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International migratory movements: The German experience

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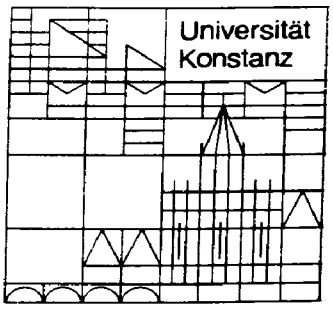

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International Migratory Movements: The German Experience

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INTERNATIONAL MIGRATORY MOVEMENTS: THE GERMAN EXPERIENCE[1]

Wolfgang Franz

Serie II - Nr. 160

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Abstract: This paper is concerned with the experience of the Federal Republic of Germany with migratory movements. It presents, firstly, quantitative magnitudes and describes some institutional regulations concerning the immigration and remigration of foreign workers, including some remarks on more recent developments. Secondly, an econometric analysis of economic determinants of inflows and outflows is carried out taking into account several legal regulations. Thirdly, simulation experiments with a macroeconometric rationing model may highlight some effects of migration on the German economy.

1 Introduction

Issues on migration are one of the leading topics in economic policy which will share increasing importance in the next years. Moreover, migration is an issue with a long history. Focussing on migrant workers and on Germany, their movement into Germany has many historical antecedents. German industrialization in the nineteenth century was accompanied by mass movements of labor from rural areas, chiefly from Austria, Hungary, Italy and especially from Poland.[2] These laborers flooded into the new industrial areas, such as the Ruhr area, and became part of the "proletariat". They partly filled the gap in labor supply caused by the tremendous emigration from Germany to overseas countries. However, the free movement of labor as well as agitation against foreign workers by the native population can be traced back to the turn of the century, too. The number of foreign workers in Germany totalled four percent of the total labor force in 1907, but in the same year several mass deportations of Polish workers took place, and laws were passed which restricted their employment and reinforced their remigration.[3] Due to the high economic growth rates in the Ruhr area, those restrictions were finally abolished, and many of those Polish workers became permanent residents, a fact which is easily verified by an inspection of the area's telephone books.

This paper is concerned with the experience of the Federal Republic of Germany with migratory movements. More specifically, the paper investigates the determinants of these movements and their effects on the German economy.

The paper is organized as follows. The next section provides a brief overview of the quantitative magnitudes of migration of foreigners into and out of Germany and describes some of the institutional and legal regulations concerning the immigration and remigration of foreign workers. As a side step section 3 comments on some recent developments in migration from Eastern and Central Europe to Germany. Section 4 is devoted to an econometric analysis of the economic determinants of inflows and outflows of foreign workers. Section 5 presents some simulation results based on a macroeconometric rationing model in order to highlight some effects of migration on the German economy. The paper concludes with a summary.

2 Quantitative Magnitudes and Institutional Regulations

At the outset, a brief overview of some aspects of labor market conditions in the FRG after World War II, with specific reference to the employment of foreign workers, may be helpful.[4] As a standard reference figures 1 and 2 exhibit the number and the flows of foreign workers 1960–1989.

To begin with, three time periods with markedly different labor market conditions can be distinguished. The period 1950–1960, usually regarded as the reconstruction phase, was characterized by a high rate of economic growth, limited primarily by a shortage of capital with labor in excess supply. The latter was caused partly by the inflow of refugees from Eastern Europe and East Germany, which amounted to a total net immigration of 3.1 million persons (i.e., nearly six percent of the entire population of the FRG). In addition, female labor supply was high because, as a consequence of

[2] See Stolper (1940), p.40 for details.

[3] See Rist (1978).

[4] Parts of this section draw upon Franz (1981).

the war, many women were the sole breadwinners of their families.[5] Moreover, their participation rate in the labor force increased from 42 percent in 1950 to almost 50 percent in 1960. Since then, however, labor market conditions have evolved rather differently.

The second time period 1961–1972 starts with the construction of the Berlin Wall in 1961 which abruptly stopped the immigration of refugees. Furthermore, the increasing demand for higher education resulted in a decrease in labor force participation rates. For example, in 1960 only 15 percent (9 percent) of the male (female) population between the ages of 15 and 25 years old attended high school and universities, whereas the figure was 34 percent (26 percent) in 1975.

On the other hand, because of the high growth rates of domestic aggregate demand and of exports –supported by an undervalued exchange rate of the Deutsche Mark (compared with the purchasing power parity)– and because of the shortened work week, the demand for workers increased.

The resulting excess demand for labor was satisfied largely by the immigration of foreign workers. Employment of foreigners rose from 280,000 in 1960 to a peak of 2.5 million in 1973 (i.e., from about 1.3 percent to 10 percent of all employees).[6] During this period the German economy had enjoyed virtually unlimited access to foreign labor markets because the supply of labor from those markets was highly elastic with respect to the difference between German real wage rates and those of such countries. Consequently, a large supply of foreign labor was available at constant German wage rates, ceteris paribus, and was one important reason why Germany was able to avoid the price adjustment process via higher inflation rates. Moreover, intersectoral shifts by German employees from sectors such as manufacturing, construction, and energy to the public and service sectors was managed without substantive structural changes:[7] Foreign workers were substituted for German employees in the former sectors without a major change in the wage rates prevailing in them, ceteris paribus, and hence, even industries with low productivity were protected which would not have survived had there been competition in a closed labor market. Thus, the recourse to foreign workers may have retarded rationalization of industry.[8] In this second time period the first interruption to the continuous increase in employment of foreign workers came with the recession in 1967. Figure 1 illustrates the fact that the number of foreign workers decreased from 1.3 million persons in September 1966 to 904,000 persons in January 1968, but regained its pre–recession level in June 1969. Compared with this 30 percent reduction, the decline in employment among German workers was only about 4 percent for the same time period.

Finally, the third time period, 1973–1989, was characterized by recessions of greater magnitudes as consequences of adverse supply shocks in the seventies and restrictive monetary and fiscal policies in the beginnings of the eighties.[9] Unemployment in the FRG rose to unprecedented levels since 1960. The unemployment rate increased from

[5] For some economic aspects of female labor supply in the FRG see Franz (1985).

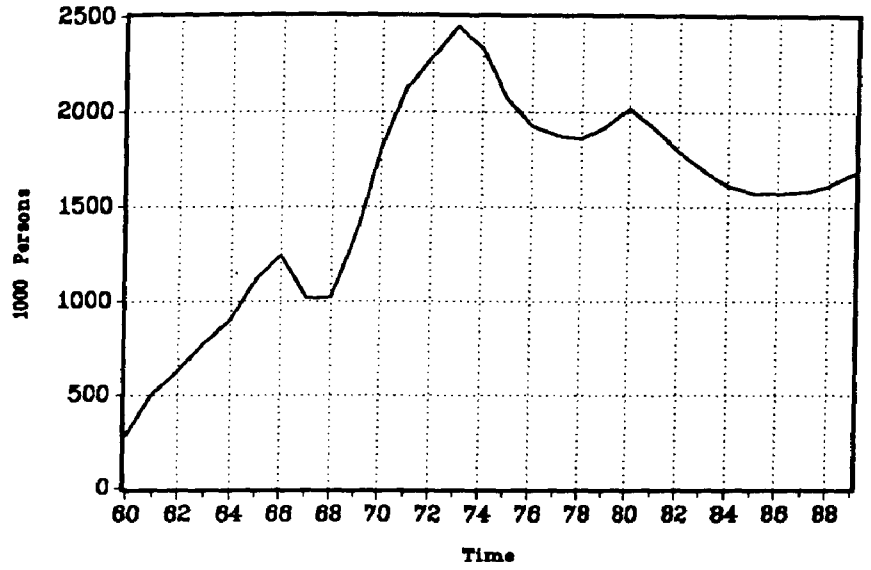
[6] The inflow of guestworkers into the FRG can be traced back to 1955 when several thousand Italian farmworkers were granted temporary work permits.

