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## Skilled migration: a theoretical framework and the case of foreign researchers in Italy

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### ABSTRACT

Different solutions are called for in order to resolve the difficulty of finding a satisfactory definition of migration. In this paper the authors propose dividing migratory movements into two distinct major categories: economic migration and non-economic migration. Economic migration can, in turn, be divided into two separate categories: mass migration and skilled migration. Both micro differences (that relate to single individuals) and macro differences (related to the economies of the countries involved) are analysed. In the category of skilled migrants are included people such as scientists and researchers, international consultants, employees of international organisations, managers of multinational businesses, professionals, clergy, artists, actors, tourism operators, athletes, specially qualified workers, military personnel, and university students. The characteristics of each group are illustrated in the paper. Since the traits that identify skilled migration are not generally considered negative, unlike the characteristics of mass migration, but have today become more and more a part of professional life, it is preferable not to talk any longer of “brain drain” but rather of “brain movements” or “brain circulation”.

As an illustration of skilled migration, the present paper provides the results of a survey carried out in Italy in public research institutes. In the study, 241 especially designed questionnaires were collected from foreign researchers who were working in these research institutes in 2001. The paper analyses their socio-demographic characteristics, the typologies of employment, the duration of their stay in Italy, their reasons for moving and their return home.

## 1. Skilled migration and mass migration

Today migratory movements have become so diversified that it is difficult to find a definition that manages to cover all the various reasons for these transfers ([Brandi 2001](#); [Salt 1997](#); [Boulier 1999](#); [Koser & Salt 1997](#); [Kuptsch & Oishi 1995](#); [Paganoni & Todisco 1995](#); [Todisco 2002b](#); [Francovich 2000](#), etc.).

We believe that present day migration can be classified into two main groups: economic migration connected to work, and other types of migration for non-economic reasons. This second group includes family reunifications, moves for medical treatment, moves to a residence of choice, moves for retirement, adoptions and transfers for judicial reasons.

Economic migration has, in turn, been divided into two groups: mass migration and skilled migration (Todisco 2002b).

Today, at the beginning of the third millennium AD, we have moved from a Malthusian interpretation of migration as movements for the survival of poorer people towards a more economic interpretation in which the migrant is but one, and perhaps not the most important, of the factors to be considered in exchanges. In fact, in the era of globalisation all the different factors that interact on the integrated economy must be taken into consideration at the same time. Migration acts as a means of rebalancing the availability of the workforce. If we consider the Earth as a single territory in which human activities take place, migration allows the movement of human resources to those areas in which they are required. The redistribution of manpower permits a redistribution of wealth, market potentiality and consumption.

Here we are talking about large movements of people, what we have called mass migration. There is a very rich literature on this typology of migration (see [Maffioletti, Todisco & Tramontana 1993](#)) but we will mention just a few of the characteristic aspects of large movements of people who generally have very low qualifications or none at all.

The advantages for the receiving country consist first of all in a low cost workforce. Furthermore, immigrants fill those occupational niches that have previously been abandoned by native workers because they offer very low job satisfaction (for example, hard manual labour, caring for old people, semi- or non-skilled work). This guarantees the survival of the country's economic system, which needs professional people at different levels, from the less qualified to the managerial levels.

Immigrants also give a certain flexibility to the local labour market in so far as they are very adaptable, are not well-protected by trade unions, or are perhaps illegally employed. At times of economic difficulties, the economic system is able to make substantial cuts in the workforce, by first dismissing immigrants without touching the local workforce and thus limiting the protests of the native workers. Immigrant workers are, therefore, an element of social harmony in so far as they are sacrificed when necessary, thus allowing the survival of the productive systems which would be in serious difficulty otherwise ([Abu-Rashed & Slottie 1991](#)).

Certainly it is worth noting that immigrants, as a more economical and less rigid workforce than local workers, are welcomed by the industrial system because they tend to limit the needs and requests of the native labour market.

