

# METHODOLOGICAL ASPECTS OF THE MEASUREMENT OF INTERNATIONAL MIGRATION

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## INTRODUCTION

1. Is it useful to approach once more the methodological problems of defining and measuring international migration (1)? A considerable number of articles, official documents and studies on the subject have already been prepared in the course of the last fifty years, and when one considers the failure of attempts to render these methods comparable between countries, one may well wonder whether this effort is worthwhile.
2. In the past, scarcely any interest was in fact shown in migration in the two fields in which it might play an important part: economics and demography. For the economist, migration appeared only as a result of his theories. For him it was therefore a secondary phenomenon, the measurement of which was of little interest. The demographer, on the other hand, was concerned primarily to clarify the connections between the phenomena he was studying, and neglected migration, the main causes of which were economic.
3. This attitude, which persisted for a very long time, led to the independent development of studies on particular points, based on existing statistics, and prevented any complete approach to the phenomenon.
4. This view of migration, which was plainly too cursory, has now been discredited by a certain number of researchers. Migration should, in fact, be integrated within the framework of economic theory and the demographic analysis of populations, since there are complex links connecting it with the other elements of these two sciences (2).
5. Bearing the above in mind, when one examines the existing forms of measurement, one quickly sees that they are scarcely capable of use in research. These measurements, made for administrative and political purposes, give too imperfect a picture of the phenomenon and do not allow its integration with a demographic or economic analysis.
6. We must therefore follow another course: Instead of starting from existing statistics to discover what kind of analysis they permit, it would be useful to plan the analysis first and then to decide what statistics are needed.
7. This analysis should, in the first instance be demographic in order to eliminate the internal causes which affect the phenomenon. Only when this stage has been passed, can research into the external causes be successfully undertaken.
8. This is the procedure which will be followed in this report. It will attempt to show that migration is somewhat different from other demographic phenomena and to discover a possible method for demographic, and subsequently economic and sociological analysis of it. Of course, since this report is concerned only with what is measurable, the latter analyses will be largely incomplete. It is important however to bear constantly in mind these limits to quantitative methods.

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(1) For the remainder of this report, "migration" will be understood to mean international migration. Where internal migration is referred to, this will always be explicitly stated.

(2) We are speaking here only of labour migration, which at present accounts for the greater part of migration. Movements of refugees, deportees, or population transfers, the main causes of which are political, are not considered in the report. In this connection, see [3] and [15].

## I. PREVIOUS WORK

9. There can be no question here of presenting all the previous work on methods of measuring migration. We will content ourselves with placing in their context the main works or articles on the subject, seeking to bring out the various approaches to the phenomenon they imply.

10. In fact, the methodological problem is two-fold:

- to find a definition of migration which will be acceptable to all countries, and
- to establish a measurement of migration which would allow international comparisons.

These two problems will henceforward be treated together, since it will be seen that the existing methods have influenced both the definition and the improvement of methods of measurement.

11. Migration statistics date mainly from the beginning of the 19th century. Imre Ferenczi [7] made a historical study and gathered all the statistics existing on the subject up to 1924. His work shows clearly the variety of definitions and measurements.

12. However, the first important study, devoted to the improvement of these statistics and especially to the possibility of rendering them more easy to compare, dates from 1932 [3]. It confirms the multiplicity of definitions used in the various countries and proposes a single definition of migration. A first important distinction is drawn between the term "*migration*" which denotes the act of moving and the term "*migrant*" which denotes the person performing the act. Migration is defined as passage from one country to another for a period of more than a month. The movements concerned fall into two main classes for which statistics are desirable:

- temporary and permanent migration (1), excluding tourist travel and frontier traffic;
- seasonal migration and transit (2).

13. The use in these studies of the sole term migration, shows clearly that only the act of moving is being considered, quite independently of the individual performing such acts. However, the individual seems to appear in the classification of temporary or permanent but it is a question of the intention of the migrant at the time of migration, which is uncertain in character and must be interpreted with great caution.

14. This definition of the various types of migration leads to a classification of the existing methods of measurement according to the information they provide on such migration. The three categories recommended are:

- passport statistics;
- port statistics;
- declaration of residence statistics, which may be regarded as superior to the two preceding types.

The first two categories, which are of interest in connection with inter-continental migration, lose much of their value when it comes to intra-continental migration, which is now in a majority. The last category is comparable to the method of population registers which unfortunately applies only in very few countries (about ten).

15. Recommendations are made to allow comparison of the various statistics. Similarly, a list is proposed of the main items of information which are desirable to obtain from migrants.