[7] See Lamberts (1975) for details.

[8] Parenthetically, we may note that due to the access to foreign labor markets, there have been less incentives for the German industry to substitute capital for labor, e.g. "robots", compared with the Japanese industry, for example. This may be one reason for the higher technology of the Japanese automobile industry which became apparent in later years.

[9] See Franz and König (1986) and Franz (1990).

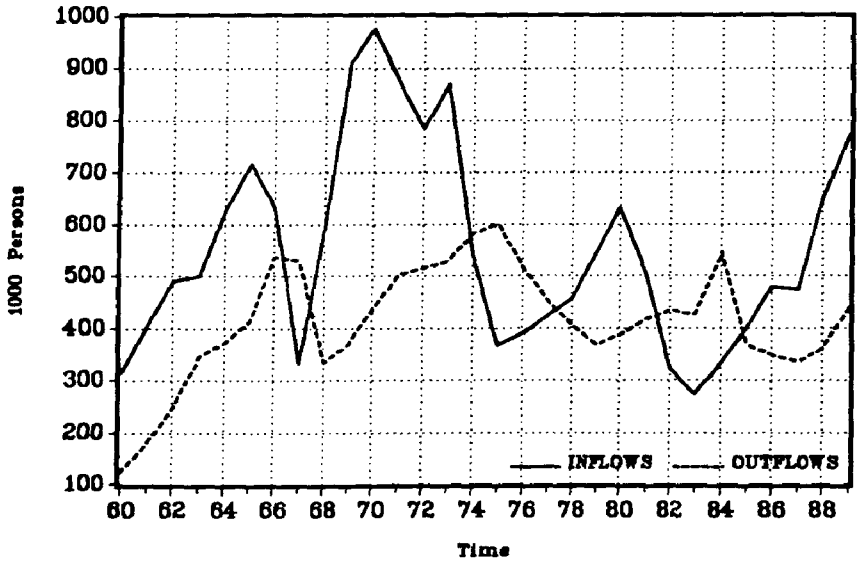
Figure 1: Number of Foreign Workers in Germany (Thousands)[a)]



a) Workers covered by social security laws.

Source: Amtliche Nachrichten der Bundesanstalt für Arbeit, various issues.

Figure 2: Inflows and Outflows of Foreigners[a)]



a) All persons regardless of their labor market status.

Source: Statistisches Bundesamt, Fachserie 1: Bevölkerung und Erwerbstätigkeit, Reihe: Wanderungen.

1.2 p.c. in 1973 to 4.6 p.c. in 1975 and to 8.9 p.c. in 1985 and is then falling to a 7.6 p.c. rate in 1989. The number of foreign workers declined to about 1.6 million in 1989 (i.e., by about 900,000 from the peak of 2.5 million in 1973). This decrease occured rather steadily (with 1979/80 as an exception of a slight increase). It was, however, not brought about by simply an expulsion of, say, all unemployed foreigners. For example, the number of unemployed foreign workers had averaged about 235,000 between 1980 and 1989, equivalent to an average unemployment rate of 12 p.c. This is a considerably higher figure than the average unemployment rate for German workers.[10] In order to understand how this decline was managed, some remarks on important institutional regulations concerning guest workers are in order.

Table 1: Foreign Workers in Germany by Nationality[a)]

Country of Origin	1975/79	1980/84	1985/89
Turkey	27.3	30.6	32.8
Jugoslavia	19.8	17.7	18.3
Italy	14.8	14.3	11.3
Greece	8.6	6.5	6.3
Spain	5.4	4.3	4.0
Portugal	3.2	2.8	2.3
Others	20.9	23.8	25.0
Total (1000)	1,931	1,804	1,599

a) Percentages of all foreign workers; included are workers covered by social security laws.

Source: Amtliche Nachrichten der Bundesanstalt für Arbeit, Jahreszahlen 1990, p.18.

Before doing so, some characteristics of the foreign workforce are highlighted in tables 1–5. They reveal, firstly, the considerable shares of foreign workers from Turkey and Jugoslavia, whereas the importance of Italian guest workers is declining. Secondly, labor force participation rates of foreign persons exceed those of Germans. This is most obvious for Jugoslavian people. Thirdly, the age structure of foreign employees is to the advantage of prime ages, i.e., employees in the age between 25 and 45 years. Finally, the share of foreign employees with completed school and/or vocational training falls short of the respective shares for German workers.

Turning to institutional regulations a very important distinction to be made is whether the foreign worker comes from a country which is a member of the Common Market. In general terms, foreign workers coming from an EC member country cannot be prohibited from working in Germany because of the freedom of movement for labor within the EC.[11] This ruling basically concerns the Italian, Greek and Spanish workers, i.e., roughly 20 p.c. of all foreign workers in 1986 as is displayed by table 1.

[10] Source: Amtliche Nachrichten der Bundesanstalt für Arbeit, Arbeitsstatistik 1990, p.69.

[11] Articles 48 and 49 of the treaty of Rome stipulated that full labor mobility was to be achieved by the end of 1969. In fact, the ratification of the final stage of the agreement was signed in 1968.

Table 2: Labor Force Participation Rates of Foreigners and Germans 1983 (Percentages)[a)]

Nationality	Males	Females	Married Women
Germans	59.1	34.5	41.7
Foreigners	63.2	36.7	53.0
- Italy	69.8	39.5	57.7
- Jugoslavia	71.0	51.0	70.9
- Turkey	56.0	26.7	42.4

a) Labor force divided by population.

Source: Thon (1987), p.38.

Table 3: Foreign and German Employed Persons by Age 1983 (Percentages)[a)]

Nationality	less than 25	25–45	45–55	more than 55
German	23.2	45.4	21.5	9.9
Foreign	14.7	61.8	18.8	4.7
- Italy	20.8	56.0	17.2	5.9
- Jugoslavia	4.8	70.0	20.8	4.3
- Turkey	20.4	59.6	18.3	1.8

a) Percentages of all employees of each row.

Source: Dietz (1987), p.93.

