2

The Choice to Migrate

This chapter considers the choice to migrate. We chose an approach of individual (or family) choice, ignoring the structural explanations, which suggest that individuals move only because of deep social change. However, it is acknowledged that the historical-sociological context in which the choice to migrate is made is extremely relevant, and so such factors are incorporated into a model of individual choice.

The aim of this chapter is to carry out empirical tests on the choice made by immigrants from Spain, Greece, Italy, and Portugal to northern European countries in the postwar period. We compare the explicative power of three approaches – economic, gravitational, and sociological – to analyze the choice to emigrate.

The economic approach draws on the theory of human capital and its development. Individuals decide to invest in migration if it implies a better return on their human capital, net of economic and psychological costs.

In contrast, the gravitational pull approach emphasizes territorial factors, in that it is derived from regional economics. Movement from one area to another is interpreted as in the physical sciences – that is, forces attract each other but are hindered by the inertia of distance.

The sociological approach to the individual choice to emigrate emphasizes the relevance of certain factors, such as social organization, especially the networks of knowledge and family links that can be found in the migratory chain.

The decision to consider these three approaches recalls a lively debate in which economists, although neither denying nor ignoring the importance of information networks, often use variables that can be considered proxies of the migratory chain in their empirical tests. Their content is not specified, however, so one of the aims of this empirical test is to specify the economic and sociological content of such variables.

Furthermore, in the past few years there has been a return to gravitational models in order to interpret the movement of individuals and production factors between areas. Hamilton and Winter (1992), for example, use a gravitational model when they interpret the flows of imports and exports that might be generated between the EU countries and the eastern European countries. Similarly Gowa and Mansfield (1993) use this type of model to interpret international trade, grafting onto it a variable of systems of alliances. In a critical overview of aggregate economic approaches to the study of the migratory phenomenon, demographer M. Termote (1996) asserts that gravitational models offer greater insight into the territorial dynamics of migratory phenomena.

It would be interesting and certainly relevant to conduct an empirical analysis of the current migratory choice of emigrants toward southern European countries from Maghreb, the Philippines, Albania, and Yugoslavia. Unfortunately, such an analysis would need data from the departure country, and at the moment such information is limited and not completely reliable. In addition, information about the level of employment and unemployment is not available in these countries, and such information is indispensable in an empirical analysis. Even when the data on total inflows of immigration into the receiving country are used, the recent and frequent regularizations make it impossible to have a historical series that is sufficiently long and reliable.

This chapter introduces a survey of the economic models, starting with the traditional human capital theory and continuing with the most recent and the most interesting specifications of the choice to migrate. This review has the twofold aim of emphasizing how much effort economists have made to find realistic explanations and how these efforts are an attempt to overcome, at least at a theoretical level, the interpretative limits of using only wage differentials, and not territorial or sociological factors, as the engine of migration.

The first part of this chapter reviews various economic interpretations of the choice to migrate, and then it defines an empirical model that can be used to conduct empirical tests. This is followed by an analysis of the gravitational model and the sociological model. Data describing the trend and the evolution of emigration flows from southern European countries to northern Europe are presented later, together with separate estimates of the three models and combinations of them. The conclusions include comments on the implications that can be drawn from the current migratory phenomenon in the southern European countries.

2.1 AN OVERVIEW OF THE ECONOMIC MODELS

The models of migratory choice begin with models in which the choice to migrate is the result of a maximization process based on labor market variables. Then some causal models whose relations go beyond the labour market are examined. Later some papers are presented not only because of their intrinsic value in the definition of the migratory process but also because they overcome some of the limits of the neo-classical approach such as perfect rationality, perfect information, and homogeneous agents.

2.1.1 The Human Capital Model

In the human capital theory, migratory choice is considered an *investment* by an individual (Sjaastad 1962) who wants to maximize his or her income and therefore finds it advantageous to emigrate because of an income differential, net of the monetary and psychological costs of the transfer. The choice is an intertemporal one in which the future flows of income that can be earned in the area of origin (o) and the area of destination (d) are compared, migration can be permanent or temporary, and employment is immediate.

$$M = f(Wd - Wo) \tag{1}$$

Where $f > 0$, $M = 1{,}0$, and $M = 1$ if $Wd > Wo$ and $M = 0$ if $Wd < Wo$.

$$Wd = \int_0^t Yd_e^{-rt} dt - C \tag{2}$$

$$Wo = \int_0^t Yoe^{-rt} dt \tag{3}$$

Where M indicates the individual's decision to migrate, positive or zero, $Wi\ i = d{,}o$ represents the flow of future incomes discounted for the present, r is the discount rate, Yi is the income in the two areas, and C is the cost of migration.

This formulation of the choice to migrate suggests that the larger the differential is, the more probable the choice to migrate will be, and the longer will be the period during which the benefits can be enjoyed – that is, the younger the immigrant is, the higher the expected income will be and the more probable will be the choice to migrate. Later specific studies on migration have tried to analyze the choice to migrate closely, introducing elements that integrate or substitute income differences as the central element in the choice.

2.1.2 Expected Income Model

In the seminal study by Todaro (1969), workers find themselves exposed to the risk of being unemployed in the destination area, and therefore their migratory choice is made comparing the income earned in the area of departure with the expected income in the receiving area.[1] In Todaro's study, the probability of finding work is linked to the rate of unemployment. Therefore, the expected income in the receiving area (*Ewd*) depends on the probability (P_1) of getting a job at wage *Yd* and the probability ($1-P_1$) of receiving unemployment payments *Ydu* (which could be equal to zero), as shown in equation (4). In the departure country the expected wage (*Ewo*) is given by the probability P_2 of getting a job at wage *Yo* (equation (5)), generally considered to be equal to 1.

$$EWd = \int_o^t [P_1 Yd + (1 - P_1) Ydu] e^{-rt}\, dt \tag{4}$$

$$EWo = \int_o^t P_2 Yoe^{-rt}\, dt \tag{5}$$

If it is possible to enter the receiving country illegally, the valuation of the expected wage in the receiving country should be extended, with the introduction of the possibility of not being deported (equal to 1 in the case of legal immigrants, and with a value of less than 1 in the case of illegal immigrants).

The analytical differences in the models have important implications for economic policy. In the first case, the optimum policy to reduce the rate of migration would be to reduce the difference in income between the departure area and the receiving area. In the second case, an increase in the level of employment would increase the probability of the emigrant's getting a job in the area of potential emigration and so increase the flow of immigrants. However, only a limited number of immigrants will manage to get a job, and the rest will join the ranks of the unemployed, again influencing the expected wage. In this second model it is not the equal wage level but the equal expected wage that slows migration.

Summing up the models presented thus far:[2]

- Central to this version of the neoclassical model of the choice to migrate is the dynamics of the labor market: Wage and employment levels determine the dynamics of the expected return to migration.

[1] In Todaro's 1969 version, there is only the first part of equation (4); unemployment benefits are not considered. $Ydu = 0$, and $P_2 = 1$.

[2] See Massey et al. (1993).

- Migration will be more probable among individuals whose human capital guarantees them a higher income and a higher probability of getting a job abroad.
- The probability of migration will also be higher if the individual's characteristics and the social and technological conditions reduce the costs of moving and so increase net return.
- At an aggregate level, migration flows are the sum of different individual choices that depend exclusively on the trend of the labor market.
- A policy to slow migration can intervene exclusively on expected wages; that is, wages earned, the probability of getting a job, and the probability of being deported. They also include long-term policies in the departure country. These can increase production and therefore employment and wages, thereby increasing expected wages so that wage differentials are reduced and migration is discouraged.

2.1.3 Risk Propensity and Risk Aversion

A difference between expected wages in the receiving country and certain income in the departure country can, however, be sufficient to decrease migration in the case of individuals averse to risk. Empirical literature tends to suggest a positive relationship between individuals who emigrate and their propensity to risk. The more the worker is willing to risk – that is, has a convex utility curve with respect to wealth – the more probable it is that the worker will emigrate even if the difference in income is limited (Langley 1974; Hart 1975).[3]

An interesting development of the introduction of risk into the utility function is put forward by Oded Stark (1991; Stark and Katz 1986). The coordinates of the choice to migrate were changed radically, and for this reason the authors called the theory "The New Economics of Labour Migration."[4] In this case it is not the individual but the family that decides on the migration issue in order to diversify the portfolio of sources of income

[3] Langley (1974) in his theoretical work introduces a utility function with aversion to risk ($U = a - ce^{-bD}$, where b identifies the aversion to risk and a, b, and c are parameters, $c, b > 0$ and $a \geq 0$, and D represents the net return of migration in the period considered), which, however, is not estimated in empirical work. Hart (1975) does not elaborate a model with aversion to risk; he limits himself to emphasizing its relevance.

[4] The New Economics of Labour Migration covers the theme in which the choice is familiar and is made with the idea of diversifying one's portfolio. In addition, there are two other interpretations: asymmetric information and relative deprivation. The article that summarizes these three themes and has the title later given to this theory is Stark and Bloom (1985).

and insure against the risks of poor agricultural income.[5] Therefore, it is not the propensity to take risks that favors the choice to migrate, but risk aversion, which, joined to a particular return function of wealth (for example, very high for low levels of income), enables the family to enjoy the fruits of modernizing agricultural production. Something that would otherwise not be possible. Stark shows that the concavity of the utility function (aversion to risk) is neither a necessary nor a sufficient condition for the convexity of the admissible set; that is, the average value is always preferred to an extreme value.

Given a sum of wealth A held by an individual, he or she will be indifferent to emigration if the utility obtained from wealth A and from its return R is equal to the expected utility of emigration, which has a probability q of guaranteeing employment at wage W, and a probability $(1-q)$, in the case of unemployment, of consuming part C of the person's initial wealth (see equation (6)).

$$UA[1 + R(A)] = qU(A + W)[1 + R(A + W)] + (1 - q)U(A - C)[1 + R(A - C)] \qquad (6)$$

For every given A, an isoutility curve can be drawn, where C is a function of $C = G(W)$ and its slope $W = C = 0$ is

$$\frac{dC}{dW} \propto \frac{q}{1 - q} \qquad (7)$$

$$\frac{d^2C}{dW^2} = \frac{q}{(1 - q)^2}\left[\frac{U''(.)}{U'(.)} + \frac{2R' + AR''}{(1 + R + AR')^2}\right](1 + R + AR') \qquad (8)$$

and whose second derivative can be positive or negative because its sign depends on the degree of Arrow-Prat aversion to risk (without the negative sign), and the rate of return (R'), which, if very high, can result in the derivative having a positive sign; therefore it can be concave with an admissible nonconvex set. If R' is sufficiently large, the potential emigrant worker overcomes his or her aversion to risk, even if it implies accepting an *unfair game* and a nonconvex admissible set. The important implication of this analysis is that in this case income is not a homogeneous good, as assumed

[5] In a very interesting study, Daveri and Faini (1999) analyze the family's choice to spread risk by sending its members to different countries. Assuming that the correlation between income in various countries is not zero, concave family mobility costs and idiosyncratic preferences of destination theoretically explain and check empirically two contradictions of the phenomenon in the Italian case: spatial agglomeration and territorial spread.

in neoclassical theory, but the source of income is important because it is linked to different risks.

An indirect estimate of mobility as insurance against the risk of agricultural income has been made by Rosenzweig and Stark (1989; republished Stark 1991). This study used longitudinal data on about six Indian villages in a semiarid area of the tropics carried out by the International Corps Research Institute from 1975 to 1985.

Therefore the most relevant implications of this approach in defining the causes of the choice to migrate are:

- The family and not the individual is the decisional unit, and it tries to maximize future income by minimizing the risk for present income.
- Therefore, the fact that there is a difference in expected income is no longer a necessary condition for mobility given that the family is interested in spreading risks.
- The family is involved in both local work and migration, and therefore the higher local growth does not necessarily mean that pressure to migrate will be reduced.
- The implications for economic policy are clearly different in this case, where the decrease in the migratory flow passes through more agricultural finance and wider insurance against its risks – that is, market intervention outside the labor market.
- Insurance intervention in the labor market in the departure country, such as unemployment payments, influences the family's need for protection.
- However, in these models even though the choice to migrate is made within the family, no family decisional process has been elaborated; instead, the family operates as an individual.