16. Almost twenty years later, a United Nations report in 1949 [15] notes that "the situation regarding statistics on migration is substantially the same today as it was in 1932". This is all the more troublesome in that certain methods which formerly proved useful have become out of date owing to changes in the phenomenon, though they continue to be employed.

17. This report resumes and refines the previous definition of migration and especially recommends (3) new methods of measurement, i.e.,

- information collection at frontier control posts,
- information collection from population registers, which are better adapted to post-war migration.

(1) Temporary migration is migration assumed to last between one month and a year, permanent migration is migration lasting more than a year.

(2) Entry into a third country which lies on the route from the country of emigration to the country of immigration.

(3) These recommendations are developed in a study published in 1953 [16].

**18.** Once more, twenty years later, A.J. Jaffe in his report to the International Population Congress in London in 1969 [12] states that definitions still remain just as diverse and methods of measurement are far from being unified. He is surprised that numerous governments, deeply concerned by the considerable flow of migration, are unaware of the numbers entering and leaving the country and the number of nationals returning, which constitute the minimum information (1) necessary to shed light on the phenomenon.

**19.** Inquiry into the reasons for this situation leads him to suppose that the governments of the various countries do not consider the subject sufficiently important to justify the collection and processing of data. Other reasons have been given elsewhere [4], including inability or ignorance on the part of governments regarding the importance of these recommendations, or else, the fact that they do not apply in certain special situations.

**20.** Faced with the persistent non-application of the system recommended by the United Nations, Jaffe proposes the use of census data, and in particular the reply to a question on the place of residence at an earlier date. It is now no longer migration that is being defined, but migrants, as will be seen later (§ 25), though without detecting all of them.

**21.** Apart from the usefulness of such a method of measurement in analysing migration, certain conditions are necessary for it to be valid. In particular, the censuses asking the question must take place in all countries on the same date. Only on this condition would it be possible to ascertain both the emigrants and the immigrants for each country. Without this, the measurement would lose much of its interest. Unfortunately, few countries as yet ask a question of this kind and, among those that do, the period of reference may vary considerably.

**22.** Other census data, on the place of birth or the last change of residence, provide similar information on migration. These data are not always known for all countries and thus lose some of their value. We will return to them later.

**23.** Thus, almost fifty years after the first international effort to define and measure migration in a correct and uniform manner, the results obtained are disappointing. The reasons given for this do not seem to us to be entirely satisfactory. These methods of measurement may fail to cover a considerable proportion of the phenomenon and are therefore of little use either to the demographer or the economist. We will therefore examine the definition of migration or migrants in more detail.

## II. DEFINITION

**24.** We noted earlier (§ 12) that, already in 1932, a distinction was drawn between migration (an event) and the migrant (an individual). The demographic analysis of internal migration has shown that these two important concepts must be accurately defined.

**25.** The United Nations manual [17] defines *migration* (2) as *a move from one migration-defining area to another, that was made during a given migration interval and that involved a change of residence.* A *migrant*, on the other hand, is *a person who has changed his usual place of residence from one migration-defining area to another at least once during the migration interval.* Taking the various countries as migration-defining areas, we obtain a perfect definition of migration and migrants.

**26.** For this definition to be consistent from one country to another, it is necessary that all countries define an individual's place of residence in the same way. The definition given by the multilingual demographic dictionary as the place where the individual habitually lives, appears to be entirely satisfactory only if all the countries are agreed on the meaning of the term "habitually" (3). This problem can only be solved by an international meeting but it does not appear to present insurmountable difficulties.

**27.** When it is a matter of permanent migration, that is to say migration where there is no return and no further migration to other countries, then the number of migrations observed between two countries is equal to the number of migrants. In this case, the distinction between the two concepts ceases to be meaningful.

(1) We shall see later that this flow is not sufficient to provide a clear definition of a country's migration.

(2) This manual deals only with internal migration, but the definition is perfectly valid for any type of migration.

(3) In the french section.

**28.** But, in most cases, there are multiple migrations or returns. Then the number of migrants within a given period will always be smaller than the number of migrations.

**29.** We have already seen that, if we count the numbers entering and leaving a country, without relating the two, we measure that country's migrations. But, if we include in the census a question on the place of residence at an earlier date, we measure certain migrants, though not all: an individual who has emigrated and returned, or who has died in the country of emigration during the period, will not be counted as a migrant by this question.

**30.** These two concepts do not appear sufficient to define completely the migratory phenomenon in a country. In fact, this phenomenon is not only connected with the number of migrations or the number of migrants experienced by that country. To demonstrate this, let us take a simplified example which, however, in no way detracts from the general application of the result.

