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The demographics of inequality*

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Abstract. This paper presents a survey of recent literature on the effects of demographic variables on economic inequality. First, a number of conceptual and methodological questions are raised and discussed. They pertain to what is meant by inequality, what the range of demographic variables is, and how variable and endogenous are the demographic variables most widely used.

The paper then turns to a review of empirical works on the distributive incidence of the following demographic variables: baby boomers entering the job market, aging population, variable fertility and mortality rates, internal and external migrations, divorce and widowhood, and finally donations and bequests. It appears that a lot of caution is needed when assessing the incidence of any demographic variable changing the size of the population because in this case standard inequality measures yield conflicting signals.

1. Introduction

The subject of this paper is the demographics of income and wealth distribution. It is concerned with the various and complex influences that population related factors may have on the degree of inequality and on the level of poverty. This is an important and contemporary topic and the questions it raises are both difficult and controversial. The major source of controversy is over the meaning of income and wealth inequality on the one hand and on the range of demographic factors on the other hand. As to the difficulty, it essentially lies in the dynamic nature of both demographic and economic realities and in their endless interplay.

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Our purpose is to bring together in an orderly and consistent fashion an important literature which has blossomed over the years, particularly the latter ones. In the second section, we deal with the conceptual issues pertaining to what is really meant by inequality and to what the relevant range of demographic variables is. We also try to assess how variable demographic variables actually are. The third section is devoted to the joint incidence of age and of cohort size on the level and the distribution of income. The fourth section reviews the influence of a number of sociodemographic factors on the observed distribution of income and wealth. A last section concludes with an assessment of current research and some suggestions for further work.

2. Conceptual issues

2.1 Inequality

Quite often the issue of inequality is cast in terms of individuals' income in a particular year. This has proved a too simplistic view which leaves a number of questions unanswered[1]. Is it with income only that we should really be concerned? What about wealth? What should be the basic unit of reference, the individual, the family, the household, . . .? Is it sufficient to look at income over a year, and not over the life cycle of a person or even over the infinite length of a dynasty?

There is quite a large consensus on the idea that what really matters is a comprehensive indicator of the economic position of the unit concerned which includes not only after tax income but also capital gains, fringe benefits, production from home consumption, imputed rent, both in kind and cash transfers from whatever sources.

There is more disagreement on both the time period and the family unit to be considered. At one extreme, one could use the yearly income of each individual and, at the other extreme, the average income of an infinitely lived dynasty within which resources are transferred back and forth according to some intergenerational altruistic criterion. Without going that far, it is clear that the concept of lifetime income makes more sense than that of yearly income as it takes into account the possibility of averaging consumption expenses from an income stream fluctuating over years.

What really matters in this respect is who is the decision unit and what are its freedom of choice and its objectives. If the decision unit is the household, if it can allocate its income so as to maximize its lifetime utility, then using the household's lifetime income is relevant. If this household is concerned with the welfare of its offspring, then the dynastic income may be the correct indicator. Finally, if one takes the case of an individual facing liquidity constraints and thus consuming just what he/she earns, yearly income makes sense. This latter myopic viewpoint is often adopted for measuring the poverty level.

The choice of the appropriate family unit is also important. When data concern households or families, one conventionally uses equivalence scales to

[1] See, on this, Atkinson (1983).

translate them into individual units. Whether this is a correct approach depends on whether both household formation and resource sharing within it are freely chosen by its members (Danziger and Taussig 1979; Lazear and Michael 1980, 1988; Kapteyn et al. 1985).

Finally, even if one agrees on an indicator of income, on a time period, and on an income receiver unit, one still has to interpret the ensuing income distribution in terms of inequality. At the level of generality of this survey, let us just note that what is needed is more than a mere statistical measure of dispersion but an indicator with social welfare implication. For demographers, an important property to be considered is whether the indicator retained, the Gini coefficient or a poverty measure, whichever, is decomposable. Thus, one can assess the contribution to inequality of specific demographic factors. The relevant class of decomposable inequality measures has recently been characterized by Shorrocks (1980, 1982)[2].

There is an abundant literature on the link between inequality measures and social welfare functions, clarifying the value judgements implicit in particular inequality measures. What has been found recently (Lam 1984, 1986; Cyrus Chu 1987; Fields 1979; Morley 1981) is that with a changing population, the resulting effects on inequality measures need not be consistent with the social welfare function implicit in a particular index. Using evidence from Brazil, Lam (1986) finds that most standard measures of inequality yield confusing signals in the presence of income differentials in fertility.