2.1.4 Relative Deprivation Model

Stark, who developed a theoretical model with Levhari (1998) and an empirical version with E. J. Taylor (1991), identifies *relative deprivation* as a reason for migration. It is assumed that it is not the level of income in absolute terms that pushes an individual to emigrate but the level compared with the number of individuals who have a higher income. This approach assumes that the utility of wealth is not constant in society. Individuals emigrate so that they can improve their (and their families') relative position in the departure country. It is therefore not the income differential that causes migration. Rather it can take place even when there are not any average income differences.

If $F(y)$ represents the cumulated income distribution and $h[1-F(y)]$ represents the perceived unhappiness of the family whose income is y, the relative deprivation $RD(y)$ can be expressed in equation (9).

$$RD(y) = \int_{y}^{ymax} h[1-F(y)]dz \tag{9}$$

In the simplest version, where n = 1, it is equivalent to equation (10).

$$RD(Y) = [1-F(y)]E(z-y|z>y) \tag{10}$$

That is, the relative deprivation is the product of two terms: the members of the family who have an income higher than y and the average difference of income between the richest families and income y.

Stark and Taylor (1989; republished Stark 1991) carried out an empirical test using individual data taken from a survey of two Mexican villages with migration to the United States. The importance of relative deprivation in determining the choice to emigrate was revealed.

This approach questions several points:

- Whether the utility of wealth is constant for an individual depending on the economic environment. Even if the expected income from migration remains unchanged, a change in the distribution of income can encourage a family to send a member abroad in order to improve the family's relative position. Therefore, it is a change in the income of the other elements in the area of reference that represents an incentive to migrate.
- Whether the policies that are aimed at limiting migration must influence the distribution of income and make its distribution more egalitarian.
- Whether government policy and the economic shocks that influence the distribution of income will influence migration independently, irrespective of their effect on average income, in as much as it is relative wealth and not absolute wealth that determines migration.

It is necessary to emphasize that in the models, the choice to emigrate is analyzed using a neoclassical model even though some non-neoclassical components – such as the nonhomogeneous utility of income and the utility of income that varies depending on external conditions – have been added. In such models individuals have perfect information, are able to maximize returns, and are homogeneous – that is, they can have different characteristics initially but cannot differ in their decisional processes.

Future studies will consider not only the specific assumptions regarding what determines the choice to migrate (which is of particular interest in this review) but also the following:

- The heterogeneity of individuals, as in the work of Faini and Venturini (1993, 1994a, 1994b) – with the use of a Pareto distribution of "probability" and "possibility" of emigrating – and the work of Domenicich and McFadden (1975) on the use of random utility functions
- Uncertainty concerning the convergence of wage differentials, as introduced in the work of Burda (1993), and asymmetric information in the work of Katz and Stark
- Procedures of choice different from maximization, as examined in section 2.1.9.

2.1.5 Differences in the Utility of Consumption

Another type of theoretical work uses a utility function of an individual who attributes *greater utility to consumption* in the departure country with respect to consumption in the receiving country. Djajic and Milbourne (1988) and Hill (1987) use this assumption to explain the length of migration. Dustmann (1994) uses it in his theoretical model to interpret *remigration*: the decision to remain in the receiving country.

Such an assumption is used by Faini and Venturini (1994a) to explain the particular role played by wages (or income) in the departure country in the choice to migrate. The authors represent the utility of the potential emigrant as a function made up of two elements: consumption and a localization factor, which leads the worker to prefer to remain in the departure country – for example, with the family:

$$[U(Wi,\ fi)]$$

where W identifies the wage, f is the localization factor, and i is the area of destination (d) and the area of origin (o). It is reasonable to assume that wages in the area of destination are higher than wages in the area of departure, so we have $W_d > W_o$ and $f_o > f_d$. Migration will take place if the wage differential is large enough to compensate the worker for the loss of utility due to localization being less attractive.

Migration will take place if $U(Wd,\ fd) > U(Wo,\ fo)$. Later, the authors develop the analysis taking a first-order expansion of $U(Wd,\ fd)$ around

$U(Wo,\ fo)$ in which the condition of migration becomes

$$\frac{1-d}{d} \geq \frac{f_o - f_d}{W_d - W_o}\left(\frac{W_o}{f_o}\right)^{(1+\rho)} \tag{11}$$

The right side of equation (11) is only the marginal rate of substitution between the real wage and the localization factor; on the left side, ρ represents the distributive parameter of the CES function, associated with *f*, and $(1/1+\rho)$, the elasticity of substitution between *W* and *f*.

The important implication of equation (11) is that, as expected, the probability of migration $[(1-d)/d]$ will be much greater, the higher the income differentials $(Wd - Wo)$ are and the less unpleasant it is to be a long way from home $(fo - fd)$. But, above all, an increase in wages in the departure country (Wo) – even if accompanied by a similar increase in wages in the receiving country (Wd) so as to maintain the wage differential constant $(Wd - Wo)$ – would make the migration less likely.

The result is quite logical. Because the good, "localization," is a normal good, when income increases in the departure country, the potential emigrant will try to consume more of it; this is an example of the traditional *income effect.* Migration, when wages are increasing, will be less likely because of the reduction in the difference in wages and because of the income effect.

The authors also argue that workers are not homogeneous, and therefore it is reasonable to imagine that the probability of emigrating $([(1-d)/d]$ will have a Pareto distribution in the population. Defining *g* (the left side of (11)), *z* (the right side), and *Xo* (the lower limit of the distribution of *g*), we get (12).

$$\frac{M}{P} = X_o^{\theta} Z^{-\theta} X_1^{\varepsilon} C^{-\varepsilon} \tag{12}$$

It is also reasonable to assume that migration is conditioned not only by the probability of wanting to emigrate but also by the possibility of achieving it. If a potential emigrant wants to emigrate, he or she must have an initial endowment of resources in human capital (*A*) higher than a minimum threshold (*C*). The authors assume that the possibility of emigrating is distributed in the population according to a completely independent Pareto distribution, and therefore the probability that those who want to emigrate will have the resources necessary to achieve it will be given by the intersection of the two sets. The lower limit (X_1) of distribution *A* has been associated with a positive, but decreasing, function to wage in the country of origin $(X_1 = W_o e^{(a+bW_o)},\ a > 0,\ b < 0)$.

Therefore, it follows that the number of emigrants M as a share of the population P will be equal to 12, where θ and ε are the parameters of the Pareto distribution of the willingness to emigrate and the possibility of actually emigrating, respectively. Substituting in (12) and inserting logarithms we get expression (13).

$$Ln(M/P) = \theta LnX_o + \theta Ln(W_d/W_o) - \theta pLnWo + \theta Ln(f_o - f_d) + \theta(1+\rho)Lnf_o + \varepsilon aLnW_o + \varepsilon b(LnWo)^2 - \varepsilon LnC \quad \textbf{(13)}$$

From equation (13) the following working conclusions are drawn:

- The higher the differential between the country of origin and the receiving country, the higher the migration.
- The wage effect of the country of origin a priori will be ambiguous. On the one hand, if εa $> \theta\rho$ the increase in income in the departure country has a positive effect because it implies that a restriction on emigration has been relaxed, in that more people can now consider the opportunity of leaving the country; on the other hand, if $\theta\rho > \varepsilon a$ the effect of the increase in wages is negative because, as shown earlier, the wage increase slows migration and favors consumption of the localization good in the departure country (the income effect).
- The square of the wages logarithm has the expected negative sign ($b < 0$). The authors have carried out an empirical test on European emigration after the war and have found that the coefficient of the per-capita income logarithm has a positive sign, although it is negative for the square.

The implications to be drawn from this model are very different from those already examined.

a. The income differential is a necessary condition for migration. However, its dynamics for a given differential are determined by the trend of wages in the country of origin.
b. At low levels of per-capita income, an increase in income has a positive effect on migration because it reduces the restraint of insufficient human capital resources. Only at a later stage of development – for medium or high levels of per-capita income in the country of origin – does the growth of income slow migration and produce an income effect.
c. The implications for economic policy are reversed because policies aimed at reducing income differentials between areas of departure and areas of destination, if pursued when the difference are very high (as in very poor countries), have only the effect of reducing the potential emigrant's

human capital restraint and so encourage a larger number of individuals to emigrate and enter the foreign labor market. Furthermore, the more egalitarian growth policies are, the larger will be the number of individuals who can enter the foreign labor market. This result contradicts the conclusions of the previous model of relative deprivation.

2.1.6 Random Utility Model

Another microeconomic model that considers an individual's heterogeneity is that of *random utility*, developed by Domenicich and McFadden (1975) in their analysis of urban transport. The utility function, which individuals maximize in a traditional way, is made up of a component that reflects the representative individual's behavior and a second factor that reflects an individual's unobserved idiosyncrasies.

$$U_{kin} = V_{in} + \varepsilon_{kn} \tag{14}$$

Where U_{kin} represents the expected utility of the individual k who lives in i and who wants to emigrate to n, which forms the set of possible destinations in which there is i. V_{in} is the nonrandom element that reflects an individual's preferences, and ε_{kn} is a random variable that reflects differences in preferences due to individual idiosyncrasies.

In the case of random utility, although the error term, ε, is usually introduced into the empirical version of the models, here the error term is introduced explicitly. Thus, if we make assumptions about the distribution of the stochastic element, it is possible to get a series of models of discrete choice – namely, the probability that the individual k emigrates from i to n.

The advantage of this approach is that it explicitly models the individual's error and considers a discrete choice, the best known models of which are the logit and the probit. As suggested by Domenicich and McFadden (1975, p. 69), if it is assumed that the error has a Weibull distribution – double exponential – an extremely simple version of probability (P_{kij}) is obtained in which the individual k who lives in i chooses destination j from a possible set n (which includes i).

$$P_{kij} = \frac{e^{V_{ij}}}{\sum_{j=1}^{n} e^{V_{in}}} \tag{15}$$

This model not only inserts an individual's heterogeneity into the choice to emigrate and models this choice in a discrete way, but also it has the advantage of inserting different possible destinations into the choice. In this way, the analysis is no longer limited to bilateral mobility. The possibility of using such a model empirically is conditioned, however, on the availability of appropriate individual data.

2.1.7 The Option to Migrate Model

Burda (1993), in contrast, tries to link the choice to migrate to the research done by Dixit (1992) on the *option value*. The models of option value can be extended to the choice to migrate as long as there is (a) a fixed cost, which, in a certain way, cannot be recovered, (b) an uncertainty that is revealed over time and that cannot be insured against, (c) the possibility of waiting and postponing the decision without paying any penalties.

As Dixit and others have shown, the return on projects in this context must exceed the *Mashallian trigger*, that is, the ex ante return has a present value of zero. This assumes that the worker has an infinite future horizon and has the possibility of earning the wage Wo in the departure country and Wd in the receiving country, where $Wd > Wo$. It is also assumed that the differential $Dt = (Wd - Wo)/Wd$ follows the trend in equation (16), that is, it is reduced to the rate n minus time changes v_t.

$$\Delta D_t = -n + \nu_t \text{ for } Wd > Wo; \quad \text{or } \Delta D_t = 0;$$
$$\text{with } E\nu_t = 0; \quad E\nu_t^2 = \sigma^2 \tag{16}$$

In a finite time horizon, wages in the departure country will converge on wages in the receiving country at the expected rate n. Ignoring savings and assuming that the worker's utility is logarithmic at wage level $U(.) = logW = w$, the differential becomes the wage log difference $D_t = W_{dt} - W_{ot}$, which approximates the instantaneous differential of utility. Furthermore, assuming that the cost of migration is to be a fixed share of utility in the departure country, f, and in conditions of certainty (that is to say, $v_t = 0$ for $t \geq 0$) the worker emigrates if equation (17) is true.

$$\frac{D_t}{d+n} > f; \qquad \text{where } d \text{ is the time discount rate} \tag{17}$$

Therefore, if the terms of drift n (the expected rate of wage convergence) increases or if fixed costs (f) increase, then the critical value of differential $\hat{D} = (d+n)f$ (the Marshallian trigger value) increases, namely raises the value beyond which migration increases utility.