**31.** Let us imagine a country which, over 1 year, records a flow of immigrants amounting to 100 (census data) and which each year also records a flow of immigration and emigration amounting to 100 (frontier records). If we first suppose that each migrant stays for 1 year, we may deduce that the migrants supply the said country with 500 years' work during a five-year period. If however we suppose that each migrant stays 20 years and that the annual flow was the same in the past, these migrants supply the said country with 10,000 years' work during the same 5-year period.

**32.** We see therefore that for a given flow of migration and migrants, a country may in fact enjoy a highly variable number of hours of foreign labour, depending on the length of stay of the foreign workers concerned.

**33.** This third concept must therefore be included in the analysis of migration. In fact, international migration has never been entirely permanent. The significance of return migration is now recognized in most countries, but it was far from negligible in the past and a question on the presumed length of stay could only provide a vague estimate.

**34.** Now, this concept was virtually omitted in the past and the information now available on the subject is still very sparse and very incomplete [4], [11], [13]. It appears however to be an indispensable addition to any analysis of migration and only the difficulty of measuring it can explain its absence from current statistics.

**35.** It is now important to see whether migration defined as length of stay of foreign migrants, or as loss of nationals for a certain length of time, allows us to obtain a better grasp of the phenomenon. For this, it is necessary to indicate the course that the demographic analysis will take, and we shall see at the same time what economic and sociological corollaries it allows.

### III. SUGGESTED ANALYSIS OF MIGRATION

**36.** No demographic phenomenon can be directly observed in the pure state. The raw data which constitute the statistics must be processed so as to isolate each phenomenon from the influence of numbers, structures and other phenomena. These other phenomena or causes fall into two classes: internal or demographic causes and external causes belonging to other fields. Now, before examining the external causes, it is advisable to make sure that internal causes play no part, or else to eliminate the part they do play. This is the proper function of demographic analysis [8].

**37.** However, for migration which does not escape this examination, it is not other demographic phenomena which will play the dominant part, but migration itself. We have seen indeed in the previous section that a migration followed by a return migration is, by that very reason, cancelled out. The resulting net migration is nil, and the number of migrants discoverable during the period in which they occur is nil. Only the length of stay of the migrant reveals this migration.

**38.** To bring the phenomenon into the open, it is therefore necessary to work on the various orders of migration, and this analysis is akin to the analysis of internal migration or, more remotely, of fertility.

**39.** This study should initially be longitudinal. We will consider the case of a generation, but it can be taken for other sub-populations.

**40.** It appears useful, in the first instance, to define the first migration, taking a given generation. Eliminating the effect of mortality, which operates as a disturbing factor, the phenomenon can be described without difficulty. It can be expressed as an intensity, a percentage of individuals belonging to the generation who have experienced the phenomenon before a given age, and by an average age at the first migration. Emigrants can be classified by country of destination. This classification allows us to analyse the effects of economic and political measures in the countries of departure and arrival on the likelihood of emigration from a country. A classification by occupation and social status would also be useful.

**41.** The study of second-order migrations is based on the country of first emigration. It can be broken down into the study of returns or of migrations to another country. The population at risk is the population which has made a first migration, and this in turn may be broken down according to country of origin or according to age at the time of the first migration. The phenomenon may still be expressed by its intensity and by the average length of the first migration.

**42.** For migrations of a higher order, a study of the same kind can be made, but the numbers considered are likely to be small. However, a distinction may be drawn between returns followed by further migration, and migrations between countries which rapidly dwindle into insignificance.

**43.** An analysis of this kind (1), if the period of observation is long enough, permits us to determine the number of permanent migrations per 1,000 initial migrations. For temporary migrations, we may calculate the total length of stay produced by the entry of 1,000 temporary migrants and even the distribution in time of the returns. Conversely, we also learn the corresponding losses of labour to the countries of emigration.

**44.** Thus, this analysis allows comparison of the results obtained for various generations or cohorts, once we have eliminated the effect of the demographic phenomena which influence migration most strongly: returns and—to a lesser degree—migrations to other countries, and mortality. On the basis of these results, we may look for the periods during which the phenomenon fluctuates and link these periods with economic and political events in the various countries. Alternatively, it is also possible to study a long-term development of the phenomenon by eliminating these periods of fluctuation.

**45.** Finally, this analysis allows us to study the part played by migration for certain population policies: thus, does the encouragement of family migration entail an increase in permanent migration? This analysis of the role policies play in the recorded length of migration appears very important, since there is at present no available method of estimating their success.