In this survey, we have deliberately chosen to deal with the observed distribution of annual incomes. Such a distribution comprises two types of effects, inter- and intra-generational effects which cannot be easily disentangled. To evaluate intergenerational effects, one usually assumes that each cohort or generation comprises individuals who are identical as to their lifetime incomes. The problem is then to check the effect of a particular demographic change on the relative well-being of successive generations. As shown by Kotlikoff (1985) for the joint effect of social security and population aging, one has to take into account all sorts of public and private transfers between generations to measure the net and final incidence of aging populations (see also Boskin et al. 1986).

When approaching the intra-generational distribution of income, one also uses lifetime income to control for age effects within a given cohort. Here too, demographic variables such as differential fertility of mortality rates across members of a generation can affect the degree of income inequality. It thus appears that traditional measures of income distribution encompass three sources of interrelated differences: age, inter- and intra-generational differences.

2.2 Demographic variables

But what do we really mean by demographics? Deliberately, we take that word in its broadest meaning, that is the set of vital and social characteristics of human population. This is why the term "socio-demographic" is often used. The first variables which come to mind are fertility and mortality rates which may vary not

[2] See also Fields (1980).

only over time but also across individuals. Variable population growth first of all affects the age structure and thus the intergenerational allocation of resources, particularly when combined with pay-as-you-go pensions schemes or with public debt. Differential fertility rates imply different family sizes with clear distributive implications in terms of well-being. Differential mortality rates have also important inter- and intra-generational effects, notably through bequests, annuities and pensions.

Households' formation and dissolution can also play a crucial role on income inequality. Marriages and divorces, the young leaving their parents' house, the moving of the elderly back to their children or to nursing homes, all these decisions happen to deeply affect the well-being of the people concerned.

Another important demographic characteristic is the position of both men and women, married or not, towards the labor market. This touches upon decisions such as the participation rate of women, length of schooling, labor migration and retirement. Finally, one could also include in this broad definition of sociodemographic variables the types of links one finds in a family, including inheritance and intra vivos in-kind and cash donations.

All these variables, with maybe the exception of mortality, are viewed by some economists as resulting from rational decision making. Indeed, it is clear that some individuals can choose to a certain extent whether to migrate, to get married, to seek a job, to have so many children, to leave them some bequests and provide them with a certain level of education, possibly to divorce and eventually to retire. For these individuals, demographic characteristics are the result of deliberate and unconstrained choices; hence, trying to assess their impact on these individuals' well-being raises some problems. We shall come back to this point, but first let us ask whether all these demographic variables actually vary.

2.3 How variable are demographic variables?

Before further exploring the distributional effects of population factors, it seems appropriate to give some rough estimates as to the actual dispersion of demographic variables. As a matter of fact, if there were only a relatively limited dispersion of these variables, we would not expect them to have large distributional consequences. Inversely, a relatively high degree of variability in demographic patterns should have substantial implications on income and more generally on well-being distribution.

Let us start with life duration. Lifetable data are numerous and one might wonder why there have been so few works trying to measure the inequality of life duration per se (see, however, David and Menchik 1986). Two polar cases can be distinguished: everyone dies at the same age, or an identical mortality rate applies to every age, in which case there is a high variability in life duration. A look at the derivative of actual survival functions reveals that the degree of life duration variability remains quite high in industrialized societies (across individuals, sex, occupation, ...) even though it has decreased lately. Life duration was more dispersed in the past, when survival probabilities were lower at every age. Still, when exploring the incidence of mortality differentials, one has to keep in mind that they remain quite significant.

Regarding fertility, one is often concerned with the degree of dispersion in family size. In a country like France, in 1982 there were half of all families with no children under 16, 22.7% with one child, 17.7% with two children and only 9.1% with more than two children aged less than 16. These figures are static; they refer to the observed distribution of children per household at a given point of time, regardless of the mothers' age. It seems in that respect preferable to adopt a longitudinal approach and to focus on completed families.

The third important socio-demographic factor to take into account concerns migration flows and notably their structure by age and sex. Those in- and outflows contribute to shape population structure as much as fertility and mortality. There is as much variation in migration as there is in fertility or mortality. Periods of heavy migration often alternate with periods of slow immigration, if not of emigration.

