ECONOMIC AND SOCIAL DEVELOPMENT: PARTICIPATION IN THE LABOUR FORCE AND FERTILITY

II. Women's participation in economic activity as a strategic factor of change in fertility: The cases of Mexico and Costa Rica

by

Andras Uthoff and Gerardo González
LATIN AMERICAN DEMOGRAPHIC CENTRE (CELADE)

Santiago, Chile
July 1976

I N D E X

I. INTRODUCTION

When, how and why fertility rates will begin to decline in the countries of the Third World, and how quickly this final stage of demographic transition will come about, are unknown quantities of outstanding world-wide significance, both from the scientific and political points of view. Hence the importance of studying in depth those countries which in recent years have shown a marked reduction in their rate of population growth, with a view to attaining a more complex and global understanding of such processes and thus acquiring knowledge that will be of use in the formulation of more efficacious population policies, designed to induce and regulate demographic transition.

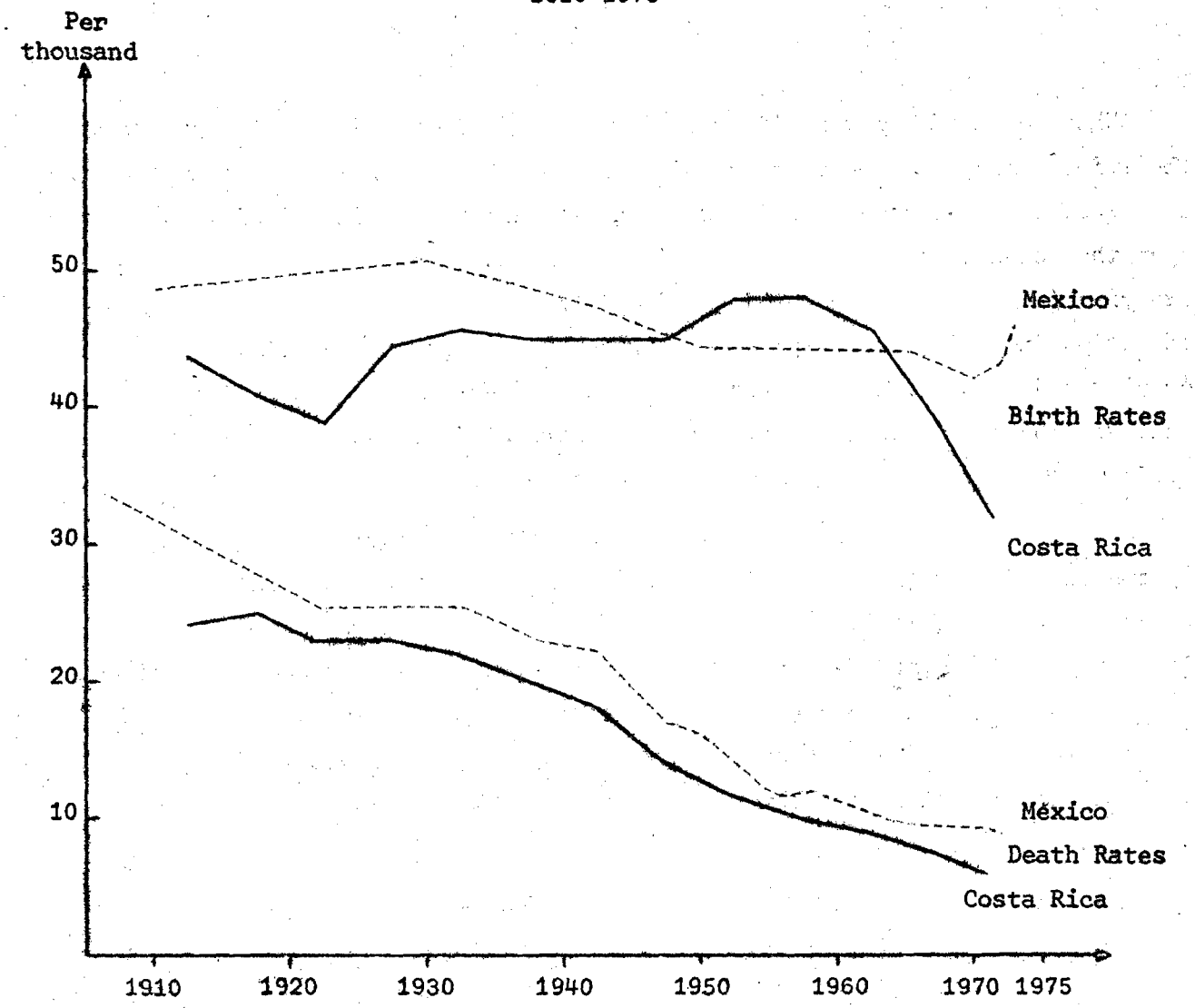
Within Latin America, Costa Rica offers the most obvious example of a spectacular fall in the population growth rate. As can be seen in figure 1, towards the end of the 1950's the mortality rate had already dropped to decidedly low levels (10 per thousand per annum), generating an exceptionally rapid demographic growth (about 3.8 per cent per annum). At this point a swift and steady decline in the birth rate began, which in the short space of a decade brought about a change that in the developed countries, where demographic transition occurred earlier, had taken half a century.

México is one of the countries of the region which most sharply contrasts with Costa Rica in this respect. While the course followed by the overall death rate was parallel and very close to the corresponding trend in Costa Rica, and the latest vital statistics published show a marked reduction of infant mortality in 1970-1973, the gross birth rate remained at more than 42 live births per thousand inhabitants, rising over the period 1970-1973 until it reached 45.8 per thousand in the latter year. This phenomenon is observable even in the Federal District, in which, in view of its metropolitan character, a decrease might have been expected. Here, too, in 1970-1973 the birth rate climbed from 41.3 to 43.8 per thousand.[1/]

1/ See Secretaría de Industria y Comercio, Departamento de Estadísticas, "Imagen Demográfica 1960-1973", Estadísticas Vitales, Serie I, N°1, México, 1975.

Figure 1

BIRTH AND DEATH RATE TRENDS IN COSTA RICA AND MEXICO.
1910-1973



Sources: - Costa Rica: Dirección General de Estadística y Censos. Informes Estadísticos y Anuarios Estadísticos, taken from Campanario, Paulo, Caracterización Demográfica de Costa Rica, Proyecto, Estrategias de Desarrollo y Políticas de Población, CELADE (unpublished).
- México: Death Rates before 1950, Anuarios Estadísticos de los Estados Unidos Mexicanos, taken from El Colegio de México, Dinámica de la Población de México, 1970, Cuadro II-1. Birth Rates before 1950, El Colegio de México, op. cit., Cuadro III-2. 1950-1973, Dirección General de Estadísticas, Estadísticas Vitales. Serie I, N° 1, 1975, Cuadro 1.

This is not the place for a detailed discussion of whether this increase in the birth rate is real or merely apparent; how far it reflects a change in the age structure of the female population of child-bearing age; or how far it is only the result of an improvement in the recording of vital statistics, etc. What can be maintained for the moment is that whereas in Costa Rica the birth rate has notably declined since the 1960's, in Mexico there has been no significant change at all, at least until 1973, the latest year for which official statistics have been published. This fact emerges even more clearly from a comparison of specific fertility rates by quinquennial groups in the two countries for the years 1960 and 1970 (71), (see figure 2).

The problem to be dealt with in the present study can be summed up in the following question: why is it that a change has taken place in Costa Rica and in México it has not? Only one of the many possible explanations will be explored here, namely, the relation between changes in women's participation in economic activity and changes in reproductive behaviour patterns. Women's participation will serve as a link connecting the overall economic and social development process, in its specific historical forms, with one aspect of its dynamics, i.e., fertility.

The empiric material which will be used for the analysis will basically consist of the census samples available in the CELADE Data Bank (OMUECE), which correspond to the censuses taken in Mexico in 1960 and 1970 and in Costa Rica in 1963 and 1973.

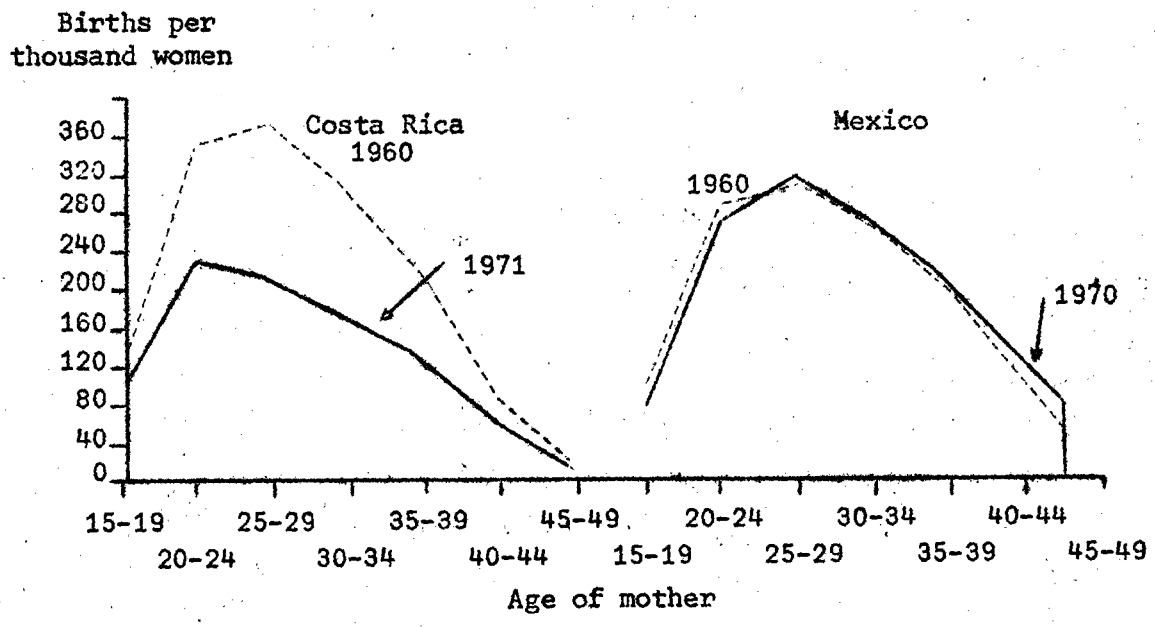
The structure of the document is as follows.

In an initial section, of a theoretical and methodological character, some general and specific hypotheses are first propounded as guidelines for the analysis. The method of analysis chosen is next presented, and certain problems and limitations deriving mainly from the available supply of information are discussed. The following section describes and discusses the most important changes that took place in women's participation in economic activity and in variables closely linked to it -such as marital status and level of education- in the capital cities of México and Costa Rica between 1960 and 1970. The purpose of the third section will be to analyse the capacity of the above-mentioned variables to explain the fertility differentials noted in women of child-bearing age, in the light of the

data available in the two countries for the year 1970. In the next section, this analysis will be complemented by a simulation exercise designed to estimate the probable effect of the changes in women's economic activity, in interaction with education and marital status, upon the fertility rate. Lastly, before the conclusions are put forward, a section will be devoted to presentation and analysis of the changes that took place during the intercensal period under consideration between the capital, other urban areas and the rural population. Since the data available for Mexico do not differentiate between other urban areas and the rural population, this analysis will consider only Costa Rica.

Figure 2

AGE SPECIFIC FERTILITY RATES (FIVE YEARS AGE GROUPS)



Source: United States Bureau of the Census, World Fertility Patterns, 1974.

II. THEORETICAL AND METHODOLOGICAL ASPECTS

A. Some theoretical statements

The studies hitherto carried out on the subject of the relations between women's participation in economic activity and reproductive behaviour patterns lead to the following general conclusions:

- In most cases a negative correlation is to be found between women's participation in economic activity and the fertility rate;

- This relation varies widely from one socio-economic context to another: where it seems to be closer is in the developed rather than in the underdeveloped countries,[2/] in urban rather than in rural areas, and in industrialized urban areas rather than in those where little industrialization has taken place;[3/]

The relation in question virtually disappears or is inverted in certain rural contexts, particularly when the work in which women participate is agricultural.[4/]

It thus seems obvious that the relation between women's economic activity and reproductive behaviour is not univocal, and may vary both from positive to negative and from one degree of intensity to another, according to the nature of the work done (inter alia). This factor acquires special importance in developing countries, in view of the marked heterogeneity of their economic structures.

The explanations given for this phenomenon can be grouped under three major hypotheses, which are complementary: role incompatibility, the socializing effect of work and the influence of industrial-urban culture.

2/ R. Weller, "The Employment of Wives: Role Incompatibility and Fertility", A Study among Lower- and Middle-class Residents of San Juan, Puerto Rico, W.r. 1968, Milbank Memorial Fund Quarterly, vol. XLVI, N°4, October, 1968, pp. 507-521.

3/ B. Rosen and A. Simmons, "Industrialization, Family and Fertility: A Structural-Psychological Analysis of the Brazilian Case", Demography, vol. 8, N°1, February, 1971.

4/ Demographic Aspects of Manpower, Report N°1, Sex and Age Patterns of Participation in Economic Activity (ST/SOA/Ser. A/33), United Nations publication (Department of Economic and Social Affairs), Sales N°: 61.XIII,4, New York, 1963.

1. Role incompatibility

The first of these postulates assumes that the greater the incompatibility between the role of mother and the role of worker, the greater will be the (negative) correlation between women's participation in economic activity and the fertility rate. The degree of incompatibility seems to depend upon different factors, some of an economic and others of a socio-cultural character, so that to estimate it in specific situations is an extremely complex task.[5/]

The role-incompatibility hypothesis serves to explain both the influence of work on fertility and that of fertility on work. If the degree of incompatibility is high, the desire or the need to continue working may conduce to low fertility and, in turn, the desire to have a child may lead to abandonment of economic activity. Given a high degree of incompatibility, the direction of this relation, or, in other words, the role which will take precedence, will depend upon the opportunity cost that having a child represents for the woman concerned.[6/] This opportunity cost will depend in its turn upon such factors as the wife's level of technical or professional skill, the existence of job opportunities, the corresponding levels of remuneration and the size and significance of the proportion of the family income that is contributed by the wife. The greater the opportunity cost, the greater too will be the probability that the wife will work and that her reproductive behaviour will therefore be oriented towards a small number of children.

5/ Among the factors referred to, consideration should be given, for example, to the following:
- Functions culturally assigned to the role of mother;
- Family characteristics which make it easier or more difficult for other family members to undertake maternal functions (extended family or functional relationship network, for example);
- Work characteristics: location of place of work (at home, near to or far from the home); time schedule (full- or part-time, rigid or flexible); regularity (permanent, seasonal or sporadic); facilities for child-care in the place of work;
- Legislation protecting and facilitating procreation on the part of the working woman: pre- and post-natal leave of absence, safeguards against dismissal on maternity grounds, etc.

6/ For a discussion of some hypotheses on the value of the mother's time (opportunity cost) in under-developed environments, see Marc Nerlove, "Household and Economy: Toward a New Theory of Population and Economic Growth", in Journal of Political Economy, The University of Chicago Press, Vol. 82, Part II, March/April 1974, pp. 200-218.

2. Socializing and modernizing effect of work

Another line of explanation is based on the assumption that in certain circumstances exposure to the working atmosphere, as well as the actual exercise of the role of worker, contributes to:

- Reduce the wife's economic dependence on the family and to improve her intra-household status, developments which in turn make for her greater participation in family decisions and her increasing emancipation from the husband's authority.
- Changes in values and interests, with the emergence or growing importance of extra-family spheres of interest, relating to trade-union, artistic, educational, political and other activities.

The convergent and combined action of the above-mentioned factors would seem to lead -from this theoretical point of view- to a redefinition of the system of women's roles, with a relative decline in the importance of her roles as wife and mother.

This hypothesis assumes a type of incorporation in the structure of production which represents participation in what is known as the primary (or formal) labour market. This is characterized by relatively large enterprises, with high levels of internal organization and productivity, demanding from the worker some degree of skill and offering him in return stability of employment and higher wages.

In highly heterogeneous economic structures, however, like those prevailing in Latin America, where the secondary (or non-formal) labour market[7/] has acquired considerable dimensions, the analysis must take into consideration the type of labour market in which women's participation in economic activity occurs. This becomes even more indispensable in the light of various lines of argument which suggest that mobility between the two markets is probably low.

7/ The use of the terms "primary labour market" and "secondary labour market" is proposed by Michael J. Piore, in "The Dual Labour Market: Theory and implications", D.M. Gordon, ed., in Problems in Political Economy: An Urban Perspective, Lexington, Massachussetts, D.C. Heath, 1971.

From this point of view, there would appear to be three elements in a woman's participation in economic activity that determine, in our opinion, the direction and intensity of the role played by the socializing influence of work. These are: herepast experiences in the labour market; her stability in previous jobs; and the way in which these antecedents are assessed by employers in the labour market with regard to offering her employment if she should at any time decide to rejoin the labour force. If her employment experience has been in the secondary labour market, it will have been characterized by low levels of income and productivity, technological stagnation, minimum possibilities of on-the-job training and of the consequent acquisition of new skills, and, as the outcome of all this, high levels of unemployment and turnover. This occupational characteristics will probably induce her to seek better working conditions, and as a result, in view of the relative inaccessibility to the primary labour market, she may enter the illicit labour market. This new feature of her occupational history will make her even more ineligible for jobs in the primary labour market, where employers set a value on the stability and legitimacy of her previous employment. The loss of such opportunities means that she is likely to be taken on only by employers in that same secondary labour market from which she wants to escape, and she is thus trapped in a vicious circle which conditions her social values as regards her participation in the labour force. In such circumstances, the chances of her remaining in the female labour force will depend solely upon whether the family can or cannot do without the earnings she contributes, however small they may be.

The case is different for those women who begin their experience in the primary labour market, where income is higher, jobs and work habits are stable, and high productivity exists, together with an occupational hierarchy, on-the-job training and possibilities of promotion. The values relating to work under these conditions will be radically different from those described above.

3. Influence of industrial-urban culture

This third source of explanation is to be found at the macro-social level. The industrialization process, inasmuch as it directly or indirectly brings a sizeable proportion of women into economic activity of a modern type, "influences fertility through shifts in the social status of the wife, both in their work and at home",[8/] thus producing a widespread cultural change which affects both

8/ B. Rosen and A. Simmons, op. cit.

women who work and those who do not, or even those who never have done so. This type of cultural change would seem to be conditioned by the creation of modern employment opportunities for women and to be a process of relatively long duration.

From this set of hypotheses certain propositions derive which have to be taken into account in the analysis.

In the first place, although economic activity does not constitute a permanent personal attribute, since it can begin, end and recommence at any time, a woman's experience in the labour market may leave imprints both at the individual and at the collective level which survive the passage of time. Thus, different types of hypothesis can be distinguished in the light of this criterion. Those hypotheses which are based on role incompatibility imply the direct and concurrent influence of work on fertility and vice versa. From this point of view alone, the influence of previous economic activity on subsequent reproductive behaviour is not comprehensible. The hypothesis relating to the socializing influence of work, on the other hand, makes it possible to envisage effects at the level of the working woman's attitudes and interests which would continue to influence her reproductive behaviour even if she temporarily abandoned economic activity. Lastly, the third hypothesis (which in some measure epitomizes the other two, amplifies them and projects them to a macro-social level) implies effects of women's work which transcend the economic activity of each individual woman and even influence the reproductive behaviour of women who have never worked.