From the point of view of the countries of origin, there is no denying the disadvantages of migration, which have frequently been reported. The country loses the best part of its workforce. In fact, it is usually the young, healthy, dynamic and, at times, the most highly educated and qualified who decide to leave their country.

A different interpretation suggests that the departure of a certain part of the workforce relieves the unemployment problem, which is very serious in these countries. It must be remembered that almost all this emigration comes from developing countries where large numbers of job seekers enter the domestic labour market every year. There are certainly far more workers looking for jobs than the local, usually weak, labour market is in a position to absorb. Without the safety valve of emigration, local labour markets would soon be in grave difficulty, thus intensifying the problem of internal economic growth and human development ([Passaris 1989](#)).

Another advantage for the donor country arises from the remittances that its countrymen abroad send back to their families who are left behind in the home country ([Bureau International du Travail 1976](#)). These favour an increase in certain types of consumption, which would otherwise be impossible. Although the remittances have an individual value in so far as they belong to the migrants' families, there is also a macro dimension to them, which should not be underestimated. The country has exported young, healthy manpower whose upbringing has been paid for by the state (modest sums admittedly, given the poor quality of social services such as the health service and education), and it is deprived of the best part of its workforce. But in return there is a net amount of money coming into the country, net in the sense that no expenditure has been made on raw materials or power, nor have internal productive resources been employed. These remittances represent an enormous potential for domestic consumption which is created without burdening the country's balance of payments.

This point, however, is not so straightforward as it may appear. In fact, if the remittances are spent on the purchase of new agricultural tools, new seed or the building or maintenance of a house, they either add to domestic consumption or stimulate national production. But if the remittances are spent on the purchase of a foreign car or to buy an electrical appliance or an electronic calculator, the country's balance of trade will be weighed down by large imports.

It should be noted that the savings made by immigrant workers act as a fundamental part of their economic behaviour, especially temporary workers. In fact, saving is for them not just a secondary action to consumption, as happens with native workers, but an active, deliberate action. Immigrants tend to maximise saving, which they view as their main objective, whilst consumption becomes a secondary question for them ([Todisco 2002a](#)).

What has been said so far refers to what we have defined as *mass migration*, whereas *skilled migration* has different points of reference. In order to define migration, which is by its very nature multidimensional, it is necessary to use at least a three-dimensional grid of interpretation based on a spatial scale, a time scale and a social scale. The spatial and time variables can be easily understood, though some clarifications may be appropriate (Todisco 2002a; Todisco 2002b; [Todisco 2002c](#); [Golini 1987](#)). The social variable presents many different aspects that, however, can be found in the *push-pull factors*.

The migrants' plans differ substantially for the two types of migration. Mass migration involves people with a low-level of education and without specific qualifications, who move under the influence of *push* factors (escape from their present difficult situation). Rather than being attracted to the receiving country, they go there in search of any job, but with the hope of returning to their home country a few years later, although they can have no guarantee of this. In contrast, skilled migration is conditioned by the more attractive factors (the *pull* factors) and is more likely to be temporary. It involves people with high professional qualifications and working experience and the decision to migrate has been carefully calculated and thought out.

We must point out that our definition of skilled migration includes more than just the migration of intellectuals, since in our opinion there are also migratory movements of people with high professional qualifications that are not strictly connected to their specific intellectual ability. To give but one example: the migration of sportspeople, which is particularly prominent in some fields, such as football, basketball and volleyball. For this reason we will not use the term "brain drain", which is so dear to everyone.

## **2. Who are the skilled workers? Brain drain and brain movement**

The category of *skilled migration* covers a number of types of workers, who have well-defined characteristics and distinctive features connected with their particular professional sector. In our opinion it should include: scientists, researchers and scholars; international consultants; employees in international organisations; multinational managers; professionals; ecclesiastics; artists, actors, entertainers and workers in tourism; sportspeople; specialised workers; military personnel; and students and post-graduate students.