Uncertainty shifts the distribution of the differential and allows waiting to increase an individual's utility. This is because if a negative shock takes

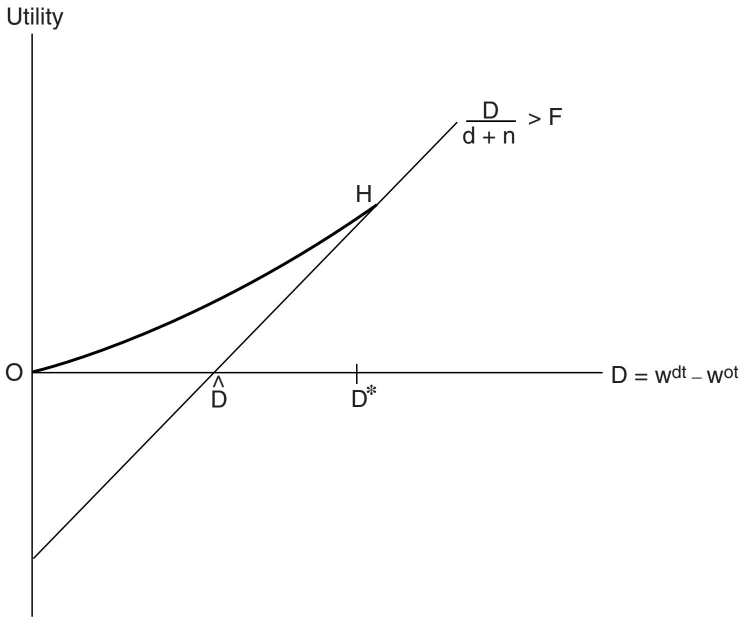

Figure 2.1. The decision to migrate and the optimal option value. *Source*: Burda (1993), p. 10.

place, the potential migrant does not necessarily incur fixed costs; while if there is a positive shock, the decision to migrate can still be undertaken.

The wage differential on which migration occurs is D^*, higher than $\hat{D}$ (the Marshallian trigger). The option value is shown in Figure 2.1 by the difference between OH and the value of the case of certainty, and it depends negatively on the discount rate d and positively on the rate of wage convergence n as well as on the variance vt (s_v^2). The greater the uncertainty, the greater will be the probability of improving the results of the decisional process. Using a binomial logistic function and a sample of 3,710 individuals, the authors estimate the willingness to emigrate to West Germany or West Berlin.

2.1.8 The Asymmetric Information Model

Another model of the choice to emigrate, developed by E. Katz with Oded Stark (Stark 1984; Katz and Stark 1986; Stark 1991), introduces into the choice to emigrate *asymmetric information* from agents, which can cause migratory flows in the opposite direction of those expected considering the wage differentials. This assumes that for a given job workers' wages depend – in a linear and positive way – on their level of skill (£) and assumes that in the receiving country the wage paid is higher ($Wd(£) > Wo(£)$) than that in the departure country. Because the worker tends to prefer the departure country, a discount factor must be applied (k positive and lower than 1) to the wage in the receiving country; therefore, the choice to emigrate will be decided by comparing $kWd(£)$ and $Wo(£)$.

The author assumes further that the wages are a linear function of skill so that

$$Wd(£) = ro + r£ \qquad Wo(£) = po + p£ \qquad ro, po, r, p > 0 \tag{18}$$

If skill £ is defined in the closed interval [0,1], it can be assumed that workers are spread uniformly within the interval [0,1]. Because it is impossible for an employer to value an individual's productivity, the firm offers the worker an average wage $Wd(£^*)$ relative to the interval being considered [0,£].

Considering the situation in which $kWd(0) > Wo(0)$ – that is, in the case of symmetric information – it is advantageous for unskilled workers to emigrate. An individual's choice can be represented graphically. In Figure 2.2a and b the solid line indicates the distribution of wages in the departure country and the receiving country, where there is symmetric information; the dashed line traces the case of asymmetric information. In case b, even though asymmetric information induces the employers to offer a wage lower than a worker's actual productivity, it does not reduce the incentive to emigrate for all levels of skill, and the migratory choice is not changed. In case a, where the two wages intersect at skill level $£_1$, the choice to emigrate is distorted and skilled workers are discouraged from emigrating. Thus, both the number and the quality of migrants is reduced.

Therefore, also in this case

> reducing differentials and adopting policies aimed at reducing the pressure to migrate through economic growth are not necessarily efficient.

On a related topic, even though he uses a purely empirical approach, T. Hatton (2001) traces the dimension and the composition (skilled versus unskilled) of the migration flows to the wage differential between origin and destination countries but above all to the relative wage dispersion. If for a given wage differential wage dispersion is relatively wider in destination countries, more skilled immigrants will arrive; but if wage dispersion

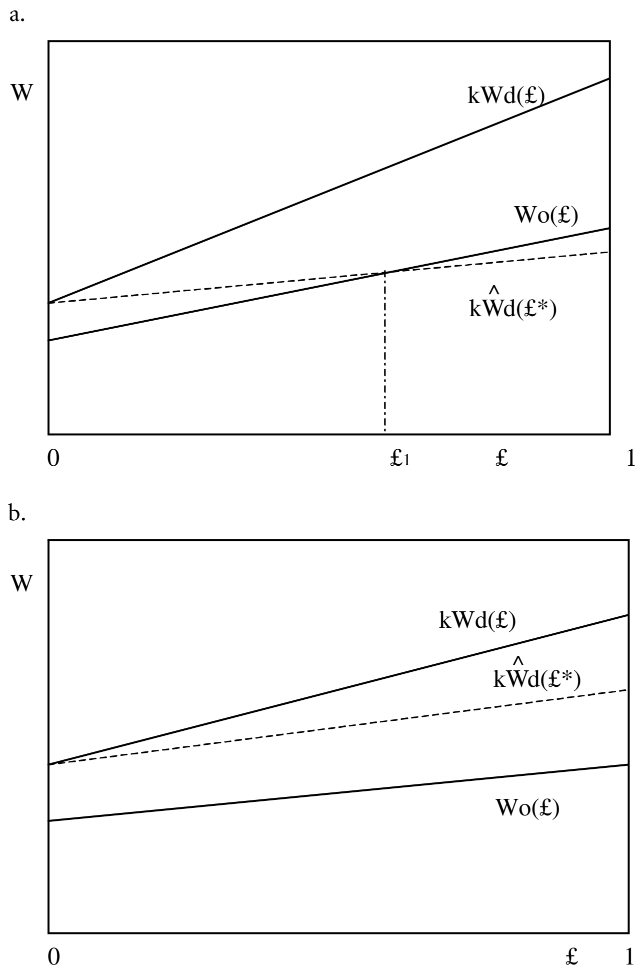

Figure 2.2. Migratory choice under symmetric and asymmetric information. £ = skill distributed between 0 and 1; Wo(£) = wage in the origin country; Wd(£) = wage in destination country discounted by a factor k. The dashed line represents wage payments at the destination under asymmetric information. *Source:* Stark 1991, p. 175

is relatively wider in origin countries, more unskilled immigrants will move.

2.1.9 A Non-Maximization Migration Choice Model

The models presented in this study describe migration as being the result of a choice of maximization. However, some researchers argue that foreigners are not in a position to choose because the little information available to them is very complex, offering a great many alternatives. This objection can be countered both factually and theoretically.

The facts show that there is a large amount of information available to foreigners. Often, they already have a contract for a potential job or a very clear idea of what their earnings will be because they have relatives abroad or because there are channels that coordinate the migratory flows. This situation is confirmed by Böhning (1984) and by Stalker (1994).

On the other hand, it might seem unlikely that individuals are aware of all the available possibilities and that they can choose from such a wide range of possibilities. It is more reasonable to assume that individuals adopt a different decisional procedure, building subsets of alternatives and deciding whether the return is sufficient. Thus, they can be considered to be *satisfying*, and not *maximizing*, agents.

This distinction, however, is semantic because an individual who is satisfying can be seen as an individual who is maximizing returns but is subject to high constraints due to the cost of gathering information. Stark's model with asymmetric information (1991) points out the erroneous consequences and inefficiency of the procedure of choice but takes information errors for granted. The procedure of making a choice is represented ex post following a maximization process without uncertainty.

Drawing on Wolpert (1966) and Speare (1974), the choice to migrate can also be interpreted as a response to *stress*. A tolerance threshold can be imagined that is made up, for example, of a certain difference between expectations, aspirations, and reality; above this threshold an individual decides to actively look for information in order to emigrate. The concept of stress was used by Speare (1974) and redefined as *dissatisfaction* in his analysis of the mobility of Rhode Island residents, interviewing 1,081 individuals in 1969. The variations in time and place regarding the links between the observed variables and their satisfaction make it impossible to extend the observed relationships to other cases.

Amrhein and MacKinnon (1985) incorporated the concept of stress in an economic context, but their approach raises further problems. They assumed that the population is divided into "movers" and "stayers." The effective number of movers who emigrate is a function of the difference in perceptions that emigrants have of their actual job and a possible job in another region. Assuming that the expected value of an alternative job is the average of jobs that a similar worker can get in other regions, it is assumed that an emigrant can calculate such a value without making a mistake. However, some individuals will be risk averse, so some will move only if the differentials are very high, whereas others will move whenever the differentials are positive, as in the case, for example, of people who are unemployed.

The exact calculation of the sum of emigrants is based on the concept of stress. The level of stress (β_i^{kl}) for an individual i who lives in k and is thinking of emigrating to l can be calculated in the following way, where a_{ij}^k represents the nonwage benefits that the individual type i derives from work type j in the region k, and s_{ij}^k represents the wage that the individual type i earns in work j in the region k. The sum represents the whole benefit for the individual i of the job j in k, and this is compared with the average wage of a possible job that individuals of type i do in l, and it is obtained by dividing the wage bill by W_i^l for the number of individuals of type i in region l.

$$\beta_i^{kl} = \frac{\left[\sum_{j=1}^{N}\left(a_{ij}^l + s_{ij}^l\right) / W_i^l\right] - \left(a_{ij}^k + s_{ij}^k\right)}{\left(a_{ij}^k + s_{ij}^k\right)} \tag{19}$$

The percentage of individuals of type i who emigrate from k to l (P_i^{kl}), given a saturation level a at which all movers would emigrate, will be equal to 1 if the level of stress is equal to or higher than a, and will be less than 1 if the stress level is positive and less than a.

In this model the percentage of movers and stayers in the population is specified exogenously, and the saturation level can be higher or lower depending on how much the population is averse to risk. Amrhein and MacKinnon continue their analysis with a simulation of ten cases in which the stationary state or chaotic results are quickly reached.

However interesting and different this version of a choice is from the traditional maximization model, it does not offer a fruitful line of analysis. Because many terms are based on exogenous data and perfect information as well as on the ability of the individual to compare different incomes in both the departure area and the receiving area, it is no more illuminating than previous models. Also, Burda's study (1993) can offer an interpretation of the choice to emigrate based on stress. Recalling the previous discussion, the models with options of waiting imply that migration can respond to information that leaves the observed variables constant; therefore, migration as a response to stress can mean that the waiting option value is reduced when new information is received.

2.2 COMMENTS ON AN EMPIRICAL VERSION OF THE ECONOMIC MODEL

The survey in section 2.1 highlights some of the efforts economists have made in their attempts to offer an interpretation of the choice to migrate that goes beyond the traditional process of maximizing one's own utility and the potential emigrant's simple calculation of income differentials between two areas in order to decide whether to invest in migration. As this partial overview shows, the effort has been substantial and extremely varied. Some of these studies have concentrated on specifying alternative causes of the choice to migrate, whereas others have concentrated on defining different decisional processes.

The implications of these works in terms of economic policy are often contradictory. For example, Faini and Venturini (1993, 1994a) find that a policy of egalitarian growth (in countries with low per-capita income) encourages migration, whereas an interpretation in terms of relative deprivation (Stark and Levhari 1988) suggests that such a policy would discourage it. Only empirical tests can settle these contradictions.

Together, these models try to present the choice to migrate in a broader picture of the income differentials and so question the belief that growth policies reduce migratory pressure. It is very difficult, however, to test these models. To test the assumptions empirically, it is necessary to carry out individual interviews or ad hoc surveys; data should be collected, or at least individual panels of data consulted.

Stark's model, which assumes relative deprivation or family choice under conditions of uncertain agricultural income, is an example in which it is necessary to gather details about the distribution of income and the expected trend of agricultural income. But the latter case shows how basically the differential in expected income is at the center of the choice to migrate and how the significance of this variable at an empirical level does not necessarily lead to a traditional model such as Todaro's. Some of these models describe a different decisional and economic context and suggest that expected income differentials are due to different causes, thus implying different economic policies.