Secondly, the influence of women's work on fertility seems largely to depend upon the nature of the economic activity in which they participate, and this in a twofold sense: on the one hand it depends on certain characteristics of the enterprise or production unit (size, degree of organization of workers, intensity of side activities) and, on the other hand, upon the specific characteristics of the jobs that women obtain, particularly the level of remuneration and the work status conferred by the technical and professional skills involved and by the responsibility of the job held. In this respect the observations made in connection with the primary and secondary labour markets are applicable.

Thirdly, the influence of women's work on fertility is very greatly dependent upon the stage in the potentially reproductive period in the woman's life during which the activity in question takes place. From this standpoint, the way in which participation in economic activity is distributed over the woman's lifetime and the various events in her reproductive history (initiation of a stable sexual union, first pregnancy, second pregnancy, etc.) condition the interaction between the two line of behaviour and the direction of the influence exerted..

Among both young people and older adults situations are found in which the direction of the influence seems to differ or in which there simply appears to have been no interaction between the two lines of behaviour. The following examples may be cited, which are commonly to be found among young people: a woman who leaves work because she has married or in order to look after her first child;[9/] a married professional woman who deliberately prolongs the interval before starting a pregnancy in order to continue working; and a woman who, even if she would like to get married, remains single, and for that very reason has no children and at the same time needs to work. The first two cases belong in one and the same dimension. In both roles incompatibility occurs, the opportunity cost being low in the first and high in the second, a fact which, as previously pointed out, accounts for the direction of the relation.

Among older adults, too, prototype situations can be identified in which the direction sign of the relation differs. For instance, a recent study shows that among women in the low socio-economic strata, the greater the number of children the higher are the rates of participation in economic activity, the reverse being true for women in the upper socio-economic brackets.[10/] In the first case, it may be supposed that the need to provide for the basic requirements of a numerous family compels the mother to work; in the second, the wish to take better care of a large family induces the mother to leave a job which is not strictly

---

9/ In a survey carried out in 1967 in marginal settlements in Greater Santiago (Chile), it was found that of the total number of women between the ages 15 and 49, living in a conjugal union (legal or otherwise), only 18 per cent had never worked, and most of them (60 per cent) had worked but had left off doing so. The main reasons the latter gave for having stopped working were marriage (56 per cent) and the need to look after their children (24 per cent). See Gerardo González, La Limitation des Naissances dans la Population Marginale de Santiago du Chili, CELAP, 1969, pp. 77-78.

10/ See Angel Fucaraccio, El Trabajo de la Mujer en Chile, 1970. Parte I, Capital del País, CELADE, Santiago, Chile, 1974 IPI/3, 29 pages.

necessary for the upkeep of the home. In these instances, even if the earnings of a woman in the upper socio-economic stratum are higher, the economic significance of her contribution to family income is less than in the case of a woman in a lower stratum, which means that the relative importance of the opportunity cost represented by the birth of an additional child that prevents her from working is greater in the latter instance than in the former. It also happens in these age groups that widowhood or divorce simultaneously and independently determines a low level of exposure to the risk of conception and the necessity of undertaking gainful economic activity.

Fourthly, at a more general level, it should be pointed out that the factors taken into consideration in the hypotheses seem to present different values according to the sector or branch of activity and the formal or non-formal character of the labour market in which women participate.

It may be considered that the lowest values in respect of role incompatibility, opportunity cost, the socializing and modernizing effects of work and the influence of industrial-urban culture usually correspond to jobs in the non-formal market and the primary sector of the economy (agricultural and extractive activities). The highest values, in contrast, will probably be found in jobs in the formal market and in the secondary and tertiary sectors of the economy.

The foregoing observations raise one of the crucial questions in the study of the present topic, namely: <u>what type of qualitative and quantitative changes in women's participation in economic activity might contribute to a decline in fertility</u>?

In attempting to answer this question, it is thought advisable to take the following dimensions into account in the analysis:

- Changes in the economic structure which affect the distribution of employment opportunities by sector of economic activity, as well as the size of the formal and non-formal labour markets;

- Changes in the rates of women's participation within each sector and fraction of the labour market;

- Changes in the status of the jobs obtained by women;

- Changes in the rates of women's participation among the younger age groups, in which reproductive activity begins, and usually reaches its peak.

Such changes result from the combined and convergent action of at least two types of factors: firstly, those connected with the sectoral structure of employment opportunities, and, secondly, those relating to attributes of women or characteristics of their situation which determine their need to work and their capacity to compete in the labour market.

The first of the dimensions listed above depends essentially upon the dynamics of each country's economic system and the economic policies adopted by governments. In contrast, the other three are basically dependent upon attributes of the women concerned. The chief of these seems to be their qualification for work, which results from general education of the formal type, technical and professional training, and apprenticeship through the actual job or through training activities undertaken by the enterprises themselves or by the trade unions. It may be maintained that the better the qualifications, the greater will be the capacity to compete in the labour market, and the stronger the probabilities of finding employment in the formal market and in the modern secondary and tertiary sectors and of obtaining jobs with a higher status. In brief, the raising of women's educational levels, and in particular the improvement of their technical and professional training, would seem to contribute to two results: an increase in their participation in economic activity, and the likelihood of their working in the context of enterprises or institutions and in jobs that imply role incompatibility with a high opportunity cost, and, at the same time, exposure to the socializing and modernizing influence of such work environments. Obviously, this effect of education is conditioned by the existence of jobs of the type in question, which brings us back to the structural factors first mentioned.

Thus, it may be concluded that one of the ways in which education influences fertility is through women's participation in economic activity.

Marital status is another of the variables that must be taken into account in the analysis, after prior definition of its explanatory importance, since it constitutes one of the key intermediary variables,[11/] and its influence on fertility in our societies is obvious, inasmuch as it conditions open recognition of exposure to sex relations.

11/ See Kingsley Davis and Judith Blake, "Social Structure and Fertility: An Analytic Framework", in Economic Development and Cultural Change, Vol. IV, N°3, April 1956, pp. 211-235.

The relations between marital status and women's participation in economic activity are also close, although more complex. Single women, widows and divorcees, by their very circumstances, are more likely than married women or partners in a stable union to be unprovided for in the economic sense. Consequently, there is a greater probability of their needing to earn their living. It is also probable that this need to work will increase in direct relation to the number of children they have had, while the latter are still unable to supply the economic requirements of the home. In these cases marital status and fertility account for women's economic activity.

From the standpoint of the objectives of the present document, what is of most interest is to identify and single out situations in which the relation operates in the opposite direction: namely, those in which it may plausibly be supposed that economic activity affects marital status (more specifically, defers the age of initiation of stable sexual unions), and those in which it influences the fertility of women with the same civil status, especially partners in a conjugal union, legal or otherwise.

It may be propounded as a hypothesis that a woman's economic activity will make for the postponement of marriage in so far as it gives her financial independence, with the result that she does not need a husband to keep her; and in so far as it raises the level of her aspirations in terms of life style and consumption patterns. If this is so, the key factor in the relation lies in the status of the woman's job, which -as previously pointed out- depends to a great extent on the educational and technical or professional levels attained.

As regards the influence of economic activity on the fertility of women living as partners in a stable union, the hypotheses previously discussed with respect to the imprints of the socialization resulting from economic activity undertaken before and after marriage, as well as the hypotheses relating to role incompatibility and opportunity cost of procreation, are all valid.

B. Methodological aspects

The pursuit of the analytical objectives proposed is hampered by various difficulties, which derive on the one hand from the nature of the variables considered and, on the other hand, from the data available.

The data chiefly used for the empirical analysis carried out in the present study were those contained in the samples relating to the most recent population censuses taken in Costa Rica (1963 and 1973) and in Mexico (1960 and 1970).

Both reproductive behaviour and economic activity are distributed over the course of each individual woman's life. The former has a cumulative effect which can be assessed through the census data by means of the number of live births per woman. As regards the latter, all that can be ascertained is the situation of each person at the time of the census, a datum from which no useful information on past occupational experience can be deduced. Consequently, this indicator will have to be handled with extreme caution throughout the analysis.

The theoretical observations just made in the preceding section point to the necessity of introducing three other variables into the analysis of the relations between women's participation in economic activity and reproductive behaviour. These are age, education and marital status, each with its own special explanatory importance.

Fertility, as stated above, will be studied through the average number of live births per woman, and since this is a cumulative measurement, it is advisable to break down the analysis by age groups.

For the purposes of studying economic participation, a distinction will be drawn between active and non-active women, and the former group will be classified by occupational categories. The system of categories used will be such that an approximation can be made to stratification by job status.

The education variable will be measured in terms of years of instruction, six intervals being distinguished, which in some sections will be reduced to three in order to simplify the analysis.

Since all these variables, with the exception of education, are highly age-sensitive, the seven quinquennial age groups between 15 and 49 years of age will be considered in the study.

The aims of the present research make it necessary to focus the analysis on the changes observed during the intercensal period. Here a serious deficiency in the data arises, since information on fertility is available only for the last year of the period. This is because in Costa Rica the 1963 census did not include a question on the number of live births, and although the question was putiin Mexico's 1960 census, the data recorded in the census sample are not considered reliable.

An attempt will be made to overcome this handicap by means of a typification exercise which introduces changes in the other variables into the analysis. With this end in view, the first step will be to estimate, by means of the Theil Index, the importance of the interaction between economic activity, education and marital status from the standpoint of explaining the differences in fertility noted in 1970 (see the methodological annex); and on this basis the typification exercise will then be carried out.

Because of the limitations of the data available, some aspects of the subject which it would have been advisable to introduce into the analysis will have to be excluded on this occasion, or will be only indirectly considered. Among the former, mention may be made of the technical and professional skills which women may have acquired through channels other than formal education. Among the latter may be included the distinction between the formal and non-formal markets, to which only a rough approximation can be made through the occupational category.

Lastly, before embarking upon the analysis, stress should once again be laid on the most serious of the deficiencies in the data, i.e., the absence of information on occupational history. This limitation necessitates adopting the assumption that the levels and patterns of women's participation as measured at two particular points in time represent the prevailing situation in those respects, and that the differences observed between the two dates reflect the trend of a regular process of change.

III. CHANGES IN WOMEN'S PARTICIPATION IN ECONOMIC ACTIVITY AND IN ASSOCIATED VARIABLES. COSTA RICA (1963-1973) AND MEXICO (1960-1970)

In the present chapter, a brief analysis of the changes that took place at the national level in the occupational structure and in women's participation in that structure will be followed by a more detailed presentation of the changes in rates of women's participation, in job status, and in the relation between these variables and education and marital status, at the level of the capitals of the two countries.[12/]

A. Changes in structure by branches of activity

Around 1950, the structures by branches of activity of the total economically active population (EAP) were fairly alike in the two countries (see table III-1). In both cases agricultural activities absorbed more than half of the EAP and the transforming industries did not employ more than 11 or 12 per cent. Only in "services" had Costa Rica, as early as that date, a relatively larger proportion of EAP than Mexico.

The pattern of change over the whole period 1950-1970 is also relatively similar in the two countries: the percentage of EAP in agriculture is reduced by one-third and the percentage in "services" increases considerably. The most significant differences are observable in the transforming industries and in "commerce". Although participation in these branches of activity increases in both countries, in the case of the transforming industries the increment is greater in Mexico (42 per cent) than in Costa Rica (only 9 per cent); in "commerce", on the other hand, it is bigger in Costa Rica.

These changes in the occupational structure are accompanied -and either strengthened or weakened- by certain changes in women's participation within each branch (see table III-2). The percentage of women in the agricultural EAP

12/ The Statistical Annex has been omitted.

follows a downward trend in both countries, although it was in 1950, and tends to remain, lower in Costa Rica than in Mexico. In services, the only branch in which there was a majority of women around 1950, the percentage of women shows a tendency to decrease in both countries, although still standing higher in Costa Rica than in México. In contrast, in both countries a substantial increase in women's participation can be noted within the transforming industries. On the other hand -and here there is a difference between the two- the percentage of women in commerce rose in Costa Rica between 1963 and 1973, whereas in Mexico the level of participation remained the same.

The combined effect of the changes in occupational structure and in women's participation within each branch finds its ultimate expression in significant changes in the distribution of the female EAP by economic activity (see table III-3).

In the profile of the female EAP in México in 1960, agriculture absorbs one-third and services a little more still (38 per cent), while the proportion working in the transforming industries is relatively small (12 per cent). By 1970 this profile has undergone a notable modification. The percentage of the female EAP in agriculture has dropped by two-thirds, now representing less than 11 per cent; in contrast, the percentages in services and in transforming industries have considerably increased.

In Costa Rica, both the initial situation and the process of change are different in serveral respects. The proportion of the female EAP in agriculture was much smaller than in México (5.5 per cent in Costa Rica in 1963 as against 32.6 per cent in México in 1960), and shows a tendency to decline still further. It should be noted in this connection that the percentage of economically active women found to be working in agriculture in Mexico in 1970 closely resembles that observable in Costa Rica twenty years before (10.8 per cent and 11.3 per cent, respectively).

Thus, the Costa Rica profile is characterized in 1963 by a very small percentage of economically active women working in agriculture and a large proportion -almost two-thirds- employed in services. The importance of transforming industries and commerce is far less (although much the same as in México): they absorb 16.7 per cent and 10.7 per cent of the female EAP, respectively.

The low percentage of economically active women in agriculture as early as 1963 perhaps explains why the profile of the female EAP alters much less in Costa Rica than in Mexico during the 1960's. The only changes worth pointing out take place within the tertiary sector and consist in a slight decrease (from 64 per cent to 59 per cent) in the importance of the services branch and an increase in that of commerce.

To sum up, it may be concluded that in both countries, alongside a steady decline in the relative importance of the primary sector, a tertiarization process takes place, which is even more advanced in Costa Rica than in Mexico (see table III-1).

Although women's participation is much greater in the tertiary than in the primary sector (see table III-2), this process of tertiarization of the occupational structure did not imply so significant an increase as might have been expected in the female labour force within the total EAP (see table III-4). This would appear to be due to the reduction in women's participation in the services branch observable in both countries, during the period 1960 (1963) - 1970 (1973).

Lastly, in Costa Rica and in Mexico alike, it is in respect of the secondary sector that steady and convergent increases can be observed in the weight it carries in the occupational structure and in women's participation within it.

B. Changes in rates of economic participation

Although the rates of women's participation in economic activity in the age groups under consideration do not vary very much in the reference period, in both capitals a slight increase can be noted, which is a little larger in San Jose (Costa Rica) than in Mexico City (see table III-5).

If age groups are taken into account, it can be seen that in both countries the direction of the changes, broadly speaking, is the same: the rate of participation shows a downward trend in the youngest group (15-19 years) -probably as a result of the rise in levels of instruction, which entails devoting attention to educational activities up to a later age-, whereas in the age groups in which reproductive activity is usually concentrated (20-39 years), participation increases. Mention should be made, however, of significant differences between the two countries. These relate to the scale of the change and to the levels reached by the rate of participation.

In Costa Rica, the decrease in this rate in the 15-19 age group and the increase in the 20-39 age group are considerably more marked than in Mexico. Again, in the age groups where reproductive activity is greatest, rates of participation in Mexico are a good deal lower in 1970 than they already were in Costa Rica by 1963, and those noted for the latter country in 1973 reveal a widening gap between it and Mexico. The most striking difference is to be noted precisely in the age group in which reproductive activity is greatest (25-29 years), with 45.9 per cent of economically active women in San Jose as against only 33 per cent in Mexico City.

C. Changes in the occupational status of economically active women

This aspect of the question, which is of crucial importance from the theoretical standpoint, will be studied via two complementary avenues of approach: occupational position and level of instruction.

The classification of occupational positions was constructed for the present analysis with a view to establishing some sort of rough stratification by job status.

The second approach relates to a personal attribute which is used here as an indicator of the worker's technical or professional skills and which for that reason is assumed to be associated with job status. Later on the relations of this variable with fertility and with economic activity will be analysed in depth.

1. Changes in distribution by jobs

Four categories are distinguished, i.e.:

M - Managers and/or professionals

C - Clerical workers, saleswomen, and transport operators

A - Artisans, operatives, manual workers

O - Others, comprising mainly domestic servants

In this respect, the contrast between the two countries is remarkable. Generally speaking, whereas in Mexico City the distribution of the female EAP by jobs undergoes no changes that reflect an improvement in the status of the jobs held by women, in San Jose the changes noted imply a significant upward movement (see table III-6).

Thus, when all the age groups are taken into account, it can be seen that in San Jose the highest category and the category comprising artisans, operatives and manual workers show note worthy increases of 36 per cent and 67 per cent respectively, at the expense of the lowest category, which is reduced by 25 per cent. In Mexico City, on the contrary, a slight relative increase can be observed in the lowest category, and the only change of any importance consists in a reduction of the second category (-12 per cent) and an increase in the highest category (23 per cent).

It should be pointed out that in Costa Rica the lowest category, which was quantitatively the most important in all age groups in 1963, loses this position in 1973 in the 20-39 age groups, which are the most significant from the standpoint of reproductive behaviour. What is more, in three of these four groups the highest category becomes the most numerous. In Mexico, in contrast, the lowest category remains more or less constant in all age groups, and in 1970 continues to be the most important in all of them except the group aged 20-24 years.

2. Changes in the educational level of the EAP

Here the educational level of economically active women is used as an indirect indicator of the status of their respective jobs.

From an examination of tables III-10 and III-11 the following general conclusions can be drawn:

- Both in San Jose and in Mexico City the average educational level of economically active women rises during the period under consideration more sharply than that of the non-active;

- The average level of education at the beginning of the period is higher in Costa Rica than in Mexico and also shows a greater improvement in the former than in the latter.

Reference to table III-7 enables a more detailed analysis to be made of the changes taking place in the level of education of economically active women.

If all age groups are taken into consideration to begin with, the contrast between the two capital is noteworthy and coincides with what was noted above in using the occupational stratification as an indicator of job status.

In San Jose the percentage of economically active women with a "high" level of education increases considerably, while there is a marked reduction of the relative importance of women whose educational level is low. In Mexico, on the other hand, it is the two extremes that lose importance, and the percentage of women with an average level of instruction (higher primary education) increases. This overall trend is also to be found within each age group.

If the increase in the percentage of economically active women whose level of education is higher than the completed primary cycle is taken as an indicator of changes in the status of women's jobs, the following conclusions can be drawn:

- The small gap of 2.7 points which existed in 1960 (1963) between Mexico City and San Jose widens to one almost ten times greater (20.3 points) in 1970 (1973), the difference still being in favour of Costa Rica;

- The same phenomenon also occurs within the age groups that are of most significance from the standpoint of reproductive activity (20-39 years).

It should be pointed out that this change is accompanied by a reduction in the rate of participation of women with a low level of instruction, apparently reflecting the effect of education as a credential in the competition for existing employment opportunities.

These changes in the educational level of the EAP should be viewed in the broader framework of the corresponding changes in the female population as a whole.