Some of these categories are self-explanatory, such as the first which includes scientists, researchers and scholars in general who find jobs in public or private research institutions. *International experts*, whose number amounts to just a few thousand in the whole world, are people with a high level of professional skills, recruited by the United Nations and its Agencies and sent to solve technical or organisational questions in various countries, almost always developing countries.

These contracts are signed with experts selected from people with very high qualifications and long-term international experience, and the length of their contracts may vary from a period of a few months up to a few years.

There is certainly a much larger number of *employees in international organisations* who work for example for the United Nations and its various sectors, the European Union, the OECD, the World Bank, and all those bodies that coordinate the interests of different countries or whole geographical areas in the world. These are people who are recruited directly from the member countries of these organisations. Even though they sometimes have short-term contracts, there is usually no time limit to them.

*Multinational managers* represent the decision-making bodies of big international companies. They include both those involved in the financial and investment sectors and the technicians who have the task of evaluating the production and plants of the company. They play an important strategic role in so far as they decide on the investment policies of a multinational company, making use of estimates of the potential offered by the area and cost-benefit analyses of the factors of production. They are in a position to decide on the location of new factories and can even have the economic future of a country in their hands, or at least the sector of the product they are working on. In fact, in many developing countries, industrialisation is a great attraction and the opening of a new factory can mean survival for a large number of families. The decisions of a single manager may have greater consequences for the economic destiny of a country than the actual economic policy implemented by its government.

The term *professionals* refers to different kinds of very specialised workers such as lawyers, physicians and surgeons, engineers, accountants, chemical engineers and so on. They generally work independently, either alone or in a professional association. A new and increasingly important professional is the expert in informatics, to which some countries (USA, Germany) are paying much attention in their immigration policy

*Ecclesiastics* are also included in the category of skilled migration. They are all well-educated (very often graduates, though in disciplines connected with their religious beliefs). Unlike mass migration they move for their work within the Church and to give pastoral care to the inhabitants of a country. Their moves may take them very long distances from home (in the case of missionaries) and the length of their stay abroad is mid to long term.

*Actors and entertainers* usually make temporary moves, generally for short periods. Theatrical actors prefer to migrate within their own country, while film actors are much more mobile at an international level. There are also painters and sculptors who move for longer periods than entertainers. Their curricula are often proof that many of them have spent all, or most, of their artistic lives abroad.

In addition to entertainers there are also workers employed in the tourist industry. We are not referring to seasonal workers (such as tourist entertainers), but rather the administrative and managerial staff who find themselves working on a more regular basis, though not necessarily permanently. Basically we are dealing with managers once again, but this time employed in the field of tourism.

*Sportspeople* can be divided into two categories: those who play sport and those who work in sport. In the first group there are the athletes who play professional sport (for example, football players, basketball players, volleyball players, water polo players, racing drivers). The second group includes all those workers who make a valuable contribution to the world of sport, such as coaches, trainers, doctors and sports managers. In the case of both these groups the length of their stay abroad may be fairly short since these professionals are bound by short term contracts of just one or a few seasons. An athlete's career, anyhow, has a limited length of time as their performance declines as they get older. Therefore the length of their migrations is quite limited (Todisco 1997).

*Specialised workers* can fit quite easily into one of the categories mentioned above, but here we refer specifically to workers with skills that are not available in a particular country and therefore must come from abroad. Technicians are a case in point: they are highly qualified and work on international worksites where the planning workforce and the high level operational workforce are imported. Their migration plans are well defined because they depend entirely on their contracts, which are of medium length (from 1-2 years to a number of years).

We also include the transfer of *officers, warrant officers and soldiers* who are on active duty in the armed services, as for example in the international forces of the United Nations (blue berets) or the NATO forces. Their period abroad may be of varying length, depending on whether it is for training, exercises or military operations in war zones.

The *student* category deals with those in tertiary education, including those attending technical institutes, music academies and art schools, as well as university students. The term university education is used to refer to all levels of courses, whether they are first degree courses, post-graduate courses or PhDs. The choice of university can be totally free and determined by pull factors (the most prestigious colleges attract the most), but sometimes it can be determined by necessity, as in the case of Greek university students who are faced with a limited number of places, in which case push factors prevail.