**46.** Such a longitudinal analysis, which is necessary to throw full light on the phenomenon, should be complemented by a transverse analysis. Migrations in a given year, mainly first migrations and returns, in fact depend [19] :

- on the size of the various generations in the countries of emigration in the case of first migrations, and on the size of the entry cohorts in the case of returns,
- on the particular behaviour of each generation and cohort,
- on the existence of accidents in the past (economic crises, policy changes, wars...), and
- on the reactions of the generations or of the cohorts to the economic, political and social conditions of the year.

**47.** Analysis of each of these factors would allow us to form the most realistic hypotheses concerning the development of the phenomenon in the near future.

**48.** Apart from this line of research, which we consider should come first, other subjects for quantitative study emerge. We will mention here those which seem to us to be the most important.

**49.** First, as opposed to the influence of other demographic factors on migration, the influence of migration on these other factors calls for study, in particular its effect on nuptiality and fertility.

**50.** Similarly, the combined study of migration and certain economic variables is necessary, in order to integrate migration with economic theory.

**51.** Finally, the sociological study of migration should be attempted. But this can only be undertaken on the basis of detailed surveys on the subject and can be only partly quantitative.

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(1) For more details of this analysis, applied to internal migration, see [8], [5]. For a study of returns, see [4].

**52.** Having thus laid down the main lines along which the analysis of migration should proceed, without taking into account the measurements which actually exist, let us now see whether these measurements permit of such analysis.

#### IV. INADEQUACY OF MOST PRESENT METHODS OF MEASUREMENT

**53.** We cannot in this report consider all the methods of measurement used throughout the world. We will confine ourselves in the main to two chief sources of data: frontier records and census data. We will look at them separately first before studying in more detail what may be achieved by combining them.

##### 1. Frontier records

**54.** We are taking the most favourable case, in which a definition independent of the country is applied to migration and in which the numbers are recorded without errors or omissions. We have already seen that this is not at present the case, and that, since most migration has become intra-continental, the omissions may be very considerable.

**55.** Since records of migrants entering and leaving a country are not linked, no estimate of the length of stay is possible. To have an estimate of permanent migration, it would also be necessary to record the date of birth of migrants.

##### 2. Census data

**56.** These may be of several kinds and we will consider them separately.

###### a) *Question on the place of residence at an earlier date*

**57.** Let us again take the most favourable case, in which the question is asked on the same date in all countries, with the same period of reference, which we will suppose to be 5 years.

**58.** In this case, we still do not know the date of migration, which occurs during the period. Thus, if there is a strong current of immigration just over 5 years before the census and if the migrants are still present during the census, no migrants are recorded. Conversely, if this strong flow occurs just under 5 years before the census and if the migrants are still present during the census, the movement is completely revealed, although the situation is very similar to the earlier one. Corresponding data in the countries of emigration allow returns to be estimated but they still do not give information as to their exact date nor, more particularly, do they link them with previous departures.

**59.** These figures again give no serious estimate of the length of stay, even when they are combined with data on the place of birth.

**60.** In fact, data of this kind can be more usefully employed in the study of internal migration, owing to the great stability in time of this phenomenon [5]. In studying migration, the greater irregularity of the phenomenon detracts considerably from the interest of a question of this kind.

###### b) *Question on the last change of residence*

**61.** This question seems to give the length of stay between entry into the country of migration and the census. In fact, in the form in which it is often put, if the migrants have made at least one internal migration within the country, only the last internal migration is recorded. We will consider henceforward only questions on the last migration (1).

**62.** The question does not give any information on the length of stay in the country: an individual who has entered shortly before the census may subsequently stay longer than an individual who entered the country before him, who may leave the country shortly after the census.

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(1) It should be mentioned that a question of this type was asked in a country of emigration (Yugoslavia) [1], in order to ascertain the number of people employed outside the country. The question asked the year of departure abroad and was put to members of the family who had remained in the country, or, if the whole family was abroad, to neighbours. The advantage of such a question is to provide coherent statistics for the various countries of emigration, which they could not get by reference to their records. Unfortunately it still does not always provide information on the length of stay abroad.

c) *Question on the place of birth*

**63.** A question of this type permits no estimate of the length of stay of migrants. It does, however, provide data on the permanent migration of generations of advanced age. But it only gives the numbers present during the censuses; the total number of first migrants to which they should be related is not known.

**3. Combined use of several types of data**

**64.** We will consider here only the frequent case in which a country has both frontier records classified by year of migration and age at migration, and also a question asked during the census, of one of the three types mentioned above (1).