In studying this variable it must be borne in mind that in the Latin American countries the educational level does not usually undergo much change in the adult age groups, and for the vast majority of the population is virtually crystallized before 20 years of age. Consequently, it may be supposed, for example, that the levels of education shown by women of 45 to 49 years of age in 1963 approximately reflect the levels reached by the younger age groups about 30 years before, that is, around 1933. A similar assumption may be adopted with respect to the other age groups, making it possible, up to a point, to reconstruct a series of estimates of educational levels from the 1930's up to the recent past on the basis of the census sample data we are using. Needless to say, they are quite rough estimates, since they take into account neither the effects of the death rate nor

those of migration, which would be differentials by education. This device served as the basis for the construction of table III-8, which gives some idea of the evolution of education in both capitals during the last four decades.

As can be seen in this table, of the young women recently incorporated in the contingent of child-bearing age (15-19 years) in Costa Rica, only one-third had not attained or surpassed, by about 1935, what might be called a "threshold level". In Mexico a similar situation had only just been brought about by 1960, that is, about 25 years later. Moreover, in 1970, at the close of the period on which this analysis of changes is focused, the levels reached by women in this category in Mexico were those that in Costa Rica had already been achieved 15 years before.

It can thus be concluded that the democratization of education is a process which began and expanded much earlier in Costa Rica than in Mexico, and that in the former, by virtue of its cumulative effect, it produced considerably higher levels of instruction in the whole contingent of women of child-bearing age during the period 1960-1970.

It may be noted, however, that although the process lagged behind in Mexico, its pace was rapid during the period 1955-1970, as is reflected in the differences observed between 1960 and 1970 among the younger age groups. Thus, the proportion of women with a sub-threshold level of instruction decreased in the 15-19 age group from 31.6 per cent to 20.9 per cent, and in the 20-24 age group from 36.4 per cent to 26.2 per cent. On the other hand, the same phenomenon is not observable among women who have succeeded in reaching levels of instruction higher than the primary cycle; in these categories neither increases nor decreases of any importance took place. This is another respect in which Costa Rica differs from Mexico, since in the former there is a significant increase in the percentage of women who have attained post-primary levels, in particular in the first three age groups (15-29).

3. Occupational situation and educational level of economically active women

From table III-9 both the degree of association between these two variables and their changes in the two capitals under consideration can be assessed. An examination of this table leads to the following conclusions:

- A close association exists between occupational situation and educational level in both countries and in both the years under study;

- At the beginning of the period (1960-1963), educational levels are considerably higher in San Jose than in Mexico City, in each of the categories. This difference is the expression, in respect of economically active women, of the significant disparities in levels of education observable among the female population as a whole, as was shown in the preceding section;

- During the period under study, levels of education in San Jose can be seen to rise considerably in each and all of the occupational categories. In Mexico the position is somewhat different: in the top and bottom categories a moderate improvement in levels of education can be noted; in the two middle categories, in contrast, although a decrease takes place in the percentage of women with very low educational levels (less than 4 years of instruction), there is also a decline in the percentage of women reaching the post-primary level (over 6 years of instruction). It is precisely in these two categories -made up of clerical workers, saleswomen, artisans, operatives and manual workers- in which the biggest contrast is to be found between the two capitals under study.

In short, not only the changes noted in the distribution of economically active women by occupational category, but also those observable in their levels of education, would seem to indicate that the occupational status of economically active women was higher at the beginning of the period and tended to rise more rapidly during the 1960's in San Jose than in Mexico City. It can also be concluded that these differences between the two cities become more pronounced precisely in those age groups which are most significant from the standpoint of reproductive behaviour.

D. Changes in education, marital status and women's participation in economic activity

In summarized form, tables III-10 and III-11 show, for San Jose and Mexico City, respectively, the average level of education (measured in years of instruction) and the percentage of single, separated, widowed or divorced women, by age groups and economic participation.

The principal changes taking place in San Jose indicate a significant rise in the average level of instruction, which by 1963 was already higher than that attained by women in Mexico City in 1970. Except in the 15-24 and 45-49 age groups, the improvement in the average level of instruction was greater among the economically active than among the non-active, which denotes an increase in the rates of participation of women with higher levels of instruction. Moreover, the percentage of single women increases, especially in the younger age groups (15-29), reflecting a tendency to defer marriage to a later age. Nevertheless, the percentage of economically active women represented by single women falls in almost all age groups, which points to an increase in the participation of the non-single. Among the latter, the percentage of separated, widowed and divorced women drops significantly, in both the active and the non-active groups, the implication being that the economic participation of women living in stable unions (legal or otherwise) increased. In brief, between 1963 and 1973 Costa Rica's economic and social development process was accompanied by a substantial improvement in the level of instruction of the female population, a phenomenon whose origins date back to long before the period under study.

This improvement appears in conjunction with an increase in the participation in economic activity of women with higher levels of instruction and of those living in stable unions (legal or otherwise).

In Mexico City, on the other hand, among the total number of women in the 15-49 age groups not only are the levels of instruction attained by 1970 lower than those reached by women in San Jose in 1963, but the change between 1960 and 1970 is on a considerably smaller scale than its counterpart in San José between 1963 and 1973. It is not the better-educated women who tend to participate to the greatest extent; on the contrary, it is among those with intermediate levels of instruction (between 4 and 6 years of primary education) that a slight increase in the rate of participation is found. The percentage of single women remained virtually unchanged at the level of the female population as a whole; but it decreased, in the case of economically active women. Among these, however the percentage of separated or divorced women and widows increased.

Consequently, our figures show that the percentage of economically active women represented by those living in stable unions (legal or otherwise) remains unchanged. Thus, in contradistinction to what took place in San José,

where women living in conjugal unions were incorporated in economic activity on a considerably larger scale, in Mexico City participation increased to a greater extent among women without stable sexual relations (single, separated and divorced women and widows).

To sum up, the expansion of educational services which accompanied the economic and social development process in Mexico had weaker repercussions than in Costa Rica, and although it was reflected in improvements in the average level of instruction, it was not the better educated women that were incorporated into economic activity to a greater extent. Nor was there any increase in the labour force participation of women living in stable unions (legal or otherwise).

Table III-1

STRUCTURE OF THE ECONOMICALLY ACTIVE POPULATION BY SECTOR OF ECONOMIC ACTIVITY. MEXICO (1950-60-70) AND COSTA RICA (1950-63-73)

(Percentages)

Sector	Mexico			Costa Rica		
	1950	1960	1970	1950	1963	1973
Agriculture	58.3	54.2	39.4	54.7	49.2	36.4
Other extractive	1.2	1.2	1.4	0.3	0.3	0.3
Primary Sub Total	59.5	55.4	40.8	55.0	49.5	36.7
Industry	11.8	13.7	16.7	11.0	11.5	12.0
Construction	2.7	3.6	4.4	4.3	5.9	6.7
Secondary Sub Total	14.5	17.3	21.1	15.3	17.4	18.7
Public Utilities	0.3	0.4	0.4	0.6	1.1	1.0
Transportation	2.5	3.1	2.8	3.5	3.7	4.3
Commerce	8.3	9.5	9.2	7.9	9.8	11.6
Services	10.6	13.5	19.8	14.8	17.2	22.7
Terciery Sub Total	21.7	26.5	332.2	26.8	31.8	39.6
Other activities	4.3	0.7	5.8	3.0	1.4	5.3
Total	100.0	100.0	100.0	100.0	100.0	100.0

Source: Population Censuses, Mexico 1950-60-70, Costa Rica 1950-63-73.

Table III-2

PERCENTAGE OF WOMEN AMONG ALL ECONOMICALLY ACTIVE POPULATION BY SECTORS OF ECONOMIC ACTIVITY IN MEXICO (1960-70) AND COSTA RICA (1950-63-73)

Sector	Mexico		Costa Rica		
	1960	1970	1950	1963	1973
Agriculture	10.8	5.2	3.2	1.8	2.1
Other extractive	6.8	7.5	0.9	1.3	4.3
Industry	16.0	20.6	21.9	23.6	26.1
Construction	3.5	3.1	2.2	0.5	0.5
Public Utilities	9.4	8.8	0.5	1.5	4.9
Transportation	5.6	4.7	5.3	4.3	4.5
Commerce	27.0	27.9	19.0	17.8	26.6
Services	50.2	43.9	63.9	60.8	50.4
Other activities	21.8	31.9	3.0	11.9	12.0

Source: Population Censuses.

Table III-3

STRUCTURE OF THE FEMALE ECONOMICALLY ACTIVE POPULATION BY SECTOR OF ECONOMIC ACTIVITY. MEXICO (1960-70) AND COSTA RICA (1950-63-73)

(Percentages)

Sector	Mexico		Costa Rica		
	1960	1970	1950	1963	1973
Agriculture	32.6	10.8	11.3	5.5	4.1
Other extractive	0.5	0.5	0.02	0.02	0.06
Primary Sub Total	33.1	11.3	11.32	5.52	4.16
Industry	12.3	18.1	15.7	16.7	16.2
Construction	0.7	0.7	0.1	0.5	0.2
Secondary Sub Total	13.0	18.8	15.8	17.2	16.4
Public Utilities	0.2	0.2	0.1	0.3	0.2
Transportation	1.0	0.7	1.2	1.0	0.1
Commerce	14.3	13.5	9.7	10.7	15.9
Services	37.6	45.7	61.3	64.3	59.2
Terciary Sub Total	53.1	60.1	72.3	76.3	75.4
Other activities	0.9	9.7	0.6	1.0	3.3
Total	100.0	100.0	100.0	100.0	100.0

Source: Population Censuses.

Table III-4

PERCENTAGE OF WOMEN AMONG THE TOTAL ECONOMICALLY ACTIVE POPULATION AND STRUCTURE OF THE FEMALE ECONOMICALLY ACTIVE POPULATION () BY LARGE SECTORS OF ECONOMIC ACTIVITY. MEXICO (1960-70) AND COSTA RICA (1950-63 AND 1973)

Large sectors	Mexico		Costa Rica		
	1960	1970	1950	1963	1973
Primary	5.93 (33.1)	2.16 (11.3)	1.75 (11.3)	0.88 (5.5)	0.78 (4.1)
Secondary	2.32 (13.0)	3.58 (18.8)	2.49 (15.8)	2.74 (17.2)	3.15 (16.3)
Terciary	9.56 (53.1)	11.43 (60.1)	11.11 (72.4)	12.39 (76.4)	14.73 (75.4)
Others	0.15 (0.9)	1.85 (9.7)	0.09 (0.6)	0.17 (1.0)	0.63 (3.3)
Total	17.96 (100.0)	19.02 (100.0)	15.44 (100.0)	16.18 (100.0)	19.29 (100.0)

Source : Population Censuses.

Table III-5

A. FEMALE LABOUR FORCE PARTICIPATION RATES BY AGE (Women 15-49 years old)

Age	San Jose			Mexico City		
	1963	1973	Percentage variation	1960	1970	Percentage variation
Total	36.8	37.8	+ 2.7	33.3	33.8	+ 1.5
15-19	35.7	30.4	- 14.8	36.6	34.2	- 6.6
20-24	42.4	46.1	+ 8.7	40.9	41.2	+ 0.7
25-29	39.5	45.9	+ 16.2	30.3	33.0	+ 8.9
30-34	39.4	41.8	+ 6.1	27.2	30.4	+ 11.8
35-39	32.2	36.0	+ 11.8	29.3	29.7	+ 1.4
40-44	35.0	32.4	- 7.4	30.2	29.3	- 3.0
45-49	27.1	27.6	+ 1.8	32.0	30.1	- 6.0

B. AVERAGE AGE FROM FEMALE POPULATION (Women 15-49 years old)

	San Jose			Mexico City		
	1963	1973	Variation (months)	1960	1970	Variation (months)
Total	29.0	28.0	- 12.0	28.7	28.2	- 6.0
Economically Active	28.3	27.6	- 8.0	27.7	27.4	- 4.0
Non Economically Active	29.4	28.1	- 16.0	29.1	28.6	- 6.0

Table III-6

STRUCTURE OF THE ECONOMICALLY ACTIVE FEMALE POPULATION AGED 15-49 BY AGE GROUPS AND OCCUPATIONAL POSITION[a]

(Percentages)

Age groups	Occupational position	San Jose 1963	San Jose 1973	Mexico City 1960	Mexico City 1970
All ages	M	14.7	21.0	12.0	14.8
	C	24.5	24.3	35.6	31.4
	A	9.8	16.4	11.7	12.1
	O	51.0	38.4	40.7	41.7
15-19	M	0.6	2.3	5.5	4.7
	C	14.5	17.8	29.2	25.5
	A	9.2	16.8	9.6	11.7
	O	75.7	63.1	55.7	58.1
20-24	M	12.5	15.8	12.0	15.0
	C	31.1	33.4	40.0	37.4
	A	7.8	20.0	9.8	10.9
	O	48.7	30.8	38.2	36.7
25-29	M	23.5	30.1	15.2	23.0
	C	30.9	27.7	37.1	31.7
	A	10.4	12.4	13.2	11.5
	O	35.2	29.8	34.4	33.8
30-34	M	18.7	32.5	14.7	19.3
	C	27.1	23.4	36.0	31.5
	A	7.6	13.6	13.6	12.8
	O	46.6	30.4	35.7	36.4
35-39	M	26.1	33.5	14.7	15.5
	C	26.5	17.5	35.2	30.6
	A	20.8	17.2	13.0	13.8
	O	36.6	31.9	37.2	40.1
40-44	M	19.7	26.9	13.3	20.1
	C	21.7	19.8	36.5	30.4
	A	10.3	15.4	13.3	13.0
	O	48.3	38.0	36.9	36.5
45-49	M	14.4	24.6	15.3	16.1
	C	31.1	19.9	40.3	31.6
	A	6.7	18.1	14.7	13.5
	O	47.8	37.3	29.7	38.7

a/ M : Managers and/or professionals; C: Clerical Workers, Saleswomen and Transport Operators; A: Artisans, Operatives, Manual Workers; O: Others, comprising mainly domestic servants.

Table III-7

STRUCTURE OF THE ECONOMICALLY ACTIVE FEMALE POPULATION AGED 15-49
BY AGE GROUPS AND EDUCATIONAL CATEGORIES

(Percentages)

Age groups	Years of instruction	San Jose			Mexico City		
		1963	1973		1960	1970	
All ages	0-3	26.4	13.9	- 47.3	38.4	30.2	- 21.4
	4-6	43.0	41.3	- 4.0	33.7	45.2	+ 34.1
	7 and over	30.6	44.8	+ 46.4	27.9	24.5	- 12.2
15-19	0-3	24.4	13.0	- 46.7	41.9	29.8	- 28.9
	4-6	56.4	61.1	+ 8.3	36.0	54.0	+ 50.0
	7 and over	19.2	25.9	+ 34.9	22.1	16.2	- 26.7
20-24	0-3	21.0	9.7	- 53.8	29.6	20.9	- 29.4
	4-6	40.3	34.3	- 14.9	31.3	48.6	+ 55.3
	7 and over	38.6	55.9	+ 44.8	31.8	30.5	- 4.1
25-29	0-3	24.7	10.8	- 56.3	33.7	27.1	- 19.6
	4-6	32.9	32.2	- 2.1	32.8	42.6	+ 29.9
	7 and over	42.4	57.0	+ 34.4	33.5	30.3	- 9.6
30-34	0-3	27.9	14.7	- 47.3	38.9	33.8	- 13.1
	4-6	42.9	34.9	- 18.6	32.7	38.9	+ 19.0
	7 and over	29.2	50.4	+ 72.6	28.4	27.4	- 3.5
35-39	0-3	29.2	19.0	- 34.9	42.8	36.9	- 13.8
	4-6	40.9	38.6	- 5.6	32.2	42.4	+ 31.7
	7 and over	29.9	42.4	+ 41.8	25.0	20.8	- 16.8
40-44	0-3	37.6	24.6	- 34.6	45.8	43.6	- 4.8
	4-6	38.2	39.6	+ 3.7	33.1	34.4	+ 3.9
	7 and over	24.2	35.8	+ 47.9	21.1	21.9	+ 3.8
45-49	0-3	31.1	19.1	- 38.6	43.0	41.8	- 2.8
	4-6	41.7	51.7	+ 24.0	32.5	34.8	+ 7.1
	7 and over	27.2	29.2	+ 7.3	24.6	23.4	- 4.9

Table III-8

ESTIMATED PERCENTAGE OF YOUNG WOMEN (AGED 15-19) WITH LESS THAN FOUR YEARS OF INSTRUCTION

Year	San José: Estimation based on: 1963 data	San José: Estimation based on: 1973 data	Year	Mexico City: Estimation based on: 1960 data	Mexico City: Estimation based on: 1970 data
1933	35.5	-	1930	47.6	-
1938	31.7	-	1935	45.1	-
1943	30.2	26.1	1940	44.8	46.9
1948	24.9	28.3	1945	44.3	46.3
1953	23.6	25.3	1950	39.8	42.3
1958	19.9	19.6	1955	36.4	38.9
1963	16.5	14.1	1960	31.6	32.6
1968	-	10.3	1965	-	26.2
1973	-	7.6	1970	-	20.9

Table III-9

STRUCTURE OF THE ECONOMICALLY ACTIVE FEMALE POPULATION (AGED 15-49) BY EDUCATION AND OCCUPATIONAL POSITION[a/]

Occupational position	Education	San Jose 1963	San Jose 1973	Mexico City 1960	Mexico City 1970
M	0-3	3.8	0.4	10.1	3.4
	4-6	18.0	6.8	21.0	22.7
	7 and over	78.2	92.8	68.8	73.9
C	0-3	6.8	3.0	16.7	12.5
	4-6	33.2	28.0	36.7	57.2
	7 and over	60.0	69.0	46.6	30.3
A	0-3	18.1	11.5	39.4	28.6
	4-6	63.8	64.0	50.6	63.9
	7 and over	18.1	24.5	10.0	7.4
O	0-3	44.1	29.1	65.4	53.4
	4-6	50.9	59.0	30.0	38.9
	7 and over	5.0	11.9	4.6	7.7

a/ M: Managers and/or Profesionals.
C: Clerical Workers, Saleswomen, and Transport Operators.
A: Artisans, Operatives, Manual Workers.
O: Others, comprising mainly domestic servants.

