Chapter 4 ANALYSES ON NET MIGRATION AND TOTAL IMMIGRATION AND EMIGRATION[23]

4.1 Aim and background

As we saw in the previous chapter, an economic point of view accounts for a considerable part of the theoretical background of international migration. In this first analytical chapter economic determinants of net migration in Western Europe and total immigration and emigration in Eastern Europe are estimated. The availability of long time series, which go back to 1960, is a major advantage of using net migration data. I conducted long-term analyses with these data for all Western European countries. Reliable immigration and emigration data are only available for the former labour-importing countries in Northern and Western Europe after 1985. I did not carry out separate analyses on these total immigration and emigration data, as the pattern of immigration highly corresponds with the pattern of net migration. In addition to the analyses on Western European countries, I also conducted some tentative analyses on total immigration and emigration in five non-Soviet former communist countries (the Czech Republic, Hungary, Poland, Romania and the Slovak Republic) in the period 1991-1998. Long-term analyses on net migration for Eastern European countries are not carried out, as the data for the communist period are rather unreliable.

The outline of the chapter is as follows. First, the hypotheses are formulated (section 4.2). The data are described in section 4.3, and the methodology in section 4.4. For the empirical application, the European countries are split into Western and Eastern European countries, viz. countries without and with a communist past. The countries in Western Europe, in turn, are divided into two groups: the former labour-importing countries and the former labour-exporting countries. The results of country-specific time series analyses are presented in section 4.5 for the former group and in section 4.6 for the latter group. In each section, the results for a particular country will be presented in more detail so as to facilitate a better understanding of the relevant mechanisms (economic, political, colonial and social) in the analyses. Section 4.7 shows the results of pooled cross-sectional time series analyses for all Western European countries simultaneously. The results of pooled cross-sectional time series analyses for five Eastern European countries are described in section 4.8. The chapter ends with some concluding remarks and some implications for international migration projections.

[23] This chapter is for a large part based on an article published in the *European Journal of Population* (Jennissen, 2003).

4.2 Hypotheses

Based on the theoretical considerations presented in chapter 3, a number of specific hypotheses for independent variables used in the models have been developed. By far the largest part of the analyses in this chapter pertains to net migration data. Therefore, I start with the formulation of hypotheses about the influence (positive or negative) of socio-economic determinants on net migration. Formulating these hypotheses is quite complex. We have to keep in mind that an increase in net migration can be an increase in net immigration in a receiving country, but also a decrease in net emigration in a sending country. The hypotheses are summarised in *Table 4.1*.

According to *neo-classical economic theory*, international labour flows exist as a consequence of wage differences between countries. In the case of two countries only, the wage difference between the labour-importing and the labour-exporting country has a negative effect on net international (labour) migration in the latter country and a positive effect on net international migration in the former country. However, with multiple countries, a country's net migration figure is the net result of the aggregated migration flows between this particular country and all other countries. Therefore, these aggregated data do not allow a proper testing of neo-classical theory. However, two former labour-exporting countries in this analysis (Finland and the Irish Republic) have a net migration pattern which is dominated by (labour, family and return) migration flows to and from one country (Sweden and the UK, respectively). For these two countries, the difference in GDP per capita between the dominant receiving and the sending country has been used in the analyses for these two countries. For the other countries, the respective country's GDP per capita was used. Hypothesis 1 may now be formulated as follows: *GDP per capita has a positive effect on net international migration* (an increase in GDP per capita will decrease net emigration from labour-exporting countries and increase net immigration into labour-importing countries). This hypothesis is based on the assumption that GDP per capita is directly correlated with international wage differentials.

In *Keynesian economic theory*, international migration removes unemployment differences. Another theory, the *dual labour market theory*, argues that international migration is mainly driven by the unemployment level in receiving countries. On the basis of Keynesian theory and the dual labour market theory hypothesis 2 reads as follows: *unemployment has a negative effect on net international migration* (unemployment has a negative effect on net immigration into labour-importing countries and a positive effect on net emigration from labour-exporting countries). In Keynesian theory this hypothesis applies to both labour-exporting and labour-importing countries, whereas in the dual labour market theory it applies to labour-importing countries only. With respect to Keynesian theory this hypotheses is based on the assumption that unemployment is directly correlated with international unemployment differentials. Again, differentials for Finland (Finland minus Sweden) and the Irish Republic (the Irish Republic minus the UK) are used.

The third hypothesis is related to education. The *dual labour market theory* argues that shortages at the bottom of the job hierarchy will be larger, the higher the average level of education of the country's population. The educational level may also influence net migration in labour-exporting countries. Educational expansion negatively affects the degree of inequality, which, in turn, according to *the relative deprivation approach*, has a positive effect on emigration. These aspects of the dual labour market theory and the relative deprivation approach constitute the basis of hypothesis 3: *the educational level in a country has a positive effect on net international migration* (a higher educational level in a labour-exporting country will decrease emigration, a higher educational level in labour-importing countries will lead to an increase in immigration).

So far the hypotheses have been based on theoretical aspects of labour migration. However, migration driven by other motives, such as family reunification and formation, return migration and asylum migration, are partly determined by economic factors (see section 3.4.1). Therefore, also in periods of relatively low labour migration, economic prosperity continues to positively affect net international migration.

Economic determinants, however, are not the only factors that play a role in international migration. Social, cultural and political factors are also important. Of special importance is the effect of migrant networks and organisations involved in international migration. From the viewpoint of *network* and *institutional theory* hypothesis 4 may be formulated as follows: *migrant stocks that are the result of recent (labour) migration have a positive effect on net international migration*. According to this hypothesis, an increase in the migrant stock will lead to additional immigration into both labour-importing and labour-exporting countries.

Other social, cultural and political factors are important as well. These factors often refer to specific circumstances and events in individual countries, and they have to be taken into account when explaining international migration trends and differences.

Table 4.1. Hypotheses

1	GDP per capita has a positive effect on net international migration.
2	Unemployment has a negative effect on net international migration.
3	Educational level has a positive effect on net international migration.
4	Migrant stocks which are the result of recent (labour) migration have a positive effect on net international migration.

Within the extensive international migration literature, empirical research which attempts to test migration theories is rather scarce. Nevertheless, I have found some empirical

support for hypotheses 1, 2 and 4 in the recent literature on international migration in Europe. Studies of Straubhaar (2001) and Bruder (2003) provided support for all these three hypotheses and hypotheses 1 and 3, respectively. They analysed international migration from Greece, Portugal and Spain to other EU countries. Vogler and Rotte (2000) found significant positive effects of GNP per capita (receiving country / sending country) and the stock of nationals of the sending country on total immigration and asylum migration from African and Asian countries to Germany. According to analyses by Van der Gaag and Van Wissen (1999), unemployment turned out to be the most important economic indicator of international migration in Germany, the Netherlands and the UK.

4.3 Data

Net migration numbers, which are computed as the quotient of population growth minus natural increase and the midyear population, were used as the dependent variable for Western European countries (sources: Council of Europe (1999) and Eurostat (2000))[24]. Similar to the analyses in chapter 2, the analyses in this chapter do not take the year 1990 into account for consistency and comparability reasons. As stated earlier, a major advantage of using *net* migration is that long time series are available for almost all countries. However, using (computed) net migration data has also some disadvantages (see section 1.6). One disadvantage is that peaks and falls in net migration patterns may be the result of factors other than real migration moves, for instance legalisation of clandestines or administrative corrections. In order to correct for this as much as possible, observed net migration (immigration minus emigration) was, if it was available, compared with computed net migration. If the differences between the two were too large, the data for a particular country were left out of the analysis[25].

The independent variables used in the analyses on Western European countries are: GDP, unemployment, educational level, and the migrant stock. Population at the beginning of the year and the midyear population (source: Council of Europe (1999)) have been used to compute GDP per capita and the migrant stock per capita. *Table 4.2* gives details on data sources and operationalisation.

[24] I have used Eurostat data for Greece, the Irish Republic, Spain and the UK, as the Council of Europe data for these countries are not complete. Recent values for non-register (census) countries are often estimates. The data for former Yugoslavia are the sum of Slovenia, Croatia, Bosnia-Herzegovina, Serbia-Montenegro and the former Yugoslavian Republic of Macedonia.

[25] The data for Belgium 1961, 1970, 1981, 1988 and 1995, Spain 1962, 1963, 1967 and 1971, Sweden 1960 and Yugoslavia 1962 were left out of the analyses for this reason. In addition, the data for West Germany 1970 and Spain 1980 are inexplicably high in comparison with surrounding years and were also left out.

Table 4.2. Independent variables used in the analyses on Western European countries[i]

Variable	Operationalisation	Source
GDP	1990 US$ converted at Geary Khamis PPPs	Groningen Growth and Development Centre (GGDC) (2001)
Unemployment	Total unemployment as percentage of the total labour force[ii]	Gärtner (2000)[iii]
Educational level	Average years of schooling of the total population aged 25 and over	Barro and Lee (2000)
Migrant stock	Foreign-born population at the beginning of the year[iv]	United Nations (1998c)

i Years of observation: 1960-1998; West Germany: 1960-1989; Germany: 1991-1998; Yugoslavia: 1960-1988; GDP Sweden 1961-1998; unemployment Norway: 1963-1998; unemployment Switzerland: 1962-1998.

ii For Yugoslavia registered unemployment as percentage of the total labour force has been used.

iii The data source for Yugoslavia is Mencinger (1989 in Woodward, 1995).

iv This operationalisation of the migrant stock does not take into account the native-born ethnic population, although migrant networks may be formed in this part of the population as well. The data for Austria, Belgium, (West) Germany, Greece and Switzerland refer to nationality (citizenship). West Germany 1990 = Germany 1990 – East Germany 1985.