### **3. The macro dimension of skilled labour migration. Significance for the receiving country. Not all is lost for the donor country**

There has been a very heated debate on the brain drain and there is still talk about it today, with special emphasis on its negative aspects.

The country of origin suffers a net loss owing to the fact that it has had to bear the cost of educating a person up to a high level of qualification. When the person is ready to be employed in the local economic system, emigration prevents this employment. It is a net loss for the country of departure which has invested resources in educating a person but then is unable to make use of this professionalism. On the other hand, the receiving country has the advantage of using immediately a human resource for which it has not had to spend anything in terms of investment and education costs. This simplistic outline, in truth, should be clarified further, as there are other points that cannot be overlooked.

Firstly, the donor countries have very high unemployment and underemployment levels, making the chance of finding a job very unlikely for many workers. These human resources would have difficulty in finding useful employment because of an excess labour supply and so the country of origin has the advantage of finding its domestic unemployment problem eased, which could actually favour a policy of national development. In some cases emigration even provides migrants with the opportunity to use their professional skills, which would otherwise have remained unused. The country that receives and uses these human resources acquires a brain gain, that is, a useful bonus of brains from the labour market of the country of origin.

Secondly, it must be remembered that the significance of the brain drain varies according to the country of departure. It may be that there is an excess of qualified human resources and that the emigration of a number of workers actually helps to ease the unemployment problem. But it is a different matter in the case of a country, especially a developing country, which has invested heavily in top-quality education to create the necessary skills for internal social and economic development and later sees a large part of its expected returns disappear when the human resources it has looked after and trained leave the country for new destinations. These brains do not leave behind people capable of taking their place and the loss in this case is absolute. A good example of this problem is a developing country where doctors, teachers and engineers are needed to work on the planning and organisation of the country as a whole and where for years investments have been made in these human resources that are essential for the development of the country. Once these professionals leave, there are no other human resources available at the same level. Once they have emigrated, they leave behind them a void.

Thirdly, it does not necessarily follow that the human resources that have received their training in one country can be immediately employed in another. It does not follow that a doctor, a teacher or an engineer is sufficiently qualified for the standards in the receiving country. The doctor is, therefore, employed as a nurse and the engineer as a land-surveyor, giving rise to a brain waste, to the under-utilisation of brains. In addition, there are a number of cases in which people with high academic or professional qualifications have to resort to a makeshift type of employment, much inferior to their professional capabilities and outside their field, as for example when a graduate finds employment as a driver or as a waiter.

Another point to be considered is where the professional qualifications of workers are awarded. So far we have supposed that these persons received their education and training in their own country, and only at a later stage did they emigrate. But it may happen that their professional knowledge and experience have been acquired abroad. Imagine students who take a university degree followed by a post-graduate course in a foreign country. As their cultural and professional training progresses, it follows the norms and standards of the receiving country. Their degree or PhD will have an immediate saleable value on the local labour market. This time, however, the cost of their upbringing has been borne by the country of immigration and not of that of emigration. The investment has been made by the receiving country, but the value added to the human capital is a resource belonging to the home country. Certainly many Chinese, Filipinos, Mexicans, Asians and Africans, once they have completed their university studies, decide to stay in the country that has given them their training, for example the United States or Canada, the most popular destinations



in the field of research. But it is also true that these high level skills will be available to the country of origin should these citizens decide to return home (Todisco 2002a,b).

One comment that immediately springs to mind is that the country of origin will, in this case, have human resources with high qualifications, but it does not have suitable structures in which to employ them. They may have very good doctors with high qualifications, but no hospitals for them to work in. This argument may be well founded, but it can be contested by suggesting that a good doctor may act as a stimulus to improve the health facilities of the country. A number of Nobel Prize winners, who have spent most of their working lives abroad, have returned home and set up national research centres to continue their studies and bring prestige to their country (like Rita Levi Montalcini and Rubbia in Italy).