Table III.10

AVERAGE LEVEL OF INSTRUCTION, PERCENTAGE SINGLE AND PERCENTAGE SEPARATE, DIVORCED OR WIDOWED BY AGE AND LABOUR FORCE PARTICIPATION

(San Jose 1963-1973)

	Average level of instruction (years of instruction)			Percentage single			Percentage separate, divorced or widowed		
	1963	1973	Variable	1963	1973	Variable	1963	1973	Variable
Total Capital	5.9	7.0	+18.6	44.4	48.7	+ 9.7	7.4	4.9	-33.8
Active	5.9	7.3	+23.7	66.5	64.4	- 3.2	11.1	7.6	-31.5
Non Active	5.9	6.8	+15.3	31.5	39.1	+24.1	5.2	3.2	-38.5
15-19	6.4	7.3	+14.1	89.5	91.3	+ 2.0	0.9	0.3	-66.7
Active	5.0	5.8	+16.0	98.3	96.7	- 1.6	0.3	0.5	+66.7
Non Active	7.1	8.4	+18.3	84.6	88.9	+ 5.1	1.3	0.3	-76.9
20-24	6.3	7.8	+23.8	55.6	59.2	+ 6.5	3.3	2.7	-18.2
Active	6.6	8.0	+21.2	83.0	78.8	- 5.1	4.6	3.2	-30.4
Non Active	6.1	7.7	+26.2	35.4	42.5	+20.1	2.3	2.3	-
25-29	6.3	7.4	+17.5	31.0	34.3	+10.6	5.6	5.6	-
Active	6.9	8.3	+20.3	63.5	56.9	-10.4	6.3	8.4	+33.3
Non Active	5.9	6.7	+13.6	9.7	15.1	+55.7	5.1	3.2	-37.3
30-34	5.7	6.7	+17.5	26.6	24.6	- 7.6	11.2	6.1	-45.5
Active	6.0	7.9	+31.7	51.3	45.3	-11.7	17.9	11.3	-36.9
Non Active	5.5	5.9	+ 7.3	10.6	9.7	- 8.5	6.8	2.4	-64.7
35-39	5.5	6.0	+ 9.1	16.5	19.8	+20.0	9.0	7.4	-17.8
Active	5.7	7.1	+24.6	36.6	37.3	+ 1.9	17.7	13.6	-23.2
Non Active	5.3	5.4	+ 1.9	6.9	9.9	+45.5	4.9	3.9	-20.4
40-44	5.1	5.6	+ 9.8	20.8	17.9	-14.0	15.6	10.1	-35.3
Active	5.2	6.5	+25.0	39.5	35.5	-10.1	29.3	15.8	-46.1
Non Active	5.0	5.2	+ 4.0	10.7	9.4	-12.1	8.2	7.3	-11.0
45-49	4.8	5.4	+12.5	21.1	19.0	-10.0	18.2	13.0	-28.6
Active	5.6	6.3	+12.5	35.0	39.0	+11.4	28.2	19.9	-29.4
Non Active	4.5	5.1	+13.3	15.9	11.3	-29.0	14.4	10.4	-27.8

Table III-11

AVERAGE LEVEL OF INSTRUCTION, PERCENTAGE SINGLE AND PERCENTAGE SEPARATE, DIVORCED OR WIDOWED BY AGE AND LABOUR FORCE PARTICIPATION

(Mexico City 1960-1970)

	Average level of instruction (years of instruction)			Percentage single			Percentage separate, divorced or widowed		
	1960	1970	Variable	1960	1970	Variable	1960	1970	Variable
Total Capital	4.7	5.1	+ 8.5	39.0	38.7	- 0.8	5.4	7.3	+ 35.2
Active	5.1	5.5	+ 7.8	63.1	60.3	- 4.5	10.6	14.0	+ 32.1
Non Active	4.5	4.9	+ 8.9	27.0	27.7	+ 2.6	2.8	3.9	+ 39.3
15-19	5.2	5.8	+11.5	86.0	86.9	+ 1.0	0.7	0.9	+ 28.6
Active	4.6	4.9	+ 6.5	94.9	95.5	+ 0.6	1.0	1.4	+ 40.0
Non Active	5.5	6.3	+14.5	80.8	82.4	+ 2.0	0.6	0.7	+ 16.7
20-24	5.1	5.6	+ 9.8	50.6	47.9	- 5.3	1.6	3.6	+125.0
Active	5.8	6.2	+ 6.9	81.7	80.0	- 2.1	2.6	5.0	+ 92.3
Non Active	4.6	5.1	+10.9	29.0	25.4	-12.4	0.9	2.7	+200.0
25-29	4.9	5.2	+ 6.1	25.6	23.6	- 7.8	3.6	6.5	+ 80.6
Active	5.3	6.1	+15.1	56.8	53.9	- 5.1	7.9	14.7	+ 86.1
Non Active	4.5	4.8	+ 6.7	12.0	8.7	-27.5	1.8	2.5	+ 38.9
30-34	4.6	4.7	+ 2.2	16.9	13.8	-18.3	5.5	8.4	+ 52.7
Active	5.2	5.6	+ 7.7	40.7	35.1	-13.8	14.4	20.1	+ 39.6
Non Active	4.2	4.3	+ 2.4	8.0	4.4	-45.0	2.1	3.3	+ 57.1
35-39	4.4	4.3	- 2.3	14.9	10.1	-32.2	8.7	11.2	+ 28.7
Active	4.8	5.0	+ 4.2	34.2	22.9	-33.0	21.5	26.8	+ 24.7
Non Active	4.2	4.0	- 4.8	6.9	4.7	-31.9	3.4	4.6	+ 35.3
40-44	4.2	4.2	-	15.2	9.8	-35.5	12.7	16.0	+ 26.0
Active	4.5	4.8	+ 6.7	32.6	22.1	-32.2	25.7	33.1	+ 28.8
Non Active	4.1	4.0	- 2.4	7.7	4.7	-39.0	7.0	8.9	+ 27.1
45-49	4.0	4.2	+ 5.0	13.3	8.9	-33.1	18.2	21.1	+ 16.5
Active	4.8	4.9	+ 2.1	23.5	16.5	-29.8	35.0	39.2	+ 12.0
Non Active	3.7	3.9	+ 5.4	8.5	5.6	-34.1	10.2	13.1	+ 18.4

IV. FERTILITY CHARACTERISTICS BY ECONOMIC PARTICIPATION, OCCUPATIONAL SITUATION, LEVEL OF INSTRUCTION AND MARITAL STATUS, IN SAN JOSE (1973) AND MEXICO CITY (1970)

The importance of the changes just analysed will depend upon the magnitude of the differences in the fertility of women grouped in the categories used in our analysis, as well as upon the interaction between these variables in the determination of differential fertility.

Table IV-1 shows the average number of live births per 100 women, both in San Jose and in Mexico City, by age groups.

The first conclusion which can be drawn from an examination of this table -and which bears out our expectations- is that in both countries the economically active women have a considerably smaller average number of children than the non-active, in each and all of the age groups. A second conclusion is that in the case of the active women -control by age being maintained-, the lower their job status, the higher their fertility tends to be. This relation is closer and more clearly-defined in Mexico than in Costa Rica. Alongside these similarities which appear to be universally prevalent, the following differences are evident at a glance:

In all age groups, levels of fertility are significantly higher in Mexico City than in San Jose. It should be noted, however, that this difference becomes less marked as higher age levels are reached;

Among the younger women (15-34 years of age) the differences between the two capitals in respect of levels of fertility are accounted for entirely by the behaviour of the non-active groups, since the fertility levels of the active women in these age groups are much alike in the two cities.

This makes it necessary to devote careful study to the category of younger economically active women in an attempt to determine whether the explanation of these similar fertility levels is the same in both cases.

The beginnings of a reply to the question just raised can be deduced from tables IV-2 and IV-3. In the first place, nuptiality, measured by the percentage of single women, is very similar in the two capitals for economically active

women, in the first three age groups. Among the rest of the active and all the non-active women, on the other hand, the differences in nuptiality are very marked, the percentage of single women being considerably greater in San Jose than in Mexico City, in all age groups.

Secondly, in both cities the highest average levels of instruction are found among economically active women between 20 and 29 years of age. It should be noted, however, that the patterns of relations between the average level of education and economic activity, by age groups, is much the same in San Jose and in Mexico City, with the one important difference that in the former the average level of instruction tends to be two years higher than in the latter.

Thus, in order to explain why, despite the differences in average levels of instruction between the younger economically active women in the two capitals, their levels of nuptiality and of fertility are alike, it would have to be assumed that the relation between education and nuptiality is non-linear and that there are threshold levels of instruction above which it becomes weaker.

Tables IV-4 and IV-5 make it possible to pursue this discussion in greater depth, inasmuch as they present the average number of live births among active and non-active women, by level of instruction and marital status, respectively. If attention is focused on the younger active women (15-29 years of age), surprising facts emerge, especially when marital status is taken into account. For example, it can be seen that the similarity between the cumulative fertility levels of these women in the two capitals results from a combination of considerably higher fertility among single women in Costa Rica than in Mexico with higher fertility in Mexico than in Costa Rica among women living in stable conjugal unions (legal or otherwise).

It must be borne in mind that this particular distribution of fertility by marital status also occurs among active women between 30 and 49 years of age and among the non-active in all age groups. Hence the resemblance between the levels of fertility found among the younger active women in both capitals is primarily explained by their high -and similar- proportion of single women (see table IV-2).

If attention is now turned to the younger women living in conjugal unions (legal or otherwise) (see table IV-5) a group whose reproductive behaviour is of crucial significance in relation to a change in fertility, it will be seen that

that the average number of children is substantially larger in Mexico City than in San Jose, both among the active and among the non-active women. The same situation is to be found in the older age groups.

The differences in fertility by level of instruction may shed some light on this area of the subject. It is shown in table IV-4 that among the total female population considered, fertility is much alike in the two capitals at the same level of education, and that within each city the disparities in fertility between different levels of education are noteworthy: at the lower educational levels, the average number of children is more than three times as large as at the higher levels.

Moreover, when age controls are maintained, it can be seen that this relation between educational level and fertility remains the same in all age groups, although it tends to weaken as age increases. Another point brought out is that whereas the average fertility levels of women with an equivalent level of instruction are similar in the two capitals when all age groups are considered in the aggregate, this is not so when the younger age groups (between 15 and 29 years of age) are taken separately. What is observable in that case, on the contrary, is that at one and the same level of instruction, fertility is markedly higher in Mexico City than in San Jose. The sharpest contrast is found at the lowest educational levels (0-3 years), while at the higher levels of education (7 years and over) the disparities are relatively slight (see again table IV-4). Lastly, it should be pointed out that the differences just reviewed originate essentially in the reproductive behaviour of the non-active women.

This differential fertility of non-active women as between the two capitals, in the same age groups and at the same educational levels, may be atributable to previous economic activity -of which the census data afford no record-, to later initiation of stable unions in Costa Rica than in México, and/or to other factors not considered in the present analysis. An attempt will be made to explore the only vein that the available data permit, namely, nuptiality.

Table IV-6 leaves no room for doubt that in Mexico City full corroboration if found of the hypothesis put forward in chapter I, according to which, the higher the level of education the later is the age of initiation of stable sexual unions, this being one of the ways in which education influences fertility. The

data for San Jose, in contrast, give absolutely no support to the hypothesis and are to some extent disconcerting, since in the first two age groups the relation expected appears, although in a very feeble and confused form, and in the 25-29 age group it is inverted, since the lower the level of instruction the higher is the percentage of single women.

This phenomenon must be linked with another surprising fact noted earlier, i.e., the very high level of fertility of single women in Costa Rica. Table IV-7 gives the relevant data and reveals the notable differences between the two cities in respect of the fertility of single women, even after control by age and education.

The very high levels of fertility of single women in the younger age groups (particularly 25-29) with low and average levels of instruction seem to indicate that in Costa Rica there are forms of sexual union that neither strictly correspond to the single state nor imply the stable cohabitation proper to consensual unions. Thus there would seem to be qualitative differences between Mexico and Costa Rica as regards the existence and frequency of certain forms of sexual union which confer a different significance in the two countries on "the single state" as formally recorded in the censuses, in terms of the behaviour expected in the sexual and reproductive sphere. This fact invalidates, or at least imposes great caution in attempting, comparisons between the two countries where the marital status position is concerned; on the other hand, it does not invalidate comparisons between the situations arising in the same country through time.

To pick up the thread of the discussion once more, it may be contended -with all the appropriate reservations- that the differential fertility of the younger non-active women in the two capitals, in the same age groups and at the same educational levels, seems to be at least partly due to quantitative and qualitative differences in nuptiality, which are particularly marked where the level of instruction is low.

In brief, it may be concluded that the fertility differentials by participation in economic activity which have been noted are largely attributable to differences between the active and non-active categories of women, in composition by marital status and level of instruction, both within one and the same country and from one country to the other. As between the countries, higher fertility

can be explained to a great extent by differences in respect of nuptiality or education. Within one and the same country, fertility differentials by labour force participation may be due to the substantial difference between the composition of the active group and that of the non-active group by marital status and level of instruction.

The foregoing results highlight the importance of the interactions between the participation, education and marital status variables in the determination of fertility. These interactions must be clarified prior to embarking upon analysis of the relation between changes in the composition of the female population and changes in fertility; in particular, if the latter is measured, as in the present case, on the basis of the average number of live births.

Table IV-1

AVERAGE NUMBER OF LIVE BIRTHS PER 100 WOMEN
BY AGE AND LABOUR FORCE PARTICIPATION

Age	Active					Non-active	Total
	M	C	A	O	S. Total		
				San Jose (1973)			
15-19	10.0	6.4	6.7	7.0	6.9	10.0	9.1
20-24	23.1	24.7	41.7	50.4	35.7	92.6	66.4
25-29	90.4	104.3	117.9	133.6	110.6	229.8	175.0
30-34	161.7	181.7	315.1	238.8	210.8	373.1	305.3
35-39	257.3	235.9	293.5	321.7	280.4	454.9	392.0
40-44	268.1	317.9	315.4	334.4	310.6	543.5	468.1
45-49	248.3	242.6	262.8	397.7	305.5	519.7	460.5
Total	145.7	100.9	134.0	130.7	127.1	239.6	197.1
				Mexico City (1970)			
15-19	10.8	3.4	5.6	7.7	6.5	21.3	16.2
20-24	18.2	20.8	30.3	55.9	34.3	159.2	107.7
25-29	62.4	97.4	115.5	146.0	107.9	296.2	234.1
30-34	155.7	217.2	270.7	264.4	229.2	450.0	382.9
35-39	283.4	343.6	346.8	419.7	365.1	535.4	484.8
40-44	213.0	399.3	391.5	442.2	376.3	583.1	522.5
45-49	287.1	389.4	381.1	415.3	382.0	563.4	507.2
Total	117.0	137.1	158.8	154.5	144.1	303.2	249.4

Table IV-2

PERCENTAGE SINGLE BY AGE AND LABOUR FORCE PARTICIPATION

Age	San Jose (1973)			Mexico City (1970)		
	Active	Non-Active	Total	Active	Non-Active	Total
15-19	96.7	88.9	91.3	95.5	82.4	86.9
20-24	78.8	42.5	59.2	80.0	25.4	47.9
25-29	56.9	15.1	34.3	53.9	8.7	23.6
30-34	45.3	9.7	24.6	35.1	4.4	13.8
35-39	37.3	9.9	19.8	22.9	4.7	10.1
40-44	35.5	9.4	17.9	22.1	4.7	9.8
45-49	39.0	11.3	19.0	16.5	5.6	8.9
Total	64.4	39.1	48.7	60.3	27.7	38.7

Table IV-3

AVERAGE LEVEL OF INSTRUCTION BY AGE
AND LABOUR FORCE PARTICIPATION

Age	San Jose			Mexico City		
	Active	Non-Active	Total	Active	Non-Active	Total
15-19	5.8	8.4	7.3	4.9	6.3	5.8
20-24	8.0	7.7	7.8	6.2	5.1	5.6
25-29	8.3	6.7	7.4	6.1	4.8	5.2
30-34	7.9	5.9	6.7	5.6	4.3	4.7
35-39	7.1	5.4	6.0	5.0	4.0	4.3
40-44	6.5	5.2	5.6	4.8	4.0	4.2
45-49	6.3	5.1	5.4	4.9	3.9	4.2
Total	7.3	6.8	7.0	5.5	4.9	5.1

Table IV-4

AVERAGE NUMBER OF LIVE BIRTHS PER 100 WOMEN BY LEVEL OF INSTRUCTION, LABOUR FORCE PARTICIPATION AND AGE

Age	San Jose			Mexico City		
Total	Active	Non-Active	Total	Active	Non-Active	Total
0-3	201.8	439.4	360.0	230.5	437.1	372.5
4-6	129.7	292.3	228.7	116.8	270.4	218.3
7 and over	101.5	116.8	111.0	87.6	157.3	131.3
15-19 years	Active	Non-Active	Total	Active	Non-Active	Total
0-3	9.6	20.8	14.9	10.5	50.0	30.7
4-6	6.7	24.7	15.4	5.1	22.3	15.9
7 and over	6.1	3.9	4.2	3.6	7.0	6.4
20-24 years	Active	Non-Active	Total	Active	Non-Active	Total
0-3	51.9	132.4	97.1	75.6	208.3	164.6
4-6	52.9	122.8	92.9	28.7	154.9	103.6
7 and over	22.3	60.5	41.9	14.9	97.8	55.4
25-29 years	Active	Non-Active	Total	Active	Non-Active	Total
0-3	185.5	245.0	223.9	175.9	347.8	300.7
4-6	113.0	257.1	200.5	102.2	283.8	227.5
7 and over	95.0	195.4	141.0	55.4	227.1	149.3
30-34 years	Active	Non-Active	Total	Active	Non-Active	Total
0-3	269.6	479.9	414.2	299.0	515.8	458.5
4-6	255.9	368.2	328.7	232.6	429.3	375.3
7 and over	162.5	300.0	225.6	138.3	325.0	239.5
35-39 years	Active	Non-Active	Total	Active	Non-Active	Total
0-3	364.7	550.4	500.3	467.0	620.8	581.0
4-6	283.2	455.3	400.0	331.2	492.5	444.7
7 and over	240.0	344.8	293.9	253.4	381.3	329.6
40-44 years	Active	Non-Active	Total	Active	Non-Active	Total
0-3	333.3	654.2	561.7	481.4	649.2	597.1
4-6	337.8	534.5	479.2	355.4	554.2	499.7
7 and over	269.7	409.2	347.3	200.0	445.7	352.7
45-49 years	Active	Non-Active	Total	Active	Non-Active	Total
0-3	417.8	646.6	600.4	448.1	656.8	599.3
4-6	302.5	495.0	442.0	358.5	499.7	458.1
7 and over	237.7	396.6	338.3	298.9	396.5	353.4

Table IV-5

AVERAGE NUMBER OF LIVE BIRTHS PER 100 WOMEN BY MARITAL STATUS, LABOUR FORCE PARTICIPATION AND AGE

	San Jose			Mexico City		
Total	Active	Non-Active	Total	Active	Non-Active	Total
Single	45.0	26.5	35.8	12.9	10.0	11.5
Married or in stable union	268.91	374.3	350.3	347.2	417.6	406.3
Others	301.2	415.8	348.4	335.7	378.9	351.0
15-19 years	Active	Non-Active	Total	Active	Non-Active	Total
Single	4.6	2.3	3.0	2.1	3.2	2.8
Married or in stable union	72.0	72.5	72.4	88.4	107.7	106.0
Others	100.0	66.7	80.0	126.3	73.7	100.0
20-24 years	Active	Non-Active	Total	Active	Non-Active	Total
Single	20.6	22.4	21.3	6.6	15.5	9.3
Married or in stable union	81.1	142.0	128.8	140.9	209.3	202.6
Others	151.4	297.1	176.2	158.6	177.4	166.7
25-29 years	Active	Non-Active	Total	Active	Non-Active	Total
Single	56.6	64.0	58.3	18.6	35.1	22.7
Married or in stable union	171.1	258.0	234.9	197.0	323.8	305.0
Others	226.6	293.1	247.3	245.2	220.9	239.1
30-34 years	Active	Non-Active	Total	Active	Non-Active	Total
Single	101.2	128.8	107.6	49.0	51.7	49.6
Married or in stable union	306.0	401.7	376.6	347.5	472.9	451.0
Others	283.6	316.7	291.1	280.7	346.7	298.8
35-39 years	Active	Non-Active	Total	Active	Non-Active	Total
Single	135.3	132.9	134.6	46.9	24.2	39.5
Married or in stable union	364.1	494.0	462.5	486.5	569.6	553.8
Others	375.4	409.7	387.0	409.3	382.0	401.4
40-44 years	Active	Non-Active	Total	Active	Non-Active	Total
Single	156.2	259.7	193.1	33.7	55.8	41.2
Married or in stable union	402.4	575.0	537.3	516.2	626.8	607.3
Others	374.1	550.0	460.4	416.6	438.8	425.3
45-49 years	Active	Non-Active	Total	Active	Non-Active	Total
Single	135.9	160.0	146.3	87.5	60.4	75.9
Married or in stable union	433.0	572.1	548.9	468.0	600.9	574.7
Others	374.5	517.2	456.8	408.8	644.2	466.4

Table IV-6

PERCENTAGE OF SINGLE WOMEN AMONG THOSE AGED 15-29 YEARS
BY LEVEL OF INSTRUCTION
AND AGE GROUPS

Years of instruction \ Age	San Jose (1973)			Mexico City (1970)		
	15-19	20-24	25-29	15-19	20-24	25-29
0-3 years	89.6	59.0	41.0	77.5	33.4	17.0
4-6 years	85.9	53.0	35.1	86.1	47.8	23.5
7 and over	95.0	63.6	31.7	94.9	63.7	33.6

Table IV-7

AVERAGE NUMBER OF LIVE BIRTHS PER 100 YOUNG SINGLE WOMEN
(15-29 YEARS) BY LEVEL OF INSTRUCTION
AND AGE GROUPS

Years of instruction \ Age	San Jose (1973)			Mexico City (1970)		
	15-19	20-24	25-29	15-19	20-24	25-29
0-3 years	7.6	33.6	120.8	6.0	23.1	25.0
4-6 years	5.2	40.6	75.0	2.2	7.6	28.3
7 and over	1.2	7.8	20.4	1.7	4.4	13.0

V. EDUCATION, MARITAL STATUS AND LABOUR FORCE PARTICIPATION AS DETERMINANTS OF DIFFERENTIAL FERTILITY

In the foregoing chapters evidence was given of significant fertility differentials among women regrouped by educational levels (years of instruction), marital status and current participation in economic activity. The aim of this chapter is to ascertain for each quinquennial age group the way in which these variables interact one with another in determining levels of fertility.

