{MZ}/R^2_{VZ}	Observations
Experience level				
Low - all				**6,035**
Occupation				
ISCO 1	1.376	0.203	0.19	
	(1.3)	(1.3)	0.17	
ISCO 3	3.281	0.031	0.17	
	(3.5)	(0.2)	0.16	
Intra-firm	-2.059	-0.832	0.14	
	(-1.3)	(-2.7)	0.09	
Inter-firm	2.122	0.158	0.12	
	(1.8)	(1.0)	0.09	
High - all				**6,820**
ISCO 1	-5.637	-0.028	0.31	
	(-4.2)	(-0.1)	0.29	
ISCO 2	-2.358	-0.307	0.30	
	(-2.0)	(-1.9)	0.31	
Intra-firm	-0.557	-0.233	0.12	
	(-0.3)	(-0.8)	0.06	
Inter-firm	6.698	0.128	0.17	
	(3.1)	(0.5)	0.10	

Figure 1: Trade Balance (Exports - Imports) in Percent of Gross National Product[a]

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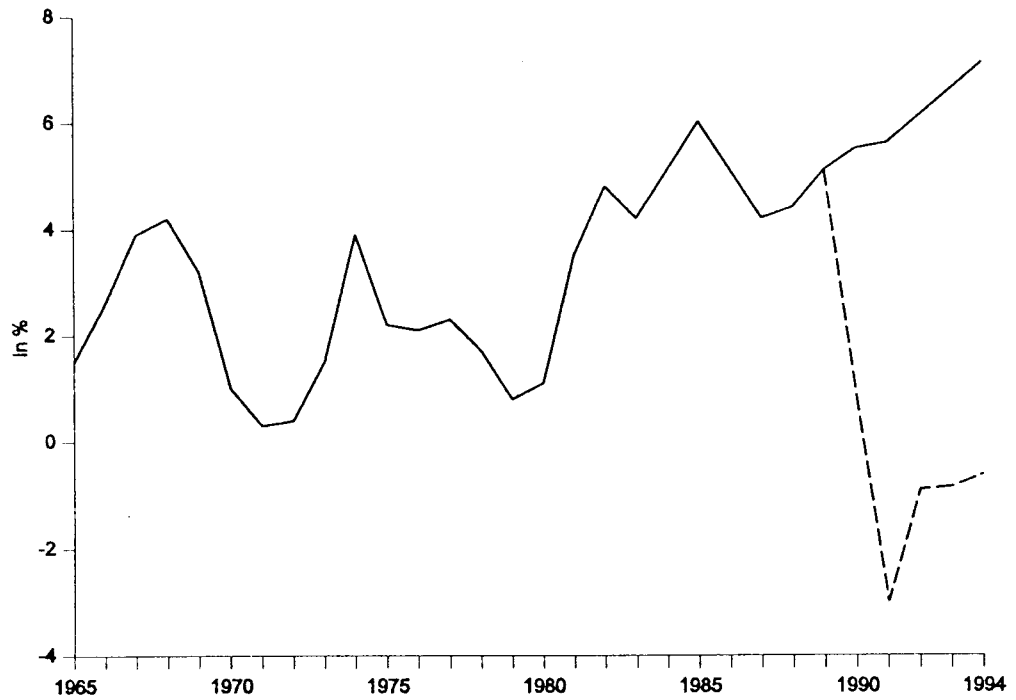
[a] <u>Source:</u> Sachverständigenrat (German Council of Economic Advisors, Annual Report 1994), pp. 360-361. DIW-Wochenbericht, various issues. Dashed line is unified Germany, solid line is West Germany only.