Finally, it should not be forgotten that the process of globalisation underway in the world tends to standardise and spread culture, work, consumption and professions. Skilled migration latches on to this process, allowing a transfer of knowledge and skills. The brains become “cultural bees” that carry the pollen of knowledge from one place to another in the world. This is possible when mobility is not limited to one country of departure and one country of arrival. If we look beyond the macro dimension to the individual dimension, we cannot help but see that greater geographical mobility will always be increasingly necessary for the academic and professional careers of future human resources. This is what is already happening throughout the Western world; it is taking place in Europe with the Erasmus-Socrates programs, which encourage intense mobility of both students and professors.

All this means that the concept of the brain drain has become out of date and should be replaced by the broader but more appropriate term *brain movement* or *brain circulation*.

#### **4. A case study: foreign researchers in Italy [\[1\]](#)**

As we have already pointed out, within the field of skilled migration the movement of scientists, researchers, university professors and post-graduate students makes up an important sector that helps the exchange of knowledge and contributes to scientific knowledge. We have already expressed our preference for the term *brain movement* instead of *brain drain*, because there are not always negative implications in these migrations. In order to evaluate the complex relationship between the mobility of researchers and the mobility of skills in international scientific circles we have carried out a field survey to study foreign researchers working in the research system in Italy.

There are no statistics available on foreign researchers in Italy. This lack of information forced us to carry out the survey directly at the various public research institutes in Italy. The Italian public research system is organised in two sectors: the universities and the public research institutions. The 79 Italian universities were not included in our survey, for technical reasons: each Italian university is totally autonomous and it was difficult to ensure the efficient distribution of the questionnaire to all of them. It is intended to extend this survey to the universities at a future date. On the other hand, the Italian public research institutions form a homogenous group, with similar rules and a similar funding system (most of the funds



come from the State administration, but they are allowed to obtain contract funding from private enterprises). The major Italian public research institutions are: the National Research Council, covering most of the research fields (both basic and applied) with dedicated structures, spread over the whole nation; the National Institute of Nuclear Physics, with a number of sections in some Italian cities; and the National Agency for Alternative Energy, dedicated only to applied research on energy in a few very large research centres. These institutions have their central administrations in Rome. A further important institution is the National Institute of Health, located in Rome and dedicated to pure and applied research in the medical sciences. A number of other minor institutions are dedicated to Astronomy, Agriculture, Economy, Industrial Research, etc: most of them too have their directorates in Rome. Since we did not know the total number of foreign researchers in Italy, we did not attempt to select a statistically significant sample. Instead, we invited the central directorates of the various research bodies to ask all the foreigners present in their institution, regardless of their position, to fill in, between January and July 2001, a questionnaire that we had prepared. The questionnaire, which was distributed to all the foreign researchers by the administration of the different research units of the various institutions, asked the foreign scientists for demographic data, details of their scientific activity and migration project (pull and push factors, the difficulties experienced when relocating in Italy, if they are planning to return to their country) and their opinions concerning their stay in Italy.

Of the 459 research structures situated throughout the country that received the questionnaire, only 60 failed to respond, while 268 reported that they had no foreign workers in the period in question. Out of a total of 378 foreign researchers employed in the remaining 131 research structures, 241 responded to the questionnaire.

The largest concentration of foreign workers was to be found in the National Research Council (CNR) and the National Institute of Nuclear Physics (INFN), which respectively account for 46.9 and 31.5 per cent of the total. The National Agency for Alternative Energy (ENEA) and the National Institute of Health (ISS) returned a much smaller number of responses: 5.8 and 4.1 per cent of the total. Other entities and agencies produced, almost without exception, isolated responses only. It should be noted, moreover, that the four above-mentioned institutes from which the vast majority of responses arrived together account for 80 per cent of the research activity carried out in Italy, and employ the bulk of non-university public sector researchers.