The number of workers coming from EC member countries cannot serve as a matter of employment policy, therefore, even though the amount of non–EC workers is under governmental control. As long as an excess demand for labor exists in Germany, the government will have little difficulty in filling this gap, due to the high degree of willingness among non–EC workers to migrate to Germany.[12] Permission is required for the employment of non–EC workers, a permission which the firm can obtain as long as the vacancies cannot be filled by German workers. However, in the case of excess labor supply in Germany, the government can stop the inflow of foreign workers coming from non–EC countries. Such an immmigration stop was ordered in 1973 when the overall unemployment rate increased because of the recession. This immigration stop is still in operation, but it was not a complete one, since family members of a guest worker living in Germany have been allowed to immigrate and therefore to supply labor under some conditions. At the same time the immigration stoppage was accompanied by a quasi–"export of unemployment". Unemployed foreigners have to leave Germany if their residence permit expires and if they have insufficient means of support – such as a claim

[12]To give an example; before the immigration stop was enacted in 1973, more than one million Turkish nationals reportedly wanted to become employed in Germany.

Table 4: Foreign and German Employed Persons by Qualification 1984[a)]

Nationality	Vocational Education		School Education		
	completed	without	Lower Secondary School[b)]	Abitur[c)]	University[d)]
Foreign	30.0	53.6	79.1	1.3	3.2
German	72.6	22.3	87.8	2.0	5.1

a) Percentages of all foreign and German employees, respectively. Figures do not sum up to 100 percent due to employees with unknown qualification.

b) "Haupt- and Realschule " where pupils stay until the age of 14 or 15 unless they join a high school.

c) High School leaving certificate giving access to universities.

d) Including colleges of higher education ("Fachhochschule").

Source: Dietz (1987), p.95; calculations by the author.

to unemployment compensation, for example. The extent to which unemployment can be exported in this way depends, partly, on how long the foreigner has been in Germany. According to laws (enacted in 1978 and 1979) a foreigner has a claim to an unlimited residence permit if he has worked in Germany for at least 8 years and if he fullfills some requirements concerning knowledge of the German language, residency, and the like.[13] Thus the effectiveness of an active remigration policy depends on the length of time for which the foreign workers have been in Germany. In 1979, about 1.6 million foreign persons had lived for more than eight years in the FRG (i.e., about half of the total foreign population in the FRG).[14] In 1984 already two thirds of all foreigners had lived in Germany for at least eight years.[15] The more time passes, therefore, the fewer will be the number of non-EC foreign workers serving as an instrument of a remigration policy. In addition, the immigration stop may have induced some reluctance to return home voluntarily. Some of those non-EC workers who have planned to go back to their home country (temporarily) will now stay in Germany, since they will have no possibility of returning to Germany now that the immigration stop is in operation. Hence, the enforcement of involuntary remigration of some non-EC workers may be compensated for or even offset by a higher unwillingness to leave Germany by other non-EC workers who would otherwise have departed.

As a consequence, remigration policy focussed on financial incentives to encourage voluntary remigration. In 1983 a "return promotion law" ("Rückkehrhilfegesetz") was enacted which for 1984 granted a single lump-sum payment on the surrender of residence and work permits and the permanent departure of the worker and his family provided that he had become unemployed due to a bankruptcy of (parts of) the firm

[13] This is the so-called "Aufenthaltsberechtigung" which is to be distinguished from permission to stay in Germany or "Aufenthaltserlaubnis". Unlimited permission can be granted to the foreign worker who has worked for at least five years in Germany without interruption.

[14] Both figures exclude Italians (Greece and Spain have not been EC-members before 1981 and 1986, respectively.). Source: Deutsches Institut für Wirtschaftsforschung, Wochenbericht Nr.30 (1980), p.317.

[15] Source: Thon (1987), p.20.

he was employed before or that he has experienced short–term work.[16] Entitled to this "repatriation grant" were basically foreign workers from Jugoslavia and Turkey. The law had limited success, however. Only some 14,000 workers made use of this grant, i.e., only 1.5 p.c. of all guest workers entitled.[17] Despite the immigration stoppage for the non–EC foreigners there was still an inflow of these persons. Foreigners in Germany, under certain circumstances, may be permitted to be joined by their family members living abroad. This ruling is based on how long the foreigner stayed already in Germany and, as far as his children are concerned, there is an age ceiling for such a family unification in Germany. In addition, the number of foreigners in Germany changes not only due to inflows and outflows but also due to births and deaths. Both, family unification and births (net of deaths) in Germany explain the increase of the number of non–EC foreign workers in some years even after the immigration stoppage. For example, after the immigration stoppage the number of Turkish employees decreased to some 505,000 persons by the end of 1977, but increased to about 590,000 in 1980.

Table 5: Foreign Employed Persons by Sector[a)]

Sector	1970	1989
Agriculture, Forestry, Fishing	0.7	6.7
Energy, Mining	11.0	7.2
Manufacturing	11.3	10.6
Construction	14.6	10.0
Trade, Banking, Insurance	2.2	3.7
Transportation, Communication	2.7	6.5
Services	2.4	7.7
Government	5.1	3.7
Total(1000)	1839,9	1689,3

a) Percentages of all employees, covered by social security laws.

Source: Statistisches Jahrbuch 1971, p.125, p.131, Statistisches Jahrbuch 1990, table 6.11.1.

3 Migratory Movements from Eastern and Central Europe

As a side step, this section comments very briefly on more recent developments in migration from Eastern and Central Europe to Germany.

[16] The amount of this grant was some 10,000 DM for the worker and 1,500 DM for each child.

[17] A remigrant could cash in his contributions to social security (old age pensions) and his claims to subsidized savings accumulated on the basis of a governmental program for wealth accumulation of workers. See Hönekopp (1987), pp.287 for details. Some 100,000 foreigners made use of this possibility.

In principle, three groups of migrants from Eastern and Central Europe[18] to Germany can be distinguished.[19]

(i) German emigrants from the former German Democratic Republic (GDR) and East Berlin ("Übersiedler"). It is clear that after German unification on October 3rd, 1990, these persons no longer can be regarded as international migrants.

(ii) Repatriated persons ("Aussiedler") are German nationals and people of German origin who left the emigration areas in Eastern Europe.

(iii) Migration of non–German foreigners from Eastern Europe into Germany.

To begin with the development of East German emigrants official data are available only prior to July, 1st, 1990. Beginning with this date East German emigrants are no longer registered as such. In 1989 and the first half of 1990 a total of some 580,000 Germans emigrated from East Germany to West Germany (with 400,000 persons belonging to the labor force).[20] It is estimated that in 1990 and 1991 some 350,000 and 180,000 East Germans, respectively, will enlarge the West German labor force.[21]

With respect to repatriated persons from Eastern Europe their number amounts to about 400,000 persons in 1990 which is slightly more than in 1989 (377,000).

Table 6: Net Inflows into Germany from Eastern Europe (1000 persons)[a)]

Nationality	1980/84	1985/89	1989
Germans	197	577	297
- Poland	119	371	191
- Romania	61	58	15
- USSR	14	143	88
Foreigners	128	413	163
- Poland	83	312	118
- Romania	16	32	11
- USSR	7	33	22

a) See text for explanations; cumulated sums; "Eastern Europe" includes Bulgaria, Czechoslovakia, Hungary, Poland, Romania, USSR.

Source: Hönekopp (1991), pp.127–128; calculations by the author.