To this end, recourse was had to a breakdown of the variation observed in the average number of children per woman in each age group, for Mexico City in 1970, and San Jose in 1973.

An inequeality index which is useful for this purpose is that worked out by Henry Theil on the basis of Information Theory (see Methodological Appendix). This indicator makes it possible to distinguish three components of the total variation observed in the number of live births among women in each age group. The first component expresses the variation in the average number of live births among women grouped in each of the different analytical categories considered, and corresponds to the component "Between" in tables V.A.a and V.A.b.

The second component reflects the variation in fertility in each of the analytical categories considered, and corresponds to the component "Within" in tables V.A.a and V.A.b. Lastly, the third component enables us to single out that part of the variations in average numbers of live births among women grouped in each of the analytical categories which is attributable to variations in the average number of live births among women grouped separately by educational levels, marital status or current labour force participation; as well as the part resulting from the interaction of each pair of these variables (triple interactions were not studied).

Observation of tables V.A.a and V.A.b reveals several facts on which stress should be laid. The first is the marked concentration of fertility in a few women in the younger age groups, both in Mexico City and in San Jose, although situation is more intensively prevalent in San José up to 24 years of age; and the second, as it was logical to expect, is the great significance of the marital status variable in the determination of this concentration of fertility, especially in Mexico City.

Thirdly, in the younger age groups (15 to 24 years), the concentration of fertitity by educational levels is much greater in San Jose than in Mexico City, while from 25 years of age upward the behaviour pattern of fertility among women grouped by levels of instruction is similar, both in Mexico City and in San Jose.

Fourthly, the powerful interaction between education and marital status in the determination of fertility among women of 15 to 19 years of age denotes a negative relation between higher educational levels and nuptiality. This pattern clearly persists for the older age groups in Mexico City, but not in San Jose, where the fact that the interaction is positive would seem to be due to the inversion of this relation, and the prevalence of a direct relation between nuptiality and higher educational levels, a phenomenon already discussed in the preceding section.

Fifthly, as regards current participation in economic activity, the low index of inequelity in the fertility of women between 15 and 19 years of age who do and of those who do not participate in economic activity in San Jose, contrasts with the value shown for the same index in México City. In both cases, the interaction with education is positive, as a result of the fact that in this age group higher rates of participation are in inverse relation to educational levels, but the interaction with marital status is negative, indicating a low rate of participation among women living in a stable conjugal union (legal or consensual), especially in Mexico City.

Sixthly, in the groups above 20 years of age a vigorous interaction of the marital status and current labour force participation variables reflects the fact that the rates of participation of women living in a stable conjugal union (legal or consensual) are always low.

The analytical connotations of these interactions are of importance from a dynamic standpoint. When women's levels of instruction rise, the initiation of stable unions is deferred. In turn, the supply of more highly skilled female labour expands, with the resulting increase in women's wages and, therefore, in the opportunity cost for women who devote themselves to running the home. The first phenomenon makes for a relative increase in fertility differentials in those more traditional societies where a stable relationship is an indispensable prerequisite for procreation. The second is prone to step up the differentials in those societies where levels of instruction are lower. This is what our figures show for the

younger are groups, where the differentials by labour force participation alone and by participation interacting with education or marital status are greater in the case of Mexico than in that of Costa Rica (table V-1).

In the older age groups, when fertility has reached completion, differentials by education and labour force participation will be more important in those societies where the incorporation of married women in economic activity has been on a larger scale. In contrast, the importance of differentials by participation and marital status will be greater in those societies in which married women take less part in economic activity. Our figures indicate that for the older age groups the explanatory force of participation, as well as of participation interacting wigh education, is greater in Costa Rica than in Mexico. Differentials by participation and marital status are more significant in Mexico in all age groups (except 45-49 years).

This interdependence between participation in economic activity and marital status and/or education emerges clearly from a study of table IV-5. Most of the eonomically active women, both in Costa Rica and in Mexico, are characterized by average levels of instruction superior to those of the non-active women and by a high percentage (more than 50 per cent for all age groups) of women who are either single or separated, divorced or widowed, according to their age group. As a major proportion of the fertility differentials result from differences in respect of marital status and levels of instruction, when these variables remain constant, the differential effect of labour force participation is significantly reduced. In other words, education and marital status are important determinants of women's participation in economic activity, but are also, in turn, determinants of the number of live births; consequently, most of the variations in the number of live births as between economically active and non active women are due to differences between the levels of education and the composition by marital status of the active and non-active groups.

Another possible view of the differences between active and non-active women is indicated in tables V.A.a and V.B.b. They present, for Costa Rica and Mexico City, respectively, a breakdown similar to that appearing in tables V.A.a and V.A.b but differentiated for economically active and non-active women.

In the case of economically active women, the breakdown is made by marital status (column 1), education and occupation (column 2). In the latter column a distinction is drawn between women reporting themselves as managers or professionals; clerical workers, saleswomen and transport equipment operators; artisans, operatives and manual workers; and others (under which head are basically included domestic servants). In the case of non-active women, the breakdown is made only by education (column 2) and marital status (column 1).

This classification enables us to analyse the effect of occupational structure on fertility among economically active women. The composition of this group of women may be envisaged as a continuum extending from women with high levels of education, high-status jobs and -because they are working-, few children (in the case of married women), to women with low educational levels who are engaged in marginal economic activities and are working because they have a large number of children. The fertility differential which is the product of variations in the average number of children born to women grouped on the basis of these criteria will be all the greater in societies where the average level of instruction of the female population is lower and the participation of married women in economiccc activity is less.

It is obvious from these calculations that the disparities in fertility behaviour patterns are closely linked to women's labour force participation. For all age groups indiscriminately, and in both countries, fertility behaviour is much more uneven (more concentrated) among economically active women than among the non-active. This is manifestly linked to the composition of each of these categories of women by marital status, there being more single women among the economically active group. These differences are much more marked in Mexico City than in San Jose, and are due to the lower rates of participation among women living in stable conjugal unions (legal or consensual).

As might be expected from the existence of interaction between the labour force participation variable and marital status and education, the relative importance of education as compared with marital status fluctuates between the active and non-active categories and by age groups. Among non-active women it increases with age, which denotes that it is enhanced in so far as the original differentials in the age of initiation of stable unions become less important as women grow older.

Among the economically active, differentials by marital status show no significant decrease, owing to the fact that the rate of participation of married women or partners in a consensual union is relatively low in all age groups.

In relation to women who participate in economic activity, it should be emphasized that although inequality in fertility behaviour is significantly reduced as age increases, the relative importance of the variation in the average number of children born to women grouped by education and occupational category remains unfailingly constant. This, together with the fact that fertility behaviour by marital status also maintains its relative importance approximately unchanged, serves to confirm that among these women, where job status is relevant, individual fertility behaviour would seem to be much better represented by the averages established for women grouped according to the above characteristics; hence it appears that their nuptiality and fertility decisions are conditioned by concern for job status.

The reverse is true of non-active women; the older they are the smaller is the proportion of the observed inequality in fertility behaviour explained by variations in the average number of children recorded for women grouped by marital status and education. Among these women, individual and personal characteristics relating to fecundity, religion, access to and use of contraceptive devices, customs associated with social status and stochastic elements, inter alia, would seem to be gradually acquiring increasing importance in the explanation of the additional variation which occurs within our analytical categories as age increases.

In comparing Mexico City with San Jose, stress should be laid on the similarity of the relative importance attaching to education and marital status, in every age group, with respect to the explanation of the observed inequality in the fertility behaviour of women not participating in economic activity. These variables, however (especially marital status), are of much more striking significance in the determination of the concentration of fertility among economically active women. Thus, pronounced variations in fertility may be expected in both countries in the face of changes in nuptiality rates, particularly in the 15-29 age groups.

These changes would appear to have, on the whole, a much stronger impact in Mexico City.

What the figures indicate is that improvements in employment opportunities and in educational levels which might lead to decreases in fertility, may easily be offset by slight rises in nuptiality rates. Such risks will be lessened in so far as the rates of labour force participation of married women or partners in consensual unions increase.

In the case of Mexico City, in view of the fact that the status of women's jobs is relatively low, marital status and fertility may be expected to determine with greater frequency participation in economic activity or its abandonment. Where Costa Rica is concerned, because the status of women's jobs is considerably higher than in Mexico, it may be expected that economic activity will influence with greater frequency changes in nuptiality and in the reproductive behaviour of women in stable unions.

Table V.A.a

DECOMPOSITION OF THEIL'S CONCENTRATION INDEX FOR THE NUMBER OF CHILDREN BORN ALIVE AMONG WOMEN BY AGE GROUPS[a/]

San Jose (1973)

	Age groups							
	15-19				20-24			
Total	2.622	2.622	2.622	2.622	1.029	1.029	1.029	1.029
Within	2.609	1.488	2.282	1.411	0.932	0.670	0.843	0.587
Between	0.013	1.134	0.340	1.211	0.097	0.359	0.186	0.442
L.F.P.b/	0.013	0.013	0.013	-	0.097	0.097	0.097	-
M.S.c/	-	1.125	-	1.125	-	0.342	-	0.342
ED.d/	-	-	0.202	0.202	-	-	0.090	0.090
Interactions								
L.F.P. - M.S.	-	- 0.004	-	-	-	- 0.080	-	-
L.F.P. - ED.	-	-	+ 0.125	-	-	-	- 0.001	-
M.S. - ED.	-	-	- 0.116		-	-	-	+ 0.010
	25-29				30-34			
Total	0.488	0.488	0.488	0.488	0.365	0.365	0.365	0.365
Within	0.428	0.335	0.409	0.301	0.329	0.273	0.308	0.235
Between	0.060	0.153	0.079	0.187	0.036	0.092	0.057	0.130
L.F.P.b/	0.060	0.060	0.060	-	0.036	0.036	0.036	-
M.S.c/	-	0.139	-	0.139	-	0.086	-	0.086
ED.d/	-	-	0.030	0.030	-	-	0.030	0.030
Interactions								
L.F.P. - M.S.	-	- 0.046	-	-	-	- 0.030	-	-
L.F.P. - ED.	-	-	- 0.011	-	-	-	- 0.009	-
E.S. - ED.	-	-	-	+ 0.018	-	-	-	+ 0.014

(Continued)

Source : OMUECE 1973, CELADE.

a/ Measured in natural logarithms

b/ L.F.P.: Labour Force Participation (Economically Active and Non Economically Active).

c/ M.S.: Marital Status (Single; Married or in Stable Union; and Separated, Divorced or Widowed).

d/ ED.: Education (None; 1-3 years of instruction; 4-6 years of instruction; 7-9 years of instruction; 10-12 years of instruction; more than 12 years of instruction).

Table V.A.a (Concluded)

DECOMPOSITION OF THEIL'S CONCENTRATION INDEX FOR THE NUMBER OF CHILDREN BORN ALIVE AMONG WOMEN BY AGE GROUPS[a/]

San Jose (1973)

	Age groups							
	35-39				40-44			
Total	0.315	0.315	0.315	0.315	0.313	0.313	0.313	0.313
Within	0.291	0.240	0.274	0.215	0.284	0.253	0.272	0.237
Between	0.024	0.075	0.041	0.100	0.029	0.060	0.041	0.076
L.F.P.b/	0.024	0.024	0.024	-	0.029	0.029	0.029	-
M.S.c/	-	0.068	-	0.068	-	0.046	-	0.046
ED.d/	-	-	0.022	0.022	-	-	0.016	0.016
Interactions								
L.F.P. - M.S.	-	- 0.017	-	-	-	- 0.015	-	-
L.F.P. - ED.	-	-	- 0.005	-	-	-	- 0.004	-
M.S. - ED.	-	-	-	+ 0.010	-	-	-	+ 0.014

	45-49			
Total	0.342	0.342	0.342	0.342
Within	0.318	0.265	0.301	0.239
Between	0.024	0.077	0.041	0.103
L.F.P.b/	0.024	0.024	0.024	-
M.S.c/	-	0.073	-	0.073
ED.d/	-	-	0.022	0.022
Interactions				
L.F.P. - M.S.	-	- 0.020	-	-
L.F.P. - ED.	-	-	- 0.005	-
M.S. - ED.	-	-	-	+ 0.008

Source: OMUECE 1973, CELADE.

a/ Measured in natural logarithms

b/ L.F.P.: Labour Force Participation (Economically Active and Non Economically Active).

c/ M.S.: Marital Status (Single; Married or in Stable Union; and Separated, Divorced or Widowed).

d/ ED.: Education (None; 1-3 years of instruction; 4-6 years of instruction; 7-9 years of instruction; 10-12 years of instruction; more than 12 years of instruction).

Table V.A.b

DECOMPOSITION OF THEIL'S CONCENTRATION INDEX FOR THE NUMBER OF CHILDREN BORN ALIVE AMONG WOMEN BY AGE GROUPS[a/]

Mexico (1970)

	Age groups							
	15-19				20-24			
Total	2.459	2.459	2.459	2.459	0.945	0.945	0.945	0.945
Within	2.350	1.124	2.136	1.084	0.756	0.375	0.699	0.432
Between	0.109	1.335	0.323	1.375	0.189	0.570	0.246	0.513
L.F.P.b/	0.109	0.109	0.109	-	0.189	0.189	0.189	-
M.S.c/	-	1.343	-	1.343	-	0.484	-	0.484
ED.d/	-	-	0.141	0.141	-	-	0.074	0.074
Interactions								
L.F.P. - M.S.	-	- 0.117	-	-	-	- 0.103	-	-
L.F.P. - ED.	-	-	+ 0.073	-	-	-	- 0.017	-
M.S. - ED.	-	-	-	- 0.109	-	-	-	- 0.045
	25-29				30-34			
Total	0.510	0.510	0.510	0.510	0.340	0.340	0.340	0.340
Within	0.428	0.310	0.402	0.301	0.301	0.237	0.284	0.222
Between	0.082	0.200	0.108	0.209	0.039	0.103	0.056	0.118
L.F.P.b/	0.082	0.082	0.082	-	0.039	0.039	0.039	-
M.S.c/	-	0.189	-	0.189	-	0.097	-	0.097
ED.d/	-	-	0.032	0.032	-	-	0.024	0.024
Interactions								
L.F.P. - M.S.	-	- 0.071	-	-	-	- 0.033	-	-
L.F.P. - ED.	-	-	- 0.006	-	-	-	- 0.007	-
M.S. - ED.	-	-	-	- 0.012	-	-	-	- 0.003

(Continued)

Source: OMUECE 1973, CELADE.

a/ Measured in natural logarithms

b/ L.F.P.: Labour Force Participation (Economically Active and Non Economically Active).

c/ M.S.: Marital Status (Single; Married or in Stable Union; and Separated, Divorced or Widowed).

d/ ED.: Education (None; 1-3 years of instruction; 4-6 years of instruction; 7-9 years of instruction; 10-12 years of instruction; more than 12 years of instruction).

Table V.A.b (Concluded)

DECOMPOSITION OF THEIL'S CONCENTRATION INDEX FOR THE NUMBER OF CHILDREN BORN ALIVE AMONG WOMEN BY AGE GROUPS[a/]

Mexico (1970)

	Age groups							
	35-39				40-44			
Total	0.290	0.290	0.290	0.290	0.327	0.327	0.327	0.327
Within	0.277	0.208	0.262	0.189	0.310	0.242	0.293	0.229
Between	0.013	0.082	0.028	0.101	0.017	0.085	0.034	0.098
L.F.P.b/	0.013	0.013	0.013	-	0.017	0.017	0.017	-
M.S.c/	-	0.082	-	0.082	-	0.082	-	0.082
ED.d/	-	-	0.018	0.018	-	-	0.019	0.019
Interactions								
L.F.P. - M.S.	-	- 0.013	-	-	-	- 0.014	-	-
L.F.P. - ED.	-	-	- 0.003	-	-	-	- 0.002	-
M.S. - ED.	-	-	-	+ 0.001	-	-	-	- 0.003

	45-49			
Total	0.329	0.329	0.329	0.329
Within	0.314	0.266	0.300	0.252
Between	0.015	0.063	0.029	0.077
L.F.P.b/	0.015	0.015	0.015	-
M.S.c/	-	0.058	-	0.058
ED.d/	-	-	0.020	0.020
Interactions				
L.F.P. - M.S.	-	- 0.010	-	-
L.F.P. - ED.	-	-	- 0.006	-
M.S. - ED.	-	-	-	- 0.001

Source: OMUECE 1973, CELADE.

a/ Measured in natural logarithms

b/ L.F.P.: Labour Force Participation (Economically Active and Non Economically Active).

c/ M.S.: Marital Status (Single; Married or in Stable Union; and Separated, Divorced or Widowed).

d/ ED.: Education (None; 1-3 years of instruction; 4-6 years of instruction; 7-9 years of instruction; 10-12 years of instruction; more than 12 years of instruction).