Figure 2: Sectoral Trade Deficit Ratios
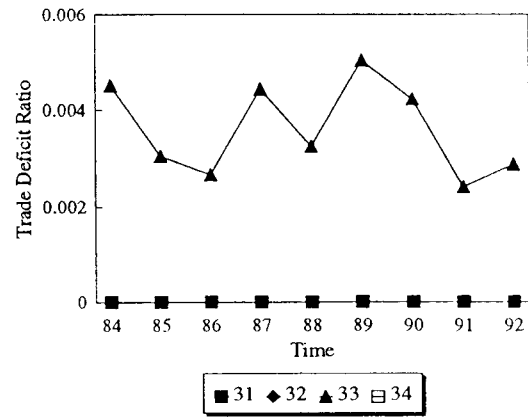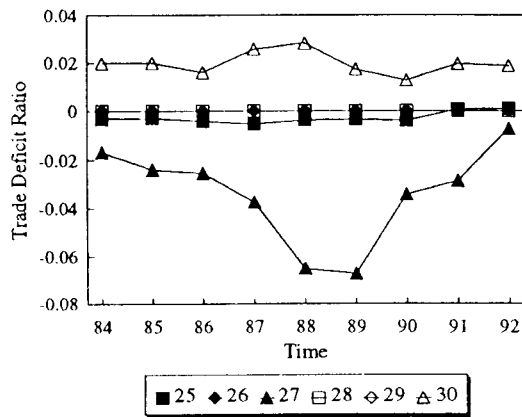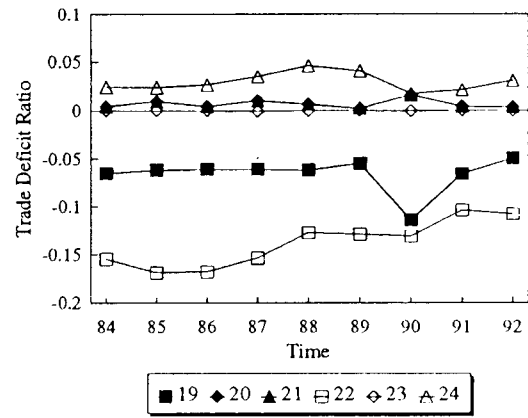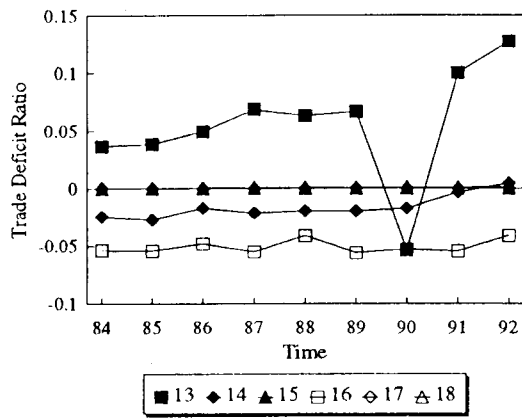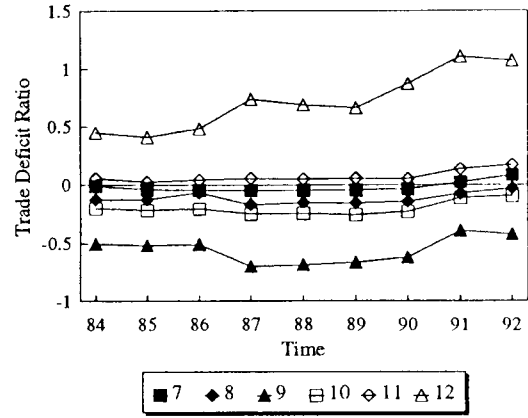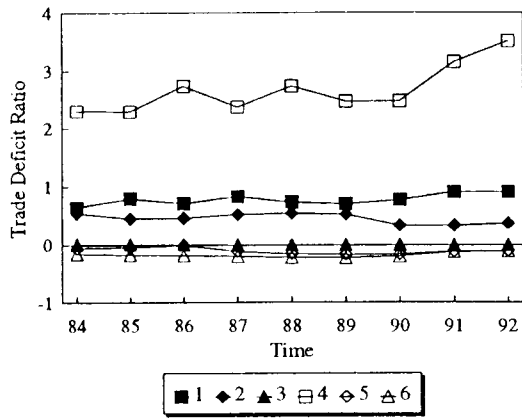
Table 3: GSOEP Industry Classification

(1) Agriculture and Forestry
(2) Fishery
(3) Energy and Water
(4) Mining
(5) Chemical / Coal Processing / Oil

(6) Plastics / Rubber / Asbestos
(7) Stone / Ore / Ceramics / Glas
(8) Iron / Foundries / Processing
(9) Steel / Machine / Vehicle Assembly
(10) Electro / Fine Mechanics

(11) Wood / Paper / Printing
(12) Leather / Textile / Clothing
(13) Food and Sundries
(14) Construction: Main
(15) Construction: Subsidiary

(16) Wholesale
(17) Trade Middlemen
(18) Retail
(19) Railway
(20) Post / Telephone / Postbank

(21) Other Transportation / Communication
(22) Banks / Savings Banks
(23) Insurance
(24) Hotels / Restaurants
(25) Personal Service

(26) Cleaning / Garbage Disposal
(27) Education / Sport
(28) Health
(29) Legal Advice
(30) Other Service

(31) Churches / Organizations
(32) Private Households
(33) Municipalities
(34) Social Insurance

Appendix: Data Construction

The survey data used in this study are the first 9 waves for 1984-1992 of the German Socio-Economic Panel (SOEP) for western Germany. The panel is provided by the Deutsche Institut für Wirtschaftsforschung (DIW, Berlin), and a general introduction can be found in Wagner, Burkhauser and Behringer (1993). The group of foreigners is slightly oversampled. Since our analysis involves changes, the first wave is lost. For the Probit mobility analysis, the last wave is lost as well due to missing information. Hence we study the period 1985-1991. We concentrate on males only. The definition of the variables is like follows:

(i) Data from the SOEP:

General background information:

Foreigner:	*(0,1)* : dummy for foreigner *(Turk, Yugoslav, Greek, Italian, Spanish)*
Age:	Year - year of birth
Married:	(0,1) : dummy for marriage
Union Member:	(0,1) : dummy for union member in 1985
Handicapped:	Percentage handicapped
Firm Size (Med):	200-2000
Firm Size (Lrg):	more than 2000
City (Small):	< 100,000 inhabitants

Industry breakdown:

Sector:	Potentially available are 34 sectors

Human capital variables:

Years Education:	Own calculation on the basis of individual degrees
Experience:	Experience= Age - (Years Education) - 6
Tenure:	Current year - first year in current firm

Job Type and Mobility variables:

ISCO1:	change in ISCO 1-digit: 8 job categories
ISCO3:	change in ISCO 3-digit: 224 job categories with observations available
Intra-Firm:	Change of workplace within firm (0,1)
Inter-Firm:	Change of firm (0,1)

Job Groupings	by Job Qualification	by Work Experience
Blue Collar:	LOW 1: no training	LOW <=25 yrs experience
	2: some training	HIGH >25 yrs experience
	HIGH 3: vocational training	
	4: foreman	
	5: Meister	
White Collar:	LOW 1: Werkmeister	LOW <=25 yrs experience
	2: simple job	HIGH >25 yrs expereince
	3: qualified job	
	HIGH 4: very qualified	
	5: manager	

Months Unemp: Number of months unemployed in the last 10 years, asked in 1984

Num Prev Jobs: Number of employers in the last 10 years, asked in 1984

(ii) Data merged by us from other sources:

The merging process was undertaken by connecting the industry code in the various sources with the industry code in the SOEP.

Foreigner Share (Migration):
The share of foreigners by industry, state and year is taken from the published issues of the Amtliche Nachrichten (1985-1993) der Bundesanstalt für Arbeit. Specifically, of those workers covered by the federal mandatory social insurance program, it is the share of workers with nationalities other than German as of September 30th in each year. Thus, depending on the individual micro level indicators for industry, state and year, the macro data have been appropriately merged into the micro data at the SOEP 2-digit level (34 values).

Trade Deficit Ratio:
The real DM value (1991) of exports, imports and output (Bruttowertschöpfung, gross value added) by industry and year have been taken from published issues of the Volkswirtschaftliche Gesamtrechnungen FS18,R1.3 (1986-1993) from the Statistisches Bundesamt. "Trade Deficit Ratio" is calculated as (imports - exports)/ output.

Unemployment:
Unemployment rate, detailed by year and German state (Länder). Source: Statistisches Bundesamt, Statistisches Jahrbuch, various issues.

Growth:
Industry growth calculated as the growth rate of gross value added. Detailed per year and industry according to the Statistisches Bundesamt, Statistisches Jahrbuch, various issues.

Union Density:
Union density, share of union members to total workers in that industry. Source: Statistisches Bundesamt, Statistisches Jahrbuch, various issues.