These data are of course not linked.

a) *Frontier records and question on the place of residence at an earlier date*

**65.** Possession of these two types of data, always supposing them to be perfectly recorded, scarcely improves the information on migration.

**66.** For migrations recorded at the frontiers which took place 5 years before or more:

— in the country of arrival, whether the individuals remain in the country or return to their country of origin, the census does not record them,

— in the country of departure, the census still does not record them if the individuals remain in the country of immigration. But if the individuals return during the 5-year period, the returns are recorded, though it is not known to which population of migrants they refer.

**67.** For migrations recorded at the frontiers which took place less than 5 years before:

— in the country of arrival, the census records the migrants remaining in the country and these can be compared with the annual numbers of migrants, though only over the whole 5-year period, which gives a somewhat inaccurate estimate of the returns. In addition, multiple migrations occurring before the date of the last migration may falsify this result.

— in the country of departure, the census generally records nothing, unless there occurs within the period a return followed by a further emigration followed by another return, a very rare case indeed.

b) *Frontier records and question on the last change of residence*

**68.** We will take the most interesting case, in which the question relates to the last migration.

**69.** For the countries of arrival, we learn the entries for a given year from the records and the census gives the number of these individuals still present when it is taken.

**70.** We may therefore calculate the return rates for a cohort within a given period, each cohort having a different period of observation. This allows transverse study of the phenomenon and, where the behaviour of the migrants of the various cohorts is identical, we obtain a longitudinal idea of the phenomenon.

**71.** For the country of departure, however, it will not be possible to link the returns recorded by the census with the relevant emigrations, in order to calculate the length of stay.

c) *Frontier records and question on the place of birth*

**72.** Let us suppose that, for a given country, we have a frontier record of entries, together with data on the age of the migrants. We can then compare the total numbers of migrations of individuals born in a given year coming from another country, with the individuals born in that other country in the year in question and enumerated in the country of arrival. This estimate of returns will be very vague, since it does not apply to an entry cohort, but to a generation, regardless of the date of entry into the country. In addition, multiple migrations will falsify the phenomenon, for while they are counted only once in the census (migrant) they are counted in the frontier records every time the individual migrates to the country concerned.

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(1) We are not considering here the comparison of successive censuses, which only gives an estimate of net migration. In this connection, see [14].

#### 4. Conclusions

**73.** Thus, even the combined use of the various types of methods considered in this section does not give an adequate idea of length of stay. The best combination observed, frontier records and question on the last migration, does give return rates. But it should be noted here that the use of such a method requires an identical definition of migration for the administrative records at frontiers and statistical departments to carry out the censuses. This condition appears to be far from being fulfilled as yet.

**74.** In addition, this method requires 2 questions to be asked in the census :

- one on the date of the last migration, and
- the other on the previous country of residence,

whereas for the method based on the place of residence at an earlier date, there is only one. It is easy to see that by asking a greater number of questions on the successive migrations of persons completing the census, one could obtain all the information necessary for the analysis of migration. Unfortunately, questions of cost make this eventuality somewhat unlikely. We must therefore now see what possibilities remain for the correct measurement of migration.

### V. PROPOSED METHODS OF MEASUREMENT

**75.** We shall consider separately two methods, which are in fact presented in greater detail in this seminar, as types of systems for observing migration: population registers (1) and sample surveys (2).

#### 1. Population registers

**76.** Population registers, insofar as they note all migrations, both within and across frontiers, provide a valuable source for the study of the phenomenon. Unfortunately, only some ten countries use these registers.

**77.** In fact, for migration in a given country, there is only one record (either of leaving or entering) whereas for internal migration there are two. Frequently the declaration of departure from a country is not made, so that the data are incomplete.

**78.** In addition, the data taken from these registers are most often limited to the volume of entries and exits, and take no account of the links between them. It would therefore be necessary to make provision for this information to be specially processed, where possible, in order to reconstruct the individuals' migratory history.

**79.** Up to the present, it has only been possible to conduct studies confined to small populations on the basis of these registers [10]. The general processing of all the information would in fact be very costly and cannot easily be envisaged.

#### 2. Sample surveys

**80.** Faced with the difficulty of using exhaustive statistics and the cost of these operations, we are left with sample surveys.

**81.** The sample to be chosen can only be representative of the whole population of the country and not of its foreign population. This sample should indeed reveal emigrations and returns on the part of the country's nationals. In addition, the choice of such a sample permits study of both internal and foreign migration, which are no doubt closely linked. A survey of this kind would bring out the connection.