For example, Katz and Stark suggest that the cause of expected income differentials is the impossibility of insuring against uncertain agricultural income. Therefore, the implications for economic policy do not favor a reduction only of income differentials but also of the expected income, which depends on easing and insuring credit.

Not all models can be so easily adapted to a version of expected income differentials, and other ways of interpreting the facts – such as asymmetric information or relative deprivation – cannot be traced in the information available about the flows of emigration from the southern European countries.

Unfortunately, individual data do not exist in the southern European countries; there is only aggregate data about the gross flows of emigration.[6] Because only this source of information is available, it is necessary to renounce possible tests that take into account the composition of the family and background in the area of departure. For this reason, only average or aggregate variables are used.

It is necessary to emphasize again that it is not the economic approach that is limited to examining the expected income differential as a function of the choice to emigrate. But it is the empirical version which is constrained by what data is available.

The theoretical reference that is used in this study is the well-known Todaro model (1969). In this model, migration (*Mod*) from the area of origin *o* to the area of destination *d* will take place only if the expected income differential is positive. Such a theoretical reference was used by T. Straubhaar (1988) in his estimates of emigration from the southern European countries, by Molle and van Mourik (1987) in their analysis of migration inside Europe, and by Hatton (1995) in his estimate of English emigration in the nineteenth century, as well as by other authors.

The empirical model can be found in section 2.1.2 of the previous review.[7]

2.3 THE GRAVITATIONAL APPROACH TO MIGRATION

The gravitational approach was first used to analyze mobility between two areas by Ravenstein in 1885. He elaborated a model in which mobility is the

[6] The most appropriate data that can be used to test the choice to emigrate is information about gross flows of people leaving the departure country. Gross flows are preferred to net flows, which are a better proxy of the success of the migratory process.

[7] The empirical version is derived as follows:

1. $Mij/Pi = (Yj\ Uj)/(Yi\ Ui)$ where $M/P > 0$ if $YjUj/YiUi > 1$
2. $Ln(M/P) = Ln(Yj/Yi) + Ln((LF–N)/LF)j - Ln((FL - N)/FL)i$
3. $Ln(M/P) = Ln(Yj/Yi) - N/FLj + N/FLi$
4. $Ln(M/P) = Ln(Yj/Yi) + U/LFj - U/LFi$

Where M, FL, and P mean, respectively, emigration flows, labor force, and population, N and U mean employed and unemployed workers, and i and j mean origin and destination countries.

result of two forces of attraction consisting of the population in the receiving country and in the departure country and a decelerating force represented by distance.

This approach differs from later models because it uses aggregates and is very often atemporal. The model has its own physical logic; the larger the number of individuals in the area $i(Pi)$ and the higher the number of individuals in the area $j(Pj)$, then the greater the flow of individuals who move from i to $j(Mij)$. This flow will be decreased by the distance between i and $j(Dij)$ and increased by factors of attraction (A) in j or expulsion (B) in i. This model has been applied mostly to internal migration; see, for example, Munz and Rabino (1988) in the case of Italy, or Salt and Clout (1976) in the EU area. It has been used less to analyze international migration.[8] It has been rediscovered[9] by Hamilton and Winter (1992)[10] and by other researchers in other disciplines.

Empirical versions of the gravitational approach to migration do not have a definite standard form, but it is generally represented as [a,b].[11]

$$\text{(a) } Mij/(PiPj) = Bi\,Aj\,f(Dij) \qquad \text{(b) } Mij = Pi\,Pj\,Bi\,Aj\,\exp(Dij) \qquad \textbf{(20)}$$

where Mij represents the net flow of immigrants from i to j; as previously mentioned, Pi,j is the population in i and j; Aj and Bi represent the factors of attraction and expulsion; and D is the distance between i and j.

The version proposed here (21) enables the results of this estimate to be compared with those of other models. It uses the rate of emigration (Mij/Pi) as a dependent variable and uses the respective rates of activity $(Fli/Pi$ and $FLj/Pj)$ as factors of attraction and the distance.[12]

$$Mij/Pi = Fli/Pi\;FLj/Pj\;Dij \qquad \textbf{(21)}$$

In this formulation the populations of the departure country and the receiving country lose their characteristic as factors of attraction (with an expected positive sign). Instead, in this interpretation of migration, the labor force assumes that role. In this formulation there are no specific factors of attraction or expulsion other than the rate of activity because (21) identifies

[8] Bianchi (1993) should be consulted here.
[9] Linnemann (1966) was the first to use the gravitational model to interpret the flows of exports.
[10] See also Wang and Winters (1991).
[11] This version of the gravitational model was dealt with by Gordon and Vickerman (1982).
[12] The gravitational model both in the case of migratory flows and in the flows of exports and imports is generally estimated in levels; there are, however, also cases (as in Linnemenn) in which the rate of exports over GNP is estimated.

a "basic" formulation of the gravitational model, which can be expanded by adding variables to subsequent models.

2.4 THE SOCIOLOGICAL APPROACH TO THE MIGRATORY CHAIN

The sociological interpretation of the choice to migrate incorporates processes of transition in society (Sassen 1988) and cannot be compared with economic or traditional regional approaches. One element, however, that is often found in such interpretations is the importance of the migratory chain as a determinant in the choice to emigrate (Massey et al. 1993). It is therefore a useful interpretative factor of the growth of migration when wage differentials decline.

The *migratory chain* approach does not claim that economic variables are irrelevant but rather that they are not sufficient – or, in some cases, necessary – to interpret the decision to migrate. Migration from i to j will take place if there are economic conditions (Zij) that favor it, and it will be conditioned by the presence of relatives, friends, and acquaintances ($Cmij$). These people represent channels of information and economic and moral support as well as a lifestyle model for migrants.

The model can be represented in algebraic form as shown next, where f and g represent two functions of an emigrant's interaction with the migratory chain and his or her reaction to economic factors.

$$Mij = f(Cmij)g(Zij) \qquad (22)$$

The most relevant problem in such an approach is to identify an adequate proxy for the migratory chain. Gould (1979, 1980a, 1980b) proposes and uses a lagged dependent variable as a proxy for the migratory chain. However, this variable creates problems because it is used to build a short-term, dynamic model. Therefore, it is not a specific variable for sociological models.

There are other reasons why lagged dependent variables are not chosen as proxies for the migratory chain. One reason is that the concept that must be approximated is not only what is remembered of the phenomenon, and sums of a number of lags (with or without the first) could be better indicators.

Another possible indicator could be the stock of foreigners in the receiving country. This kind of variable was used by Hatton and Williamson (1994), but there are many objections. For example, why should the Italian immigrants of twenty years ago influence recent immigration? They could originate from different communities and therefore not have any contacts or links with the recent migrants.

2.5 THE EVOLUTION OF MIGRATORY FLOWS

Emigration to northern European countries from southern Europe – Portugal, Spain, Italy, and Greece – after the Second World War is the subject of our analysis. As was emphasized in the Introduction, this emigration can offer indications about the dynamics of the current flows of immigrants to the southern European countries. Unfortunately, there are not enough data to conduct an empirical analysis on the same scale.

Although emigration from southern European countries presents similar patterns, national differences exist. Emigration across the Atlantic Ocean had a common raison d'être for the four countries, with flows mostly to South and North America. The large wave of migration took place between the end of the nineteenth century and the beginning of the twentieth, before the United States introduced a quota system in the 1920s. Emigration across the Atlantic recovered during the two wars, but after the Second World War, despite a decrease in the cost of crossing the ocean, it became less important than migration to the northern European countries.

These flows were mostly for economic reasons, even though some migration from Spain and Greece was also for political reasons. The most consistent flows of emigrants from Greece, Spain, Italy, and Portugal to the northern European countries took place in the 1960s and the first half of the 1970s, when economic recession hit the northern European countries and restrictive emigration policies were introduced. Later there was a resumption of migration from Italy to Germany and from Portugal to Switzerland, but at much lower levels than before (see Figures 2.3, 2.4, 2.5, and 2.6). Available data, which refer to overall annual flows from the departure country to the main receiving country, come mainly from OECD sources and the central statistical offices in the departure countries.

In the case of Greece we can draw on an unbalanced panel made up of flows to the Netherlands (from 1963 to 1988), to Germany (from 1960 to 1988), to Switzerland (from 1974 to 1988), and to Sweden (from 1960 to 1981). For Spain, we have a balanced panel made up of flows to the Netherlands (from 1960 to 1988), to Germany (from 1960 to 1988), to France (from 1960 to 1988), to Switzerland (from 1960 to 1988), and to Belgium (from 1961 to 1988).

In the case of Portugal, we use an unbalanced panel with flows to France (1960), Germany (1960 to 1989), the Netherlands (1965 to 1991),

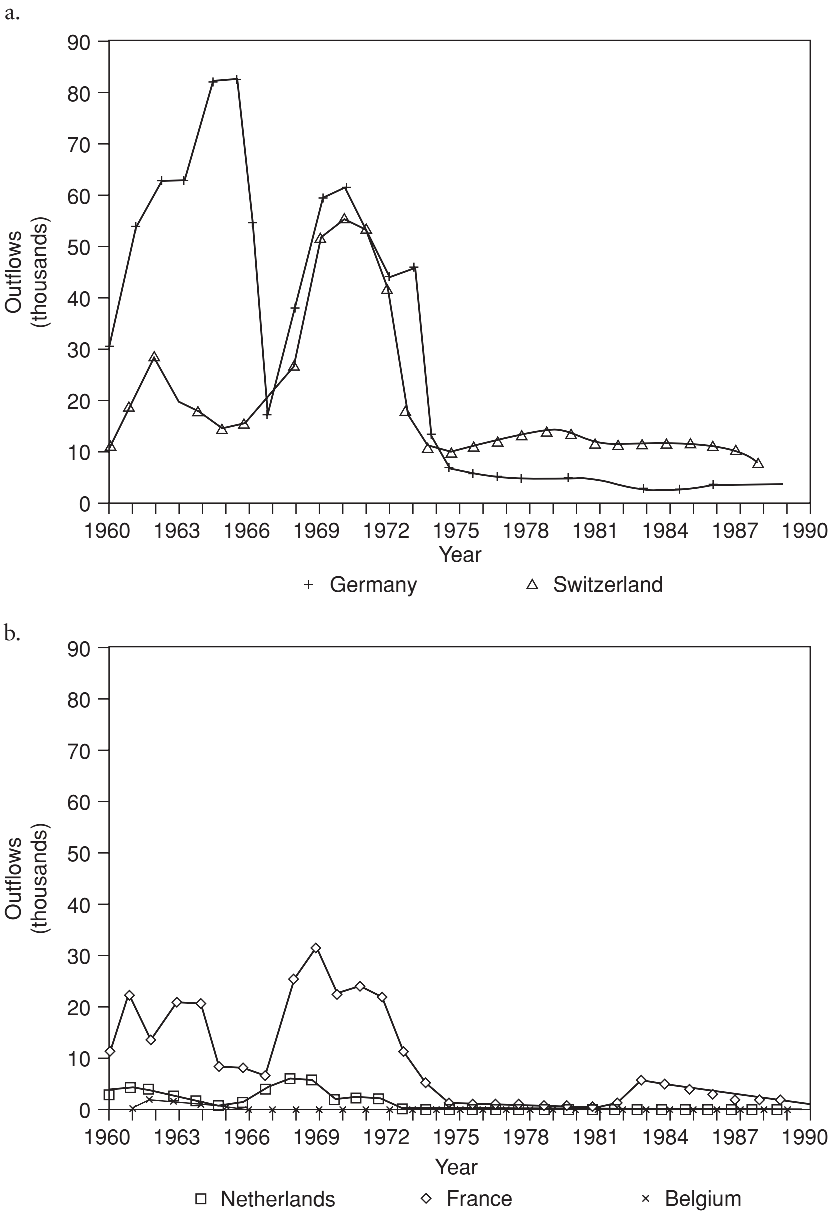

Figure 2.3. Gross emigration flows from Spain to the northern European countries.