Table 6 provides a summary statistic of net inflows from Eastern Europe (without Jugoslavia) in the last decade. Focussing on 1989, total net inflows amount to 460,000 persons. Roughly two thirds are Germans (297,000) and among these again about two

[18] "Eastern Europe" includes Bulgaria, Czechoslovakia, Hungary, Poland, Romania, and the USSR but not Jugoslavia. The latter country allowed emigration much more generously and is dealt with in the previous section. "Central" Europe refers to the former German Democratic Republic (GRD).

[19] See Hönekopp (1991) for a more detailed overview.

[20] Source: Bach et.al. (1990), p. 473.

[21] ibid. p. 471.

thirds came from Poland (191,000). The figures in table 6 highlight the tremendous increase of net inflows during the past decade. Net inflows of Germans from the USSR are ten times higher in the second half of the eighties compared with the first half. Moreover, 62 percent of all net inflows of Germans from the USSR during the period 1980–89 immigrated in 1989.

These immigrants coming from Eastern Europe had various advantages over some other groups.[22] People being repatriated ("Aussiedler") were normally recognized as Germans[23] and had therefore unlimited access to the German labor market and to social–benefits including special "integration benefits". Until recently foreigners from Eastern Europe were regarded as refugees for political reasons. This means that they were not sent back to their native countries and, until some years ago, were allowed to have immediate access to the German labor market, rather than having to wait for this permission for five years as has been the rule for other asylum–seekers. Now, both groups have to wait one year to enter the German labor market.[24]

There is virtually no information about subsequent migrations from Germany to other countries including the native country. Germany is to a considerable degree a transit country. The reasons for foreigners from East Europe to emigrate from Germany may include unsuccessful job search and favourable political changes in their country of origin. Moreover, there are no quantative assessments about the number of East Europeans engaged in illegal work. Casual experience points to a considerable amount of short–term or seasonal illegal employment especially of Polish people.

4 The Importance of Economic Determinants of Migration

This section is devoted to an empirical test of several possible determinants of migration provided by economic theory. From the preceding section it should be clear that in the German case some specific institutional regulations have to be considered such as EC membership and the like.

From the literature on migration it is conventional wisdom that a theoretical model of migration has to take into account at least the following aspects.

Typically, the migrant is assumed to maximize expected utility EU which is mostly defined on income Y at the end of the relevant time period, i.e., $EU = EU(Y)$, where $U'(Y) > 0$.[25] If Y_m denotes income associated with migration, net of moving costs, and if Y_0 stands for income in the absence of migration, the person will migrate if $EU(Y_m) > EU(Y_0)$. If EU is replaced by its Taylor series approximation around EY we obtain:

$$EU(Y) = UE(Y) + 0.5U''(EY)\sigma_Y^2, \tag{1}$$

[22] See Hönekopp (1991), p. 117.

[23] Hitherto, more than 90 percent of all "Aussiedler" were definitely recognized as Germans. Source: ibid.

[24] Recently, guest workers agreements were signed with Czechoslovakia, Hungary and Poland. Under these agreements, employment for 12 to 18 months for a limited number of persons are possible (1,000 Polish and 500 Hungarian workers). The aim is to enable these persons the acquisition of occupational and language skills. Moreover, special arrangements for commuters are in effect for the CSFR and for Poland. See Hönekopp (1991) for more details.

[25] See Stark (1991), p.141, for example. A survey of theories of migration is also given by Molho (1986) and Straubhaar (1988).

where σ_Y^2 is the variance of income and $U''(EY)$ is the second derivative of utility evaluated at EY. Risk neutrality implies that $U''(EY) = 0$ and $EU(Y)$ collapses to $UE(Y)$. In the case of risk aversion, i.e., for $U''(EY) < 0$, both the mean and the variance of income stemming from alternative locations are determinants of migration (as well as the degree of risk aversion).

For all practical purposes, risk neutrality of the decision maker is assumed and the expected income difference $E(D)$ is measured as:

$$\begin{aligned} E(D) &= [W(1-t)(1-UR) + uW(1-t)UR]^d \\ &- [W(1-t)(1-UR) + uW(1-t)UR]^f, \end{aligned} \tag{2}$$

where d and f denote domestic and foreign, respectively. W is the real gross wage rate, measured in, say, purchasing power units, t the constant income tax rate and u the percentage of unemployment compensation of previous income. The probability of receiving W is approximated by one minus the unemployment rate UR. The considerations outlined before about whether or not to migrate carry over by using the present value criterion such as:

$$PV(t) = \int_{t_0}^{T} E(D)_S \ e^{-rs} ds - C, \tag{3}$$

where C denotes the direct costs involved in migration and where r is the discount rate.[26] $T - t_0$ is, of course, not necessarily the remaining time span of working life but may represent the actual time the foreigner wants to stay abroad (if so). He may wish to migrate only temporarily in order to accumulate a certain amount of wealth ("target earner").

It goes without saying that the above framework is set up rather modestly in order to provide a basis for empirical analysis the scope of which being limited by the availability of adequate time series data. It suppresses aspects such as incomplete information. Taking into account belated information, for example, yields the result that remigration in most cases is a decreasing function of information known prior to migration. Put differently, migrants who possess inferior information about the foreign workplace and/or several other characterics of that country are more likely to return after a short duration of time.[27] Finally, not all optimal migration decisions are feasible if the foreign country puts limitations on immigration such as the German stoppage enacted in 1973.[28]

The above theoretical considerations suggest, firstly, the following prototype equation for inflows Z of foreigners into Germany. It is formulated as an error correction version in order to distinguish between short–run and long–run effects and will be estimated for five nationalities of immigrants (Italy, Spain, Greece, Turkey, Jugoslavia).

$$\begin{aligned} \Delta Z_t^i &= a_1 \cdot \Delta E(D)_t^i + a_2 \cdot \Delta UR_t + a_3 \cdot \Delta UR_t^i \\ &+ \lambda[Z_{t-1}^i + a_0 + a_4 \cdot E(D)_{t-1}^i + a_5 \cdot UR_{t-1} \\ &+ a_6 \cdot UR_{t-1}^i] + \epsilon_t^i \end{aligned} \tag{4}$$

[26] See Sjaastad (1962) for such an analysis.

[27] This result can, with considerable technical efforts, be obtained from multiarmed bandit (MAB) models such as Berninghaus and Seifert–Vogt (1991) and McCall and McCall (1987).

[28] See Section 2.

where all symbols retain their prior meaning. The ϵ_t^i are stochastic terms and i is an index which denotes the five countries mentioned above.[29] For all but three countries this equation has been estimated for the period 1961–1988 using annual data. The exceptions are Greece, Jugoslavia, and Spain where the estimation covers the time period 1961–1973 only. The reason is the immigration stop for non–EC immigrants put into effect at the end of 1973. Although immigration from these countries dropped dramatically, it was still present due to the immigration of guest workers' families joining them in Germany.[30] For the sake of simplicity, immigration from these countries during 1974–1988 is described by the following equation:

$$Z_t^j = a_7 + a_8 \cdot POP_{t-1}^j + \epsilon_t^j, \tag{5}$$

where j is a subscript for Greece, Jugoslavia, and Spain, respectively, and POP^j represents the population of nationality j, already living in Germany.