**82.** The sample should be relatively larger as foreigners and returning nationals form a smaller part of the population. Of course, for countries which have no external migration, a survey of this kind would no longer be of interest for migration but only for internal migration.

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(1) In this connection, see [2], [10], [21].

(2) In this connection, see [6], [20].



**83.** It is essential that the survey be carried out simultaneously in all countries. To show international migrations clearly, it is necessary to work on the countries of departure and arrival at the same time : by working on the country of departure, we register return migrants and by working on the countries of arrival, first migrations and certain multiple migrations.

**84.** The main questions of the survey should give, first, all the demographic characteristics of the individuals:

- date and place of birth;
- sex;
- all changes of dwelling made by the individual in the course of his life, with respective dates and locations;
- all changes affecting the individual's career in the course of his life, with dates and qualifications. It would also be interesting to have changes in economic status, and
- all family changes (marriages, births, deaths, cessation of cohabitation, children's entry on career) with the dates and locations of these events.

**85.** For each migration mentioned, additional information may be asked which would enable these to be studied more closely:

- occupational training received;
- languages spoken;
- expenditure in the country of emigration, funds sent to the country of origin;
- reason for migration, and
- reception in the country of emigration;

**86.** This list is not exhaustive; it is limited only by the risk of making the questionnaire too onerous so that replies may be refused.

**87.** Surveys of this type have already been carried out in a certain number of countries. They suggest that oversights on the part of subjects are likely to be few, since the questions are concerned with important events in the lives of the persons questioned. Moreover, comparison is possible with the various sources at present existing on the subject.

**88.** Another supposition should also be made. In fact, one is working on a population which has escaped the risk of mortality. This disturbing factor should not therefore be affected by the phenomenon under study, in this case migration [8]. Insofar as migrants have a death-rate which differs greatly from that of the initial population, there is a bias which it is difficult to assess.

**89.** Surveys of this kind are of great interest. In the first place, in the face of the complete absence of information of the type asked for here, we have no perspective from which to judge present conditions of migration. These surveys will provide information on all generations now living and will enable us to discover the long-term pattern of migration, if it exists. They therefore constitute the sole means of learning about the past, given the inadequacy or the various sources available in the different countries. In the second place, by employing a single questionnaire, at least for the main questions in all countries, we will be sure of having comparable data. We have seen that this factor of comparability, which is absolutely necessary for any study of migration, is absent from the existing statistics. Finally, these surveys allow combined study of internal and international migration. These two types of migration, between which an arbitrary distinction is drawn, are often not very different [18]. In particular, the differences between migration and the rural-urban migration are very small, and only combined study seems useful.

**90.** The main disadvantage is the size of the sample necessary to acquire adequate information. However the interest of this type of survey seems to us sufficient to outweigh this objection. They in fact permit an analysis of migration at once demographic, economic and sociological.

**91.** Before concluding this report, it seems useful to define more accurately the indices that can be constructed for the purpose of making such an analysis.

## VI. INDICES OF MIGRATION

92. We will suppose that we are working on retrospective survey data (1). We will not therefore have to take into account fluctuations due to mortality (2).

## 1. First migration quotients

93. We are working on a given cohort in the country of emigration. Let  $N_x$  be the number at the  $x$ -th birthday of the members of this cohort who have always lived in the country. Let  $E_x$  be the number of these who emigrate between the  $x$ -th and the  $(x + 1)$ -th birthday. The quotient of first emigration at age  $x$ ,  $e_x$  will read :

$$e_x = \frac{E_x}{N_x}$$

94. In the same way, first emigration quotients may be defined for every country of emigration, or calculated for part of the total population (single persons, for example) [8].

## 2. Second-order migration quotients

95. We are working now on the emigrants from country  $i$  who are present in country  $j$  and who entered  $j$  at age  $x$ . They may in the future either remain in  $j$ , or return to  $i$ , or migrate to another country  $k$ .

96. Let us suppose, at first, that there are no migrations of the last type. We may then define a return quotient  $r_y$ ,  $y$  years after the first migration:

$$r_y = \frac{R_y}{E_y}$$

where  $R_y$  is the number of returns to  $i$  recorded between the  $(x + y)$ -th and the  $(x + y + 1)$ -th birthday, among the first migrants who entered at age  $x$  and are still present in  $j$  on the  $(x + y)$ -th birthday,  $E_y$ .

If there are migrations between a number of countries, various viewpoints may be considered.