#### **4.1 Demographic characteristics**

The demographic section of the questionnaire received responses from 178 men and 62 women. Of these, 60 per cent of the men and 40 per cent of the women were married, and the majority had no children, and those that did had few (one or two at most).

With respect to the country of origin, the largest groups were from the European Union and other European states which account for, respectively, 33 and 36 per cent of our sample. Among European Union citizens, the most numerous were the French, Germans, and Spanish. Of the other European countries, the majority came from Russia, Romania and Albania. Of those from the Far East, the vast majority came from China.

Across the entire spectrum of nationalities, women were considerably fewer in number than men. The foreign scientists who responded to our survey had an average age of 36 years. Nonetheless, the average age varied considerably depending on the geographic area of origin. Foreign research workers from member states of the European Union were notably younger than those from other countries, and 40 per cent of them were under 30. The majority of other foreign workers belonged to the 31-40 age group, though some were older than 40. Women were on average younger than their male colleagues.

## 4.2 Types of work

Almost all the foreign researchers interviewed (about 89.6 per cent) had been working in the field of scientific research before coming to Italy, and 37.5 per cent of them had had permanent contracts of employment. On the other hand, a significant number came to Italy after a PhD or post-doctoral fellowship.

The type of employment contract held by the workers before coming to Italy turned out to be strongly associated with the geographic area of origin. If we look at the two largest geographical groups, we can see that among those from European countries outside the EU, a large majority had previously held contracts of employment in the research sector, and some had had a permanent post. Among workers from European Union member states, on the other hand, just 48.4 per cent had previously had a contract of employment and only a small minority had held permanent posts; but 39 per cent had had a scholarship, mostly at doctoral level.

With respect to the terms of employment and professional grades accorded to foreign researchers by Italian institutes, the survey found that while many (38.3 per cent) were being paid out of scholarship grants, almost as many (36.6 per cent) were employed on limited-term or permanent contracts of employment. [\[2\]](#) In this latter group, the distribution is notably concentrated at the lower end of the seniority scale. This distributive pattern, however, occurs also among Italian research scientists. The chief financial sources for the salaries of foreign research scientists in Italy are the ordinary funds of the host Italian institutes (44.5 per cent) and European projects (27.3 per cent). Very few foreign researchers were in receipt of funding from corporations.

As regards the fields of scientific inquiry, the foreign researchers in Italy operate mainly in Physics, Biology, Chemistry and Engineering.

## 4.3 The length of stay

The majority of the interviewees (52 per cent) were found to have been living in Italy for less than one year. Of these, 76.8 per cent had been there for no more than six months. Also, 69.1 per cent of foreign researchers expected to leave Italy within one year.

A more precise indicator of the duration of stay can be obtained by looking at the real lengths of time that foreign researchers intend to spend in Italy. This is obtained by adding the period the interviewee has already spent in Italy to the length of time s/he expects to remain.

On the basis of this calculation, we found that only a minority of our sample (16.2 per cent) expected to stay in Italy for more than five years, and a sizeable group (37.3 per cent) planned to remain for less than one year. Those foreign researchers who planned to spend only a brief period of time in Italy strongly influenced the average results for the sample as a whole.

A breakdown by nationality suggests that some differences exist in the length of stay depending on the country of origin. Citizens of non-EU states in particular showed a certain tendency to remain for either very brief or very long periods, whereas researchers from EU countries spend an average of one or two to three years in Italy.

The survey found that 44.3 per cent of the under-30s meant to stay in Italy for just one year, and 36.1 per cent for a period ranging from one to three years. We can therefore conclude that almost all the foreign researchers belonging this age group regard their stay in Italy as temporary.

Foreign research scientists aged 31 to 40 years, however, displayed a more marked tendency to stay longer. The higher the age group, the greater the proportion of those intending to stay in Italy for a long period.

Women tend to stay in Italy less than men: 48.1 per cent planned to remain for only a year and 29.6 per cent for a period of more than one but less than three years.