Both equations 4 and 5 are jointly estimated for each nationality i. The explanatory variables for countries j are multiplied by dummy variables D and $(1-D)$, respectively, where $D = 1$ for 1961–1973 and $D = 0$ for 1974–1988. This ensures that the explanatory variables are in effect only for the relevant time period as described before. For Italy and Turkey equation 4 is estimated for the whole time period 1961–1988. This is obvious for Italy due to its EC membership. For Turkey which is no (full) EC member country this procedure deserves an explanation. In contrast to the low and fairly constant level of the number of immigrants from Greece, Jugoslavia, and Spain after the immigration stoppage, the respective figure for Turkish immigrants exhibits a high variability and a substantial increase by the end of the seventies which was abruptly terminated in 1980/81. One explanation of this pattern is the family reunification mentioned above because only about 15 percent of these immigrants have been belonging to the labor force.[31] In these years several changes of institutional regulations took place such as the payment of child allowances (which, by and large, could be claimed by the foreigners only for those children who lived in Germany). Moreover, studies of Turkish migration conclude that immigration of Turkish immigrants is highly sensitive to business fluctuations[32] which are partly captured by the unemployment rates in equation 4.

Secondly, the equations describing remigration exhibit basically the same structure as equation (4). Lagged immigration serves as an additional explanatory variable, however, in order to recognize the possibility that some guest workers deliberately want to stay in Germany for a short time period only. This concerns mainly young male foreign workers planning to work in Germany for one or two years as is evidenced in Werner (1987, p. 358).[33] Therefore, the figure for remigration mirrors to some extent the lagged figure for immigration. Moreover, a dummy variable $D_{84} = 1$ for 1984 and zero otherwise is introduced in order to allow for possible positive effects on remigration due to the enactment of the return promotion act.[34]

The estimation results displayed in table 7 of the equations described above only

[29] UR without a subscript denotes the unemployment rate in Germany.

[30] See section 2. Note that Z covers all immigrants (not only workers).

[31] Source: Deutsches Institut für Wirtschaftsforschung, DIW–Wochenbericht 37/1982, p. 456.

[32] See Gümrükcü (1986) and Werner (1987) for more details.

[33] It is unknown to what extent this behaviour is due to incomplete prior information. See Brecht (1990) for an analysis of Turkish remigration based on the socio–economic panel.

[34] See section 2.

Table 7: Estimation Results[a)]

Immigration

$$
\begin{aligned}
Z_t^I &= 115.9^* - 31.52^* \cdot \Delta UR_t + 27.5^* \cdot UR_t^I + 2.5 \cdot \Delta W_t^{diff} \\
&\quad +0.53^* \cdot Z_{t-1}^I + 3.3^* \cdot W_{t-1}^{diff} - 8.13^* \cdot UR_{t-1} \\
Z_t^E &= (53.9^* - 43.67^* \cdot \Delta UR_t + 7.3^* \cdot \Delta UR_t^E + 0.38^* \cdot Z_{t-1} \\
&\quad -24.13^* \cdot UR_{t-1}) \cdot (1 - D_{7486}) + (-5.3^* + 0.05 \cdot POP_{t-1}^E) \cdot D_{7486} \\
Z_t^{Gr} &= (-5.0 - 36.70^* \cdot \Delta UR_t + 0.78^* \cdot Z_{t-1}^{Gr} + 4.3 \cdot UR_t^{Gr}) \cdot (1 - D_{7486}) \\
&\quad +(-0.7 + 0.05 \cdot POP_{t-1}^{Gr}) \cdot D_{7486} \\
Z_t^T &= 23.1^* - 41.40^* \cdot \Delta UR_t + 13.1 \cdot \Delta UR_t^T + 72.9^* \cdot D_{73} + 0.83^* \cdot Z_{t-1}^T \\
Z_t^{YU} &= (-259.7^* - 71.54^* \cdot UR_t + 53.6^* \cdot UR_t^{YU} + 0.52^* \cdot Z_{t-1}^{YU}) \\
&\quad \cdot (1 - D_{7486}) + (-88.6 + 0.20 \cdot POP_{t-1}^{YU}) \cdot D_{7486}
\end{aligned}
$$

Z^i : immigration from country i
W^{diff} : relative wage difference, Italy compared with the FRG
D_{7488} : dummy (1974-1988) = 1
I: Italy, E: Spain, Gr: Greece, T: Turkey, YU: Yugoslavia

Remigration

$$
\begin{aligned}
F_t^I &= 47.1^* + 5.77^* \cdot UR_t - 7.3^* \cdot UR_t^I + 0.28^* \cdot F_{t-1}^I + 0.52^* \cdot Z_{t-1}^I \\
F_t^E &= -5.1 + 3.81^* \cdot UR_t - 1.1^* \cdot UR_t^E + 0.54^* \cdot F_{t-1}^E + 0.46^* \cdot Z_{t-1}^E \\
F_t^{Gr} &= -0.3 + 9.09^* \cdot \Delta UR_t - 4.2 \cdot \Delta UR_t^{Gr} + 0.71^* \cdot F_{t-1}^{Gr} + 0.22^* \cdot Z_{t-1}^{Gr} \\
F_t^T &= -9.9 + 17.06^* \cdot \Delta UR_t - 9.4 \cdot \Delta UR_t^T + 0.44^* \cdot F_{t-1}^T + 0.22^* \cdot Z_{t-1}^T \\
&\quad +153.2^* \cdot D_{84} \\
F_t^{YU} &= 4.6^* + 2.67^* \cdot \Delta UR_t + 0.61^* \cdot F_{t-1}^{YU} + 0.22^* \cdot Z_{t-1}^{YU}
\end{aligned}
$$

F^i : remigration to country i
D_{84} : dummy, 1984 = 1
a) A star denotes significance at the five percent level.

Table 7 (continued):

Population

$$POP^f = POP^I + POP^E + POP^{Gr} + POP^T + POP^{YU} + POP^{other}$$

$$\begin{aligned}
POP_t^I &= 0.750^* \cdot (Z^I - F^I)_t + (1 - 0.750^*) \cdot (Z^I - F^I)_{t-1} \\
&\quad +1.012^* \cdot POP_{t-1}^I \\
POP_t^E &= 0.699^* \cdot (Z^E - F^E)_t + (1 - 0.699^*) \cdot (Z^E - F^E)_{t-1} \\
&\quad +1.018^* \cdot POP_{t-1}^E \\
POP_t^{GR} &= 0.660^* \cdot (Z^{GR} - F^{GR})_t + (1 - 0.660^*) \cdot (Z^{GR} - F^{GR})_{t-1} \\
&\quad +1.027^* \cdot POP_{t-1}^{GR} \\
POP_t^T &= 0.693^* \cdot (Z^T - F^T)_t + (1 - 0.693^*) \cdot (Z^T - F^T)_{t-1} \\
&\quad +1.030^* \cdot POP_{t-1}^T \\
POP_t^{YU} &= 0.759^* \cdot (Z^{YU} - F^{YU})_t + (1 - 0.759^*) \cdot (Z^{YU} - F^{YU})_{t-1} \\
&\quad +1.015^* \cdot POP_{t-1}^{YU}
\end{aligned}$$