97. For country  $i$ , the various countries of emigration are of little importance, all that counts is the length of stay outside the country. It is therefore pointless to take into account all the migrations between  $j, k, \dots$ . All that matters is the return to country  $i$ . If,  $y$  years after the first migration at age  $x$ , the number  ${}_iR_y$  of these individuals return to the country, then the return quotient  ${}_i r_y$  reads:

$${}_i r_y = \frac{{}_i R_y}{{}_i E_y}$$

where  ${}_i E_y$  is the number of first migrants at age  $x$ , who are still abroad at age  $(x_1^i + y)$ .

98. For country  $j$ , on the other hand, it is the length of stay in the country that counts, regardless of the country ( $i$  or  $k$ ) to which the migrant goes on his second migration. We can therefore define, on the basis of exits from country  $j$ ,  ${}_j R_y$ ,  $y$  years after the first migration at age  $x$ , an exit quotient  ${}_j r_y$ :

$${}_j r_y = \frac{{}_j R_y}{{}_j E_y}$$

where  ${}_j E_y$  is the number of first migrants at age  $x$  still present in country  $j$  at age  $(x + y)$ .

99. Of course, for a more refined analysis of the phenomenon, other quotients can be defined.

100. On the basis of these quotients, we can calculate the proportion of returns by a given age. This allows us to define permanent migrants, if this age is sufficiently advanced (it will be the age after which

(1) For indices definable for other types of data, see [14].

(2) If these fluctuations are taken into account, the following formulae are easily alterable.

there are practically no returns). In this case, it is preferable to define a new return quotient,  $r'_y$ , relating, not to all the first migrants, but to those who will return in the future (1). If  $E_a$  is the number of permanent migrants, the equation reads:

$$r'_y = \frac{R_y}{E_y - E_a}$$

This allows us to define two differently-behaving sub-populations.

### 3. Higher order migration quotients

**101.** We will take the simplified case, which must however be close to reality, in which an individual makes several migrations between two countries only, and not to others (2),

**102.** To be thorough, we should draw a distinction between individuals from country  $i$  who left for  $j$  at age  $x$ , returned to  $i$  at age  $y$ , returned again to  $j$  at age  $z$ ... It is easy to see that the numbers in these groups will rapidly approach zero. It is therefore necessary to regroup these numbers (this may indeed be necessary even with second-order migration). This may be done in various ways:

— by taking only the age at which the migration of order  $(n-1)$  was made and studying the distribution in time of migrations of order  $n$  in a given generation;

— by working on all migrations of order  $(n-1)$  and, taking as starting-point the time of migration, studying the distribution of migrations of order  $n$  in relation to this starting-point, in a given generation:

— by working on all the migrations of order  $(n-1)$  which took place in a given year and studying the distribution in time of migrations of order  $n$ .

**103.** The first method is preferable to the other two, since it allows work on a given generation and age but the numbers will be small. The second method has the advantage of providing larger numbers, while still working on a single generation. But, since the individuals may have made their migration of order  $(n-1)$  at any age, they will all be observed over different periods. The last method has the same disadvantage and it no longer allows work on a given generation. On the contrary, a new cohort is defined here, that of the individuals who made their migration of order  $(n-1)$  in a given year. It appears interesting to consider this cohort insofar as migration is very sensitive to the economic conditions of the moment: in certain years, the number may be very high but it may be nil in other years.

### 4. Other indices

**104.** Of course, numerous other indices can be constructed. In the first place, we may characterise, for a given generation, the intensity of permanent migration in a country and the average length of residence for those making a return, without taking into account either the age at first emigration or the order of successive migrations.

**105.** The question of comparing the first emigrants with the population subject to the risk of migration, can also be discussed. In particular, the population of earlier emigrants present in country  $j$  can be considered as exercising an attraction on new migrants in proportion to its numbers.

## CONCLUSION

**106.** Before drawing any conclusions from this study, it is useful to summarise here the course we have followed.

**107.** The development of earlier work on migration falls into two stages. In the first, *migration* is considered almost exclusively as an event, unrelated to the other events in the life of an individual, and in particular to any other migrations he may make. *Frontier records* constitute the most frequent measurement of this. However, the failure as yet to apply international recommendations aimed at rendering the mea-

(1) For simplicity, we are taking the case in which there are no further migrations to a third country.

(2) The most general case *can* be treated, but it is very complex.

surements of the various countries comparable, leads to a second approach. The *migrant* is now defined as an individual who has experienced at least one migration during the period in question, but without considering the number of migrations he may have made. *A question asked during census on the place of residence at an earlier date* permits an approximate measurement of these.