The conditions of employment and professional grades attributed to the interviewees are the parameters that seem to influence most the intended length of stay. The majority of scholarship researchers remain in Italy for one year or, at most, 2-3 years, being the typical length of a fellowship, a post-doctorate scholarship, and a doctoral scholarship, respectively. This statistic clearly shows that the provision of a suitable contract of employment in Italy is an effective means of securing the long-term presence of foreign research scientists. The correlation that exists between the job status of the foreign researchers and the length of their stay in the country also accounts for the distribution by age mentioned above. It makes sense that older researchers should be offered senior positions and young researchers' scholarships, which, however, constitute an insufficient incentive for permanent immigration to Italy.

#### **4.4 Reasons for choice**

One of the most interesting questions we posed in our survey asked interviewees to state their chief motivation for leaving their home country (i.e. the *push factors*).

The motivation advanced by the largest number of respondents was a desire to institute contacts with other research environments, which more than half the sample considered very important, and 30.6 per cent considered fairly important. A smaller but significant number of respondents indicated as the chief deciding factor an ambition to specialise in a field that was insufficiently developed in their home country. Similarly, the desire to have greater freedom in work and life was a very or fairly important factor for 54 per cent of our sample. The survey found that very few of the respondents cited difficulty in finding work adequate to their qualifications in

their home country as their main reason for leaving. Economic considerations also came well down in the scale of priorities, which is hardly surprising, given the low salaries of scientific workers in Italy.

With respect to the professional factors that drew the migrants to Italy (i.e. the *pull factors*), a large proportion of interviewees declared that they had chosen this country because they felt it offered good or excellent opportunities for study and scientific training, and this is an extremely significant finding. Invitations from Italian research institutes were also decisive, being considered very important by 48.3 per cent of the interviewees, and fairly important by 19 per cent. Furthermore, many of the respondents believed that Italy was at the forefront of scientific research in their field. The availability of scientific equipment was very important for 37.3 per cent and fairly important for 37.7 per cent of those who chose Italy as their destination.

With respect to the non-professional factors that drew the immigrants to Italy, the only factor with any real weight was a sense of cultural affinity. Knowledge of the Italian language was not an important factor, [3] an obvious enough finding given the limited use of Italian abroad. Geographic proximity, which modern transport has rendered irrelevant, was also practically without influence. The respondents did not report having been attracted to Italy as a country that was easy to enter and reside in – perhaps because Italy is not, in fact, easy for foreign workers to enter.

The data that we analysed indicate that foreign research scientists who left their home countries to take up a post in Italy were driven by a rather complex series of diverse factors whose relative importance varied from person to person.

#### **4.5 Returning home**

A large majority of interviewees (71 per cent) intended to return to their country of origin.

The completion of the period of time decided in advance was considered a very compelling reason for returning home by 60.9 per cent of respondents and fairly compelling by 26.7 per cent. Naturally, this figure reflects the fact that a considerable percentage of interviewees were in Italy as fellowship holders. Other important motivations mentioned were family ties.

A significant number of respondents declared that the achievement of the scientific objectives they had set themselves in coming to Italy was an important motivating factor for the decision to return home. The emergence of new employment opportunities in the country of origin was found to be a less influential factor.

Of the 69 interviewees who declared they had no intention of returning to their home countries, 77 per cent were European, and roughly half of these were citizens of the European Union. The desire to remain in Italy was an important factor for the majority of the 69, but the others were planning to move to another country where they could obtain higher salaries. Very few showed any interest in moving to a country that is scientifically more advanced, or with which they might have greater cultural affinity.

It is also interesting to observe that a large majority of the interviewees (66.7 per cent) felt their stay in Italy was advantageous for their home country, regardless of their country of origin.

The percentage of those who said the brain drain was considered a major problem in their home country was 68.7 per cent.