With regard to population, GDP, and unemployment, almost complete data series are available, while where educational level and the migrant stock are concerned, comparable data exist for a limited number of years only. Therefore, estimates had to be made to complete these series. Barro and Lee (2000) estimated the average years of schooling of the total population aged 25 and over with a 5-year bridge (1960, 1965, ..., 2000). A second-order function was fitted to these data to obtain complete time series from 1960 until 1998[26]. The Trends in Total Migrant Stock by Sex database of the United Nations (1998c) also has no complete time series from 1960 until 1998. This database contains data for 1965, 1975, 1985 and 1990. For the remaining years data have been interpolated and extrapolated[27].

[26] Actually, the theoretically best-substantiated function to fit to these data is a logistic function, because the average educational level has a natural lower limit (everyone zero education) and a natural upper limit (everyone a university degree). However, logistic estimates appeared to be less realistic if there is a break in the series with a 5-year bridge obtained by Barro and Lee.

[27] The difference in the migrant stock between two observations has been distributed over the years between these observations proportional to the net migration in the period between these observations for labour-importing countries (except Belgium 1975-1985, Norway 1960-1975 and the UK 1960-1984), Finland 1985-1998, and Greece 1985-1998. The values before 1965 and after 1990 have been estimated using the migration stock in 1965 and 1975, and 1985 and 1990, respectively, and net migration 1965-1975 and 1985-1990, respectively. In the case of missing net migration data, the average of the four surrounding years (if available) has been used. Net migration rates for Switzerland before 1965 have been divided by two as the migrant stock in

4.4 Methodology

Time series regression analysis has been used for the country-specific analyses. In these analyses, only GDP per capita, unemployment, and a vector of country-specific dummy variables (in order to capture political and decolonisation effects) have been taken into account. In addition, unemployment in the most important receiving country has been included for (former) labour-exporting countries. The average years of education and migrant stock variables were left out to avoid multicollinearity problems: both variables are highly correlated (> .80) with GDP per capita or unemployment in almost every country. The dummy variables have been constructed as follows. First, for labour-importing countries, regression analysis was conducted with only GDP per capita and unemployment. Whenever a residual turned out to be larger than two standard errors of the normal distribution and there was an indication that a major political event occurred in that year, a dummy variable was included in the model. Dummy variables can be one-year only (e.g. when a former colony became independent) but can also refer to a structural shift (e.g. policies to stop the import of labour). In the case of collinearity between GDP per capita and unemployment in former labour-importing countries, the variable with the largest absolute t-value was retained. With regard to former labour-exporting countries, collinearity between the economic variables was a problem in all cases, since unemployment in the dominant receiving country correlated strongly (> .80 in absolute terms) with unemployment or GDP per capita. If the model of a former labour-exporting country could comprise two economic variables, the model with the most (one or two) significant economic variables was selected. In the case of an equal number of significant economic variables or if the model could comprise only one variable, the model with the highest (average) absolute t-value for the economic variable(s) was selected. If autocorrelation was found in a model, an autoregression term (AR) of the first or second order was estimated. However, another (combination of) variable(s) was used if this meant that the use of autoregression terms could be avoided. I estimated models with GDP and unemployment differences between the country itself and its most important receiving country for the Irish Republic and Finland.

In addition to the country-specific analyses, I also conducted a pooled cross-sectional time series analysis (PCT analysis) for all Western European countries simultaneously. The aim of this analysis was to find a single effect per variable for all countries. Compared to single time series regression analyses, PCT analyses have the benefit of more observations. Moreover, PCT analyses have the advantage of possible additional information from

---

1960 and 1961 became negative. The intermediate values for former labour-exporting countries (except Finland and Greece after 1985), Belgium 1975-1985, Norway 1960-1975 and the UK 1960-1985 are linear estimates between the two fixed values. Before 1965 and after 1990 the linear trend between 1965-1975 and 1985-1990, respectively, has been extrapolated using equal increment.

differences between countries. Because no multicollinearity was found between the independent variables in the pooled cross-sectional time series, *all* hypotheses (see section 4.2) could be tested. The dummy variables used in the country-specific analyses were also included in the PCT analysis. Similar to the country-specific models, the pooled model was also tested for autocorrelation.

Some researchers (e.g. Straubhaar, 2001; Bruder, 2003) use one-year lagged independent variables in time series regression analyses to explain international migration. They argue that decisions to migrate are based on experiences and expectations, which are formed in the past. However, in my opinion, people may also anticipate major events like losing their job or a crop failure by making a migration plan, which they can immediately implement in the case of a predicament. As such, I decided not to use lagged independent variables in the time series analyses.

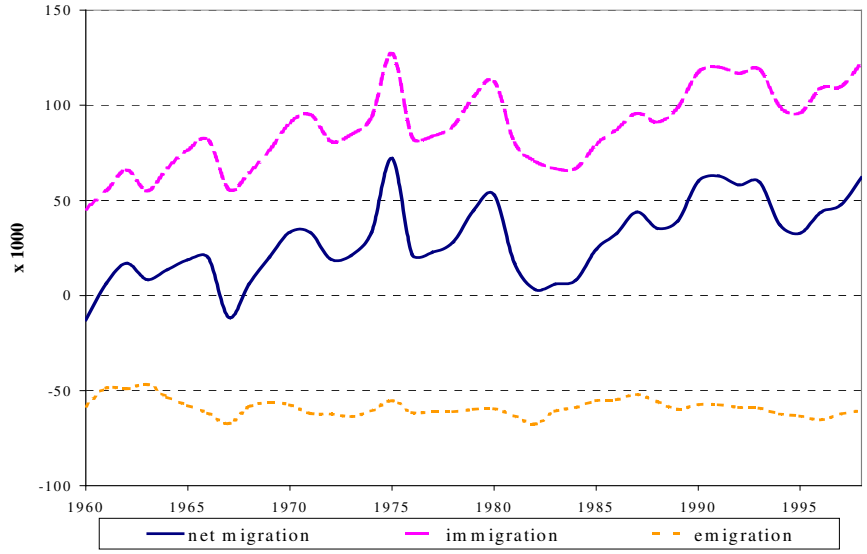
4.5 Country-specific analyses for former labour-importing countries

The former labour-importing countries with a population of more than one million are Austria, Belgium, Denmark, France, West Germany, the Netherlands, Norway, Sweden, Switzerland and the UK. These countries imported labour until the recession of 1973/1974. Within this group of countries, I will discuss the Dutch case in some detail.

4.5.1 The Dutch case study

Net migration in the Netherlands had been positive for almost the entire period 1960-1998 (see *Figure 4.1*). The net migration of nationals was predominantly negative during this period, with the exception of the years preceding the decolonisation of New Guinea (1962) and Surinam (first half of the 1970s with a peak in 1975) and the years 1985-1987 (Penninx *et al*., 1994; Statistics Netherlands, 2001). The net migration of foreigners had been positive during the entire period 1960-1998. The pattern of total net migration corresponds to the pattern of total immigration and even (except the years preceding the independence of Surinam) to the pattern of the immigration of foreigners.

Figure 4.1. Migration pattern of the Netherlands



Source: Statistics Netherlands (2001)

Over the period 1960-1998 immigration into the Netherlands gradually increased from about 60,000 to about 110,000 a year in the 1990s. This increase was mainly caused by increasing immigration of foreigners, which more than tripled (from 23,000 to about 75,000) (Eurostat, 1997). The economic situation in the Netherlands improved significantly in the 1960s. Labour shortages caused an inflow from Southern European countries (especially Italy and Spain) to the Netherlands. In the second half of the 1960s, when immigration from these countries eased, Turks and Moroccans followed. Return migration among Italians and Spaniards was significant, stimulated by the favourable economic development of their native countries. In contrast, return migration among Turks and Moroccans occurred on a much smaller scale. Instead, they opted for family reunion in the Netherlands. After family reunification in the 1970s, the character of immigration of Turks and Moroccans changed again in the 1980s to family formation (marriage migration). A prominent year was 1975: there was a large inflow of Surinamese triggered by the independence of Surinam and also a regularisation of clandestines, mainly affecting young Turkish and Moroccan males (De Mas and Hafmans, 1985 in Lakeman, 1999). A treaty between Surinam and the Netherlands, whereby Surinamese could choose between Dutch and Surinamese nationality for five years after independence, caused a second large inflow of Surinamese in 1979 and 1980 (De Beer, 1997). Since the latter half of the 1980s increasing numbers of asylum seekers were the main cause

of rising immigration figures[28]. The number of requests for asylum doubled in the years 1990-1992 in comparison with the second half of the 1980s. This increase was mainly caused by the unstable situation in the former Yugoslavia. An even greater increase took place in 1993 and 1994. The number of new applications reached a peak in 1994, probably caused by stricter asylum policies in surrounding countries (especially in Germany), but also related to the increasing inflow of Somali asylum seekers. In 1995 and 1996 the number of new requests decreased again to about the level of 1992. This decrease was caused by stricter conditions imposed on asylum application introduced in 1994 and by the Dayton Peace Treaty (Nicolaas, 1997). After 1996 the number of new requests increased again as a result of an increase in applications by Iraqi and Afghans (Statistics Netherlands, 1999).

In contrast to immigration, emigration was much more stable in the period 1960-1998 (50,000-60,000 per annum). More than half of the emigrants consist of nationals (30,000-40,000 per year, versus 20,000-25,000 foreigners) with the exception of the year 1967: the recession of 1967, which actually started in the second half of 1966, led to policy measures by the Cals Administration initiated already in October 1966 (Lakeman, 1999). Between the first of October 1966 and the end of 1967 almost half of the guest workers in the Netherlands returned (Kayser, 1972 in Lakeman, 1999).