**108.** However, when we seek to define the phenomenon accurately, we see that these two definitions are inadequate. They ignore an important aspect of migration: the *length of stay* of migrants in a country. Only this concept provides exact information on the gain or loss of labour which migration involves for a given country.

**109.** We should therefore analyse the possibilities of studying the phenomenon, without at first worrying about whether the necessary statistics exist. We must first ascertain the part played in migration by the various demographic factors: returns, multiple migrations, mortality. Only after this has been studied can the economic, political and sociological analysis of migration be developed.

**110.** When we turn to the existing statistics, mainly frontier records and census data, we see that, even if the international recommendations were applied, and if these two types of data could be used together, the information provided would not enable the analysis to be carried out.

**111.** It is necessary therefore to resort to other methods. The first that comes to mind is the use of *population registers*: the small number of countries which have such statistics and the complexity of processing them make this method impracticable. There remains therefore the use of retrospective *surveys* on migration. To give complete information on migration, these surveys should take place at the same time in the various countries.

**112.** These surveys do, however, present a certain number of disadvantages. To give valid results, they require a large sample: the cost would therefore be very high. In addition, certain oversights on the part of subjects or errors in the migration dates given are to be feared. It will be useful to refer to previous data, where possible, to ascertain the extent of these omissions.

**113.** In spite of this, the advantages outweigh the disadvantages. First of all, these surveys allow us to supply the information missing in the past. Longitudinal analysis of migration thus becomes possible. Secondly, these surveys give all the demographic, economic and sociological information for a complete analysis of the phenomenon, which the incomplete data previously available from a variety of sources did not allow. Moreover, some of these sources are of little use, since most migration is now intra-continental: this is particularly true of frontier controls.

**114.** Thus the use of surveys on migration allows a great step forward in its study, which is as yet very incomplete.

**115.** The demographic study of migration is far from lacking in interest, as was previously thought. In fact, factors such as returns or multiple migrations require analysis, which is yet to be undertaken (1). Other demographic factors also operate, among which we may mention: the birth rate of children abroad, mortality and the link between present and past migrations. This last factor may be important, since the presence in the host country of fellow-countrymen and the help they may be expected to give, also play a part in migration. Conversely, migration affects the development of other demographic factors and its effects also require evaluation.

**116.** The interest of the economic analysis made possible by these surveys is obvious. The demographic analysis already made provides indices which define migration accurately. Only when we know the period a migrant has spent in a country, can we make a serious estimate of his contribution to the economy of that country. Other data can then be adduced, in particular economic and sociological data, to produce a more thorough analysis.

**117.** These surveys are necessary both for the administration of the various countries and for the purpose of defining the right policy for a given situation.

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(1) The first results obtained [11], show that the effect of economic crises on returns is much less than might have been expected, and that the long-term development of the country's social and economic structures played a dominant part.

**118.** Many countries do have accurate statistics on births and deaths. Careful demographic analysis of these enables population forecasts to be made, without migration, which show the results that will follow from the pattern of development observed in the past. These forecasts therefore allow a policy to be defined in full knowledge of the facts.

**119.** The moment migration occurs, the situation changes. While certain countries still have migration statistics, these are in most cases incomplete, as we have seen. In addition, the absence of any demographic analysis of the phenomenon prevents any population projection being made, including migration, on the basis of the pattern of development observed in the past.

**120.** Many people think that fluctuations connected with the economic and political situation make it impossible to project the trends of migratory movements. Even if these movements have very little stability forecasts are not without value, since it is obvious that not all futures can be equally probable [9].

**121.** We would go even further, for we think that only an analysis of the phenomenon can show us whether the trends of migratory movements, outside periods of very serious economic crisis, do in fact vary only very slowly over a period of time. It seems to us that the stability of migration must be much greater than it is held to be, according to the economic point of view taken by many present governments. First attempts at analysing returns show that this certainly appears to be so [11]. We see therefore the profound interest of conducting surveys, which alone can show whether or not this supposition is well-founded. If it proves true, solidly-based projections can then be made in the various countries.

**122.** In addition, the effect of political measures taken in the past can be examined with the aid of these surveys. They will enable us to judge whether these measures modified the flow of migrants in the desired direction. It will also be possible to see what consequences they may have had in other fields.

**123.** Lastly, it will be possible to attempt a joint approach to migration by a number of disciplines. For this approach to be fruitful, the survey questionnaire must be drawn up by representatives of the various sciences concerned with migration. Only very close collaboration between both the countries and the sciences concerned will make possible these surveys, which seem to us to be of fundamental interest.

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