By and large, most of us will concur with these claims: opportunities for employment in the world of research are lacking, funds are scarce and the policies of national governments pay insufficient heed to the problems of the scientific community and, especially, the field of pure research. These failings drive many to look farther afield, particularly to the United States, for better opportunities. It is interesting that this analysis of the situation holds true not only for researchers in Eastern Europe and developing countries, but also for their counterparts in European Union member states, especially those in the south (Spain, Portugal and Greece).

British, French and Dutch researchers are divided between those who believe factors relating to work and economics in the home country prompt researchers to go to the United States, and those who believe extensive international mobility is necessary in the world of science. Of those who responded to this point, only the Germans believed their national research system was so good as to prevent a brain drain. Indeed, they believe their system succeeds in attracting foreign researchers to Germany. It is also interesting to note that some researchers (mainly Indians and Russians, but also one Dutch citizen) believe that the brain drain does not constitute a problem for their country, because the number of researchers is simply so large that any loss can easily be made up.

#### **4.6 Conclusions**

The extent to which we may derive general observations from the data we have illustrated is conditioned by the fact that the Italian system of research is considerably different from the systems in other EU states and developed countries in general. Although it may be relatively large, Italian GDP consists only in a very small part (six per cent in 2000) of high-technology products and services. Consequently, if we measure annual spending on research in Italy, we find that the public greatly outweighs the private sector, and that mobility between the public sphere and private enterprise is very limited. A foreign research worker with experience in the Italian public research system is therefore highly unlikely to find a permanent or long-term place of employment in private enterprise afterwards, whereas this is commonplace in the USA and elsewhere. Further, the ratio of public spending to GDP and the ratio of R&D workers to the total workforce are both far lower than the EU average (Ministry of Universities, Research, Science and Technology, 2001).

Italy is therefore one of the industrialised countries with the lowest number of foreigners working as professionals and technicians. Unlike many other OECD and EU states, Italy has not devised any legislation that might draw in intellectual resources from abroad or even offer incentives to Italian emigrant scientists to return. In these circumstances, it is hardly surprising that the intake of foreign researchers in Italy is far lower than the outflow of Italian researchers abroad, and it is for this very reason that our survey was based on a small number of workers. Even though the numerical presence of foreign researchers in Italian scientific institutes is small, it is

not proportionately negligible with respect to the total number of researchers in Italian public research institutes (roughly 9,000). The foreign research workers in the period of our survey amounted to roughly 4% of the active scientific workforce at the time. This survey therefore demonstrates that these institutes are securely connected to the international circuit of scientists.

The Italian scientific institutes are chosen as a place for the completion of research training by many young academics from European Union countries, particularly from France, Germany and Spain, all of which have a long history of strong cultural links with this country. In addition, the Italian institutes absorb a significant inflow of mature academics from Eastern European countries and from a number of countries outside Europe, who come to Italy to acquire the scientific prestige that some of our research institutes can offer, and avail themselves of the quality equipment that is available here.

Even so, since the number of foreign researchers intending to settle down on a permanent basis or for a long period of time in Italy is low, we cannot claim that Italy has yet become a country that attracts significant intellectual resources, not even from less economically developed countries.

In view of the appreciation expressed by interviewees for the quality of the scientific institutes of Italy and the equipment available here, the chief reasons for their reluctance to settle in Italy can probably be ascribed to the low salary levels, the unlikelihood of permanent contracts of employment, and the poor prospects for career advancement in Italian public research institutes.

Given the situation, it is clear that a survey of foreign workers in the public research system of Italy cannot produce firm conclusions relating to the brain drain phenomenon.

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## NOTES

[1] This survey was performed by IRPPS-CNR in the framework of the European Community Program: “The Brain Drain Emigration flows for qualified scientists”.

[2] People on limited-term and permanent contracts are put together since only a very few permanent positions were appointed in Italian Public Research Institutions between 1982 and 2001 and almost all of them were given to Italian citizens.

[3] The questionnaire did not explicitly ask whether the foreign researchers could speak Italian: they were asked only if a knowledge of the Italian language was one of the reasons why they chose Italy as their destination.

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