The number of heads and their age do not suffice to assess the effects of demographics and careful attention should be given to the units of observation. To take an important example, there is a link – yet looser than usually thought – between family and household, and therefore between the number of children and the household size. In France, the annual rates of growth of the size of population, the number of families and that of households for the period 1962–1982 are respectively 0.8, 1.1 and 1.5% (INSEE 1986).

Since the size of a given household varies over time due to all possible socio-demographic events – such as marriage, birth, divorce or death – affecting it, comparing households income may happen to be misleading. This explains the current search for a longitudinal definition of household (McMillen and Herriot 1985; Duncan 1985).

2.4 How endogenous are demographic variables?

What is the degree of control of individuals towards demographic variables is a hot issue in both theoretical and empirical works. At the one extreme, some people contend that one can control at least partially all of them including mortality, since the latter is a function of occupational choice and living habits (see on this, Becker 1988; Willis 1987). At the other extreme, some people contend that individuals are at the mercy of most of these phenomena. Further, even when they result from individuals' decision making, as in the case of divorce, they are forced upon most people affected by the decision.

To clarify the question at hand, let us take two polar assumptions concerning fertility[3]. Under the first assumption, a couple freely chooses how many children it wants to have and to raise. Assume further that the material well-being of a family and that of its children is negatively correlated to its size. Then comparing two households identical in all respects but for the size leads us to the conclusion that the current as well as the future economic welfare of the members of the larger family is lower than that of the members of the smaller family, even though the size choice was free and hopefully concerned with the future as well as the

[3] This opposition is analogous to that between intended and unintended reproductive behavior (see Easterlin 1986).

Table 1. Demographic phenomena: controllability and altruism

Demographic phenomena	Degree of controllability	Unanimous choice of people concerned	Altruism towards children
Fertility	debatable	yes	debatable
Mortality	small	–	–
Nuptiality	high	yes	–
Divortiality	high	debatable	weak
Retirement	low[a]	debatable	debatable
Migration			
national	high	high	debatable
international	high	high	debatable
Inheritance			
planned	high	high	high
unplanned	zero	–	–

[a] At least in a number of European countries

present. In other words, one faces the following paradox: lower well-being of the larger household taken as a whole or individually and at the same time, higher utility than it would have enjoyed with less children. This just reminds us that even the most comprehensive and dynamic notion of income may be at times misleading.

Let us now consider the other extreme assumption on fertility. Now identical households are subject to uncontrolled and variable fertility rates. Whatever the reason for that, be it cultural, technical, or physiological, it implies that there is a gap between the desired and the actual number of children each household has. In this case, fertility can be viewed as an outside phenomenon, as exogenous as lightening striking one's house. It is entirely legitimate then to expect differential fertility to have differential welfare effects and to try to assess these.

In reality, depending on personal and cultural characteristics and institutional environment[4], a variable part of each demographic phenomenon is clearly outside individuals' choice. In Table 1, we propose a ranking of demographic phenomena according to their degree of controlability but also the degree of consensus with which decisions are made by the persons directly concerned. Take the first row devoted to fertility. Whether fertility is the outcome of conscious choice or not is highly debated among demographers and economists. When fertility behavior is intended, the choice is that of both the man and the woman. Yet, it is not sure that in so doing they are concerned with the well-being of the child to come and his/her siblings, if any.

Even though a demographic phenomenon is indeed entirely up to an individual's free choice, it can be felt exogenous by other people involved in that choice particularly if their welfare is not taken into account. A couple can freely decide to have so many children without really caring about their future welfare. Not that this raises the delicate issue of how to weigh the welfare of people not yet born. Taking another example, when a person decides to leave his/her jobless

[4] In North America, retirement age is relatively free. In most European countries, most occupations are subject to a mandatory retirement age.

spouse and his/her young children, he/she is likely to be more concerned by his/her own welfare than by theirs. But then, this is somehow measured by the income differential implied by that decision.

Two questions are raised here. First, in case of free demographic choice, there is the possibility of a simultaneous increase in welfare and decrease in real income. Second, if a demographic variable is the outcome of an unconstrained choice, does it make sense to talk of its effects on individuals' well-being and not of the other way around, that is, the effect of individual's well-being on their demographic choices? We believe that these two issues are only relevant for particular demographic variables and for only some of the individuals involved in the choices.