In order to take the major political events into account, four dummy variables were used in the country-specific analysis for the Netherlands: political tension in New Guinea (1962); policy with respect to the recession of 1967 (1967); independence of Surinam (1975); and five years after the independence of Surinam (1979 and 1980). In addition, an autoregressive term of the first order AR(1) was added to correct for autocorrelation.

Table 4.3 gives the results of the time series regression analysis for the Netherlands. In model A, GDP per capita (positive) and unemployment (negative) have the expected significant effect on net international migration. Also, all dummy variables have significant coefficients with the expected sign.

[28] The relationship between the inflow of asylum seekers and registered immigration is rather complex in the Netherlands in the 1980s and 1990s and far from one-to-one. An asylum seeker was counted as an immigrant only when he/she was registered in the municipal population register, which might never happen or might happen only after a considerable time lag.

Table 4.3. Results of time series regression analysis to explain net migration (rates per 1000) in the Netherlands, 1960-1998 (T = 36)

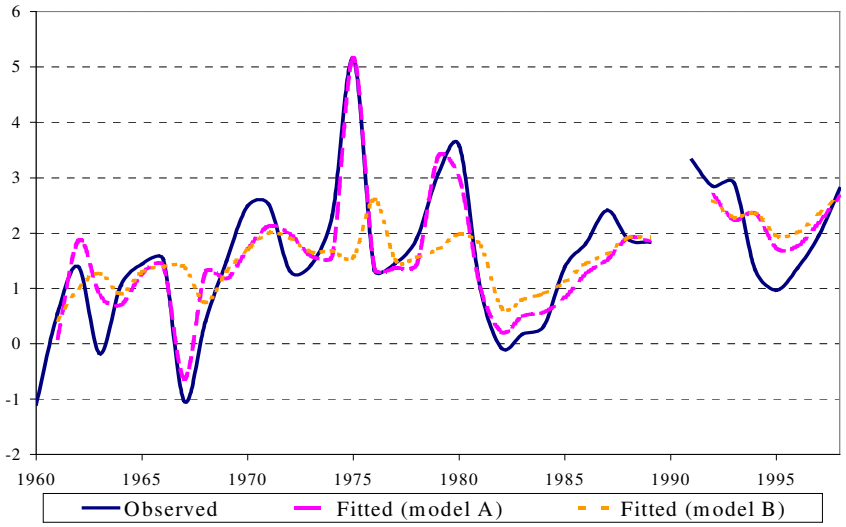
		Model A		Model B	
		Coefficients (t-values)			
	Constant	-0.57	(-0.65)	-0.43	(-0.36)
Economic variables	GDP per capita (x 10^{-4})	2.22**	(3.16)	2.02*	(1.95)
	Unemployment	-0.20**	(-2.91)	-0.14	(-1.35)
Country-specific dummy variables	Political tension in New Guinea	0.94*	(1.78)	–	
	Recession 1967	-1.99**	(-3.75)	–	
	Independence of Surinam	3.70**	(6.96)	–	
	5 years after Surinamese Independence	1.74**	(3.66)	–	
	AR(1)	0.46**	(3.05)	0.30*	(1.86)
	Adjusted R^2	0.76		0.20	
	Durbin-Watson statistic	1.72		1.93	

* significant $p < 0.05$ (one-sided test)
** significant $p < 0.01$ (one-sided test)

To check whether the dummy variables distort the estimated impact of the macroeconomic variables, I have also estimated a model without dummy variables (model B). Without dummy variables, the significance of the unemployment variable disappears, but otherwise the size of the effects of the economic variables does not change much. What *does* change is the adjusted R^2, which is much lower in model B, illustrating the considerable effect of political shocks.

Figure 4.2 plots the observed and two fitted net migration trends in the Netherlands. The figure clearly demonstrates that model A fits the migration trend quite well. However, the model without dummies (B) has large residuals for the years with significant events.

Figure 4.2. Observed and fitted net migration (rates per 1000) in the Netherlands, 1960-1998



4.5.2 Other former labour-importing countries

Similar analyses were conducted for the other former labour-importing countries. The coefficients of GDP per capita, unemployment and autoregression terms are presented in *Table 4.4*, while the country-specific dummy variables are given in *Table 4.5*.

Table 4.4. Results of country-specific time series regression analyses to explain net migration (rates x 1000) in former labour-importing countries

	Coefficients (t-values)				
Country	Constant	GDPpc (x 10^{-4})	Unemployment	AR(1)	AR(2)
Austria (T=34)					
Adj. R^2 = 0.73	2.17	2.34	-1.28**	0.65**	-0.32*
DW = 2.26	(1.54)	(1.59)	(-2.63)	(4.12)	(-2.45)
Belgium (T=26)					
Adj. R^2 = 0.75	2.32*	X	-0.22	0.77**	_
DW = 1.70	(1.87)		(-1.48)	(4.42)	
Denmark[i] (T=34)					
Adj. R^2 = 0.67	-2.13**	2.70**	-0.16*	0.48**	-0.43*
DW = 2.00	(-2.73)	(4.01)	(-2.12)	(2.66)	(-2.14)

Table 4.4. Continued

	Coefficients (t-values)				
	Constant	GDPpc (x 10^{-4})	Unemployment	AR(1)	AR(2)
France[ii] (T=36)					
Adj. R^2 = 0.98	2.30**	X	-0.13**	0.56**	_
DW = 1.74	(6.53)		(-3.15)	(4.17)	
West Germany[iii] (T=26)					
Adj. R^2 = 0.64	5.90**	X	-0.48	0.59*	_
DW = 1.59	(2.75)		(-0.83)	(2.01)	
Netherlands (T=36)					
Adj. R^2 = 0.76	-0.57	2.22**	-0.20**	0.46**	_
DW = 1.72	(-0.65)	(3.16)	(-2.91)	(3.05)	
Norway (T=38)					
Adj. R^2 = 0.69	-1.05**	1.54**	X	_	_
DW = 1.54	(-3.63)	(7.26)			
Sweden (T=35)					
Adj. R^2 = 0.62	-0.03	3.38	-0.67**	0.79**	_
DW = 1.49	(-0.01)	(0.84)	(-2.85)	(7.45)	
Switzerland[iv] (T=34)					
Adj. R^2 = 0.69	-8.51	6.39	-0.72	0.53**	_
DW = 1.75	(-0.91)	(1.26)	(-1.39)	(4.24)	
UK (T=34)					
Adj. R^2 = 0.83	-6.99**	5.77**	-0.03	0.80**	-0.16
DW = 1.94	(-4.03)	(4.10)	(-0.37)	(4.97)	(-1.05)

* significant $p < 0.05$ (one-sided test)
** significant $p < 0.01$ (one-sided test)
– not in the analysis
X not in the analysis because of multicollinearity
DW Durbin-Watson statistic
i Partial autocorrelation lag 4 is significantly different from zero at 5% significance level.
ii Autocorrelation lag 4 and partial autocorrelation lag 4 are significantly different from zero at 5% significance level.
iii Unemployment lagged one year was used in this model as the model without this lagged variable appeared to be non-stationary (AR(1) > 1).
iv Autocorrelation lag 3 is significantly different from zero at 5% significance level.

GDP per capita has a positive, significant effect in four out of seven former labour-importing countries. The coefficients of GDP per capita in Austria, Sweden and Switzerland are not significant, although the signs are as expected. The coefficients are rather similar. However, the effect of GDP per capita in Switzerland and the UK is quite larger.

Unemployment has a negative effect on net international migration in all former labour-importing countries. The effect of unemployment is significant in Austria, Denmark, France, the Netherlands and Sweden. The impact of unemployment in Belgium, Denmark, France and the Netherlands is rather similar (between –0.10 and –0.25). The coefficient is larger in Austria, West Germany, Sweden and Switzerland. According to Lahav (1995 in United Nations, 1998b), Austria, West Germany and Switzerland developed guest worker models, which attempted to preclude family reunion or long-term sojourn. This might be an explanation why net migration in these countries is more responsive to unemployment rates. The absence of a (recent) colonial past is another possible reason for the larger impact of unemployment on international migration in Austria, West Germany, Sweden and Switzerland.