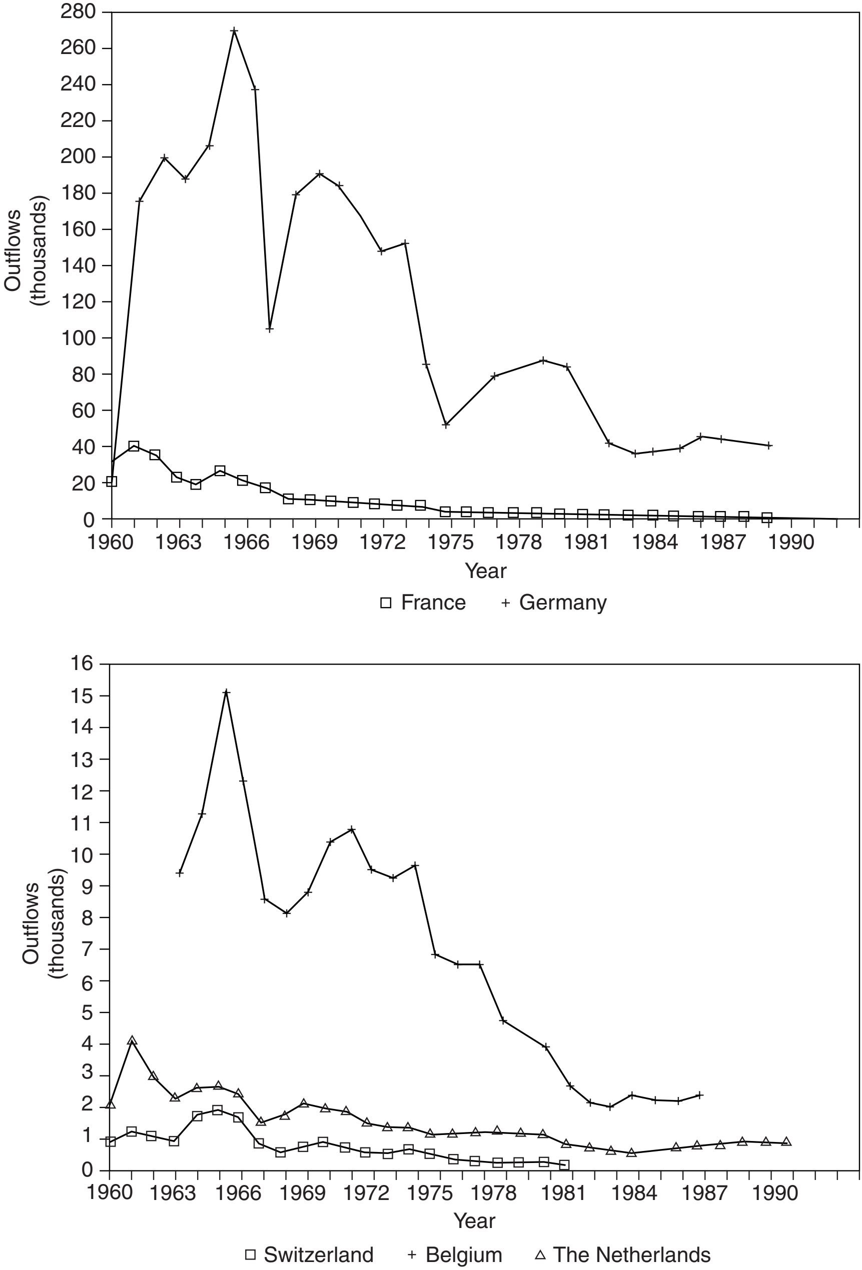

Figure 2.4. Gross flows of emigrants from Italy to the northern European countries.

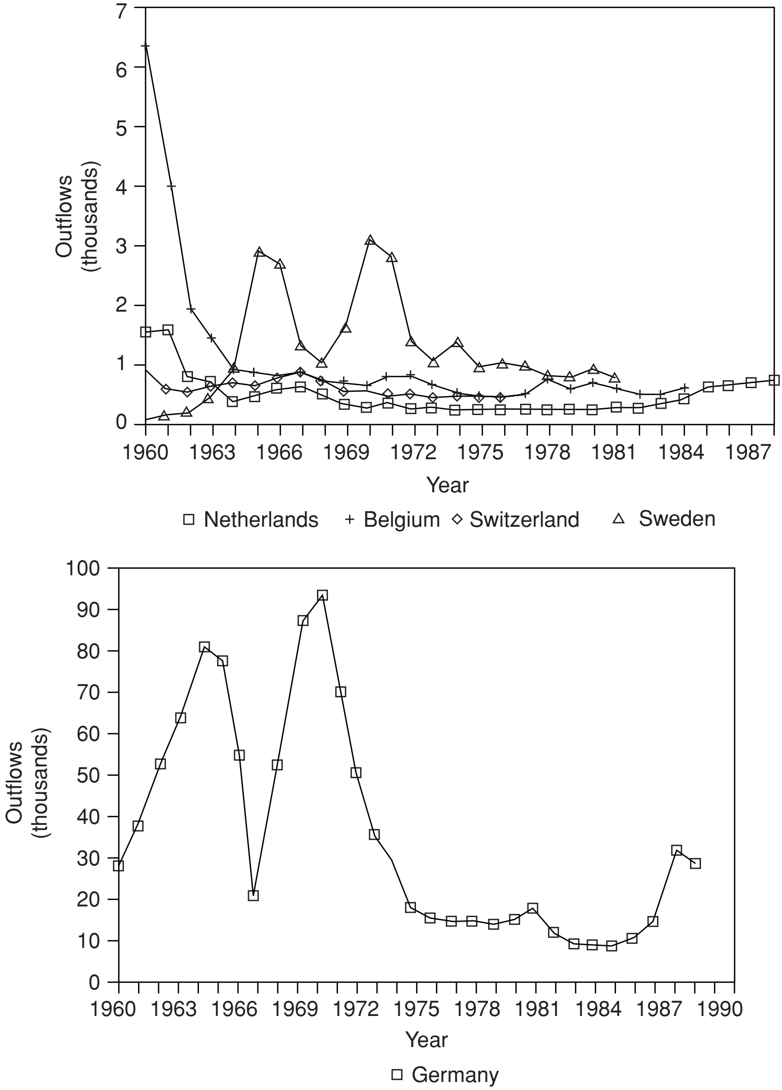

Figure 2.5. Gross emigration flows from Greece to the northern European countries.

Switzerland (1974 to 1990), and Belgium (1977 to 1987). In the case of Italy the available data are unbalanced, with flows to France and Germany (1960 to 1989), to Switzerland (1960 to 1981), to the Netherlands (1960 to 1991), and to Belgium (1963 to 1987). Other data, such as population, labor force, employment, and unemployment, are from OECD sources and were checked against national figures.

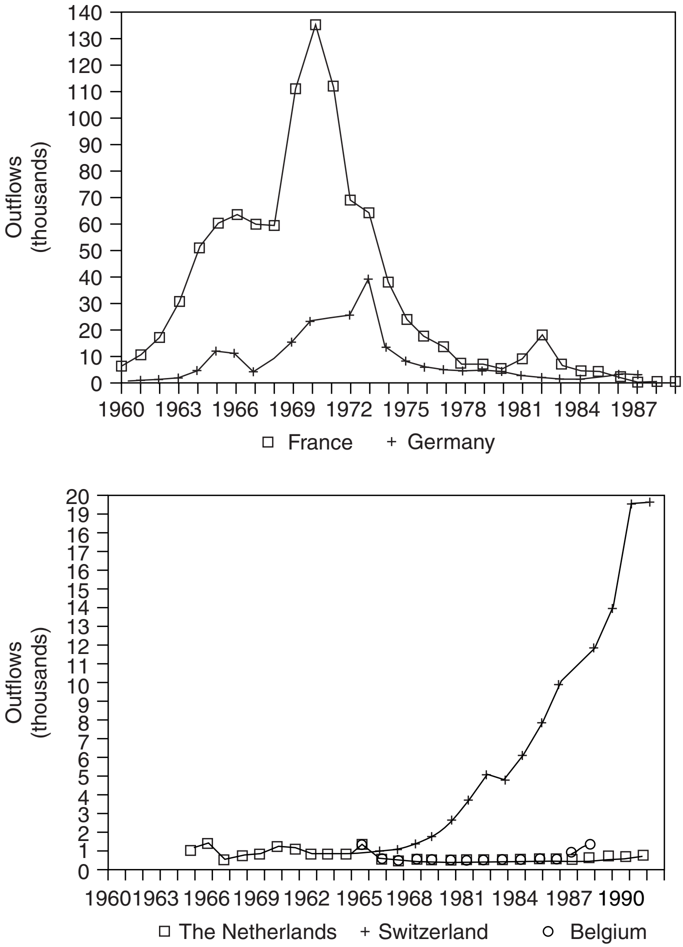

Figure 2.6. Gross emigration flows from Portugal to the northern European countries.

Distance refers to the number of kilometers between the departure area and the area of destination. For example, for Italy, where emigration was mostly from the south, the distances used were measured from a series of southern towns to the destination area.

Per-capita income was chosen instead of wages as a variable because, on the one hand, it was difficult to identify a wage level appropriate to all immigrants and, on the other hand, because studies emphasize that living standards in the destination area are an important factor in attracting immigrants. T. Straubhaar (1988) used this variable in his analysis of emigration to Germany and France from the Mediterranean countries. Choosing a real variable that provides an international comparison of purchasing power does not allow the monetary illusion to be tested; but it does not seem to be a very relevant phenomenon. However, the data we use came from Summers and Heston (1988).

The source of data regarding the stock of foreigners (or population born abroad) was derived from OECD or the emigration country's statistics, but unfortunately they cover a relatively short period. It should be noted that series were not examined for the degree of integration because in many cases the number of observations was so small as to make an empirical examination worthless. There generally seems to be a stationary trend with converging fluctuations that tend toward an equilibrium.

2.6 EMPIRICAL TESTS

The lack of empirical tests that can be used as points of reference for each single model (except for the economic model) and for the countries considered means that it is necessary to use an unusual procedure. We first tested each single model – gravitational, economic, and sociological – and than we tried to reconcile them.

The traditional procedure of passing from the general to the specific, even when it was done ex post, gave so many overparametrizations of the model that it was impossible to choose a useful line of statistical or economic research. Thus, we used the OLS technique of making estimates, with fixed effects and correction of the eterochedastic correlation in the coefficient estimates. Using the kind of panel available with five or six destinations and about twenty-eight observations for each destination, estimates are not appropriate in first differences but are appropriate in levels. For a high number of temporal observations, the estimated coefficients tend to be similar to the actual ones (see Urga 1992 and Nickell 1981).

2.6.1 The Gravitational Model

As emphasized earlier, the version of the gravitational model considered here is subject to empirical tests and refers to the basic structure of the model. To the equation (21) we can add further variables of attraction to the area of destination and of expulsion to the area of departure. However, the more variables that are added to the basic model, the more spurious it becomes and the more difficult it is to distinguish one from another.

As shown in Table 2.1, the migratory flows that seem to adapt better to such an interpretation are those for Spain, which show the highest Rsq (0.62).

Table 2.1. *Gravitational model*

Country	C	LFo	LFd	LDod	LDodSq	Rsq	n	F	Chow	T.Et.	LM
1 Portugal	7,105**	−10**	6.1**	−1,861**	121**	0.54	96	29**	6	10	69
	(4.8)	(−4.4)	(4.5)	(−4.8)	(4.8)						
1 Spain	6,336**	45**	22**	−1,716**	117**	0.62	144	61**	9	0.8	103
	(9.4)	(8)	(12)	(−9)	(−9.3)						
1 Greece	86**	4.2	2.7**	−10**	–	0.25	117	13**	5	26	99
	(5.3)	(1.5)	(2.3)	(−5)							
1 Italy	30**	0.5	0.18	−4**	–	0.37	166	33**	6	16	150
	(7.8)	(0.2)	(0.2)	(−12)							

C = constant,
Dependent variable: Emigration rate logarithm,
LFo = activity rate log of origin country, LFd = activity rate log of departure country,
LDod = distance from departure-destination country log, LDodSq = distance squared,
T.Et. = eteroschedasticity test of squared fitted values, Chow = test of constant parameters,
F = test of coefficients other than zero, LM = test of autocorrelation of residuals,
n = number of observations; t statistic of the corresponding variable in parentheses, ** 99% significant, * 95% significant.