In any case, the first objection can be overlooked as in general we expect that an increase in welfare is accompanied by an increase in income. As to the second objection, in empirical research one has to make do with operating "as if" the demographic variables were genuinely exogenous.

After all, this latter difficulty is not new. In the field of tax incidence, one could also argue that the overall tax structure with its loopholes, exemptions, and deductions is the result of a given more or less egalitarian society. Thus, one could study the effect of such income distribution on the tax system as well as the incidence of the tax system on income distribution.

To sum up, demographic patterns do indeed vary significantly in a given population, across countries and over time. One can therefore expect them to have some distributional effects. We have seen that a good measure of inequality should be based on a life cycle comprehensive definition of income; it should further control for any cohort effect. We have also seen that when demographic variables are the result of free and unconstrained choices, measuring their impact on inequality is somehow questionable.

In the rest of this paper, which is rather empirical, we depart from these provisos. First, we assess inequality on the basis of current income or wealth. Furthermore, we take the demographic variables as exogenous. This latter assumption makes it easy to define a counterfactual based stationary demography with respect to which distributive incidence can be evaluated.

3. Age and income: life-cycle or generational effect

A number of studies pertaining to several disciplines and using all sorts of methods and data sets consistently indicate that the variable "age" explains part of the dispersion in earnings, income and wealth. As most of these studies rely on annual data, it is not easy to sort out in this age effect what is due to pure life-cycle and what is due to changing cohort size. In the following, three questions are considered in that respect. First, how far can the effects of life-cycle and of demographic composition be separated in explaining changes in income distribution? Second, focusing on the labor market, what is the effect of cohort size on the earnings profile? Finally, what is the impact of the current aging of our societies on the relative welfare of the elderly?

Before proceeding with these questions, let us mention an important body of empirical work based on cross-national regressions that include population

Table 2. Evidence on the hump-shape age-earnings profile

Study	Country
Lillard (1977a and b)	U.S.A.
Creedy and Hart (1979)	U.K.
Klevmarken (1982)	Sweden
Baudelot (1983)	France
Schmähl (1983)	Germany
Nelissen (1986)	Netherlands

growth as an independent variable explaining some inequality index[5]. Most of these studies (see, e.g., Adelman and Morris 1973; Ahluwalia 1976) conclude that population growth increases inequality. The causal interpretation of these single-equation results has been questioned by Kocher (1973), Rich (1973) and Repetto (1978, 1979). Recognizing the possibility of effects in both direction leads to simultaneous-equations models which yield mixed results (see, e.g., Repetto 1979; Winegarden 1978; Ogawa 1978; Rodgers 1983). These empirical studies are subject to obvious criticisms (lack of theoretical model, too high a degree of ignorance of compositional effects) which make their conclusions strongly questionable and hardly relevant (see on this, Lam 1987).

3.1 Age composition and income distribution

Consider a society in which everyone has the same income profile over a lifetime. That is, a person's annual income is the same as that of everyone else of the same age irrespective of his/her cohort. This would be regarded as an egalitarian society by most standards. Yet, the dispersion of current income could be considerable; it would depend on both the life-cycle income profile and on the population age structure (see Atkinson 1971, 1983).

Taking the average income of household heads in the same age range, Mookherjee and Shorrocks (1982) for the United Kingdom and Blinder (1980) for the United States find a similar pattern for about the same period (1965–80 and 1947–77 respectively), that is, a hump shape profile peaking around the fifties, the concavity becoming more accentuated over the years. Within each age group, the dispersion is below the population average up to age 60 and above, it is higher than the population average (see Danziger and Poltnick (1977) for the United States evidence). Table 2 provides a survey of some typical studies of the age-earnings profile in several countries[6].

Even if individuals' lifetime profile were unchanged, demographic shift could affect the overall distribution of income. Assessing the impact of such shifts is not a straightforward exercise (see, e.g., Paglin 1975). One approach simply consists of giving to one of the two years to be compared the same demographic com-

[5] For a discussion of these issues, see Ahluwalia and Chenery (1979), Boulier (1981, 1982), Sirageldin (1975), Kuznets (1955, 1980) and Rodgers (1978).