Table V.B.a

DECOMPOSITION OF THEIL'S CONCENTRATION INDEX FOR THE NUMBER OF CHILDREN BORN ALIVE AMONG ECONOMICALLY ACTIVE AND NON ECONOMICALLY ACTIVE WOMEN AGED 15-49[a/]

San José (1973)

	Age groups							
	15-19		20-24		25-29		30-34	
Economically Active								
Total	2.896	2.896	1.546	1.546	0.817	0.817	0.557	0.557
Within	2.289	2.664	1.268	1.397	0.654	0.775	0.437	0.507
Between	0.607	0.232	0.278	0.149	0.163	0.042	0.120	0.050
M.S.b/	0.607	-	0.278	-	0.163	-	0.120	-
ED.c/	-	0.032	-	0.100	-	0.035	-	0.031
OC.d/	-	0.004	-	0.055	-	0.011	-	0.028
Interactions								
ED. - OC.	-	+ 0.196	-	- 0.006	-	- 0.004	-	- 0.009
Non Economically Active								
Total	2.608	2.608	0.749	0.749	0.280	0.280	0.238	0.238
Within	1.330	2.194	0.493	0.664	0.217	0.267	0.209	0.221
Between	1.278	0.414	0.256	0.085	0.063	0.013	0.029	0.017
M.S.b/	1.278	-	0.256	-	0.063	-	0.029	-
ED.c/	-	0.414	-	0.085	-	0.013	-	0.017

(Continued)

Source: OMUECE 1973, CELADE.

a/ Measured in natural logarithms

b/ M.S.: Marital Status (Single; Married or in Stable Union; Divorced, Separated or Widowed).

c/ ED.: Education (None; 1-3 years of instruction; 4-6 years of instruction; 7-9 years of instruction; 10-12 years of instruction; more than 12 years of instruction).

d/ OC.: Occupation (Managers or Professionals; Office Clerks-Saleswomen-Drivers; Craftworkers-Operators; Others).

Table V.B.b (Concluded)

DECOMPOSITION OF THEIL'S CONCENTRATION INDEX FOR THE NUMBER OF CHILDREN BORN ALIVE AMONG ECONOMICALLY ACTIVE AND NON ECONOMICALLY ACTIVE WOMEN AGED 15-49[a/]

Mexico City (1970)

	Age groups					
	35-39		40-44		45-49	
Economically Active						
Total	0.457	0.457	0.487	0.487	0.442	0.442
Within	0.294	0.405	0.301	0.423	0.359	0.411
Between	0.163	0.052	0.186	0.064	0.083	0.031
M.S.b/	0.163	-	0.186	-	0.083	-
ED.c/	-	0.028	-	0.051	-	0.017
OC.d/	-	0.004	-	0.030	-	0.003
Interactions						
ED. - OC.	-	+ 0.020	-	- 0.017	-	+ 0.011
Non Economically Active						
Total	0.232	0.232	0.262	0.262	0.281	0.281
Within	0.190	0.221	0.225	0.255	0.246	0.267
Between	0.042	0.011	0.037	0.007	0.035	0.014
M.S.b/	0.042	-	0.037	-	0.035	-
ED.c/	-	0.011	-	0.007	-	0.014

Source: OMUECE 1973, CELADE.

a/ Measured in natural logarithms

b/ M.S.: Marital Status (Single; Married or in Stable Union; Divorced, Separated or Widowed).

c/ ED.: Education (None; 1-3 years of instruction; 4-6 years of instruction; 7-9 years of instruction; 10-12 years of instruction; more than 12 years of instruction).

d/ OC.: Occupation (Managers or Professionals; Office Clerks-Saleswomen-Drivers; Craftworkers-Operators; Others).

Table V-1

PERCENTAGE OF OBSERVED TOTAL INEQUALITY IN THE AVERAGE NUMBER OF LIVE BIRTHS EXPLAINED BY VARIATIONS IN THE AVERAGE NUMBER OF LIVE BIRTHS PER 100 WOMEN GROUPED BY LABOUR FORCE PARTICIPATION; LABOUR FORCE PARTICIPATION AND MARITAL STATUS; LABOUR FORCE PARTICIPATION AND EDUCATION; MARITAL STATUS AND EDUCATION

(Percentages)

Age groups	Labour force participationa/		Labour force participation and marital statusb/		Labour force participation and educationc/		Marital status and educationd/	
	Costa Rica	Mexico	Costa Rica	Mexico	Costa Rica	Mexico	Costa Rica	Mexico
15-19	0.5	4.4	43.2	54.3	13.0	13.1	46.2	55.9
20-24	9.4	20.0	34.9	60.3	18.1	26.0	43.0	54.3
25-29	12.3	16.1	31.4	39.2	16.2	21.2	38.3	40.9
30-34	9.9	11.5	25.2	30.3	15.6	16.5	35.6	34.7
35-39	7.6	4.5	23.8	28.3	13.0	9.7	31.7	34.8
40-44	9.3	5.2	19.2	26.0	13.1	10.4	24.3	30.0
45-49	7.0	4.6	22.5	19.1	12.0	8.8	30.3	23.4

Sources: a/ We distinguish between Economically Active and Non Economically Active Women.

b/ We distinguish six possible combinations to be formed among the economically and non economically active women by their three possible marital statuses: Single; Married or in Stable Unions; and, Others (Separate, Widowed or Divorced).

c/ We distinguish twelve possible combinations to be formed among the economically active and non economically active women by their six possible educational levels: None; 1-3 years of instruction; 4-6 years of instruction; 7-9 years of instruction; 10-12 years of instruction; 13 and more years of instruction.

d/ We distinguish eighteen possible combinations to be formed among the women according to their marital status and level of instruction.

Table V-2

PERCENTAGE OF OBSERVED TOTAL INEQUALITY IN THE AVERAGE NUMBER OF LIVE BIRTHS EXPLAINED BY VARIATIONS IN THE AVERAGE NUMBER OF LIVE BIRTHS PER 100 WOMEN GROUPED BY LABOUR FORCE PARTICIPATION; MARITAL STATUS AND EDUCATION

Age groups	Labour force participation		Marital status		Education	
	Costa Rica	Mexico	Costa Rica	Mexico	Costa Rica	Mexico
			Interactions included*			
15-19	0.5	4.4	42.9	54.6	7.7	5.7
20-24	9.4	20.0	33.2	51.2	8.7	7.8
25-29	12.3	16.1	28.5	37.1	6.1	6.3
30-34	9.9	11.5	23.6	28.5	8.2	9.4
35-39	7.6	4.5	21.6	28.3	7.0	6.2
40-44	9.3	5.2	14.7	25.1	5.1	5.8
45-49	7.0	4.6	21.3	17.6	6.4	6.1
			Interactions excluded*			
15-19	5.1	2.6	38.3	45.4	8.0	4.3
20-24	1.6	7.3	26.4	35.6	9.6	1.3
25-29	0.6	1.0	22.7	20.8	7.6	2.7
30-34	-	-	19.2	17.9	9.6	4.1
35-39	0.6	-	19.4	24.1	8.6	5.5
40-44	3.2	-	14.4	19.9	8.3	4.3
45-49	-	-	17.8	14.3	7.3	4.0

* We had information only on two by two variable interactions. So there is a mispecification in the figures under the Title Interactions Excluded. We should have added the three by three interactions.

Table V-3

PERCENTAGE OF OBSERVED TOTAL INEQUALITY IN THE AVERAGE NUMBER OF LIVE BIRTHS PER 100 ACTIVE AND NON ACTIVE WOMEN EXPLAINED BY VARIATIONS IN THE AVERAGE NUMBER OF LIVE BIRTHS PER 100 WOMEN GROUPED BY MARITAL STATUS, BY EDUCATION AND BY EDUCATION AND OCCUPATION

	Percentage explained by variations in the average number of live births per 100 women grouped by:					
	Marital status a/		Education b/		Education and occupation c/	
	Costa Rica	Mexico	Costa Rica	Mexico	Costa Rica	Mexico
Economically active						
15-19	21.0	46.2	1.1	4.0	8.0	13.8
20-24	18.0	53.0	6.5	10.9	9.6	15.5
25-29	20.0	42.7	4.3	9.6	5.1	15.5
30-34	21.5	35.6	5.6	6.8	9.0	11.6
35-39	20.4	35.7	4.8	6.1	7.8	11.4
40-44	18.9	38.2	1.4	10.5	3.3	13.1
45-49	18.9	18.8	3.5	3.8	10.1	7.0
Non Economically active						
15-19	49.0	52.4	15.9	10.0	-	-
20-24	34.2	34.8	11.3	5.7	-	-
25-29	22.5	20.3	4.6	4.2	-	-
30-34	12.1	13.0	7.1	4.6	-	-
35-39	16.6	18.1	6.6	4.7	-	-
40-44	7.1	14.1	5.1	2.7	-	-
45-49	14.9	12.5	5.8	5.0	-	-

a/ The marital status categories are: Single; Married or in Stable Union; Others (Separate, widowed, divorced).

b/ The educational categories are: None; 1-3 years of instruction; 4-6 years of instruction; 7-9 years of instruction; 10-12 years of instruction; more than 13 years of instruction.

c/ The educational categories are the same as before, and the occupational categories are the corresponding census categories: Managers or Professionals; Clerical Workers, Salesmen and Transport Equipment Operators; Artisans, Operatives and Manual Workers; and Others.

VI. PROBABLE EFFECT OF THE PRINCIPAL CHANGES IN THE FEMALE POPULATION CHARACTERISTICS ON THE AVERAGE NUMBER OF LIVE BIRTHS

Up to now we have focused attention solely on the study of participation in economic activity and its interaction with marital status and education as structural factors in differential fertility behaviour. To highlight the importance of these factors and of their interaction in relation to changes in fertility, we have carried out a standardization exercise. This consists in applying to the female population of each capital in 1960 (63) the levels of fertility (measured by the number of live births per woman) observed in 1970 (73). By this means an estimate is made of what the average number of live births would have been, given the 1970 fertility levels but the composition of the female population actually observed in 1960. The difference between the standardized average number of children in 1960 and the number observed in 1970 is thus, by construction, the expression of the changes that took place during the period under review in the structure of the female population by educational levels, marital status and labour force participation: changes which have already been analysed in Chapter III.

This exercise must be carefully evaluated, since the cumulative fertility measure used (number of live births) is highly sensitive to the age structure of the female population.

The main changes which we underlined in Chapter III of the present document are summarized for the simple analytical categories in tables VI-1 and VI-2, relating to San José and Mexico City respectively. Attention must first be devoted to the changes in age structure. As we saw before, in both capitals these changes have lowered the average age of the female population in the 15-49 age groups. The reduction was a good deal more significant in San José, where the average age dropped from 29 to 28 years between 1963 and 1973, whereas in Mexico City it fell only from 28.7 to 28.2 years between 1960 and 1970. The resulting impact on our fertility measurement is shown in table VI-4 for San José and Mexico City, respectively. This change in age structure alone can be seen to imply a decrease in the average number of live births amounting to 8.7 per cent in San José and only 4.0 per cent in Mexico City.

It is only on the basis of this situation that we can now begin to evaluate the importance of the changes with which we are concerned. Indubitably, there is a close association between a change in age structure and changes in the composition of the female population by marital status, educational level and participation in economic activity. This is yet another reason for supposing that the validity of the analysis is impaired, unless the "age" variable is controlled.

In the preceding sections emphasis was laid on the important role of the interaction between women's participation in economic activity and marital status or education in the determination of fertility differentials. Accordingly, constant reference to this interaction should be made in analysing the impact of changes in women's participation in economic activity on changes in average fertility.

a) Participation and marital status

Interaction with marital status was powerful enough virtually to explain the whole of the difference between average numbers of children in the economically active and the non-active groups of women. In other words, the variations in the average number of children as between active and non-active women were largely due to the difference in composition by marital status existing between the two groups.

Between 1960 (63) and 1970 (73), the difference in the composition by marital status of economically active and non-active groups of women lessened significantly in Costa Rica, but not in Mexico City.

To estimate how far the composition by marital status of the active and non-active groups of women tended to become the same, X^2 (chi squared) statistics were computed for a null hypothesis postulating that the two structures are exactly alike.

What happened in San Jose is basically attributable to an increase in the labour force participation of married women or partners in a stable union, and to a decrease in participation amongst single women. In Mexico City, on the other hand, this is untrue, especially for women in the age groups where fertility is highest (20-24 years), in whose case, on the contrary, the difference between

the two structures tends to become more marked, owing to an increase in the proportion of married women or women living in a stable union who remain non-active. (See tables 13 and 14 in the Statistical Annex).

The joint effect on fertility of changes in the female population by age, participation in economic activity and marital status is noted in table VI-4.

The figures appearing in the table indicate that in San Jose, in conjunction with the change in the age structure of the female population, the increase in the rates of women's participation in economic activity, especially between the ages of 20 and 39 years, would seem to have had a significant effect on fertility, precisely because more married women or partners in stable unions appear to have been entering the labour market. In Mexico City, in contrast, the increase in participation had only a minimal impact on fertility, since its level rose just in those age groups where married women tended to participate in economic activity less than before.

b) Participation and education

It was noted in the preceding sections that the differences between the active and non-active groups of women in respect of average numbers of children were partly the outcome of different educational structures. The rise in educational levels observed in both countries should, therefore, be accompanied by a decline in fertility. As can be seen in table VI-5, the relatively greater progress in education achieved in Costa Rica during the period also implies a bigger reduction of fertility on this account than in Mexico.

c) Standardization by age groups

The next step is to analyse developments in respect of average numbers of children among women in different age groups, a distinction being made between the active and the non-active. We hope by this means to clarify the effect of the above-mentioned interactions on our findings.

The results of this exercise (which are presented in the tables following below) serve to corroborate the views expressed before. The principal changes in the variables which interact with women's participation in economic activity in

determining the average number of live births have operated in the direction of reducing fertility a good deal more intensively in Costa Rica than in México. In both countries the changes in composition by marital status tend to raise average levels of fertility among economically active women because there are fewer single women among them. In Costa Rica's case, this is due to an increase in the labour force participation of married women or partners in stable unions, whereas in Mexico the cause is a rise in nuptiality rates particularly between the ages of 20 and 49 years (where there is a significant reduction in the percentage of single women).

As a result, while in Costa Rica there is a trend towards similarity in the composition by marital status of the economically active and the non-active groups of women -average fertility increasing among the former but decreasing among the latter-, in Mexico, on the other hand, the reduction in the percentage of single women is common to both the active and the non-active groups, with the result that average fertility increases among all women in the 20-49 age groups. It shows a decrease only among women aged 15-19 years, where the educational process seems to be deferring the age of marriage.

To sum up, the rise in the educational levels of women of child-bearing age and the slight increase in their participation in economic activity, observed both in San Jose and in Mexico City, suggested that a decline in fertility might be expected in both cases, although it would probably be greater in Costa Rica than in Mexico. We know, however, that this has not been so, and that in Mexico City fertility levels remained high during the period under consideration. This phenomenon can be accounted for, at least in part, by what happened in respect of nuptiality; whereas in Costa Rica nuptiality declines in the younger age groups -which would seem to reflect the fact that stable sexual unions are being initiated at a later age-, in México the reverse takes place. In addition, in San José there is a considerable increase in the participation of married women in economic activity, which is not paralleled in Mexico City. Thus, in the latter country, the changes taking place in the "marital status" variable would seem to have more than offset the probable effect of the changes that occurred in education and participation in economic activity.

Table VI-1

CHANGES IN FEMALE POPULATION COMPOSITION, SAN JOSE DE COSTA RICA, 1963-1973

	Women aged 15-49			Standard Deviation	t Statistic
	1963	1973	Difference		
Labour Force Part.					
Economically Active	0.368	0.378	+0.010	0.009	+ 1.11
Non Economically Active	0.632	0.622	-0.010	0.009	- 1.11
Marital Status					
Single	0.444	0.487	+0.043	0.009	+ 4.78
Married or in Stable Union	0.482	0.464	-0.018	0.009	- 2.00
Others	0.074	0.049	-0.025	0.004	- 6.25
Education					
None (00)	0.048	0.032	-0.016	0.003	- 5.33
Lower Primary (01-03)	0.193	0.125	-0.068	0.006	-11.33
Higher Primary (04-06)	0.440	0.399	-0.041	0.009	- 4.55
Lower Secondary (07-09)	0.110	0.115	+0.005	0.006	+ 0.83
Higher Secondary (10-12)	0.149	0.228	+0.079	0.007	+11.29
University (13 and over)	0.059	0.101	+0.042	0.005	+ 8.40
Age					
15-19	0.223	0.256	+0.033	0.008	+ 4.1
20-24	0.187	0.208	+0.021	0.007	+ 3.0
25-29	0.147	0.146	-0.001	0.006	- 0.2
30-34	0.139	0.113	-0.026	0.006	- 4.5
35-39	0.116	0.109	-0.007	0.006	- 1.2
40-44	0.102	0.093	-0.009	0.005	- 1.8
45-49	0.087	0.075	-0.012	0.005	- 2.4

Source: OMUECE, Costa Rica, Capital, 1963-1973. CELADE, Banco de Datos.

Table VI-2

CHANGES IN FEMALE POPULATION COMPOSITION: MEXICO CITY 1960-1970

	Women aged 15-49			Standard Deviation	t Statistic
	1960	1970	Difference		
Labour Force Part.					
Economically Active	0.333	0.338	+0.005	0.005	+ 1.00
Non Economically Active	0.667	0.662	-0.005	0.005	- 1.00
Marital Status					
Single	0.390	0.387	-0.003	0.005	- 0.60
Married or in Stable Union	0.556	0.539	-0.017	0.006	- 2,83
Others	0.054	0.074	+0.020	0.003	+ 6.67
Education					
None (00)	0.169	0.136	-0.033	0.004	- 8.25
Lower Primary (01-03)	0.228	0.191	-0.037	0.005	- 7.40
Higher Primary (04-06)	0.371	0.451	+0.080	0.005	+16.00
Lower Secondary (07-09)	0.073	0.046	-0.027	0.003	- 9.00
Higher Secondary (10-12)	0.111	0.093	-0.018	0.003	- 6.00
University (13 and over)	0.048	0.083	+0.035	0.003	+11.67
Age					
15-19	0.214	0.241	+0.027	0.005	+ 5.40
20-24	0.195	0.203	+0.008	0.004	+ 2.00
25-29	0.167	0.156	-0.011	0.004	- 2.75
30-34	0.140	0.117	-0.023	0.004	- 5.75
35-39	0.122	0.113	-0.009	0.004	+ 2.25
40-44	0.085	0.094	+0.009	0.003	+ 3.00
45-49	0.077	0.075	-0.002	0.003	- 0.67

Source: OMUECE, Mexico, Capital 1960-1970. CELADE, Banco de Datos.