In an earlier work on Spain, Bianchi (1993) also got Rsq levels of around 50%. The chosen specification considers the log variable of distance (*LDod*), its square value (*LDodsq*), and the variable of attraction, which is made up of the logarithm of the activity rate in the country of origin (*LFo*) and the destination country (*LFd*). All the variables are significant, with the expected sign indicating that the effect of distance decreases as the distance between the country of origin and the destination increases, as is to be expected, and that the two poles of attraction are well represented by variations in the labor force. If economic variables, such as per-capita income, are included as factors of attraction and expulsion, the overall results are not improved. The economic variables are not significant even though they have the expected signs. The gravity variables – the coefficients and the significance – remain more or less unchanged.

In Portugal, too, the data seems to fit well to such a specification. All the variables are significant, and the distance and its square have the expected signs; the former is negative, and the latter is positive. However, the two "mass" variables – the rate of activity in the departure country and that in the destination country – are both significant; but the destination one is positive and the departure one is negative. The structure of the gravitational model is such as to expect positive signs for both variables, and a negative sign for the activity rate in the departure country suggests that these variables play an improper role as expulsion and attraction factors. If a dummy is inserted for the years 1960–73, it is significant and positive; the activity rate in the departure country has a positive sign, but it is not significant. This shows that the gravitational specification adopted does not correctly allow for the evolution of the migratory phenomenon in Portugal.[13] Such a specification would have been preferred if the 1960–73 dummy also allowed for the structural change of outward flows in the other empirical versions of Portuguese migration, but it does not.

Inserting the economic variables of attraction and repulsion as per-capita income in the destination and departure countries does not improve the results. The two variables are not significant, and both have positive signs without the signs for the gravitational variables being changed.

In the case of Greece, the very small Rsq shows that this interpretation does not clearly reflect the variations in the migratory phenomenon; the rates of activity in the destination and departure countries have the expected positive signs, but only the former is significant. The distance variable is significant and has the expected negative sign, but its square is not significant; in fact when it is introduced, the linear variable also becomes insignificant. This result is surprising because Greece is far from all the destination countries, and it would be logical to expect distance to exert a smaller effect once an emigrant is in continental Europe. However, this result probably can be explained by the fact that the migratory flow from Greece is concentrated in Germany, which is also the nearest country.

In this case, introducing economic variables of attraction and repulsion improves the regression Rsq, but the results are not as expected. Income in the departure and destination countries is significant, but the signs are the opposite of what was expected: positive for Greece and negative for the destination countries. The mass variable given by the activity rate in the country of origin is again not significant, but the sign changes. The signs for distance and activity rate in the destination country are significant and are as expected. Overall, therefore, the economic gravitational model does not offer acceptable results.

If the gravitational approach offers very little insight into the Greek case, it offers even less when applied to Italian emigration. Italian emigrants went initially east to France and then to Belgium, later to Germany, and finally

[13] This version would be preferred if the 1960–73 dummy had been introduced when the the other models of the phenomenon were specified.

	C	Lfo	LFd	LDod	LdodSq	D73	Rsq	F	n
1Po	6908	1.29	6.1	–1807	118	1.4	0.55	25	96
	(4.8)	(0.2)	(4.5)	(–4.8)	(4.8)	(1.9)			

to Switzerland only because it was outside the EU. The model performed poorly. In addition, Italian emigration has an older tradition than that of the other Mediterranean countries. In the period 1960 to 1973, flows into France decreased, and those into Germany and Switzerland increased – without, however, there being any clear geographic pattern. If the square of the distance is inserted, the variable changes sign and makes the mass variables significant, too, offering a contradictory interpretation of the phenomenon. In other words, this highlights the fact that the most important destinations are those farthest away. This is probable because such destinations offer better chances of getting an income. Similarly, if Sweden is excluded from the destination countries, the distance variable takes on a positive and significant sign, showing that distance does not allow for economic and cultural distance. Inserting a time dummy for the 1980s makes the coefficients more significant in this case, but not significant enough. Inserting an interactive dummy for the 1980s for the economic variables does not provide a better result, even though it reduces the significance of the dummy for the years 1980–88.

The variables of the basic gravitational model improve if we insert income in the departure and destination countries and their square. The activity rates in the two countries take on the role of proxies of the labor market as the coefficient of the activity rate in the departure country is negative and in the destination country is positive.[14]

The gravitational model, excluding Spain, is not really appropriate for analyzing mobility – or, more specifically, international mobility – in cases where historical and linguistic relationships are more important than geographic distance, and where immigration regulations and directly contracted labor mobility play an important role. This is also true for periods such as the 1970s, when some countries adopted restrictive immigration policies.

However, the biggest problem with this specification and estimate is that the mis-specification is revealed by the high correlation of residuals (*LM*), and corrections have been tried in two directions. The first, already described, is to insert economic variables, which can complete the model by supplying factors of attraction and expulsion; but this, as already stated, does not improve the results. A second correction is to insert lags into the explicative variables (of the basic model); but again in this case there are not

[14]

C	LLFI	LLFD	LYI	LYIsq	LYD	LYDsq	LDI	Rsq	F	n
91	–17	13	–106	6.8	160	–9.6	9	0.68	52	66
(–1)	(2.8)	(12)	(–2.4)	(2.5)	(8.2)	(–8.8)	(–23)			

any substantial improvements: The Rsqs increase slightly, and for Greece and Italy they are not more than 40%. The lagged variables are not often significant, as in the case of Portugal. Sometimes, they are the only ones that are significant, as is the case for Spain. On other occasions they have the opposite sign irrespective of whether the nonlagged variables are significant, as in the case of Greece and Italy. But above all, the residuals are still highly correlated.

2.6.2 The Economic Model (Human Capital)

The statistical tests are improved immediately when we pass from the gravitational model to the economic one. This is especially true for Rsq (excluding Portugal, where the same value is obtained), but this is due not so much to the economic variables as to the improved specification with fixed national effects. The distance variable in the gravitational model, which excludes the use of a fixed effects model, does not allow for such differences.

The specifications use the log of purchasing power per-capita income differential (*LDIF*) and a proxy for the labor market in the departure country (*Uo*, *Eo*) and in the destination country (*Ud*, *Ed*), where the level of unemployment and the rate of increase in employment are used, with the best specification being given for each country.

As mentioned earlier, we use the per-capita income variable instead of wages because, on the one hand, it is difficult to identify a typical wage level for all immigrants, and, on the other hand, many studies highlight how the standard of living in the destination area is the magnet for emigration. This choice was also made by T. Straubhaar (1988) in his analysis of the role of emigration to Germany and France from the Mediterranean countries. The choice of an actual variable of purchasing power parity, which can be compared internationally, does not allow researchers to test whether there is a monetary illusion effect. P. T. Pereira (1994), however, in his study of Portuguese emigration over the same period, was not able to find such an effect.

The results (Table 2.2) reveal the good performance of the labor market variables and per-capita wage differentials for all the countries considered, with two exceptions. In Portugal, the proxy variable for the domestic labor market trend – the rate of growth of employment – is not significant, and in Greece the proxy – the level of unemployment – is significant but does not have the expected sign.[15]

[15] Straubhaar (1988) had already found that the labor market variables for Greek emigration to Germany were not very significant.

Table 2.2. *Economic model of human capital*

	C	LDIF	Eo	Ed						Do	Db	Dg	Dsv	Rsq	n	F	Chow	TEt	LM
2Po	−1.8	2.2	.6	9.9						−3.1**		−1.2**	−2**	.54	96	19**	2.5	9	73
	(−1.3)	(1.8)	(.13)	(1.9)						(−5)		(−3.4)	(−3)	(−10)					
	C	LDIF	Uo	Ud						Do	Db	Dg	Dsv	Rsq	n	F			
2Sp	−1.3	3.2*	.05*	−.06*						−3.6**	−4.9**	0.3	−2.4**	.85	139	115**	6	13	77
	(−1.7)	(2.2)	(2)	(−9)						(−8)	(−10)	(.9)	(−3)						
	C	LDIF	Uo	Ed						Do	Db	Du	Dsv	Rsq	n	F			
2Gr	−.2	2	−.07**	6**						−4.2**	−3.3**	−3.7*	−4.2**	.86	117	105**	1.4	5.7	62
	(−.3)	(2.4)	(−3.6)	(2.3)						(−24)	(−16)	(−16)	(−22)						
	C	LDIF	LDIF80	Eo	Eo80	Ed	Ed80	D80	Df	Do	Db	Du	Dsv	Rsq	n	F			
2It	−.18	2.9**	−2.8**	−12**	10	11**	−10**	−.09	−.10	−4.2**	−2.7**	−5.4**	−1.9**	.96	166	343*	9	2.5	43
	(−.9)	(3.8)	(−3.3)	(−3.5)	(.7)	(3.9)	(−3)	(−.7)	(−.9)	(−47)	(−19)	(−49)	(−5.8)						

C = constant.
Dependent variable: Emigration rate logarithm.
LDIF = per-capita income differential log receiving country over country of origin, Eo, Ed = level of increase in employment in the receiving country and the country of origin, Uo, Ud = level of unemployment in receiving country and country of origin.
Do = dummy for Netherlands, Db = Belgium, Dsv = Switzerland, Df = France, Dg = Germans for Spain and Portugal, Du = Sweden for Greece and Italy.
The constant for Italy and Greece is Germany; for Spain and Portugal, France.
Statistics: Rsq, n = number of observations, F = test of coefficients other than zero, t statistic under the corresponding variable. TEt = heteroschedasticity test of squared fitted values; Chow = test of parameter constants, LM = test of autocorrelation residuals, ** significant at 99% and * significant at 95%.

From the beginning, we saw that different specifications were needed for Italy. The country was in a more advanced stage of emigration, and the interactive dummies turned out to be efficient, managing to neutralize the significance of the 1980s dummy.

The elasticity of the emigration rate related to the wage differential appears to be very similar in the four cases. It varies between 2 and 3%, and this means that if the per-capita income differential grows by 1%, there will be a 2–3% increase in the emigration rate. The coefficient for the growth rate of employment is greater than for the rate of unemployment, but this difference can be explained by the different units used for measuring the labor market variables. If employment in the destination country increases by 1%, the resulting increase in the emigration rate varies from 9% in Portugal to 6% in Greece to 11% in Italy; if the employment rate increases by 1%, emigration from Spain decreases by 0.06%.

The constant is not always significant, and it identifies France as the most important destination country for Spain and Portugal, and Germany for Greece and Italy. The dummies for other destinations are significant in most cases, and they can be identified as Do, the Netherlands; Db, Belgium; Dsv, Switzerland; Df, France; Dg, Germany for Spain and Portugal; and Du, Sweden for Greece and Italy. Statistical tests reveal the problems already mentioned: slight heteroschedasticity and auto-correlation of residuals.

To correct some of the uncertain specifications, definitions have been changed, and time dummies and lagged variables have been introduced. The specification, which uses the logarithm of the per-capita income in the departure country (*LYo*) and in the destination country (*LYd*) as the two variables instead of the differentials, gives worse results in all four cases. In the case of Portugal, the two variables are never significant; for Spain and Greece, wages in the departure country are not significant, whereas wages in the destination country are always significant but their sign is the opposite of what is expected.[16] In the Italian case, only the definition with interactive dummies for the 1980s gives results that conform to what the model predicts.

The introduction of a time variable dummy for the post-1974 period makes the results worse. The time dummies that identify a period during which there was a restrictive migratory policy are not often significant or are strongly interrelated with the variables for income or the labor market

[16] Straubhaar (1988) reveals that per-capita incomes in the destination and departure countries are not significant and that the differentials are significant. It is different for emigration from Italy and Greece, where the per-capita income for the departure country is significant but for the destination country it is not significant.

in the destination country. The reason is quite simply that when restrictive migratory policies are introduced at the beginning of an economic recession, the economic indicators in the destination country will have already identified a change in conditions.

Introducing interactive dummies for income variables for Spain, Greece, and Portugal does not improve the results.[17] The significance of the 1980s dummy in the Italian case shows how the economic model of migratory flows can be made significant. Interactive dummies have been inserted both for income differentials and for variable proxies for the growth of the labor market. The size of the coefficients of the income differentials shows that in the 1980s such an attraction factor has lost weight, as has also happened for the growth rate of employment in the destination country (*Ed*), whereas the growth rate in the departure country (*Eo*) kept its interpretative value in the 1980s. In the Italian case the level of unemployment did not prove to be a good proxy of the tensions in the labor market, probably because high unemployment is often limited to the least mobile workers.[18]

It is necessary, however, to acknowledge that in the Italian case, introducing dummies into the economic model improves the results. But it indicates that it is inadequate to interpret the dynamics of the migratory phenomenon, and extraeconomic elements are needed to understand what happens.