Table 4.5. Country-specific effects in time series regression analyses to explain net migration (rates per 1000) in former labour-importing countries

Country	Year(s)	Dummy	Source	Coefficient	(t-value)
Austria	1968	Recession 1967	United Nations (1998b)	-2.47**	(-2.59)
	1974-1979	Recession 1973	United Nations (1998b)	-3.37**	(-4.17)
	1981	Polish asylum seekers	Te Brake (1993)	3.01*	(2.49)
	1982	Return/transit of Polish asylum seekers	Te Brake (1993)	-3.23**	(-2.72)
	1989	Fall of Iron Curtain (Hungary)		4.39**	(3.46)
	1993-1998	*Asyl- und Fremdengesetz*	ICMPD (1994)	0.71	(0.59)
Belgium	1964	Recruitment agreement with Turkey and Morocco	Abandon-Unat (1995), Obdeijn (1993)	1.76**	(3.04)
	1968	Recession 1967		-0.58	(-1.02)
Denmark	1968	Recession 1967		-1.20*	(-1.78)
	1974-1979	Recession 1973	Pedersen (1999)	-0.77*	(-1.90)
	1995	Refugees from Bosnia	Pedersen (1999)	2.98**	(4.39)
France	1960-1961	Turmoil in Algeria	Barbour (1969)	2.59**	(2.64)
	1962	Independence of Algeria	Barbour (1969)	16.87**	(24.81)
	1963-1964	French troops in Algeria[i]	Barbour (1969)	1.63**	(3.64)
	1974-1979	Recession 1973	Seifert (1997)	-0.95**	(-3.12)
West Germany	1966-1967	Recession 1967		-5.87**	(-2.70)
	1974-1979	Recession 1973 (*Anwerbestopp*)	Bretz (1996)	-3.95*	(-2.11)
	1989	Fall of the Iron Curtain		9.82**	(2.88)

Table 4.5. Continued

Country	Year(s)	Dummy	Source	Coefficient	(t-value)
Netherlands	1962	Political tension in New Guinea	Penninx *et al.* (1994)	0.94*	(1.78)
	1967	Recession 1967	Lakeman (1999)	-1.99**	(-3.75)
	1975	Independence of Surinam	Penninx *et al.* (1994)	3.70**	(6.96)
	1979-1980	5 years after the independence of Surinam	De Beer (1997)	1.74**	(3.66)
Norway	1987	Refugees from Sri Lanka and Iran		2.09**	(3.60)
	1993	Refugees from Bosnia	COE (1995)	1.17*	(2.00)
Sweden	1967-1968	Recession 1967		-3.11**	(-3.49)
	1971-1979	(textile) production to Finland	Hammar (1995)	-2.17**	(-2.56)
	1989	Refugees from Iraq and Chile		1.20	(1.00)
	1993-1994	Refugees from the former Yugoslavia		4.61**	(4.20)
Switzerland	1970-1974	Quota system	United Nations (1998b)	-2.46	(-1.47)
	1975-1979	Recession 1973		-6.39**	(-3.41)
UK	1987-1998	Visas making family migration difficult[ii]	Morris (1998)	-0.75	(-1.29)

* significant $p < 0.05$ (one-sided test)

** significant $p < 0.01$ (one-sided test)

i French troops protecting French citizens in Algeria did not withdraw until 1964 (Barbour, 1969). Hence, French citizens were given two years to leave Algeria after its independence.

ii The correlation between GDP per capita and this policy dummy is .84.

Table 4.5 presents the estimation results of the country-specific factors. The recession dummies represent specific policies. The recession itself is represented (at least for a considerable part) by GDP per capita and unemployment. Many (Southern European) labour migrants returned to their country of origin in the second half of the 1970s. Around 1980, international migration in Europe changed in character. In the 1980s the post-industrial mobility wave started and continued during the 1990s (White, 1993). The post-industrial mobility wave consisted of high-skilled labour, clandestine, and asylum migration. The former labour-sending countries in Europe had also become net immigration countries when post-industrial migration started to be the most important migration type in Europe. Therefore, the period in which the 'recession 1973' and '(textile) production to Finland' dummy variables take effect is limited to the 1970s in spite of quite large residuals for several countries in 1980. All dummy variables, except the *Asyl- und Fremdengesetz* in Austria 1993-1998, have the expected effect (positive or negative). The dummy variables that refer to one-year only are of course significant; this is related to the way decisions were made about whether to include a dummy variable (see section 4.4.). Four policy measures (the *Asyl- und Fremdengesetz* in Austria 1993-1998; policy with respect to the recession of 1967 in Belgium; the introduction of a quota system in Switzerland 1970-1974; and the introduction

of visas for citizens of India, Bangladesh, Ghana, Nigeria and Pakistan in the UK 1987-1998) are *not* significant. This may be an indication that immigration policies could be influenced by the economic situation. The dummy variable 'Refugees from Iraq and Chile' (Sweden 1989) was also not significant[29]. This is not surprising as Gustafsson *et al*. (1990, in Lundh and Ohlsson, 1994) found a clear relationship between the Swedish business cycle and family and asylum immigration of Chileans. The very large and very significant dummy 'Algerian independence' (1962) caused a very high adjusted R^2 in the model for France. The adjusted R^2 decreases from 0.98 to 0.78 if the year 1962 is excluded.

4.6 Country-specific analyses for former labour-exporting countries

The former labour-exporting countries with a population of more than one million are Finland, Greece, the Irish Republic, Italy, Portugal, Spain and Yugoslavia. These countries exported labour until the recession of 1973/1974. Similar to the analysis of the labour-importing countries, in the models for former labour-exporting countries only GDP per capita, unemployment and political and colonial dummy variables have been taken into account. The difference in GDP per capita with Sweden and the UK was also included in the analyses for Finland and the Irish Republic, respectively. In addition, I also looked at the effect of unemployment in the dominant receiving countries, listed in *Table 4.6*. For this group of countries, Spain has been chosen as the case-study country.

Table 4.6. The dominant receiving countries of former labour-exporting countries

Former labour-exporting country	Dominant receiving country
Finland	Sweden
Greece	Germany
Irish Republic	UK
Italy	Switzerland[i]
Portugal	France
Spain	France
Yugoslavia	Germany

i The stock of Italian nationals in Switzerland was larger than that in Germany in the 1960s (Schmid, 1983). The stock of Italian nationals in Germany is larger since 1971 (Council of Europe, 1999; Haug, 2000). However, the increase in the Italian stock in Germany in comparison with that in Switzerland is mainly caused by more extensive family migration in Germany.

[29] The residual in the model for Sweden with only GDP per capita and unemployment is only a little larger than two standard errors in 1989.

4.6.1 The Spanish case study

Net migration in Spain was negative until 1974, caused by a large outflow of Spanish labour migrants. Many former labour migrants returned after the recession of 1973/1974 leading to a positive net migration figure in 1975-1978. In the 1980s Spain experienced low net emigration figures. After 1990 net migration was positive again, when labour migrants and asylum seekers started to enter Spain on a large scale.

The policies of the early Franco regime were aimed at autarky. This resulted in low emigration figures in the period after the Second World War until 1959. The stabilisation plan of 1959 liberalised international traffic of physical and human capital. Emigration to Western Europe was not only allowed, the government even stimulated it. The Instituto Español de Emigratión (IEE) was founded to encourage emigration. In the peak years (1964, 1969, 1971 and 1972) recorded emigration to Europe exceeded 100,000. A considerable number of emigrants went to America after 1959. However, this emigration decreased very markedly in the 1960s and 1970s. After the recession of 1973/1974 emigration decreased to a level which was about three or four times lower than it was before the recession (Dirección General de Migraciones, 1993 in Mansvelt Beck, 1993). In addition to the economic recession in Western Europe, the rapid economic development in Spain in the first half of the 1970s (the 'Spanish miracle') contributed to this decrease as well (Mansvelt Beck, 1993).

Spanish labour migration to Western Europe appeared to be temporary. Many former labour emigrants returned in the period 1975-1978. After the peak year 1975, when almost 112,000 recorded emigrants returned, this flow decreased. In the period 1980-1992 only 220,000 recorded return migrants entered Spain. One-fourth of these migrants returned from Latin America (Dirección General de Migraciones, 1993 in Mansvelt Beck, 1993). Starting in the second half of the 1970s Spain had to deal with new types of migration. A modest flow of pensioners from Northern and Western Europe migrated to Spain. Moreover, Spain received (mainly young) immigrants from Northern and Western Europe who wanted to work in the tourist industry. Spain joined the European Union in 1986. The effects of the integration of Spain in the European Union on international migration appeared to be limited (Van der Gaag and Van Wissen, 1999). At the end of the 1980s labour immigrants and asylum seekers made their way to the Spanish border. Most non EU-12 foreigners came from Morocco, Venezuela and the Philippines. Also for the Portuguese, Spain was a source of higher wages and better job opportunities (King and Rybaczuk, 1993).

The potential independent variables in the Spanish model are GDP per capita, unemployment in Spain, and unemployment in France. All potential independent variables correlate more than 0.80 in absolute terms with each other. This means that the three variables can only separately be estimated. The best model appeared to be the model with GDP per capita. In addition, the Spanish model includes two dummy variables: the stabilisation plan, which has a value of one in 1960 and the recruitment stop in former labour-importing

countries after the economic recession of 1973/1974, which has a value of one from 1975 to 1979. The model needs no autoregression term (see *Table 4.7*).

Table 4.7. Results of time series regression analysis to explain net migration (rates per 1000) in Spain, 1960-1998 (T = 33)

		Coefficient	t-value
	Constant	-4.52**	-10.67
Economic variable	GDP per capita (x 10^{-4})	3.99**	9.50
Country-specific variables	Stabilisation plan	-1.51*	-2.19
	Recruitment stop 1974 in labour-importing countries	1.55**	5.07
	Adjusted R^2	0.83	
	Durbin-Watson statistic	1.64	

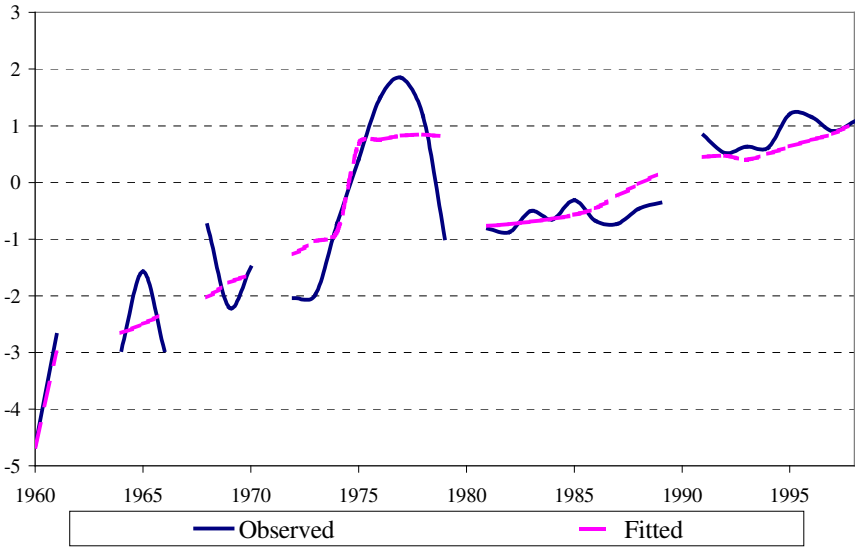
* significant $p < 0.05$ (one-sided test)
** significant $p < 0.01$ (one-sided test)

GDP per capita has a positive, significant effect on international migration in Spain[30]. Furthermore, the two dummy variables are significant and have the expected sign.