Table VI-3

X^2 STATISTIC FOR THE FOLLOWING HYPOTHESIS: "THE FEMALE POPULATION COMPOSITION BY MARITAL STATUS IS THE SAME AMONG ECONOMICALLY ACTIVE AND NON ECONOMICALLY ACTIVE WOMEN"

Age Groups	San Jose			Mexico City		
	1963	1973	Variables	1960	1970	Variables
Total	34.1	18.3	-46.3	38.8	36.9	- 4.9
15-19	11.9	5.1	-57.1	10.6	2.6	-85.5
20-24	53.4	30.2	-43.4	60.0	66.0	+10.0
25-29	65.9	36.5	-44.6	52.1	68.7	+31.9
30-34	55.5	44.4	-20.5	46.1	52.1	+13.0
35-39	40.8	32.4	-20.6	46.7	39.3	-15.8
40-44	50.8	27.3	-46.3	41.1	38.6	- 6.1
45-49	21.8	29.9	+37.2	33.5	29.3	-12.5

Note: The frequencies considered for these calculations were the corresponding percentages of "Single", "Married or in Stable Union" and "Others" among the economically active and non-economically active women, respectively. These corresponded to a 3x2 contingency table.

Table VI.4

RESULTING IMPACT ON THE AVERAGE NUMBER OF LIVE BIRTHS DUE TO CHANGES IN THE AGE STRUCTURE, LABOUR FORCE PARTICIPATION AND MARITAL STATUS

	Mexico City	San Jose
Average number of live births per 100 women, 1970*	249.4	197.1
Standardized by age structure, 1960*	259.8	215.9
Percentage change	- 4.0	- 8.7
Standardized by age and labour force participation, 1960	261.4	217.7
Additional percentage change	- 0.6	- 0.8
Total cumulative change	- 4.6	- 9.5
Standardized by age, labour force participation and marital status, 1960	251.5	217.6
Additional percentage change	+ 3.8	+ 0.1
Total cumulative percentage change	- 0.8	- 9.4

* Figures for 1970 and 1960 correspond to 1973 and 1963 in the case of San José (Costa Rica).

Table VI-5

RESULTING IMPACT ON THE AVERAGE NUMBER OF LIVE BIRTHS DUE TO CHANGES IN THE AGE STRUCTURE, LABOUR FORCE PARTICIPATION AND EDUCATION

	Mexico City	San Jose
Average number of live births per 100 women, 1970*	249.4	197.1
Standardized by age and labour force participation structure, 1960*	261.4	217.7
Percentage change	- 4.6	- 9.5
Standardized by age, labour force participation and educational levels, 1960*	265.1	225.4
Additional percentage change	- 1.4	- 3.2
Total cumulative percentage change	- 6.0	-12.6

* Figures for 1970 and 1960 correspond to 1973 and 1963 in the case of San Jose (Costa Rica).

Table VI-6

EFFECT ON THE AVERAGE NUMBER OF LIVE BIRTHS PER 100 WOMEN BY AGE GROUPS AND OCCUPATIONAL STATUS IN COSTA RICA (SAN JOSE) DUE TO CHANGES IN THE FEMALE POPULATION COMPOSITION

	Observed in 1973	Standardized by: Marital status		Educational level		Occupational category		Occupational category and education		Marital status and education	
		1963	Percentage	1963	Percentage	1963	Percentage	1963	Percentage	1963	Percentage
Economically active											
15-19	6.9	5.8	+18.9	7.2	- 4.2	6.9	-	6.8	+ 1.5	-	-
20-24	35.7	34.3	+ 4.1	40.6	-12.1	38.4	- 7.0	41.4	-13.8	-	-
25-29	110.6	101.9	+ 8.5	122.8	- 9.9	113.0	- 2.1	117.6	- 6.0	-	-
30-34	210.8	197.2	+ 6.9	230.3	- 8.5	215.0	- 2.0	215.4	- 2.1	-	-
35-39	280.4	282.3	- 0.7	296.3	- 5.4	284.0	- 1.3	289.5	- 1.3	-	-
40-44	310.6	297.0	+ 4.6	316.7	- 1.9	315.8	- 1.6	311.8	- 0.4	-	-
45-49	305.5	312.4	- 2.2	322.9	- 5.4	318.6	- 4.1	316.6	- 3.5	-	-
Non-economically active											
15-19	10.0	13.0	-23.1	12.9	-22.5	-	-	-	-	-	-
20-24	92.6	101.1	- 8.4	107.7	-14.0	-	-	-	-	-	-
25-29	229.8	240.9	- 4.6	235.2	- 2.3	-	-	-	-	-	-
30-34	373.1	367.1	+ 1.6	378.3	- 1.4	-	-	-	-	-	-
35-39	454.9	464.9	- 2.2	456.6	- 0.4	-	-	-	-	-	-
40-44	543.5	539.5	+ 0.7	545.9	- 0.4	-	-	-	-	-	-
45-49	519.7	498.6	+ 4.2	540.5	- 3.8	-	-	-	-	-	-

(Continued)

Table VI-6 (Concluded)

EFFECT ON THE AVERAGE NUMBER OF LIVE BIRTHS PER 100 WOMEN BY AGE GROUPS AND OCCUPATIONAL STATUS IN COSTA RICA (SAN JOSE) DUE TO CHANGES IN THE FEMALE POPULATION COMPOSITION

	Observed in 1973	Standardized by: Marital status		Educational level		Occupational category		Occupational category and education		Marital status and education	
		1963	Percentage	1963	Percentage	1963	Percentage	1963	Percentage	1963	Percentage
All women											
15-19	9.1	10.5	-13.3	10.7	-15.0	8.9	- 2.2	10.7	-15.0	10.9	-16.5
20-24	66.4	72.8	- 8.8	79.3	-16.3	69.6	- 4.6	79.6	-16.6	80.0	-17.0
25-29	175.0	186.0	- 5.9	190.8	- 8.3	183.7	- 4.7	188.7	- 7.3	192.5	- 9.1
30-34	305.3	700.4	+ 1.6	320.0	- 4.6	310.8	- 1.8	314.1	- 2.8	313.1	- 2.5
35-39	392.0	406.1	- 3.5	404.9	- 3.2	399.9	- 2.0	402.8	- 2.7	418.2	- 6.3
40-44	468.1	454.6	+ 3.0	465.4	+ 0.6	463.8	+ 0.9	463.4	+ 1.0	466.6	+ 0.3
45-49	460.5	448.2	+ 2.9	481.5	- 4.8	465.2	- 1.0	479.8	- 4.0	471.0	- 2.2

Source: CELADE, Banco de Datos. OMUECE, San Jose, Costa Rica, 1963-1973.

Table VI-7

EFFECT ON THE AVERAGE NUMBER OF LIVE BIRTHS PER 100 WOMEN BY AGE GROUPS AND OCCUPATIONAL STATUS IN MEXICO CITY DUE TO CHANGES IN THE FEMALE POPULATION COMPOSITION. (1960-1970)

	Observed in 1970	Standardized by: Marital status		Educational level		Occupational category		Occupational category and education		Marital status and education	
		1960	Percentage	1960	Percentage	1960	Percentage	1960	Percentage	1960	Percentage
Economically active											
15-19	6.5	7.0	- 7.1	7.5	-13.3	6.4	+ 1.6	7.3	-11.0	-	-
20-24	34.3	31.7	+ 8.2	40.4	-15.1	34.8	- 1.4	39.5	-13.2	-	-
25-29	107.9	99.5	+ 8.4	110.5	- 2.4	111.1	- 2.9	110.4	- 2.3	-	-
30-34	229.2	216.1	+ 6.1	235.4	- 2.6	231.6	- 1.0	229.3	-	-	-
35-39	365.1	319.9	+14.1	374.2	- 2.4	363.6	+ 0.4	377.4	- 3.3	-	-
40-44	376.3	334.0	+12.7	386.2	- 2.6	388.3	- 3.1	374.0	+ 0.6	-	-
45-49	382.0	358.0	+ 6.7	390.5	- 2.2	380.7	+ 0.3	390.2	- 2.1	-	-
Non-economically active										-	-
15-19	21.3	25.5	-16.5	24.5	-13.1	-	-	-	-	-	-
20-24	159.2	152.6	+ 4.3	165.2	- 3.6	-	-	-	-	-	-
25-29	296.2	287.2	+ 3.1	302.1	- 2.0	-	-	-	-	-	-
30-34	450.0	436.6	+ 3.1	453.5	- 0.8	-	-	-	-	-	-
35-39	535.4	525.4	+ 1.9	531.1	+ 0.8	-	-	-	-	-	-
40-44	583.1	569.3	+ 2.4	579.8	+ 5.7	-	-	-	-	-	-
45-49	563.4	549.0	+ 2.6	565.8	- 0.4	-	-	-	-	-	-
All women											
15-19	16.2	17.2	-13.4	18.3	-11.5	15.9	+ 2.5	18.2	- 9.3	18.0	-11.0
20-24	107.7	103.2	+ 4.4	114.2	- 5.7	108.3	- 0.6	113.8	- 5.4	107.1	- 0.6
25-29	234.1	230.3	+ 1.7	244.4	- 4.2	239.2	- 2.1	243.1	- 3.7	235.7	- 0.7
30-34	382.9	376.6	+ 1.7	394.2	- 2.9	390.6	- 2.0	392.5	- 2.4	378.8	+ 1.1
35-39	484.8	465.2	+ 4.2	483.2	+ 0.3	485.1	- 0.1	486.1	- 0.3	463.5	+ 4.6
40-44	522.5	498.3	+ 4.9	521.4	+ 0.2	524.3	- 0.3	517.6	+ 1.0	495.9	+ 5.4
45-49	507.2	487.9	+ 4.0	509.6	- 0.5	504.9	+ 0.5	509.6	- 0.5	493.7	+ 2.7

Source: CELADE, Banco de Datos. OMUECE. Mexico City, 1960-1970.

VII. ANALYSIS BY ENVIRONMENTS: CAPITAL CITY, OTHER URBAN AREAS AND RURAL AREAS

What happens to fertility and its relation with participation in economic activity when we introduce the rural-urban dimension? In order to find an answer to this and other allied questions we have studied the case of Costa Rica, distinguishing between the capital city (San Jose), the other urban areas and rural environments.

Pursuing the same plan of analysis as hitherto, we would draw attention, in the first place, to the main changes that have taken place in the composition of the female population from 15 to 49 years of age in each of these environments. The more global figures are presented in table VII-1. The following was the area distribution of the female population in the 15-49 age groups in each of the years considered:

	(Percentages)	
	1963	1973
San Jose	25.3	25.3
Other urban areas	16.7	22.6
Rural areas	58.0	52.1

Source: OMUECE, CELADE Data Bank.

From table VII-1 it can be seen that rates of participation rose in the rural areas and in the capital city, but not in other urban areas. Several phenomena already observed in the capital are also to be found in the other environments, such as a lowering of the average age; improvements in educational levels; reductions in nuptiality (increases in the percentage of single women); and greater participation of married women in economic activity. In contrast, the changes in occupational structures are different in the three environments considered; in general, there is a falling-off in the occupations classified in the residual category and a widespread increase in manual workers, artisans and operatives. In the urban areas there are signs of a growing absorption of female labour in the higher-status jobs (managers and professionals).

For the purpose of examining the influence of environment on the determination of fertility levels, two approaches have been adopted. In table VII-2 Theil's index is applied to the study of the differential fertility of all women between 15 and 49 years of age. The total observed variation is the result of the fertility differentials between women grouped by fertility classes (0, 1, 2, 3 ... 20 children and over). A calculation is also presented of the variation between women grouped by environments, by participation or non-participation in economic activity, by educational levels, by marital status and by occupation; as well as by the interactions of every pair and group of three of these variables in each of the columns in table VII-2.

Among the results shown in this table, attention must be drawn to the powerful interaction between the environment variable and the education and marital status variables. It indicates that in rural areas the interaction of low educational levels, low rates of participation and higher nuptiality is responsible for almost the whole of the increase in the level of fertility of women in the rural environment in relation to the fertility of women in other areas. It also should be noticed the extremely large interaction of participation with marital status.

A different view of the situation by environments is presented in table VII-3. There we repeat the breakdown of Theil's index separately in each region and for each age group. In the first place, stress should be laid on the fact that fertility behaviour is a good deal more homogeneous among women in rural areas than among other women. The differences by regions (rural/urban areas) not only make for higher levels of fertility but also contribute to the greater homogeneity of fertility behaviour. Secondly, as a corollary to this, the component "Within" in each of the environments, is worth a pause for study. It is this component that reflects the effect of the variation in fertility classes between women in the groups considered, and is determined by women's personal characteristics distinct from those linked to their marital status, occupational category, job and education. Examination of this component reveals that in so far as we have been able to measure the variables used in the analysis -occupational position (economically active or non-active), education and marital status-

economic participation proves particularly important in the determination of fertility among the younger age groups, especially through its interaction with marital status. This effect is significant up to the 25-29 age group in urban areas and the 20-29 age group in rural areas.

PERCENTAGE VARIATION IN NUMBER OF LIVE BIRTHS PER WOMAN AS EXPLAINED BY WOMEN'S CHARACTERISTICS ATTRIBUTABLE TO THEIR GROUPING BY CURRENT PARTICIPATION IN ECONOMIC ACTIVITY AND BY MARITAL STATUS

Age group	Capital	Other urban areas	Rural areas
15-19	43.2	43.1	48.0
20-24	34.9	28.4	34.7
25-29	31.4	30.4	25.3
30-34	27.9	19.9	22.8
35-39	23.8	16.4	18.2
40-44	19.2	18.2	15.5
45-49	22.5	16.0	16.4

Generally speaking, the results noted in earlier chapters for the capital do not differ much from those observed for the other urban areas. In rural environments, however, the fertility differentials between women who do and those who do not participate in economic activity reflect differentials by marital status to a much greater extent than in the other environments. In their turn, the differentials between women grouped by their participation in economic activity and by their educational category within it are much more significant in urban than in rural areas. Differences in levels of fertility between economically active and non-active women are particularly great as from the 20-24 age group in urban areas, whereas in rural areas they are already important in the 15-19 age group. Between 30 and 34 years of age the differences are considerably reduced in urban areas, while in rural environments the same thing happens in the 25-29 age group. In any event, since interaction with marital status has a strong influence independently of environment, an important role can be ascribed to women's economic participation in the younger age groups, the age of marriage being considerably deferred (to 25-29 years of age) in urban areas and somewhat less (only to 20-24 years of age) in rural environments. In the older age groups, this effect tends to weaken, substantially influencing fertility differentials between economically active and non-active women, which denotes the presence of more economically active women with children.

Differences in the fertility of women grouped by educational levels are marked in the younger age groups but less so in the older. This is eloquent of the importance attaching to a rise in educational levels in relation to the deferment of fertility.

To sum up, women's participation in economic activity is an important factor in the determination of fertility levels, especially in the younger age groups (from 20 to 29 years of age in urban areas and from 15 to 24 in rural areas). In these age groups, however, the differences are almost entirely due to the fact that participation is either the cause or the effect of a deferment of the age of marriage. This is particularly true of rural areas, but is not so much the case in urban areas, where participation has effects on fertility which are independent of its relation with marital status.

Moreover, education and women's participation in economic activity, in interaction, are relatively much more important determinants of fertility levels in urban than in rural areas. This would suggest that the greater heterogeneity of urban than of rural environments causes women's economic participation to play a considerably more important role in relation to fertility than is represented by the mere deferment of the age of marriage in the younger are groups. In the former areas, the improvement in educational levels and the expansion of employment opportunities for women would appear to affect, through the rise in the opportunity cost for mothers, their levels of fertility.

PERCENTAGE VARIATION IN NUMBER OF LIVE BIRTHS PER WOMAN AS EXPLAINED BY WOMEN'S CHARACTERISTICS ATTRIBUTABLE TO THEIR GROUPING BY CURRENT PARTICIPATION IN ECONOMIC ACTIVITY AND BY EDUCATION

Age group	Capital	Other urban areas	Rural areas
30-34	15.6	12.7	11.2
35-39	13.0	13.2	7.4
40-44	13.1	9.2	4.3
45-49	11.9	8.5	4.6

Table VII-1

SOME CHARACTERISTICS OF THE FEMALE POPULATION AGED 15-49 IN COSTA RICA

	1963			1973			1973/1963		
	Capital City	Other Urban	Rural	Capital City	Other Urban	Rural	Capital City	Other Urban	Rural
Average number of live births per									
-100 women aged 15-49				197,1	242,1	340.8			
-100 EAW aged 15-49 a/				127,1	159.7	160.6			
-100 NEAW aged 15-49 b/				239,6	276,0	371.2			
Percentage EAW	36,8	30,5	10,6	37,8	29,2	14,4	+ 2,7	- 4.3	+35.8
Percentage NEAW	63,2	69,5	89.4	62,2	70.8	85.6	- 1,6	+ 1.9	- 4,3
Average age	29,0	28,6	28.6	28,0	27,9	27,8	- 3,4	- 2,5	- 2.8
Average age of EAW	28,3	27,6	26,4	27,6	27,9	25.7	- 2,5	+ 1.1	- 2,7
Average age of NEAW	29,4	29,0	28,9	28,1	27,9	28,2	- 4,4	- 3.8	- 2,4
Average years of instruction	5,9	5,2	3,0	7,0	6,5	4,0	+18,6	+25.0	+33.3
Average years of instruction of EAW	5,9	6.0	4,6	7.3	7,7	5,5	+23,7	+28.3	+19,6
Average years of instruction of NEAW	5,9	4,9	2,5	6,8	5,9	3,7	+15,3	+20,4	+48,0
Percentage single	44,4	43.7	34,8	48.7	45.7	37,7	+ 9.7	+ 4.6	+ 8.3
% married or in stable union	48,2	50,5	61,9	46,4	50,3	59.4	- 3.7	- 0.4	- 4,0
% Others	7.4	5,8	3,3	4,9	4,0	2,9	-33,8	-31.0	-12,1
% single among EAW	66.5	64,2	73,7	64,4	60,0	70.2	- 3,2	- 6,5	- 4.7
% married or in stable union among EAW	22,4	27,3	19,8	28,0	33,6	24,2	+25,0	+23,1	+22.2
% Others among EAW	11,1	8.5	6,5	7,6	6,4	5.6	-31.5	-24,7	-13.8
% single among NEAW	31.5	34,7	30,2	39.1	39.8	32,2	+24,1	+14,7	+ 6,6
% married or in stable union among NEAW	63,2	60.7	66,8	57,7	57,2	65,4	- 8,7	- 5,8	- 2.1
% Others among NEAW	5,2	4,6	2,9	3,2	3,0	2,4	-38,5	-34.8	-17,2
% managers and professionals among EAW	14,8	26,5	15,0	20,8	30,9	14,0	+40,5	+16,6	- 6,7
% clerical workers, saleswomen transport operators among EAW	24,5	15,5	10,1	24.4	19,2	10,1	- 0,4	+23.9	0,0
% artisans, operative and manual workers among EAW	9,9	6,7	9,3	16,5	8,3	24.6	+66,7	+23.9	+164,5
% Others among EAW	50,8	51,2	65,6	38.3	41.6	51.3	-24,6	-18.8	- 21.8

a/ EAW = Economically Active Women

b/ NEAW = Non Economically Active Women

Table VII-2

BREAKDOWN OF THEIL'S INEQUALITY INDEX[a/]

Total	0.7648		Total	0.7648		Total	0.7648		Total	0.7648	
Within	0.4353		Within	0.5972		Within	0.5932		Within	0.3697	
Between[b/]	0.3295		Between[b/]	0.1676		Between[b/]	0.1716		Between[b/]	0.3951	
Participation	0.0414	(0.0016)	Participation	0.0414	(0.0249)	Occupation	0.0425	(0.1143)	Marital status	0.3136	(0.2524)
Marital status	0.3136	(0.2732)	Education	0.1388	(0.1113)	Education	0.1388	(0.1143)	Education	0.1388	(0.0672)
Environment	0.0268	(0.0074)	Environment	0.0268	(0.0051)	Environment	0.0268	(0.0078)	Environment	0.0268	(0.0024)
Interactions			Interactions			Interactions			Interactions		
Part.-M.S.	-0.0329		Part.-Educ.	-0.0177		Occ.-Educ.	-0.0175		M.S.-Educ.	-0.0597	
Part.-Env.	-0.0119		Part.-Env.	-0.0119		Occ.-Env.	-0.0120		M.S. Env.	-0.0125	
M.S. -Env.	-0.0125		Educ.-Env.	-0.0229		Educ.-Env.	-0.0229		Educ.-Env.	-0.0229	

a/ Measured in natural log units.

b/ The participation statuses are "Economically Active" and "Non Economically Active";the possible marital statuses are "Single", "Married or in Stable Union", "Others", the environments are "Capital City", "Other Urban Areas" and "Rural" according to Censal definitions; The six educational categories are none, lower primary (1 to 3 years of schooling); higher primary (4 to 6 years of schooling); lower secondary (7 to 9 years of schooling) higher secondary (10 to 12 years of schooling), and some University (more than 13 years of schooling); the occupational categories are "Managers and/or Professionals", "Clerical Workers, Saleswomen and Drivers", "Manual Workers, Artisans and Operatives", "Other Occupations", and "Non Economically Active".

c/ Figures in parentheses indicate the contributions of the specified characteristic, holding all the other characteristics constant.