Table A1: Wage Effects of Trade and Migration[a]: Full Specification

Variables	Full Sample	Job Qualification		Work Experience	
		Low	High	Low	High
Foreigner	-0.080	-0.086	-0.076	-0.081	-0.063
	(-8.4)**	(-8.0)**	(-5.9)**	(-6.6)**	(-4.7)**
Experience	0.034	0.030	0.034	0.055	0.017
	(35.6)**	(26.3)**	(21.5)**	(24.8)**	(4.4)**
Experience^2	-0.000	-0.000	-0.001	-0.001	-0.000
	(-27.3)**	(-20.9)**	(-16.9)**	(14.5)**	(3.2)**
Years Education	-0.015	-0.011	-0.013	0.008	-0.021
	(-3.5)**	(-2.4)**	(-2.1)**	(0.9)	(-4.0)**
Years Education^2	0.003	0.003	0.003	0.002	0.004
	(17.1)**	(10.8)**	(11.8)**	(6.2)**	(13.3)**
Tenure	0.000	0.002	-0.000	0.000	0.001
	(0.7)	(2.4)**	(-0.1)	(0.079)	(1.1)
Tenure^2	0.000	0.000	0.000	0.000	0.000
	(2.1)**	(1.6)	(1.5)	(0.1)	(1.9)*
Married	0.016	0.016	0.027	0.025	-0.007
	(2.8)**	(2.3)**	(2.9)**	(3.3)**	(-0.7)
Union Member	-0.003	0.006	-0.025	0.003	-0.012
	(-0.3)	(0.6)	(-2.3)**	(0.2)	(-1.1)
Firm Size (Med)	0.011	-0.001	0.025	0.018	0.007
	(3.0)**	(-0.2)	(4.1)**	(3.1)**	(1.5)
Firm Size (Lrg)	0.017	0.017	0.025	0.027	0.008
	(4.8)**	(3.8)**	(4.1)**	(4.7)**	(1.8)*
Num Prev Jobs	0.015	0.012	0.011	0.005	0.009
	(5.0)**	(3.8)**	(2.8)**	(1.4)	(2.0)**
Months Unemployed	-0.006	-0.005	-0.006	-0.007	-0.006
	(-7.9)**	(-6.2)**	(-5.2)**	(-7.8)**	(-5.0)**
City (Small)	-0.023	-0.033	-0.027	-0.020	-0.031
	(-4.0)**	(-4.7)**	(-3.3)**	(-2.3)**	(-4.1)**
Unemployment	-0.024	-0.023	-0.021	-0.019	-0.018
	(-23.2)**	(-19.1)**	(-13.6)**	(-12.1)**	(-12.2)**
Trade Deficit Ratio	-0.111	-0.118	-0.131	-0.065	-0.095
	(-5.1)**	(-5.1)**	(-3.2)**	(-1.7)*	(-3.5)**
Foreigner Share	0.613	0.203	1.260	0.207	0.511
	(2.8)**	(0.8)	(3.4)**	(0.6)	(1.8)*
Constant	7.449	7.548	7.457	7.186	7.621
	(204.8)**	(192.1)**	(137.1)**	(105.2)**	(95.8)**
N	17,137	8,682	8,398	8,155	8,982
R^2	0.37	0.28	0.41	0.48	0.29

[a] Full sample using SOEP micro data 1984-1992. Random effects panel models. t-values in parentheses.** significant at 5% level. * significant at 5% level with one-sided t-test. All regressions include 15 industry dummies and a constant.

Table A2: Wage Effects of Trade and Migration[a]: Full Specification

Variables	ISCO 1	ISCO 3	Intra-Firm	Inter-Firm
Constant	-0.801 (-2.1)**	0.245 (0.803)	-1.803 (-3.3)**	-0.001 (-0.0)
Foreigner	-0.178 (-3.1)**	0.021 (0.5)	-0.152 (1.9)*	-0.182 (-2.8)
Married	-0.145 (-2.5)**	-0.078 (-1.5)	0.112 (1.3)	-0.078 (-1.2)
Age	-0.037 (-2.2)**	-0.078 (-5.5)**	0.011 (0.5)	-0.052 (-2.5)**
Age^2	0.000 (1.4)	0.001 (4.2)**	-0.000 (-1.4)	0.000 (0.9)
Years Education	-0.015 (-0.5)	-0.074 (-3.9)**	-0.032 (-0.9)	-0.065 (-2.3)**
Years Education^2	0.002 (2.3)**	0.004 (5.1)**	0.003 (2.3)**	0.003 (3.0)**
Handicapped (%)	-0.001 (-0.4)	0.000 (0.2)	0.005 (2.3)**	0.001 (0.5)
Union Member	-0.106 (-2.3)**	0.040 (1.0)	0.026 (0.4)	-0.105 (-1.9)*
Num Prev Jobs	0.040 (-2.8)**	0.038 (2.9)**	-0.064 (-2.3)**	0.071 (4.8)**
Months Unemployed	0.008 (2.3)**	0.013 (4.4)**	-0.008 (-1.0)	0.006 (1.4)
Unemployment (-1)	-0.003 (-0.3)	-0.004 (-0.6)	-0.005 (-0.4)	0.000 (0.0)
Growth (-1)	0.223 (0.4)	0.049 (0.1)	1.576 (2.0)*	0.316 (0.5)
Union Density (-1)	0.050 (0.4)	-0.370 (-3.2)**	0.241 (1.4)	-1.004 (5.6)**
Foreigner Share (-1)	-3.357 (-4.3)**	0.726 (1.0)	-2.091 (-1.7)*	3.214 (3.3)**
Trade Deficit Ratio (-1)	-0.029 (-0.2)	-0.147 (-1.5)	-0.597 (-2.8)**	0.168 (1.3)
N	12,855	12,855	12,855	12,855
R^2_{MZ}	0.20	0.22	0.12	0.19
R^2_{VZ}	0.18	0.22	0.08	0.14
LRT	646.84	1057.51	146.73	373.66

[a] t-values in parentheses. ** significant at 5% level. * significant at 5% level with one-sided t-test. Probit regression. All regressions include time dummies. SOEP micro data 1985-1991.

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