Finally, lagged economic variables were inserted, but they did not turn out to be significant in Italy or Spain. No variable is significant in Portugal, and in the case of Greece only the rate of growth of employment in the destination country is significant, but in all other cases there is still autocorrelation of residuals.

2.6.3 The Migratory Chain Model

As stated earlier, the empirical version of the model of the migratory chain considers the economic variables – which, however, are not considered sufficient – as well as a proxy variable of the migratory chain.

[17] In his study of Portugal, Pereira (1994) uses, for the country of origin and the destination country, two real income variables that are weighted for the probability of finding a job and interaction dummies for the post-1974 period. His findings show contradictory signs for the wage variables (weighted for the probability of finding a job). Wages in the area of origin are not significant until 1974 and then become significant, indicating a wealth effect, in which the higher wage allows individuals to finance migration. In the case of wages in the destination country (weighted for the probability of finding a job), the variable multiplied by the post-1974 dummy is not significant, and the coefficient is unique and positive. The specification also contains other expected wage variables for three periods and for the stock of immigrants.

[18] Introducing an interactive dummy for the 1980s does not improve the results of the gravitational model for Italy.

It is not easy to find a suitable proxy for the concept of a migratory chain. Previous debate suggests two lines of approach. One is to use *lagged dependent variables* (one or more years, or other combinations) and the *stock of foreigners* of the same nationality legally resident in the destination country. The following tests were carried out to settle some of these doubts.

The possibility of building a variable proxy of the migratory chain using lagged dependent variables was examined. A study of the lags concluded that in the case of Spain and Italy, only the dependent variable lagged one year is significant, and in Greece only the first and second lags are significant. In Portugal the second lag is often significant, but when it is significant, it has a negative sign.

This result means that a composite variable that excludes the first lag – so as to avoid being similar to traditional dynamic models – and adds various lags after the first lag gains more significance as fewer lags are added (the Rsq statistic and t increase). A similar result is obtained when lags are added to the lagged dependent variable only once. Such a result is to be expected because insignificant components are added to the variable.

Given the difficulty of building a migratory chain variable that does not contain the lagged dependent variable at least once, we attempted to identify to what degree the lagged dependent variable makes up a proxy of the lagged economic model or, instead, to what degree it is a proxy for the memory of the migratory phenomenon and therefore factors such as the migratory chain or others are not modeled.

Two models have been compared: a static economic model with a lagged dependent variable (1), and an economic model with lags (2). X represents all the economic variables that were used for the various countries in the specifications described earlier in Table 2.2.

1. $$(M/POP)t = \alpha_1 C + \beta_1 Xt + \gamma_1 (M/POP)_{t-1} + \in_1$$
2. $$(M/POP)t = \alpha_2 C + \beta_2 Xt + \gamma_2 X_{t-1} + \in_2$$

The J test used to compare "nonnested" models gives the expected results: Model 1 is preferred to model 2. The coefficient of fitted variables from model 2 (Fit2) inserted into model 1 turns out to be not significant, whereas the fitted variable from model 1 (Fit1) inserted into model 2 is always highly significant.

J test nonnested models	Portugal	Spain	Greece	Italy
t statistics of Fit2 in model 1	–0.3	1.7	0.36	0.6
t statistics of Fit1 in model 2	18	13	11.7	14.7

Such a result was to be expected because it was obvious that the lagged dependent variable was better and because coefficients of the lagged economic variables were not very significant. In the Portuguese case, the estimates for model 2 do not reveal any significant variables. In the Spanish case, the lagged variables were never significant and sometimes had the opposite sign of what was expected. It was the same for Italy, whereas for Greece only the lagged variable for the labor market in the departure country was significant.

The importance that should be given to the lagged dependent variable is crucial if the models are to be distinguished, and it appears that in the case being considered it can be stripped of its economic content and, there being no other specification, it can be used to interpret the migratory chain.

In addition, model 1 has been compared with the lagged gravitational model (3), where z identifies the variable in the base model. The J test suggests that model 1 is better and that the lagged dependent variable does not even represent a dynamic version of the gravity model.

3. $$(M/POP)t = \alpha_{3C} + \beta_3 Z_t + \gamma_3 Z_{t-1} + \in_3$$

J test nonnested models	Portugal	Spain	Greece	Italy
t statistics of Fit3 in model 1	1.6	0.54	–1.6	–1.3

Now let's consider the *stock* variable. We have chosen the stock of foreigners (the foreign population) of the same nationality and not, for example, only workers. This is because the size of a community of origin in the destination country is a factor that can attract immigrants. It is a source of information, and it reduces the costs of making the choice to emigrate. Pereira (1994) used such a variable in his study of Portuguese emigration, and Antolin (1992) included it in his specification for Spanish emigrants returning home.

The stock variable is not simply a sum of entry flows because it is affected by the outward flows of immigrants returning home, moving to another country, acquiring the citizenship of the country in which they reside, and so on. There is less information available regarding the stock of resident foreigners than for other variables. There are 64 observations for Spain and Italy, 60 for Greece, and 45 for Portugal, compared with 114, 166, 117, and 96 for the other variables. Data about the stock of Spaniards in Belgium, Greeks in Sweden, and Italians and Portuguese in France are not available, so Germany replaced France as the constant.

The introduction of a variable representing the migratory chain (*MC*) into the economic model is anything but automatic because such a variable allows for autonomous dynamic factors, which can render redundant variables that were previously important or even indispensable to model the dynamism of migration.

The empirical test of the migratory chain model offers two specifications for each country of origin. The case of the lagged dependent variable will be examined first.

Lagged Dependent Variable

Introducing the lagged dependent variable improves the explicative powers of the economic model by causing the Rsqs to increase substantially. The coefficient of the lagged dependent variable is high, but except for the very high value (0.9) for Portugal, it settles at around 0.7.[19]

The income differential is significant in all the specifications. The variable for the rate of change of employment or the unemployment rate in the destination country is also significant. The proxy for the labor market in the departure country is not significant in the Greek case, and it is only slightly significant in Spain, Portugal, and Italy. In the Italian case an income dummy for the 1980s and an interactive income dummy for the 1980s have been introduced in order to get a satisfactory specification.

The introduction of a migratory chain variable changed the effects of the economic variables. If previously the elasticity of the income differential was very similar in the various countries, now it decreased to values near 1 in Italy, Greece, and Portugal. And in only one country, Spain, did it increase (to 4%).

The emigration rate is more responsive to changes in the labor market in the destination country in all versions. Where the coefficients can be compared, the coefficient is higher in Portugal and Greece, whereas in Italy and Spain the proxy variable for the labor market in the country of origin is not significant.

In the case of Portugal, both the constant (Germany) and the other fixed effects are not very significant. The constant in Greece is again Germany and is not significant, although the dummies for all the other destinations

[19] For the same period, P. Antolin (1992) analyzes Spanish emigration flows to Germany and France using a detailed specification in which he uses an index for house prices, the rate at which differentials change, the unemployment differential, disposable income differentials, the rate of change of unemployment in Germany and France, the level of interregional migration, and dependent variables lagged one period, which has a very low coefficient of 0.3.

are significant and are all negative. In Spain the constant is France, and it is significant, as is also the case for the dummies, which are all negative and significant (except for the one for Germany, which is not significant). In the case of Italy, the constant, Germany, is not significant, whereas all the others are significant and negative, except for France, which is positive and not very significant, indicating substantial differential effects. Inserting the 1960–74 dummy in the other cases does not improve the results and, in fact, the variables for the destination country are made worse.

A hypothesis that seems reasonable and must be tested empirically concerns the migratory phenomenon. Until 1974 it seemed to be driven by economic variables; then, after the economic recession, economic pressure to migrate decreased, and the migration phenomenon was driven by the migrant chain. A lagged dependent variable and its dummy were inserted into the specification, the dummy being the product of the variable itself with the value 0 until 1974 and 1 thereafter.

The introduction of this new dummy was expected to reduce the coefficient of the lagged dependent variable for the whole period, and to have a positive coefficient after 1974. The result was not what was expected in the cases of Spain and Portugal, for the dummy has a positive sign but is not significant. In the case of Greece it has a significant negative sign, and this suggests that the migratory chain plays a smaller role after 1974.

In the Italian case, a dummy for the 1980s was used, and it turned out to be positive and quite significant. In all cases the effect on the coefficient of the lagged dependent variable was very slight. It decreased in Greece (from 0.79 to 0.787), in Italy (from 0.75 to 0.73), and in Spain (from 0.77 to 0.68). In Portugal, where it was already very high, it increased (from 0.93 to 0.97), thus raising serious doubts about this interpretation.

The only country where the migratory chain explanation seems to be strengthened after the oil price increases is Italy, but it was so late in the migratory phase that it should be asked whether it reflects the phenomenon of family reunion more than the migration of workers.

Inserting the rate of lagged emigration also substantially improves the other economic specifications as we substitute per-capita income in the departure and destination countries for the differential. In the cases of Greece and Spain, income in the departure country, which previously was not significant and positive, and income in the destination country, which previously was negative and significant, are, instead, in this specification significant and have the expected signs. Among the labor market variables, the unemployment rate is not significant for Greece. In the case of Portugal, only the specification including the differentials is significant, both with and without the lagged dependent variables. In the Italian case, a dummy for the 1980s and an interactive term for income in the 1980s must be introduced into the specification with the two per-capita incomes, as was the case for the income differential case.

Above all, by including the lagged dependent variable, the statistical tests reveal the absence of autocorrelation and heteroschedasticity of residuals. The residuals remain not normal for Portugal and Italy. However, as is well known, the limited number of observations available does not justify the result being interpreted as relevant. The Chow test confirms that the coefficients are constant.

Stock of Foreign Population

Although the second specification of the migratory chain model is based on a lower number of observations, it performs better than the economic model alone. A square value was added to the stock variable, with the hypothesis that its effect decreases as the number of compatriots in the destination country increases and that there might be a level above which an increase in the number of compatriots can slow migration to that country.

Such a specification is more appropriate for the Portuguese[20] and Greek cases. In the Spanish case,[21] the square of the stock of foreigners is not significant, whereas for Italy no variable that represents the stock of foreigners is significant. The economic variables remain significant in all the specifications, except for the labor market proxy in the departure country, which is not significant in the cases of Portugal, Greece, and Italy. In the latter case, as before, interactive dummies were added for the 1980s. The version with the stock of foreign population in the destination country highlights the role played by the wage differential, which increases substantially in the cases of Portugal (7%) and Greece (5.2%); in Spain and Italy, the earlier values remain the same as in the earlier economic model.

Again in this specification of the migratory chain, the variable of the labor market in the destination country is more important than the corresponding variable in the departure country. It has a higher coefficient and is significant.

[20] Pereira (1994) also inserts the stock variable into the specification of emigration from Portugal. The multiplier dummy for the post-1974 variable is never significant, and the stock is significant only in the analysis of flows into France, contradicting the results shown in Table 2.3. This is probably because the author does not insert the square of the stock.

[21] Antolin (1992) introduces the stock variable only in the version of emigrants returning from Germany and France.

The fact that the coefficient of the stock is very small should not lead to a wrong conclusion about how important its effect is. The small size results from the high values that it assumes compared with the modest values of the emigration rates.

The introduction of the 1974 time dummy makes the results of the equation much worse. In the Spanish case it reduces the significance of the stock variable as well as alters the other income variables. And in Greece and Portugal, the significance of the destination variables is reduced.

Introducing stock variables into the other economic specifications, which include the two incomes of destination and origin, gives the same good results for Spain, Greece, and Italy. In fact, in the latter case, the stock variables are significant and have the expected signs for the level variable (positive) and for its square (negative). The income variables are accompanied by an interactive dummy for the 1980s. In the Portuguese case, only the specification with the differential is significant.

The high autocorrelation of the residuals in the specification for Portugal, Greece, and Italy raises many doubts. This indicates mis-specification but, above all, because the model with the lagged dependent variable performed well, it means that there is a lack of dynamics in this specification. It appears to be an extraeconomic and extragravity model but can be attributed to the migratory chain.