Figure 4.3 presents the observed and fitted net migration trend in Spain 1960-98. The data for 1962, 1963, 1967, 1971, 1980 and 1990 are missing because of reasons given in section 4.3.

[30] The model with unemployment in France also provided a coefficient which is significant and has the expected sign. However, the model with unemployment in Spain revealed a significant positive effect, where I expected a negative effect. The very high correlation between unemployment in France and Spain (0.98) causes this unexpected sign in the model with unemployment in Spain.

Figure 4.3. Observed and fitted net migration (rates per 1000) in Spain, 1960-1998



4.6.2 Other former labour-exporting countries

For reasons explained earlier, the models for Finland and the Irish Republic include the difference in GDP per capita and unemployment between the country itself and the dominant receiving country (Sweden, UK). In the case of Portugal no model with unemployment in Portugal has been analysed because in the mid-1970s unemployment was affected by international migration rather than the other way around. An exceptionally large number[31] of *retornados* from the PALOP (*Países Africanos de Língua Oficial Portuguesa*) caused large net immigration in this period (Solé, 1995; Rocha-Trindade, 1995), leading to unemployment in the late 1970s. In addition to political and colonial dummy variables, census dummy variables were used as well for Italy (1962, 1972 and 1992). The comparable coefficients are presented in *Table 4.8*, whereas the country-specific dummy variables are given in *Table 4.9*.

[31] According to computed net migration figures, Portugal experienced a net migration of 619,000 in the period 1974-1979. This is about 7.2% of the total population in 1974.

Table 4.8. Results of country-specific time series regression analyses to explain net migration (rates per 1000) in former labour-exporting countries, 1960-1998

	Coefficients (t-values)				
	Constant	GDPpc (x 10^{-4})	Unempl.	Unempl. RC	AR(1)
Finland (T=36)		[Fin – Swe]	[Fin – Swe]		
Adj. R^2 = 0.83	3.32*	14.76**	-0.19	_	0.70**
DW = 1.92	(2.38)	(2.76)	(-1.05)		(5.40)
Greece (T=38)					
Adj. R^2 = 0.63	-8.82**	15.36**	-0.55*	X	0.30*
DW = 2.12	(-3.75)	(5.09)	(-1.94)		(1.88)
Irish R. (T=36)		[IR – UK]	[IR – UK]		
Adj. R^2 = 0.80	9.40**	15.68*	-0.90	_	0.73**
DW = 1.74	(3.09)	(1.85)	(-1.25)		(8.69)
Italy (T=34)				[Switzerland]	
Adj. R^2 = 0.86	-1.95	1.00	X	0.63**	0.70**
DW = 1.65	(-1.26)	(0.80)		(3.63)	(4.85)
Portugal (T=36)				[France]	
Adj. R^2 = 0.89	-16.03**	X	_	1.55**	0.79**
DW = 2.20	(-2.80)			(2.43)	(7.04)
Spain (T=33)					
Adj. R^2 = 0.83	-4.52**	3.99**	X	X	_
DW = 1.64	(-10.67)	(9.50)			
Yugoslavia (T=27)				[W. Germany]	
Adj. R^2 = 0.77	-0.52	X	X	0.14	0.58**
DW = 2.11	(-1.07)			(1.21)	(4.15)

* significant $p < 0.05$ (one-sided test)
** significant $p < 0.01$ (one-sided test)
– not in the analysis
X not in the analysis because of multicollinearity
DW Durbin-Watson statistic
RC dominant receiving country

GDP per capita has a positive, significant effect on international migration in Greece and Spain. GDP per capita minus GDP per capita of the most important receiving country has a positive significant effect on net international migration in Finland and the Irish Republic. The coefficients of Finland and the Irish Republic are rather similar, but the coefficients of Greece, Italy and Spain differ considerably.

Unemployment has a significant, negative effect on net international migration in Greece. The unemployment differences between Finland and Sweden and between the Irish Republic and the UK are negative but insignificant. Unemployment in the most important

receiving country has a positive, significant effect for Italy and Portugal, and a positive but insignificant effect for Yugoslavia.

Table 4.9. Country-specific effects in time series regression analyses to explain net migration (rates per 1000) in former labour-exporting countries

Country	Year(s)	Dummy	Source	Coefficient	(t-value)
Finland	1969-1970	Pool after recession 1967 in labour-importing countries		-7.37**	(-7.59)
	1971-1979	(textile) prod. to Finland	Hammar (1995)	1.35	(1.51)
Greece	1969	Pool after recession 1967 in labour-importing countries		-3.69	(-1.45)
Italy[i]	1972	Census 1972		1.56**	(3.21)
	1992	Census 1992		1.78**	(3.83)
Portugal	1969	Pool after recession 1967 in labour-importing countries		-8.90**	(-5.26)
	1974-1975	Independence of the PALOP	Rocha-Trindade (1995)	33.90**	(11.49)
Spain	1960	Stabilisation plan	Mansvelt Beck (1993)	-1.51*	(-2.19)
	1975-1979	Recruitment stop in labour-importing countries	Mansvelt Beck (1993)	1.55**	(5.07)
Yugoslavia	1968-1969	Labour agreement with Germany	Bretz (1996)	-4.09**	(-7.53)

* significant $p < 0.05$ (one-sided test)
** significant $p < 0.01$ (one-sided test)
i The dummy variable Census 1962 was not in the analysis as unemployment in Switzerland in 1961 was not available and the model comprised an autoregression term of the first order.

Similar to the model for former labour-importing countries, all dummy variables have the expected sign. Again most of the dummy variables are significant.

4.7 Pooled models for Western Europe

In the two previous sections the focus was on impacts of macro-economic trends on international migration. I carried out separate analyses on the former labour-importing and former labour-exporting countries as some different mechanisms may determine migration in these groups of countries (i.e. unemployment in the most important receiving country may play an important role in former labour-exporting countries). This section provides information about differences between countries.

Two types of pooled cross-sectional time series models have been estimated for all Western European countries simultaneously, including both former labour-importing and labour-exporting countries: a cross-sectionally heteroskedastic and a cross-sectionally correlated model. If we assume that general mechanisms underlie international migration processes in countries in a certain area, we may expect that a seemingly unrelated regression (SUR) model, which is a cross-sectionally correlated model, is the most appropriate model. Heteroskedasticity is a characteristic of this model too. The difference between the two models is that, in contrast to a cross-sectionally heteroskedastic model, a cross-sectionally correlated model assumes that the cross-sectional units are mutually dependent (Kmenta, 1986; Judge *et al*., 1988; Dielman, 1989).

The empirical results show that a seemingly unrelated regression model proved to be a better model than a cross-sectionally heteroskedastic model (the average absolute t-value of the socio-economic variables is higher). *Table 4.10* presents the results for the seemingly unrelated pooled cross-sectional time series regression analysis. No multicollinearity could be detected in this model. Therefore, all variables, and thus all hypotheses could be tested simultaneously. However, conducting analyses on both former labour-importing and former labour-exporting countries simultaneously implies that unemployment in the most important receiving country cannot be taken into account for the latter group of countries. Moreover, this implies that the pooled models cannot comprise GDP per capita and unemployment differences with the UK and Sweden for the Irish Republic and Finland, respectively.

Table 4.10. Results of seemingly unrelated pooled time series regression analysis to explain net migration (rates per 1000) in Western Europe, 1960-1998 (N x T = 575)

Country	Year(s)	Variable	Coefficient	t-value
		Constant	-1.14*	-2.27
		GDP per capita (x 10^{-4})	1.67**	4.36
		Unemployment	-0.07**	-4.18
		Years of education	-0.01	-0.07
		Migrant stock (x 10^{-3})	2.22	0.58
1	1	Recession 1967	-1.83**	-8.76
2	2	Recession 1973	-0.79**	-3.63
3	3	Pool after recession 1967 in labour-importing countries	-4.27**	-8.10
4	4	Fall of the Iron Curtain	8.40**	8.97
5	5	Refugees from the former Yugoslavia	2.42**	10.31
Austria	1981	Polish asylum seekers	1.58*	1.84
	1982	Return/transit of Polish asylum seekers	-4.98**	-5.85
	1993-1998	*Asyl- und Fremdengesetz*	-1.03	-1.20

Table 4.10. Continued

Country	Year(s)	Variable	Coefficient	t-value
Belgium	1964	Recruitment agreement with Turkey and Morocco	1.86**	3.79
France	1961-1962	Turmoil in Algeria	2.08**	2.87
	1962	Independence of Algeria	16.92**	32.38
	1963-1964	French troops in Algeria	2.00**	6.11
Netherlands	1962	Political tension in New Guinea	1.03**	2.79
	1975	Independence of Surinam	3.95**	10.47
	1979-1980	5 years after independence of Surinam	2.20**	6.02
Norway	1987	Refugees from Sri Lanka and Iran	2.51**	7.07
Sweden	1971-1979	(textile) production to Finland	-1.36**	-2.70
	1989	Refugees from Iraq and Chile	3.02**	4.18
Switzerland	1970-1974	Quota system	-2.08*	-1.76
UK	1987-1998	Visas making family migration difficult	0.07	0.22
Finland	1971-1979	(textile) production to Finland	1.85**	3.34
Italy	1962	Census 1962	0.49	1.05
	1972	Census 1972	1.84**	4.17
	1992	Census 1992	1.48**	3.36
Portugal	1974-1975	Independence of the PALOP	36.53**	16.48
Spain	1975-1979	Recruitment stop in labour-importing countries	0.11	0.22
Yugoslavia	1968-1969	Labour agreement with Germany	-3.79**	-8.61
United Germany	1993-1998	Immigration restrictions	-1.43	-1.00
		AR(1)	0.73**	28.56
		Adjusted R^2	0.79	
		Durbin-Watson statistic	1.82	