Table VII-3

BREAKDOWN OF THEIL'S INDEX BY AREA AND AGE

	15-19		20-24		25-29		30-34		35-39		40-44		45-49	
Capital														
Total	2.622	2.622	1.029	1.029	0.488	0.488	0.365	0.365	0.315	0.315	0.313	0.313	0.342	0.342
Within	1.488	2.282	0.670	0.843	0.335	0.309	0.263	0.308	0.240	0.274	0.253	0.272	0.265	0.301
Between	1.134	0.340	0.359	0.186	0.153	0.079	0.092	0.057	0.075	0.041	0.060	0.041	0.077	0.041
Participation in economic activity	0.013	0.013	0.097	0.097	0.060	0.060	0.036	0.036	0.024	0.024	0.029	0.029	0.024	0.024
Marital status	1.125	-	0.342	-	0.139	-	0.086	-	0.068	-	0.046	-	0.073	-
Education	-	0.202	-	0.090	-	0.030	-	0.030	-	0.022	-	0.016	-	0.022
Interaction		*	-0.080	*	-0.046	*	-0.030	*	-0.017	*	-0.015	*	-0.020	*
Part.-M.S.	-0.004	*	-0.080	*	-0.046	*	-0.030	*	-0.017	*	-0.015	*	-0.020	*
Part.-M.S.	*	+0.125	*	-0.006	*	-0.011	*	-0.009	*	-0.005	*	-0.004	*	-0.005
Other Urban Areas														
Total	2.351	2.351	0.918	0.918	0.464	0.464	0.307	0.307	0.286	0.286	0.274	0.274	0.318	0.318
Within	1.337	1.989	0.657	0.734	0.323	0.373	0.246	0.268	0.239	0.248	0.224	0.249	0.267	0.291
Between	1.014	0.362	0.261	0.184	0.141	0.091	0.061	0.039	0.047	0.038	0.050	0.025	0.051	0.027
Participation in economic activity	0.019	0.019	0.086	0.086	0.065	0.065	0.025	0.025	0.017	0,017	0.020	0.020	0.010	0.010
Marital status	1.001	-	0.245	-	0.116	-	0.049	-	0.039	-	0.041	-	0.044	-
Education	-	0.248	-	0.128	-	0.058	-	0.028	-	0.028	-	0.011	-	0.022
Interaction														
Part.-M.S.	-0.006	*	-0.070	*	-0.040	*	-0.013	*	-0.009	*	-0.011	*	-0.003	*
Part.-M.S.	*	+0.095	*	-0.030	*	-0.032	*	-0.014	*	-0.007	*	-0.006	*	-0.005

* Interaction not considered.

(continued)

Table VII-3 (Concluded)

BREAKDOWN OF THEIL'S INDEX BY AREA AND AGE

	15-19		20-24		25-29		30-34		35-39		40-44		45-49	
Rural Areas														
Total	1.955	1.955	0.639	0.639	0.348	0.348	0.232	0.232	0.203	0.203	0.207	0.207	0.195	0.195
Within	1.016	1.786	0.417	0.542	0.260	0.297	0.179	0.206	0.166	0.188	0.175	0.202	0.163	0.186
Between	0.939	0.169	0.222	0.097	0.088	0.041	0.053	0.026	0.037	0.015	0.032	0,009	0.032	0.009
Participation in economic activity	0.035	0.035	0.058	0.058	0.023	0.023	0.013	0.013	0.010	0.010	0.005	0.005	0.006	0.006
Marital status	0.933	-	0.215	-	0.083	-	0.050	-	0.035	-	0.030	0	0.031	-
Education	-	0.125	-	0.061	-	0.032	-	0.020	-	0.012	-	0.003	-	0.005
Interaction														
Part.-M.S.	-0.029	*	-0.051	*	-0.018	*	-0.010	*	-0.008	*	-0.003	*	-0.005	*
Part.-M.S.	*	+0.009	*	-0.002	*	-0.016	*	-0.007	*	-0.007	*	+0.001	*	-0.002

* Interaction not considered.

Table VII-4

EFFECT ON THE AVERAGE NUMBER OF LIVE BIRTHS PER 100 WOMEN BY AGE GROUPS AND ENVIRONMENT DUE TO CHANGES IN THE FEMALE POPULATION CHARACTERISTICS

	Observed in 1973	Standardized by: Occupation and education		Labour force participation: Education		Labour force participation: Marital status		Marital status and education	
		1963	Percentage	1963	Percentage	1963	Percentage	1963	Percentage
Capital City									
15-19	9.1	10.7	-15.0	10.7	-15.0	10.5	-13.3	10.9	-16.5
20-24	66.4	79.6	-16.6	79.3	-16.3	72.8	- 8.8	80.0	-17.0
25-29	175.0	188.7	- 7.3	190.8	- 8.3	186.0	- 5.9	192.5	- 9.1
30-34	305.3	314.1	- 2.8	320.0	- 4.6	320.6	- 4.8	313.1	- 2.5
35-39	392.0	402.8	- 2.7	404.9	- 3.2	406.1	- 3.5	418.2	- 6.3
40-44	468.1	463.4	+ 1.0	465.4	+ 0.6	454.6	+ 3.0	466.6	+ 0.3
45-49	460.5	479.8	- 4.0	481.5	- 4.4	448.2	+ 2.7	471.0	- 2.2
Other Urban									
15-19	13.1	16.4	-20.1	16.5	-20.6	11.8	+11.0	13.8	- 5.1
20-24	87.3	95.7	- 8.8	101.5	-14.0	91.9	- 5.0	107.2	-18.6
25-29	214.5	229.2	- 6.4	230.0	- 6.7	215.4	- 0.4	240.7	-10.9
30-34	349.4	365.4	- 4.4	370.9	- 5.8	353.0	- 1.0	364.8	- 4.2
35-39	484.1	504.5	- 4.0	499.6	- 3.1	475.0	+ 1.9	491.3	- 1.5
40-44	570.5	559.2	+ 2.0	570.9	- 0.1	551.4	+ 3.5	566.3	+ 0.7
45-49	602.3	624.8	- 3.6	628.3	- 4.1	610.6	- 1.4	635.3	- 5.2
Rural									
15-19	21.7	28.6	-24.1	29.2	-25.7	22.8	- 4.8	25.9	-16.2
20-24	142.6	166.2	-14.2	167.2	-14.7	148.3	- 3.8	162.4	-12.2
25-29	312.8	339.7	- 7.9	340.5	- 8.1	316.6	- 1.2	334.1	- 6.4
30-34	496.8	509.7	- 2.5	515.5	- 3.6	496.8	-	510.1	- 2.6
35-39	661.8	671.3	- 1.4	682.6	- 3.0	666.6	- 0.7	675.0	- 2.0
40-44	767.3	770.4	- 0.4	776.7	- 1.2	763.6	+ 0.5	768.3	- 0.1
45-49	835.7	836.6	- 0.1	841.3	- 0.7	831.2	+ 0.5	834.1	+ 0.2

VIII. CONCLUSIONS

In the present document we have propounded various hypotheses whereby women's participation in economic activity can be related with fertility. Among them we drew attention to those bearing on role incompatibility, on the value of the mother's time (opportunity cost), on the socializing effects of work and on the influence of industrial-urban culture. In order to put forward conclusions with respect to these hypotheses we resorted to the census samples of Mexico and Costa Rica (countries selected because of their dissimilar fertility behaviour trends), studying the distribution of live births among women in different age groups and the extent to which this distribution depends upon women's participation in the labour force. Fertility was studied on the basis of the average number of live births per woman, which represents a cumulative fertility measurement. The education variable was measured by the number of years of instruction reported. With respect to the marital status variable, a distinction was drawn between single women, married women or partners in stable unions and the remainder (widowed,separated and divorced). The only way of measuring women's labour force participation was through the census data on their current participation in economic activity.

The final effect of women's economic participation and the changes therein as a strategic factor of changes in fertility was examined in the light of its interaction with these other variables in the determination of fertility levels.

In the empirical analysis presented in this study we have endeavoured to gain a better understanding of the interaction between women's participation in economic activity and two types of variable: on the one hand, intermediate variables (marital status) which facilitate continuous exposure to stable relationships (particularly in traditional societies like those of Latin America); on the other hand, determinant variables (education) which have traditionally been observed as having a negative correlation with fertility and which have been associated with hypotheses relating to the value of the mother's time (opportunity cost) or to social status.

We noted in section V of the present document that participation interacted powerfully with marital status, and much more slightly with education, in association with a measurement of fertility such as the average number of live births per woman. Consequently, as can be seen from the close correlation between the

index of concentration of participation by marital status and the figure for the same index by number of live births, to a large extent the observed differentials in numbers of births which are attributed to participation can also be ascribed to marital status. As regards the education variable, its impact on the determination of the average number of children is considerably more independent of the participation variable.

It remains to explain how this interaction between women's participation in economic activity and marital status is brought about. In the younger age groups, participation does not vary significantly among women of different marital status (the concentration index value is low).

This may be due to two mutually exclusive facts: either the age of nuptiality is being deferred, or, given a certain level of nuptiality, married women participate in the labour force in the same proportion as single women or others. According to our figures, what has been occurring in the younger age groups is the deferment of nuptiality. In Costa Rica's case, this would appear to happen largely up to the 20-24 age group, in which the proportion of single women still exceeds 50 per cent, and in Mexico up to the 15-19 age group only. Thus, in the younger age groups, higher educational levels and greater desire to enter the labour market would seem to be leading to postponement of the initiation of stable sexual relations, with the consequent effect on fertility. This deferment takes place on a considerably larger scale in Costa Rica than in Mexico.

In the age groups under discussion the incorporation of women in the labour force may be thought to influence fertility. This influence would be exerted through women's aspirations to attain higher educational levels and so equip themselves to compete for better jobs in the labour market, and then because of role incompatibility which compels them to postpone nuptiality or the initiation of their reproductive life. This relation is greatly intensified in so far as women's educational levels raise, being a good deal more important in San Jose than in Mexico City, and, within Costa Rica, in urban than in rural areas.

In the age groups where fertility is highest (20-35 years), participation in the labour force is much commoner in San José than in Mexico City, independently of marital status (concentration of participation by marital status is less). In Mexico City, greater concentration is the result of an inversion of the participation-marital status relation, participation being determined by the position

in respect of marital status. In effect there is a marked concentration of participation in the groups comprising single women and those who are widowed, separated and/or divorced, perhaps implying that the instability of their relations obliges them to take part in economic activity.

From these ages onwards, two different things happen with respect to women's labour force participation: whereas in Mexico City participation is largely concentrated by marital status and is not differentiated to so great an extent by educational levels, in San Jose, in contrast, concentration by marital status is basically less and education carries much more weight than in Mexico City in the determination of participation. Both these facts help to explain the fertility behaviour differentials between the two cities, highlighting not only the hypotheses relating to the socializing influence of work participation and the impact of industrial-urban culture on participation (especially in the case of married women in Costa Rica), but also those linked to opportunity cost as education gains increasing importance in the determination of participation. The greater the extent to which married women are incorporated in the labour force, the stronger will be the influence of women's economic participation on fertility through its socializing influence and the impact of industrial-urban culture. An additional effect will also be produced in so far as employment opportunities are more heterogeneous and education is used as a credential to give access to them, with the resulting increase in the value of the time spent on running the house. This is the most marked feature of the differences between the two capitals as regards the effect of labour force participation on fertility.

Thus the exogenous character which might be attributed to the participation variable in the determination of changes in fertility levels is not so immediate. The effects of economic development on levels of fertility through changes in the scale of participation and in the skills involved may prove insufficient to counteract the effects of other phenomena which cause, for example, changes in nuptiality.

The ultimate effect of women's participation in economic activity as a strategic factor in changes in fertility cannot be analysed independently of its association with nuptiality and with qualification. The lesson to be learnt from developments in Mexico and Costa Rica during the 1960's is that significant changes

in nuptiality may to a great extent offset the possible effects on fertility of changes in the scale of labour force participation and the qualifications involved.

In the countries under study, alongside the deferment of the age of initiation of stable sexual unions and the rise in levels of instruction and participation, there was, whether independently of these factors or not (a point for future research), a significant upswing in nuptiality in Mexico. In contrast to what occurred in Costa Rica, however, the rates of participation of married women, instead of increasing, declined. Thus, as levels of instruction rose, rates of participation increased and the occupational status of women improved, a pronounced downward movement in specific fertility rates took place. The increase in nuptiality in Mexico, however, together with the reduction of the rates of participation of married women, brought about a restructuration of the female population in respect of the attributes which raise levels of fertility (marriage and non-participation in economic activity). The joint impact of the reduction in specific fertility rates and the restructuration of the female population was responsible for the absence of change in general fertility in Mexico.

In Costa Rica, while nuptiality rates were maintained, the rate of participation of married women increased, particularly in the age groups where reproduction is highest: a situation that follows up and accentuates the direction of the previous changes. The decline in fertility observed in Costa Rica and the absence of change in Mexico thus become understandable.

The changes linked to economic development must not only increase employment opportunities for women, but must do so in such a way as to incorporate women independently of their marital status. This will be achieved only in so far as employment opportunities exist irrespective of a woman's social group of origin, so that through her job she can fulfil her aspirations and bring into line with them her own cultural values and those of her family. Otherwise, labour force participation will result from the necessity of attaining subsistence levels for herself and her family, and will not so much condition fertility as refect its result in the past. This latter situation seems to prevail in the more traditional societies and environments in Latin America.

Table VIII-1

CONCENTRATION INDEX OF LABOUR FORCE PARTICIPATION AMONG WOMEN GROUPED BY MARITAL STATUS, EDUCATION, AND NUMBER OF LIVE BIRTHS

	San Jose			Mexico City		
	Marital status	Education	Number of live births	Marital status	Education	Number of live births
Total	0.074	0.015	0.045	0.168	0.016	0.066
15-19	0.025	0.204	0.003	0.091	0.074	0.025
20-24	0.096	0.003	0.064	0.251	0.012	0.180
25-29	0.129	0.033	0.101	0.314	0.024	0.218
30-34	0.143	0.056	0.098	0.257	0.034	0.165
35-39	0.125	0.061	0.101	0.197	0.020	0.077
40-44	0.122	0.041	0.137	0.196	0.027	0.091
45-49	0.159	0.045	0.146	0.141	0.023	0.078
Coefficient of correlation between concentration index for the corresponding column and the same index for the live births column	0.92	0.71	1.00	0.96	0.59	1.00

METHODOLOGICAL APPENDIX

THEIL'S INDEX FOR THE STUDY OF DIFFERENTIAL FERTILITY

For the purposes of studying fertility behaviour on the basis of the number of live births per woman, Theil's entropy index is extremely useful.

This index can be expressed as follows: (1) $I_i = \Sigma\, yi \log \frac{yi}{Xi}$ yi being the proportion of the total number of live births occurring in fertility class i, and Xi the proportion of women in that fertility class. The index is interpreted as the information expected from a message that converts percentages of women into percentages of live births.

When the average number of children per woman is the same in all classes (which is tantamount to saying that all are in the same fertility class), the index value is zero. Its maximum value is log N -where N represents the total number of women- and is equivalent to a situation in which one woman alone has the total number of children born alive and the rest have none. When it happens that in two different populations equivalent proportions of women have corresponding numbers of children, the measurement will be the same, however many women there are in each of the female populations under study.

Like the Gini coefficient, the inequality measurement does not depend upon the distribution of the variable within the population. Its chief attraction for our purposes consists in its aggregation properties. The measurement can be broken down in two ways. One is by distinguishing its components "Between" and "Within"; the other is by singling out the contribution to total inequality made by the variation in the average number of live births among women grouped in educational, marital status and participation categories, with due regard to the interaction between participation in economic activity and each of the other categories. For our purpose both methods are used. The fertility classes were defined by the number of live births per woman (none, one, two, three... up to twenty and over). In each age group the women were distributed among these fertility classes, so as to obtain the proportion of the total number of women and the proportion of the number of live births corresponding to each class in the age groups in question. This enabled us to ascertain the value of the total

inequality measurement in each age group in accordance with the following formula: (1') $Ii = \Sigma\, yi \log \frac{yi}{\chi i}$ in which χi = the proportion of the total number of women represented by women in that age group who have had i children born alive; yi = the proportion of the total number of live births in that age group represented by the children of women in fertility class i.

This measurement makes it possible to determine the total inequality of women in the age group concerned, only variations in fertility classes being taken into account.

In its turn, the equation:

$$(2)\quad Ijk = \sum_j yj \cdot \log \frac{yj\cdot}{kj\cdot} + \sum_k y \cdot k \log \frac{y\cdot k}{k\cdot k} + \left[\Sigma\Sigma yjk \log \frac{yjk}{\chi jk} - \sum_j yj \cdot \log \frac{yj\cdot}{kj\cdot} - \sum_k y \cdot k \log \frac{y\cdot k}{x\cdot k} \right]$$

enables us to determine that part of the observed total inequality that can be explained by the variation in the average number of live births, for example, by participation in economic activity and education. The difference between (1) and (2) will be due to the variation in the fertility classes occurring within the j by k clusters of participation and education, and expresses those characteristics of women which affect their fertility and have not been taken into account. The terms of equation (2) divide the part of fertility explained into three components. The first is the difference in the average number of children born alive to economically active and to non-active women, in relation to the total average; the second is a similar variation in the average number of live births in the different educational classes, in relation to the total average; and the third is the interaction between these two variations. These values are presented as the components "Between" and "Interaction" in tables V.A.a and V.A.b.