It is not possible to insert the lagged dependent variable into the model with the stock because different specifications of the migratory chain are being compared, but it is possible to try to insert a degree of economic dynamics into the specification with the stock.[22] Given the restricted number of observations for the stock of foreigners – in some cases only five observations are available – it has not been possible to insert more than one lag. The results, however, are not encouraging because the autocorrelation of the residuals is reduced, but not sufficiently in the cases of Greece and Portugal, where the lagged variables are not significant. The variable of the labor market in the destination country is an exception. The autocorrelation is reduced in Italy, where it was already low, but the stock variables are not significant and therefore the results cannot be attributed to such a model.

A specification was tried that included economic variables as well as the stock variable; its square lagged, but the results were similar. The reduction of the autocorrelation of the residuals by the insertion of lags leads to the conclusion that with a longer series, where more lags could be inserted,

[22] There is no gravitational approach in the literature that inserts the migratory chain explicitly. Because it is mainly a cross section, such a possibility was probably not considered.

better results would be obtained and they could be compared with the socioeconomic model, which includes a lagged dependent variable.

Comparing Two Specifications for the Departure Country

The limited amount of information available for the stock variable makes it difficult to compare various specifications for the same country of origin. Only in the case of Spain is the specification with the stock variable better than the one with the lagged dependent variable. In the Italian case, the lack of significance of the stock variables makes the former specification the only one worth considering.

The Spanish specification cannot easily be compared with the one used by Antolin (1992), even though it analyzes the same period, because it concentrates on Spanish emigration only to Germany and France. It also inserts variables, such as the level of interregional emigration and an index of house prices, which are not available for all countries. The employment differential and available income are two variables that are also in Antolin's study, and both have the expected signs.

Even if the lagged dependent variable is assigned to the migratory chain model, it is still a short-term, dynamic model in which the coefficients of the explicative variables are impact coefficients, in this case short-term elasticity. Long-term elasticity is obtained by dividing the coefficient by 1 minus the coefficient of the lagged dependent variable. A variation of 1% in the income differential in the short term produces an increase of 4.3% in the emigration rate, whereas in the long term, elasticity increases by about 14%. If the model with the stock identifies a long-term specification, the difference between the two elasticities would be very high – 14% compared with 3% – but the model with the stock incorporates a certain dynamic, even though it is less direct and clear-cut than that of the model with the lagged dependent variable. Thus, the comparison between the two specifications is not direct.

In the cases of the other countries, only the specification with the lagged dependent variable is acceptable. In the case of Greece, the two specifications show a not significant unemployment rate in the country of origin and a very high Rsq; but only in the first specification is there an absence of autocorrelation of residuals. In Greece and Italy, the long-term elasticity of the rate of emigration to variations in differentials is about 3%, returning to values similar to those of the static economic model (Table 2.3).

In the Portuguese case, the specification with the lagged dependent variable is much more significant than the one with the stock, and the level of employment in the country of origin has the expected sign and is more

Table 2.3. *Migratory chain model*

	C	LDIF	Eo	Ed	Lep(−1)					Do	Dg		Dsv	Rsq	n	F	Chow	TEt	LM
3.1Po	−1.5	1.4**	−3.2	7.89**	.93					−0.16	−.07		−0.15	.94	92	239**	2.5	.34	.18
	(1)	(3.6)	(−1.8)	(3)	(19)					(−1)	(−0.5)		(−1.4)						
	C	LDIF	Eo	Ed	Se	Sesq				Do			Dsv						
3.2Po	−10	7.7*	1.7	8*	.6e-4**	−.28e-9*				.5			−.5	.63	45	11**	1.6	2.2	35
	(−3.3)	(2.6)	(.23)	(2.1)	(4)	(−2)				(.6)			(−1.1)						
	C	LDIF	Uo	Ud	Les(−1)					Do	Db	Dg	Dsv						
3.1Sp	−2.1	4.3**	0.02	−0.16**	0.7**					−0.7**	−.7*	−0.05	−1.8	.94	139	283**	8	32	1
	(−5)	(5.7)	(1.7)	(−2.9)	(13)					(−2.6)	(−1.8)	(−0.4)	(−4.7)						
	C	LDIF	Uo	Ud	Se					Do		Dg	Dsv						
3.2Sp	−3.9	3	−.03	−0.17	0.11e-4*					−5**		−4.7**	−0.02	.97	64	322**	7	20	2.3
	(−4)	(3.7)	(−2)	(−1.9)	(2.4)					(−7.6)		(−5)	(−0.03)						
	C	LDIF	Uo	Ed	Leg(−1)					Do	Db	Dsu	Dsv						
3.1Gr	−.5	1**	−.5e-2	4.6*	0.73**					−1.1**	−.9**	−.9**	−1.2**	.97	112	553**	8	2.8	1.2
	(.2.3)	(2.9)	(−.4)	(2.7)	(13)					(−4.7)	(−4.9)	(−4.7)	(−4.2)						
	C	LDIF	Uo	Ud	Se	Sesq				Do	Db		Dsv						
3.2Gr	−5.6	5.2**	0.02	−0.15**	0.16e-4**	−.2e-10				−.1	0.8		−2.3**	.97	60	350**	8	.009	23
	(−3)	(4.5)	(.7)	(−3.7)	(4.5)	(−3)				(−.1)	(1.3)		(−5)						
	C	LDIF	Ldif80	Eo	Ud	D80	Lei(−1)		Df	Do	Db	Dsu	Dsv						
3.1It	0.7e-2	0.9	−0.9	−3.7	−0.03	.23	0.76		0.09	−0.9**	−0.5**	−1.3**	0.67**	.98	160	966**	8	1.4	2.9
	(.08)	(2)	(−1.9)	(−1.6)	(−24)	(1.6)	(9.7)		(1.6)	(−2.9)	(−3.6)	(−3)	(2.7)						
	C	LDIF	Ldif80	Eo	Ud	Ud80	D80	Se	Sesq	Do	Db	Dsu	Dsv						
3.2It	−.21	2.7	.42	−6.8	−.2	.08	−.02	0.4e-5	−0.45e-11	−3.3	−1.5	−5.3	−3.2	.97	64	250**	1.6	.31	11
	(−.05)	(2.7)	(.59)	(−1.7)	(−7)	(2)	(−.1)	(.4)	(−.4)	1.1	−.5	−28	−13						

C = constant,

Dependent variable: Emigration rate log

LDIF = per-capita income differential log in receiving country and country of origin; Eo, Ed = rate of increase of employment in country of origin and receiving country, Uo, Ud = level of unemployment in country of origin and receiving country, Lep(–1) = rate of lagged emigration, Se = stock of foreign population in receiving country, Sesq its square.

Do = dummy for Netherlands, Db = Belgium, Dsv = Switzerland, Df = France, Dg = Germany for Spain and Portugal, Dsu = Sweden for Greece and Italy.

The constant for Italy and Greece is Germany; for Spain and Portugal, France.

Statistics: Rsq, n = number of observations, F = test for coefficients other than zero, and t bracketed statistic under the corresponding variable, TEt = heteroschedasticity test of squared fitted values; Chow = test of parameter constants, LM = test for autocorrelation residuals, ** significant at 99%, * significant at 95%.

significant. A direct comparison with the study carried out by Pereira (1994) is not possible. He introduced only the stock variable without its square, and it turns out to be significant only for migratory flows into France. The elasticity of the long-term income variables increases to about 14%, as in the case of Spain, but in this case the specification with the stock also gives very high values, even around 8%.

2.7 FINAL CONCLUSIONS AND IMPLICATIONS FOR THE FLOWS OF IMMIGRANTS TODAY

A comparison of the tests of the models reveals the weakness of the gravitational version, which, apart from the case of Spain, cannot take into account the dynamic of the migratory phenomenon in southern Europe. Such a weakness is not limited to the simple version of the model shown in Table 2.1; it is also found in both its combination with the economic and the socioeconomic models.

This weakness can be ascribed to the specification chosen – for example, the activity rate, which cannot take into account the physical idea of departure and destination mass. Furthermore, the traditional estimate of this model is achieved by using level variables and population standardization. These are adopted here to facilitate comparisons with the specifications of the other models, but they may be the cause of mis-specification.

The estimates adopted also differ from the traditional ones in the kind of data available. In fact, the cross section is dominated by the temporal dimension. The data used include five destinations and on average cover up to twenty-six years. In contrast, the empirical analysis that uses gravitational models generally presents a higher number of destinations but fewer annual observations.

Thus, the difficulty in reproducing previous results can be attributed to the length of the historical series and to strong time effects. The introduction of time dummies does not, however, improve the results of the basic variables in the gravitational model, which remain either nonsignificant or have the wrong sign.[23]

The economic interpretation shows in all simplicity that it can account for the migration dynamics of the south of Europe,[24] but it also reveals a degree

[23] The estimated gravitational model in version b – that is, in levels and with the variables of population on the right – presents a repeated negative sign for the population of the departure country even after temporal dummies have been introduced.

[24] J. Hunt (2000) used a simple interpretation based on an expected income differential to explain migration between East and West Germany.

of mis-specification that cannot be eliminated. The results also highlight that only the income differential can explain the high percentage of the flows between European countries and that the more complex interpretation described in the initial overview must in all the cases start from this empirical fact.

Various specifications were used, including the replacement of income differentials with the two incomes of the countries of destination and origin as well as various labor market variables. The specifications therefore show the best economic and statistical results.

The socioeconomic specification that adds the lagged dependent variable, as a migratory chain, to the economic specification described earlier provides better results. The kinds of proxies used to interpret the migratory chain can raise some doubts. The temptation to attribute all the significance of the migratory chain to the lagged emigration rate seems especially risky.

Furthermore, a comparison of the trends of the two proxies – stock and flows – seems to indicate that the two variables tend to go in the opposite direction. In fact, the stock variable also increases when flows of new immigrants decrease, even if the net flow is positive, whereas the rate of lagged emigration decreases and is affected by the downward or cyclical trend of immigration flows. It therefore tends to go in the opposite direction of the stock variable. The lagged emigration rate can also be seen as a proxy of a behavior that, as is well known, becomes habitual and repeated by other compatriots, at a lower psychological and economic cost. The underlying idea of a migratory chain is the idea of an active nucleus, which favors the exchange of information and helps migration, but it is not clear which of the two variables mentioned earlier accounts better for this concept. The results obtained, however, show that the socioeconomic explanation dominates the others presented earlier and the additional economic-gravitational version and the socioeconomic and gravitational model.

The variables of income differentials and of labor market changes in the departure or destination countries are significant and have the expected signs. The variable proxy of the migratory chain is also significant and has the expected sign, with the exception of the stock of Italian workers.

The results suggest that in the socioeconomic version there is a Todaro-like specification with the expected wage in the receiving country and the known wage in the departure country. It should be remembered that in the Todaro model the probability of getting a job in the departure area is equal to 1. Such a result was obtained by Straubhaar (1988) for the same countries even though the specifications used merged the components into a single variable.

Similar relationships were also found by Hatton and Williamson (1994) in their study of Italian emigration at the turn of the century, and by Hatton (1995) in his study of English emigration in the nineteenth century. Hatton gets better results by using separate variables than by using variables combined into a single index.

Institutional factors, such as the restrictive immigration policies introduced in 1974 in the northern European countries, do not seem to have had an autonomous effect on migration. The dummy introduced is not significant because the change in the trend is well identified in the receiving country by such variables as the product and the unemployment rate.

Eventually the policy of family reunion is more significant. It conditions the size of the migratory chain; in fact, it influences both the estimated stock of earlier emigrants and the lagged dependent variable, and it identifies a dynamic in the migratory phenomenon that is independent of labor market changes.

As was highlighted in section 2.6.2, the expected income differential does not necessarily have to be interpreted in its strictest sense. Instead, it can be seen as a development differential and can therefore have many causes, not least of which can be the lack of local employment. From this point of view, these results can be a tool for interpreting actual emigration to the southern European countries in which the per-capita income is three to five times as high as in the departure countries. Even though they often have a high level of unemployment, it is compared with countries where the level of employment is very low, but above all where detailed information about rural unemployment is not available.

Emigration seems to be inevitable in the medium term. It is not influenced by distance, which, as can be seen from the limited significance of such variables in the analysis of emigration from the southern European countries, is the same as a fixed effect. Instead, emigration is influenced by the migratory chain. This makes it difficult for destination countries to manage immigration by applying only economic priorities because there will be a positive flow even when expected income differentials decrease.