* significant $p < 0.05$ (one-sided test)

** significant $p < 0.01$ (one-sided test)

1 Austria 1968, Belgium 1968, Denmark 1968, West Germany 1966-1967, the Netherlands 1967 and Sweden 1967-1968

2 Austria 1974-1979, Denmark 1974-1979, France 1974-1979, West Germany 1974-1979 and Switzerland 1975-1979

3 Finland 1969-1970, Greece 1969 and Portugal 1969

4 Austria 1989 and West Germany 1989

5 Denmark 1995, Norway 1993 and Sweden 1993-1994

As we can see in table 4.10 the pooled cross-sectional time series analysis supports hypotheses 1 and 2: GDP per capita has a significantly positive effect on net international migration and unemployment has a significantly negative effect on net international migration. The analysis does not reveal significant effects of educational level and the migrant stock. A possible explanation for this is the considerably high, although lower than 0.80, and very significant correlation between GDP per capita and these two variables. All dummy variables in the pooled model for Western Europe but one (visas making family migration difficult in the UK in 1987) have the expected sign. Three policy dummy variables are not significant: the already mentioned dummy variable for the UK 1987-1998; the *Asyl- und Fremdengesetz* in Austria; and the immigration restrictions in Germany 1993-1998. The very large coefficient of the Portuguese dummy variable for the independence of the PALOP is remarkable. This is an important reason why Portugal is an outlier in the first cluster analysis in section 2.4.1.

The aforementioned high correlation between some independent variables induced me to estimate two additional models: a model (B) with GDP per capita and unemployment; and a model (C) with unemployment, educational level and the migrant stock as independent socio-economic variables. The results of these models are presented in *Table 4.11*. This table does not present the results for the dummy variables, as these do not differ appreciably from those presented in table 4.10.

Table 4.11. Results of additional seemingly unrelated pooled time series regression analyses to explain net migration (rates per 1000) in Western Europe, 1960-1998 (N x T = 575)

	Model B		Model C	
	Coefficients (t-values)			
Constant	-1.14**	(-3.34)	-1.21*	(-2.16)
GDP per capita (x 10^{-4})	1.70**	(7.37)	–	
Unemployment	-0.07**	(-4.04)	-0.07**	(-3.91)
Years of education	–		0.25**	(4.04)
Migrant stock (x 10^{-2})	–		1.11**	(3.44)
AR(1)	0.73**	(30.60)	0.75**	(30.35)
Adjusted R^2	0.79		0.79	
Durbin-Watson statistic	1.83		1.86	

* significant $p < 0.05$ (one-sided test)
** significant $p < 0.01$ (one-sided test)

Again, model B reveals significant effects with the expected sign for GDP per capita and unemployment. Contrary to the model presented in table 4.10, model C reveals significant effects of educational level and the migrant stock. Both effects are positive. Hence, these results tentatively support hypotheses 3 and 4.

As mentioned above, long net migration time series are available for all Western European countries. The picture is less rosy for data on total immigration and emigration: reliable data are only available for the former labour-importing countries of Northern and Western Europe (except Austria and France) and Finland from 1985 and for some Eastern European transition countries from 1991. The data for most former labour-exporting countries (Greece, the Irish Republic, Portugal and (the former) Yugoslavia) are far from complete. The data for Italy and Spain display a rather erratic pattern, as large regularisation programmes of clandestines have been conducted in these countries in the period 1985-1998. The pattern of total immigration for the former labour-importing countries of Northern and Western Europe and Finland corresponds highly with the pattern of net migration because emigration from these countries has been quite constant. I have calculated correlations between total immigration and net migration for the Northern and Western European countries to illustrate this (see *Table 4.12*). Correlations for Austria and France were not calculated as only a few immigration data are available for these two countries.

Table 4.12. Correlation coefficients between total immigration and computed net migration in Northern and Western European countries, 1985-1998[i]

	Pearson correlation coefficients
Belgium[ii]	.92**
Denmark	.89**
Finland	.92**
Germany[iii]	.83**
Irish Republic[iv]	.94**
Netherlands	.80**
Norway[v]	.69**
Sweden	.89**
Switzerland	.95**
UK	.80**

** significant $p < 0.01$ (two-sided test)

i sources net migration: Council of Europe (1999); for the UK 1998: Council of Europe (2001); sources immigration: Eurostat (2003); for Germany: Statistisches Bundesamt (2000).

ii no data for 1988, 1995 and 1998

iii including the former East Germany from 1991

iv no data for 1985, 1986, 1995 and 1998

v no data for 1996

The corresponding pattern of immigration and net migration implies that analyses on total immigration will give rather similar results as analyses on net migration in former labour-importing countries of Northern and Western Europe in the period 1985-1998. Moreover, this implies that total emigration from these countries in this period is almost uncorrelated with macro-economic determinants (i.e. GDP per capita and unemployment) as these determinants show quite some variability over time. Thus, I will not conduct separate

analyses on total immigration and emigration in the former labour-importing countries of Northern and Western Europe for the period 1985-1998.

In addition to models for the entire period 1960-1998, I have also estimated models on net migration in Western European countries in the period 1980-1998. These models may provide indications for the robustness of the PCT analysis on the period 1960-1998. The estimated residual correlation matrix of the seemingly unrelated model with an autoregression coefficient of the first order was unfortunately almost singular. Therefore, it was impossible to remove autocorrelation in this way from the SUR model. Instead, a cross-sectionally heteroskedastic model has been used. The insignificant variables of the model presented in table 4.10 were excluded. The results of this analysis are presented in *Table 4.13*.

Table 4.13. Results of cross-sectionally heteroskedastic pooled time series regression analysis to explain net migration (rates per 1000) in Western Europe, 1980-1998 (N x T = 273)

Country	Year(s)	Variable	Coefficient	t-value
		Constant	0.95	1.04
		GDP per capita (x 10^{-5})	5.22	1.17
		Unemployment	-0.08**	-3.61
1	1	Fall of the Iron Curtain	5.63**	5.00
2	2	Refugees from the former Yugoslavia	2.54**	7.38
Austria	1981	Polish asylum seekers	2.92**	2.59
	1982	Return/transit of Polish asylum seekers	-3.33**	-2.96
Netherlands	1980	5 years after independence of Surinam	2.52**	3.55
Norway	1987	Refugees from Sri Lanka and Iran	1.67*	2.30
Sweden	1989	Refugees from Iraq and Chile	2.13**	2.61
Italy	1992	Census 1992	1.57**	2.70
		AR(1)	0.75**	21.97
		Adjusted R^2	0.76	
		Durbin-Watson statistic	1.66	

* significant $p < 0.05$ (one-sided test)
** significant $p < 0.01$ (one-sided test)
1 Austria 1989 and West Germany 1989
2 Denmark 1995, Norway 1993 and Sweden 1993-1994

All variables in the analysis have the expected sign. The effect of unemployment is significant; this supports hypotheses 2. The economic variables in this model have about the same impact as in the model in the period 1960-1998, which is presented in table 4.10. This

also holds for the autoregression term. Therefore we may state that these variables are fairly robust indicators of net international migration. The effect of GDP per capita is not significant. Moreover, it differs considerably from the effects estimated above. The effect of GDP per capita on net migration in the period 1960-1998 was more than triple that of the period 1980-1998. This may be an indication that GDP per capita is not a good indicator of the dominant migration types in the 1980s and 1990s.

4.8 Tentative analyses for Eastern Europe

Analyses on immigration and emigration in five non-Soviet former communist countries have also been conducted. No hypotheses about the influence of educational level are tested in this section as the educational level does not differ much for these countries and over time (1991-1998). The migrant stock was also left out of the analyses as no clear estimates of recent migrant stocks were available. The presence of migrant or minority stocks is often the result of historical or forced migration. I did conduct analyses with GDP per capita and unemployment. Hypotheses about the effects of GDP per capita and unemployment on immigration and emigration are based on the same theoretical rationale as the aforementioned hypotheses about net migration. Hence, for immigration I expect effects with the same signs as for net migration; for emigration I expect opposite signs. As the period of analysis was a mere eight years only pooled cross-sectional time series analyses were carried out. As with the pooled model for Western Europe no multicollinearity was found in the pooled models for Eastern Europe.

The dependent variables in the analyses on Central and Eastern Europe are total immigration and emigration in the period 1991-1998 (1993-1998 for the Czech and Slovak republics) (source: United Nations, 2001))[32]. As already indicated in section 1.6, emigration is often highly underestimated in Eastern Europe. Therefore, I decided to use inflow figures (by country of last residence[33]) in the most important destination countries of the countries in the analyses. I used data for all Northern and Western European countries with more than one million inhabitants; for selected Eastern European countries; and for selected (traditional) immigration countries outside Europe[34]. For an overview of these important destination countries see *Table 4.14*.