Labour force participation

$$\begin{aligned}
LS &= LS^f + LS^d \\
LS^f &= EQ^f \cdot POP_{1565}^f \\
LS^d &= EQ^d \cdot POP_{1565}^d \\
POP_{1565}^f &= \beta_t^f \cdot POP^f \\
POP_{1565}^d &= \beta_t^d \cdot POP^d
\end{aligned}$$

$$\begin{aligned}
EQ_t^f &= -5.88^* - 1.1 \cdot UR_t + 0.5^* \cdot (wn - p)_t + 2.11^* \cdot \left(\tfrac{POP^m}{POP^f}\right)_t \\
&\quad +0.42^* \cdot EQ_{t-1}^f \\
\Delta EQ_t^d &= 0.87^* - 0.22^* \cdot UR_t - 0.07^* \cdot (wn - p)_t + 0.17^* \cdot t \\
&\quad -0.27^* \cdot EQ_{t-1}^d + 0.33 \cdot \Delta EQ_{t-1}^d
\end{aligned}$$

POP_{1565}	:	population aged 15 - 65, f: foreigners, d : Germans
POP^m/POP^f	:	share of males in foreign population
EQ^f	:	labour force participation, foreigners
EQ^d	:	labour force participation for Germans
LS	:	labour supply
wn	:	net wage rate

partially support the theoretical considerations.[35] To begin with immigation, the error correction specification has been applied but variables with insignificant coefficients have been dropped in the final version. By and large, domestic and foreign unemployment rates as well as foreign population wind up as significant explanatory variables. The notable exception is Italy where $E(D)$, measured as the wage differential W^{diff}, also plays a significant role. One explanation for the lack of significance of W^{diff} for the other countries may be that these differentials are so large that even a compression does not lead to a significant reduction of migration into Germany. Moreover, a structural break in the equations for immigration has in fact been found for Greece, Jugoslavia, and Spain (but not for Turkey) for 1974, the first year when the immigration stoppage for non–EC foreigners was in operation. Possible reasons for the absence of such a break

[35] The econometric results are based on studies by Franz and Smolny (1990) and Smolny (1991).

in the Turkish case have been discussed above. Surprisingly high (if not unrealistic) is the coefficient associated with lagged immigration in the equations for remigration. Taken at face value, the coefficient implies that 20 to 50 percent of the immigrants leave Germany in the year following the migration decision. It is obvious that this result deserves closer analysis.

5 Macroeconomic Consequences of Migration

This section discusses some effects of migration on macroeconomic variables of the German economy. The analysis is based on a macroeconometric rationing model for the German economy. The preceding discussion has emphasized that firms in Germany were rationed in several ways during the last thirty years such as labor constrained in the sixties or demand constrained in the beginnings of the eighties. Hence, a rationing model may provide a suitable framework for an investigation of the consequences of international migration. Since a more detailed description of the model and its results is presented elsewhere, only the basic philosophy of the model is outlined here.[36]

When wages and prices are not adjusting fast enough to clear markets at any instant of time, some form of rationing is observed. On each micro market for goods transacted quantities can be constrained by demand YD, productive capacity YC, or by available labor YS. Rationing on each of N micro markets can therefore be described by:

$$Y_i = \min(YD_i, YC_i, YS_i), \qquad i = 1, \ldots, N. \tag{6}$$

In the absence of labor hoarding transacted labor (L) is the minimum of labor (LD) needed to produce YD, labor that can be employed by existing capital (LC) and of labor supply (LS):

$$L_i = \min(LD_i, LC_i, LS_i), \qquad i = 1, \ldots, N. \tag{7}$$

These min–conditions hold for micro markets. If the statistical distribution of demand and supply on the micro markets follows a joint log–normal distribution, aggregate transaction can be approximated by a CES–type function of the aggregate concepts of demand and supply denoted by:

$$L = \left[LD^{-\rho} + LS^{-\rho} + LC^{-\rho}\right]^{-1/\rho} \tag{8}$$

with $L \leq \min(LD, LC, LS)$ where the inequality sign holds for all finite values of ρ. The parameter ρ reflects the mismatch between demand and supply components on micro markets. For $\rho \to \infty$, the equation tends to the usual min–condition, i.e., the aggregate economy is subject to only one of the constraints.

The variables YC and LC are explained on the basis of a technology which can be characterized by ex–ante substitution possibilities but ex–post limitationality. More specifically, we assume an ex–ante CES–production function with constant returns to scale (K denotes the capital stock and γ stands for technical progress).

$$YC = \gamma\left[\delta(e^{\gamma_l(t)} \cdot LC)^{(\sigma-1)/\sigma} + (1-\delta)(e^{\gamma_k(t)} \cdot K)^{(\sigma-1)/\sigma}\right]^{\sigma/(\sigma-1)}. \tag{9}$$

[36] See e.g. Franz and König (1990).

When prices (P) are set as a constant mark–up on average production costs (such as wages W and user cost of capital Q) in the long run, firms can maximize profits by minimizing their input costs, which gives the following first order conditions:

$$A^* := (yc - lc)^* = const. + \sigma(w - p) + (1 - \sigma)\gamma_l(t) \quad (10)$$

$$B^* := (yc - -k)^* = const. + \sigma(q - p) + (1 - \sigma)\gamma_k(t) \quad (11)$$

Small–case letters denote logs of the variables. Optimal factor productivities are determined by the respective factor– product–price ratios and an efficiency term reflecting technical progress. Ex—post productive capacity is determined by fixed factor productivities and the stock of capital:

$$yc = B^* + k \quad (12)$$

$$lc = yc - A^*. \quad (13)$$

A disadvantage of the specification (6)–(8) may be seen in the inability to distinguish between capacity mismatch, i.e., the inadequacy of installed capital to match the composition of the demand for goods and mismatch between labor supplied and demanded due to differences in qualification profiles, regional immobility and other labor market inflexibilities. Since these different types of mismatch require different types of corrective policies, it is more appropriate to assume a two–stage process of firms' employment decisions. For the goods market we assume:

$$Y_i = \min(YG_i, YS_i) \qquad \text{with} \qquad YG_i = \min(YD_i, YC_i) \quad (14)$$

and, correspondingly, for the labor market:

$$L_i = \min(LG_i, LS_i) \qquad \text{with} \qquad LG_i = \min(LD_i, LC_i). \quad (15)$$

This means that the individual firm in a first step determines its labor demand in accordance with the restrictions of the goods markets and confronts in a second step its labor demand with available labor supply. If the minimum of lognormally distributed variables is itself approximately distributed lognormally, smoothing by aggregation results in a nested employment function:

$$L = \left[(LD^{-\rho_1} + LC^{-\rho_1})^{\rho_2/\rho_1} + LS^{-\rho_2}\right]^{-1/\rho_2}. \quad (16)$$