[32] The immigration data for Romania 1991 and the Slovak Republic 1996 are missing.
[33] The immigration data for Switzerland and Hungary refer to country of citizenship. The immigration data for the USA refer to country of birth.
[34] Data for Austria, Bulgaria and the Irish Republic are unfortunately not available.

Table 4.14. Countries whose immigration figures are used to estimate emigration from Eastern European countries

	Important immigration countries used to estimate emigration
Czech R.	Northern and Western European countries, Poland, Slovak R., Ukraine, Australia, Canada and the USA.
Hungary	Northern and Western European countries, Romania, Ukraine, Australia, Canada, Israel and the USA.
Poland	Northern and Western European countries, Czech R., Hungary, Ukraine, Australia, Canada, Israel and the USA.
Romania	Northern and Western European countries, Czech R., Hungary, Australia, Canada, Israel and the USA.
Slovak R.	Northern and Western European countries, Czech R., Hungary, Poland, Ukraine, Australia, Canada and the USA.

Two data problems had to be overcome. Firstly, immigration from Czechoslovakia is not always divided into immigration from the Czech and Slovak republics respectively. Hence, some estimates had to be made[35]. Moreover, some migration flows had to be estimated as well because data were missing[36].

GDP per capita[37] and unemployment are the independent variables in the analyses. *Table 4.15* shows the operationalisation and the data sources.

[35] The number of migrants from Czechoslovakia is larger than the sum of migrants from the Czech and Slovak republics in Australia and Canada. Therefore, the immigrants from Czechoslovakia to Australia and Canada are divided up proportionally between the figures of immigration from the Czech and Slovak republics according to the registered figures of immigration from these two Czechoslovak successor states. The proportion of immigrants from the Czech and Slovak republics to Australia in 1994 is used to estimate the number of immigrants from the Czech and Slovak republics to Australia in 1993. For the USA and Belgium only reliable data on the numbers of immigrants from Czechoslovakia are available. The Dutch and Canadian proportions of immigrants from the Czech and Slovak republics are used to estimate the number of immigrants from the Czech and Slovak republics to Belgium and the USA, respectively. Migration of Czechoslovaks to Switzerland is only divided up into immigration of Czechs and Slovaks in 1996. The proportion in this year is used to estimate the figures for the other years.

[36] Belgium 1998 is 1997; for Hungary Belgium 1991 is 1992; for Romania Belgium 1991, 1992 and 1993 are 1994; for the Czech and Slovak Republic Denmark 1993 is 1994; for the Czech Republic Denmark 1997 is the average of 1996 and 1998; for the Czech and Slovak Republic France 1993 is 1994 and 1998 is 1997; for Hungary France 1993 is the average of 1992 and 1994, and 1998 is 1997; for the Czech and Slovak Republic Sweden 1993 is 1994; for the Czech Republic UK 1997 and 1998 are 1996; for the Slovak Republic UK 1996 is the average of 1995 and 1997, and 1998 is 1997; for Hungary UK 1991 and 1992 are 1993, and 1998 is 1997; for Poland UK 1998 is 1997; for Romania UK 1992 is the average of 1991 and 1993, 1995 and 1996 are the average of 1994 and 1997, and 1998 is 1997; for Hungary Romania 1991 is 1992; for the Czech Republic the Slovak Republic 1996 is the average of 1995 and 1997; for the Czech Republic Ukraine 1993 is 1994; for the Slovak Republic Ukraine 1993 is 1994, and 1997 the average of 1996 and 1998; for Hungary and Poland Ukraine 1991 and 1992 are 1993; Australia 1998 is 1997; Israel 1998 is 1997; for the Czech and Slovak Republic, Hungary and Romania USA 1998 is 1997.

[37] Again, the data source for the midyear population is Council of Europe (1999).

Table 4.15. Independent variables used in the analyses on Central and Eastern European countries[i]

Variable	Operationalisation	Source
GDP	1990 US$ converted at Geary Khamis PPPs	Groningen Growth and Development Centre (GGDC) (2001)[ii]
Unemployment	Registered unemployment as percentage of the total labour force	International Labour Organisation (ILO) (2001)

i Years of observation: 1991-1998; for the Czech and Slovak republics 1993-1998.
ii The data source for Hungary is GGDC (2003).

After the collapse of communism ethnic migration played an important role in Eastern Europe. The absence of reliable data of ethnic minorities in former communist countries led to the estimation of models with fixed effects (different intercepts for each country) to correct somewhat for the degree of ethnic migration in the individual countries. *Table 4.16* shows the results of seemingly unrelated pooled cross-sectional time series analysis with fixed effects to explain total immigration into five Eastern European countries.

Table 4.16. Results of seemingly unrelated pooled time series regression analysis to explain the natural logarithm of total immigration (rates per 1000) in five Eastern European countries, 1991-1998 (N x T = 28)

Variable	Coefficient	t-value
Fixed effect Czech Republic	-1.61	
Fixed effect Hungary	-0.77	
Fixed effect Poland	-2.60	
Fixed effect Romania	-2.43	
Fixed effect Slovak Republic	-1.91	
GDP per capita (x 10^{-4})	2.08	1.71
Unemployment	-0.02	-0.76
AR(1)	0.17	1.20
Adjusted R^2	0.77	
Durbin-Watson statistic	1.52	

The two economic variables have the expected sign. Although the variables are not significant, the t-value of GDP per capita is close to a significance level of 5%. The model without fixed effects does reveal a significant effect of GDP per capita. However, the effect of unemployment is positive (and insignificant) in this model. The absolute t-values for the economic variables were lower in a model with only cross-section weights. The adjusted R^2 of this model was smaller. Many Hungarians have lived in Romania, the Slovak Republic,

Ukraine and Serbia; not surprisingly Hungary was the destination of many ethnic migrants in the 1990s. Hence, the fixed effect for Hungary is relatively large (i.e. less negative). There was considerable international migration between the Czech and Slovak republics, an artefact of their common past. Hence, the fixed effect for these two Czechoslovak successor states is larger than for Poland and Romania, two countries which did not receive many ethnic migrants.

The analysis on emigration was hampered by problems involving the removal of autocorrelation: it was impossible to remove autocorrelation from a seemingly unrelated pooled model with an autoregression term of the first order. Surprisingly, better results were obtained with a cross-sectionally heteroskedastic model without fixed effects than with such a model with fixed effects. The result of cross-sectionally heteroskedastic pooled time series analysis to explain the natural logarithm of emigration from the Czech and Slovak republics, Hungary, Poland and Romania is presented in *Table 4.17*.

Table 4.17. Results of cross-sectionally heteroskedastic pooled time series regression analysis to explain the natural logarithm of total emigration (rates per 1000) in five Eastern European countries, 1991-1998 (N x T = 31)

Variable	Coefficient	t-value
Constant	0.21	0.40
GDP per capita (x 10^{-4})	-0.24	-0.43
Unemployment	0.05**	2.76
AR(1)	0.72**	7.11
Adjusted R^2	0.86	
Durbin-Watson statistic	1.99	

** significant $p < 0.01$ (one-sided test)

Again, the two economic variables have the expected sign. This time the regression output strongly supports our assumption about the effect of unemployment.

4.9 Conclusions and implications for projections

The aim of this chapter was to estimate the influence of economic determinants on net migration in Western Europe and total immigration and emigration in Eastern Europe. The macro-economic determinants used are GDP per capita and unemployment. Moreover, the effect of the migrant stock and the educational level were also taken into account. Country-specific information was included as well, to control for policy and other interventions. Not all the effects are significant, but the country-specific and pooled analyses demonstrate that GDP per capita has a positive effect and unemployment a negative effect on net international

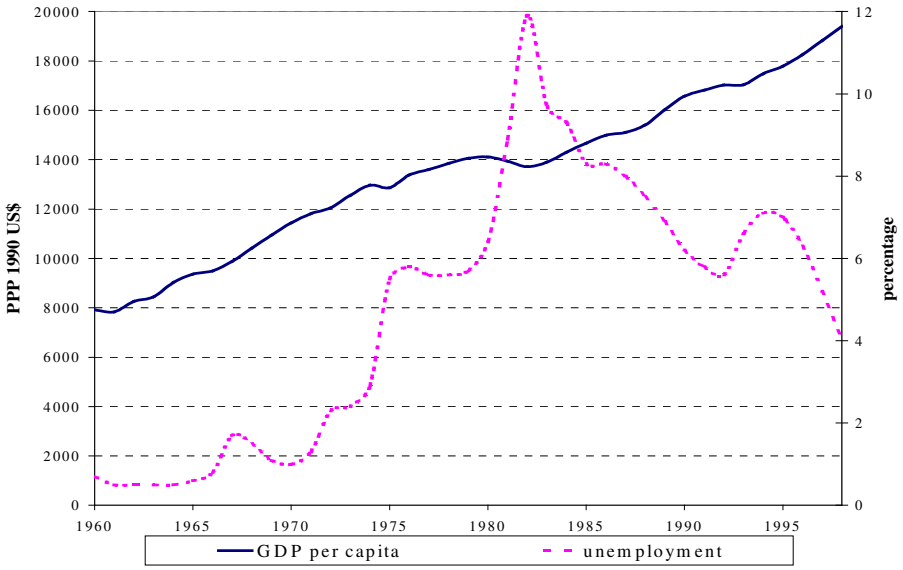
migration. The analyses for Finland and the Irish Republic show that the difference in GDP per capita between a sending and a receiving country has a positive effect and that the difference in unemployment between a sending and a receiving country has a negative effect on net international migration in the sending country. The pooled analysis for Western Europe without GDP per capita (Model C in table 4.11) supports the hypotheses that educational level and migrant stock have a positive effect on net international migration. The tentative analyses on Eastern Europe provide some support for the assumptions that GDP per capita has a positive effect and unemployment a negative effect on immigration and that for emigration reverse effects hold.