The parameter ρ_2 describes labor market mismatch, whereas ρ_1 captures capacity mismatch. Turning to the treatment of aggregate demand YD, private consumption, investment, exports and imports are endogenous variables, whereas government expenditures and housing investment are treated exogenously. Consumption depends on disposable income, the interest rate, and on a labor market indicator. The investment equation is based on the accelerator principle. Rationing is introduced in the following way. Excess demand for domestic goods will lead to additional imports to bypass the constraint, while on the other hand, excess demand on the world market will restrain German imports. The opposite may hold for exports: Domestic constraints will hinder foreign demand, while supply constraints on the foreign market may induce additional German exports. Rationing of the demand components other than exports and imports will be observed only in the case of simultaneous constraints on the domestic and the world

markets. No significance of those effects was found. Therefore they may be regarded as rather small. Demand for exports (XD) and imports (MD) are calculated for a situation with no rationing on the domestic market. This gives the following identities for goods demand:

$$YD = C + I + G + XD - MD + \text{ housing investment} \tag{17}$$

and for labor demand:

$$ld = yd - A^*. \tag{18}$$

One central feature of this model is that it distinguishes proportions of firms being constrained by the demand for goods π_D, by existing capacities π_C or by available labor π_S, where

$$\pi_D = \left[(LC^{-\rho_1} + LD^{-\rho_1})^{(\rho_2-\rho_1)/\rho_1} \cdot LD^{-\rho_1}\right]/L^{-\rho_2} \tag{19}$$

$$\pi_C = \left[(LC^{-\rho_1} + LD^{-\rho_1})^{(\rho_2-\rho_1)/\rho_1} \cdot LC^{-\rho_1}\right]/L^{-\rho_2} \tag{20}$$

$$\pi_S = (LS/L)^{-\rho_2}\,. \tag{21}$$

Labor supply consists of two components. Labor supply of German persons is modelled by an endogenously determined labor force participation rate depending on the real wage rate and the unemployment rate in order to allow for discouraged workers. The same approach is carried out for labor supply of foreign people in Germany. While the number of foreigners changes in the model according to the inflow and outflow equations described in the previous section, their labor force participation rate depends on the same variables as for Germans plus the share of males among foreign population taking into account the higher participation rates of foreign men compared with foreign women.[37]

Finally, the interest rate is an endogenous variable via endogenous demand for money and exogenous money supply. Wages and prices are determined by demand and supply factors and react slowly to market disequilibria. Price setting of firms is assumed to follow a mark–up pricing on several types of costs, where the mark–up depends on demand conditions on the goods market. Costs considered are wage costs, i.e., standard wages relative to actual labor productivity, prices of imported goods relative to the GNP–deflator, value added taxes, and the share of non–wage labor costs in total labor costs. Wages are set in negotiations between labor unions and employers. Explanatory factors are expected inflation, change in labor productivity, and several supply variables. The effect of labor market conditions is captured by the unemployment rate.

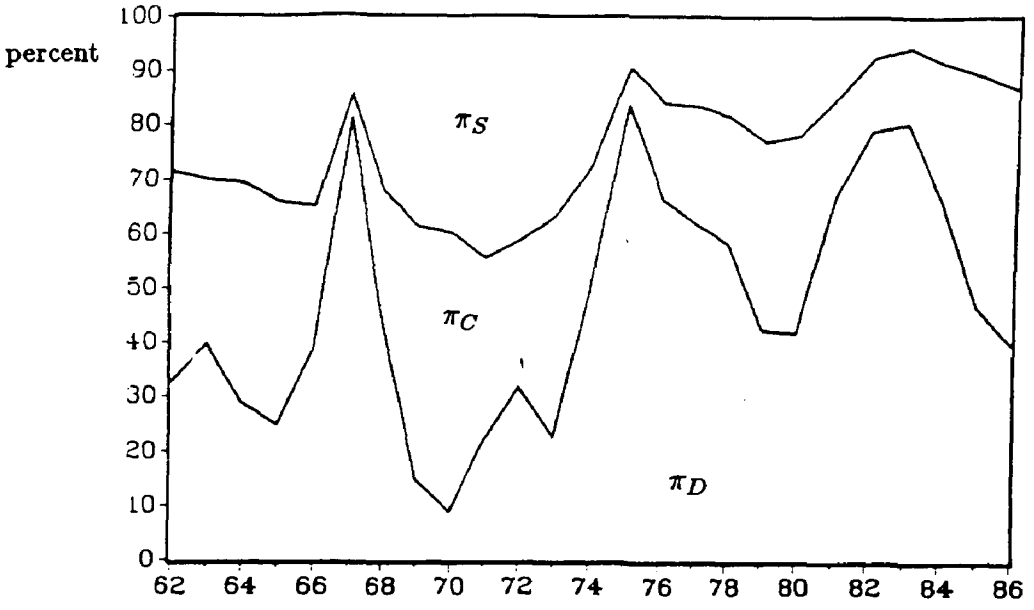
The upshot of the estimation results of this model can be summarized by figure 3 which displays the regime proportions according to equations (18)–(20). While the periods 1960– 1966 and 1969–1974 are characterized by the preponderance of capacity and labor supply constraints, the demand constraints become dominant in recession periods with peaks in 1967, 1975, and 1982/83. Referring to the period after 1982 an increasing importance of capacity constraints can be observed. This is due to the restrictive monetary and fiscal policies in the beginnings of the eighties which led to an investment squeeze.

A slightly modified version of this rationing model is now used to simulate the effects of an alternative immigration policy.[38] This hypothetical policy enacts an immigration

[37] See section 2.

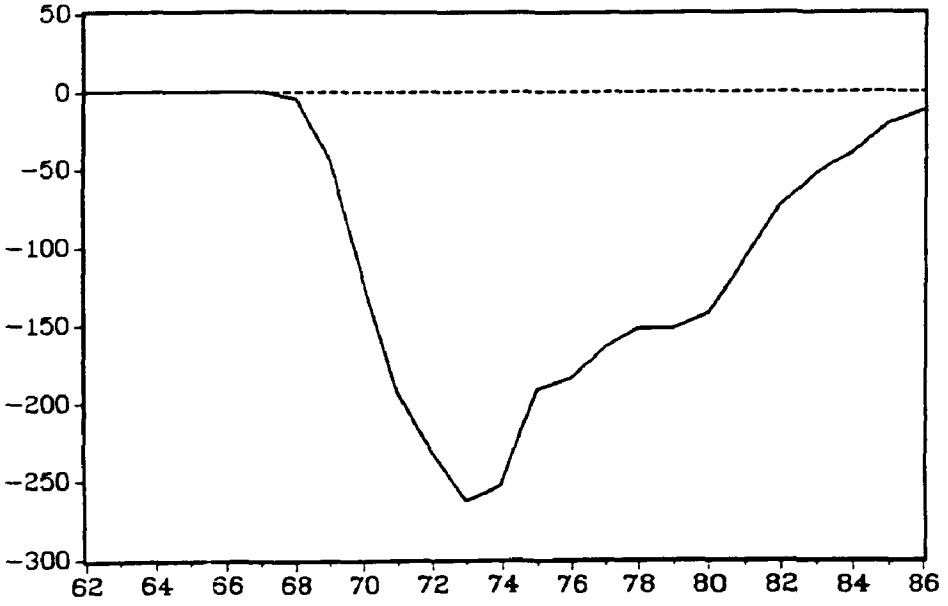
[38] The following analysis is based on Franz and Smolny (1990).