A seemingly unrelated regression model of pooled time series, which assumes that the cross-sectional units are mutually dependent, was, if it was possible to remove autocorrelation with an autoregression term of the first order, the best pooled model to estimate economic determinants of international migration in both Western and Eastern Europe. Therefore, we may conclude that countries cannot be seen as independent units with respect to international migration. Common unmeasured underlying mechanisms may affect international migration in European countries. Examples of such underlying mechanisms are the economic position of Western and Eastern Europe in relation to the rest of the world or turmoil in neighbouring parts of the world (e.g. in the former Yugoslavia or in the Middle East), which cause refugee flows to Europe. In addition, (economic) developments in certain European countries may affect international migration in other European countries. Unemployment in Switzerland, for instance, has a positive, significant effect on net international migration in Italy. A similar relation exists between unemployment in France and net international migration in Portugal.

Many dummy variables have been used in the analyses to control for country-specific effects. The large number of dummy variables used shows that international migration is difficult to predict in the short term; all kinds of political factors make international migration patterns quite erratic. However, the PCT analyses on Western Europe presented in tables 4.10, 4.11 and 4.13 reveal that in the long run, the effect of unemployment appeared to be very stable.

The regression results presented in this chapter may be used to make international migration projections. As an illustration, a simple international migration projection for the Netherlands will be made based on past developments in GDP per capita and unemployment trends. *Figure 4.4* shows these trends for period 1960-1998.

Figure 4.4. GDP per capita and unemployment in the Netherlands, 1960-1998



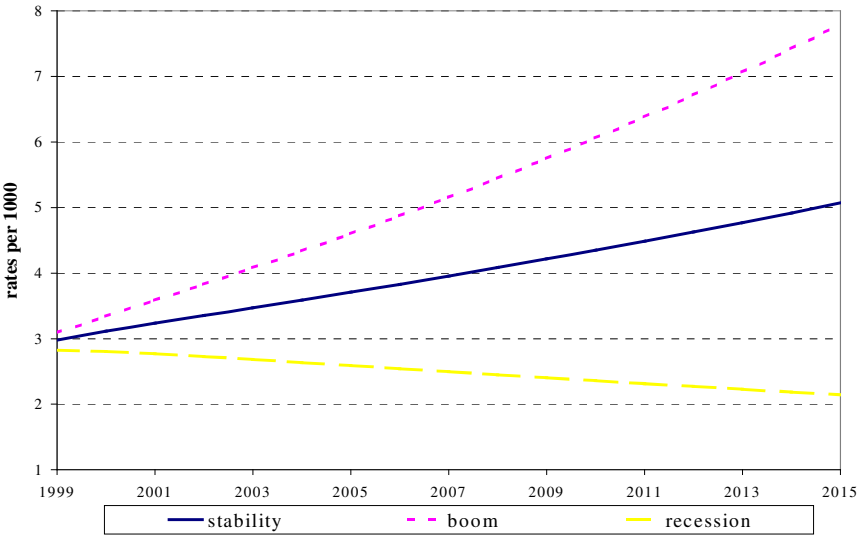
GDP per capita increased almost linearly in the Netherlands in the period 1960-1998. The annual average increase was 2.4 %. In contrast, unemployment had a more unpredictable character. It varied from 0.5% in the booming first half of the 1960s to 11.9% in 1982 when the economic depression in the Netherlands reached its lowest point. The average unemployment rate was 4.8% in the period 1960-1998.

The regression output for the Netherlands (see table 4.3) implies that we may estimate net international migration per 1000 (I) as follows:

$$I_t = -0.31 + 0.46 * I_{t-1} + 2.22 * \left(10^{-4}\right) * \left(GDPpc_t - 0.46 * GDPpc_{t-1}\right) - 0.20 * \left(unempl_t - 0.46 * unempl_{t-1}\right).$$

Figure 4.5 presents three projections of net international migration in the Netherlands for the period 1999-2015. Three scenarios are envisaged: stability (unemployment stays stable at 4% (the level of 1998)); boom (unemployment decreases linearly to 0.5% in 2015); and recession (unemployment increases linearly to 11.9% in 2015). GDP per capita rises with the average annual increase in the period 1960-1998 (2.4%) in the stability scenario; with the average annual increase in the period 1964-1973 (4.1%) in the boom scenario; and with the average annual growth in the period 1975-1984 (1.0%) in the recession scenario.

Figure 4.5. Net migration projections for the Netherlands

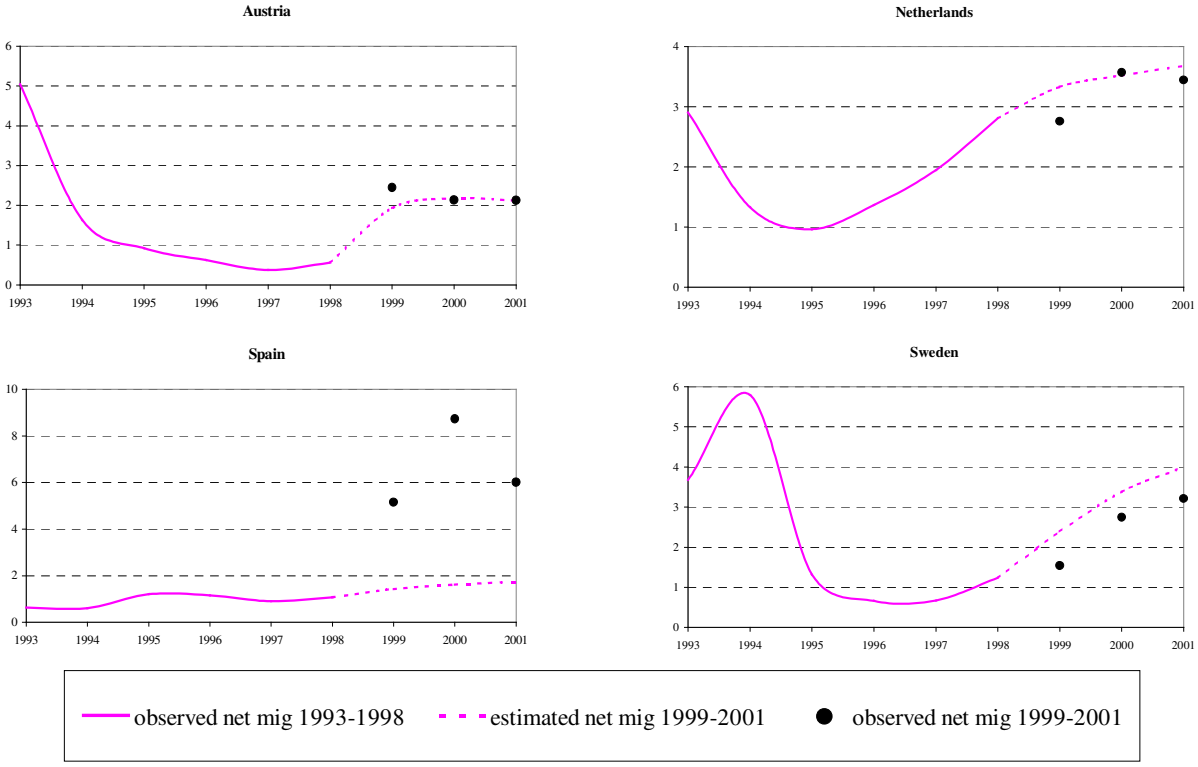


The autoregression term of the first order (0.46) in the equation, used to forecast net international migration in the Netherlands, makes the volume of net migration in the last observed year (1998) important for the prognosis of international migration in the short term. However, the impact of the first I_{t-1} vanishes after a few years. Figure 4.5 demonstrates that net migration will steadily increase to a net migration rate of 5.07 per thousand in 2015 in the stability scenario. The difference in the forecast of net migration in the boom and recession scenario increases over time. A business cycle (consecutive periods of boom and recession) characterizes modern capitalistic economic systems. Hence, we may assume that net migration will increase in the long term (after 2015) in the recession scenario and will decrease in the long term in the boom scenario.

It is possible to make net migration projections with this method for other former labour-importing countries. However, only one economic variable was used to estimate net migration for some countries (see section 4.5). Therefore, the economic scenarios can only be based on one economic indicator for these countries. It is not possible to make net migration projections for most former labour-exporting countries with this method, because economic indicators in former labour-importing countries were used to estimate net migration in most countries (see section 4.6).

The validity of the aforementioned projections, which are based on the country-specific analyses, is unknown. This validity was tested somewhat by comparing fitted net migration in the years 1999, 2000 and 2001 with observed net migration in these years. *Figure 4.6* shows this fitted and observed net migration for Austria, the Netherlands, Spain and Sweden.

Figure 4.6. Fitted and observed net migration (rates per 1000) in four selected countries, 1993-2001



As can be seen from figure 4.6, the country-specific models estimated in this chapter, were able to predict net international migration in Austria, the Netherlands and Sweden in the years 1999-2001 considerably well. However, the model for Spain was not able to predict the very large net migration in the years 1999-2001. Large regularisations and the economic crisis in Latin America caused these very high net migration figures. These are events that make the prediction of international migration in the short term difficult. I would have used an additional dummy variable if these years were included in the time series regression analysis to explain net migration in Spain.

The analyses in this chapter are based on net migration and total immigration and emigration figures. These figures provide no information on the type of migrants (e.g. labour, family or asylum migrants) that enter or leave a country. Chapters 7 (asylum migration) and 6 (all the other migration types) deal with the estimation of determinants of specific migration types. First, a detailed description of international migration in the period 1985-1999 (the only period for which data on specific migration flows are available) will be given.