Figure 3: Regime Proportions[a)]



a) See text for explanations.

Figure 4: Simulated Change of Employment (1000 Persons)



stoppage for non–EC foreigners already in 1968 rather than in 1973 as actually happened. More specifically, the immigration of non–EC foreigners is restricted on its average value between 1962–1966. This means that immigration of non–EC foreigners is roughly halved until 1974. The recession year 1967 is not included in this average in order not to simulate an overly restrictive immigration policy. This ceiling of 229,000 foreigners from non–EC countries is in operation during the entire simulation period, i.e., from 1968–1986.

As an immediate effect, labor supply of foreigners is reduced with a maximum of 504,000 persons in 1973. The reduction amounts to 227,000 persons in 1986. This negative impact on labor supply is mitigated, but not offset, by the increase of German labor supply. This in turn is induced by the inverted discouraged workers effect stemming from the decrease in unemployment due to the more restrictive stoppage. As is displayed by figures 4 and 5, we observe a decrease of both employed and unemployed persons.[39] At the end of the simulation period, however, the negative effect on employment vanishes whereas the decrease of unemployment is more permanent. The highest decline in employment occurs in 1973 (–264,000 employees). Real GNP–growth rates are influenced rather modestly: negatively until 1972 (with a maximum of –0.3 percentage points) and positively since 1973 (with an exception in 1979 and 1986). How are these effects brought about?

As is documented in figure 2 in section 2, the period 1968–1973 can be characterized by a substantial labor supply shortage. Hence, a reduction of labor supply has stronger consequences in this time period compared with the following years where employment was to a greater extent determined by goods demand. This implies for the period 1968–1973 stronger influences on wages and prices, too. At the maximum, nominal wage inflation increases for 1.4 percentage points[40] and the growth rate of the GNP deflator exceeds its actual value for 0.9 percentage points. Therefore, the real product wage is now higher and employment lower. Reduced employment affects consumption negatively[41] as well as investment expenditures enforced by the accelerator principle in the investment equation. This explains why real GNP growth rates may fall. On the other hand, labor productivity may increase because firms substitute away from labor in due course of higher real product wages. This phenomenon gives rise for higher real GNP growth rates as a possible outcome of a more restrictive immigration policy. Taken together, the period 1968–1972 was dominated by the negative impact on real GNP growth, while the reverse holds for the period afterwards (with the two exceptions mentioned already).

Figure 6 shows to what extent the labor constraint regime increases due to the reduction of the foreign work force. This process lasts only until 1973, however. The first oil price shock causes an immediate loss in purchasing power thus leading to an enlarged share of firms subject to goods demand constraints. Simulated wage and price inflation is only slightly higher (0.25 and 0.36 percentage points, respectively, for an average of the period 1975–1979). The real product wage and, consequently, labor

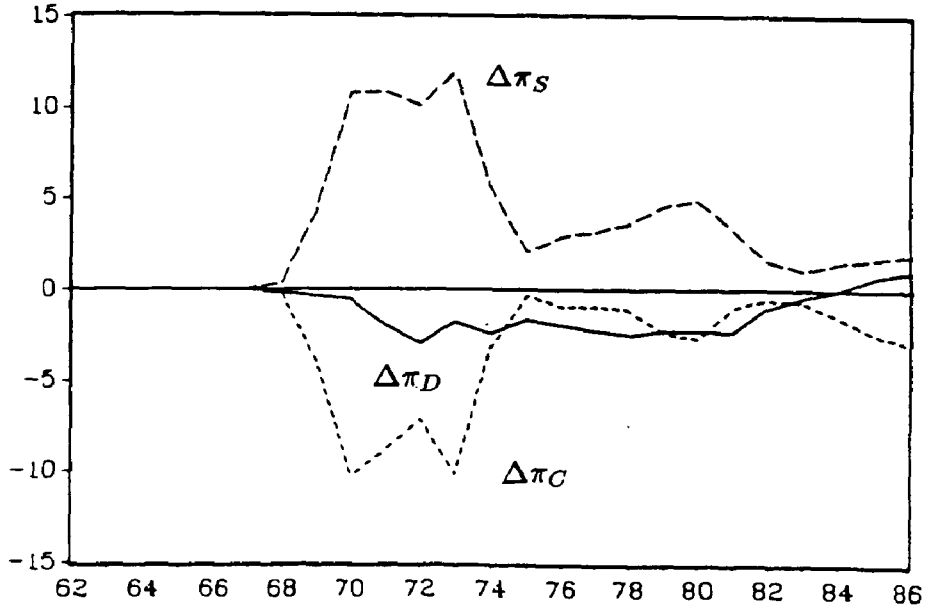
[39] Figures 4–6 show the difference between simulated values and ex–post forecasts of each variable in question.

[40] The share of firms being labor constrained is one of the explanatory variables of wage inflation (with a positive coefficient). A higher simulated share therefore implies additional wage inflation.

[41] According to the life cycle hypothesis on consumption the employment rate reflects the probability of receiving (future) income.

Figure 5: Simulated Change of Unemployment (Percentage of all Unemployed Persons)

Figure 6: Simulated Change of Regime Proportions (Percentage)[a)]



a) See text for definitions.

productivity decline. These developments are continued in the eighties. Employment is now mainly determined by aggregate goods demand so that a reduction of the foreign work force has smaller effects, if any, on employment.

What, if anything, can be learnt from this exercise? Most importantly, macroeconomic consequences of migration are "regime specific", so that everyone who claims to know "the" effects of migration is probably wrong.

6 Conclusions

International labor mobility is a topic which shares increasing importance among major leading policy issues in most, if not all, industrial countries. The creation of a single European market, the break–down of the communists regimes in East Europe, and, last but not least, mass movements of refugees in various countries including the "third world" highlight the sources of (future) international migratory movements. How to cope with these developments is the theme of lively political debates. Can international differences in welfare only be maintained by restrictive immigration policies?

A prerequisite of an informed discussion on economic aspects of these issues is a theoretical and empirical analysis of possible effects of international migratory movements. Recent experience and historical perceptions may provide additional insights. Both, economic analysis and past experience are subjects of this paper. It should be stressed that this paper focusses on economic issues rather than on political or psychological topics such as the fear of natives being dominated by foreign infiltration.

The quantitative part of our analysis showed that the economic effects of immigration are "regime–specific". They depend on whether labor is in excess demand or excess supply. First, if labor is in excess demand, the inflow of foreign workers reduces wage and price inflation, but such a recourse to foreign workers may retard rationalization and thus create difficulties for the country's international competition. The likely outcome depends crucially on the development of the real wage rate. If it falls, employment may increase but labor productivity may decrease. Hence, the impact on real GNP growth rates is ambiguous. Second, if labor is in excess supply, an inflow of foreign workers has little effects on major economic variables but gives rise to additional costs stemming from social benefits granted to these people. These opposite influences of international migratory movements (of workers) explain why studies on the economic welfare gains or losses stemming from migration are anything but united in their assessment.

A great deal of issues remains on the research agenda. Since the time series analysis presented in this paper gives only limited insights into the motives for immigration and remigration, a careful study based on individual data seems most desirable despite the difficulties in obtaining adequate data sets.

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