[6] Among the factors explaining such a profile, seniority rules and unions are often cited. See on this Abraham and Farber (1987a and b).

position as the other. Though mixed, the findings of Blinder (1980), Danziger and Plotnick (1977), Mookherjee and Shorrocks (1982) and Semple (1975) point to some influence of changes in age composition.

Morley (1981) tries to identify the contribution of changes in age structure to increased inequality between 1960 and 1970. He concludes that the composition effect of a younger age structure was to slightly increase inequality. Winegarden (1978) also cites the effects of a younger age structure as one reason why more rapid population growth would lead to higher inequality. Not all authors agree that a younger age structure implies greater inequality. Repetto (1979, p. 21) suggests an effect in the opposite direction when he argues that "lower fertility and mortality rates, by elongating the age pyramid and increasing the variation in age among earners, would tend to increase the current inequality in the distribution of earned income".

As Lam (1987, p. 593) puts it, both sets of arguments are correct. "Those arguing that a younger age structure will increase inequality are referring to the effects of increased proportions of young workers on intercohort variance". On the other hand, it is correct "that if the age-specific variance of earnings tends to increase with age, a decline in population growth will have a disequalizing effect by shifting the population into the higher-variance older age groups. The complete picture is that total inequality is the combination of the intercohort and intracohort components, with conflicting statements about the effect of a younger age structure reflecting the fact that these two components may be affected in opposite directions by an increase in the population growth rate".[7]

In many countries, demographic changes over the post-war period have been substantial with the proportion of both young households and elderly households increasing. This shift towards age groups that on the average have lower incomes raises all sorts of issues related to their relative economic status with respect to other age groups but also to the same age groups in other cohorts. The problem of the young baby boomers is dealt with in terms of the effect of cohort size on the labor market whereas that of the elderly population is linked to the issue of pensions, social security, wealth holding and widowhood.

3.2 Cohort size and earnings

In a number of industrialized countries, young workers have lately experienced lower earnings and higher unemployment rates than usual. To account for these difficulties, there are two types of conjectures. The first view is that they are age related with the implication that they will disappear as recent youth cohorts grow older. The second view is that these difficulties experienced by recent youth cohorts are a consequence of their large number and thus will not necessarily vanish for these cohorts[8].

On the basis of a multi-country analysis of patterns of cohort size, earnings and unemployment, Bloom et al. (1987) have shown that these two views comple-

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[7] These effects are particularly important when assessing the incidence of income maintenance programs. See, on this, von Weizsäcker (1988, 1989).

[8] This hypothesis is generally attributed to Easterlin (1987a).

Table 3. Evidence of cohort size on earnings

Study	Country	Effects on earnings	Lasting effect?
Bloom et al. (1987)	International	yes	–
Riboud (1987)	France	no	–
Ben Porath (1988)	Israel	yes	–
Ermisch (1988a and b)	U.K.	weak	–
Martin and Ogawa (1988)	Japan	yes	–
Murphy et al. (1988)	U.S.A.	yes	no
Tan and Ward (1985)	U.S.A.	yes	no
Dooley (1985)	Canada	yes	no
Berger (1985)	U.S.A.	yes	yes
Freeman (1979)	U.S.A.	yes	–
Welch (1979)	U.S.A.	yes	no

ment each other to explain both low earnings and high unemployment for the baby boom generation entering the job market.

Their study follows a long list of works on the effects of cohort size on earnings (see Table 3). All of them find that larger cohorts experience depressed earnings conditions on entry in the labor market; there is however some disagreement on whether that depressing effect worsens or dissipates with experience. Some of these studies also address the question of whether high unemployment is associated with cohort size; they all conclude to a positive significant effect (see Ben Porath 1988; see nevertheless Russell (1982) for a mixed finding, see also, OECD 1986).

One might also note the work of Stapleton and Young (1984) who try within a multiple skill model to explain changes in the United States distribution of wages from 1967 to 1977 across not only age but also education, sex, and race. Their most striking result is that the decline in wages of young males relative to older males is confined to males with a college education (see also Denton and Spencer 1982, and Guillotin (1987) for France).

If we take for granted that there is a negative effect of cohort size on earnings growth, what conclusions can one draw in terms of income inequality? Taking everything else as constant, in particular public policy and household composition[9], one should expect first an increase in inequality and then after two decades or so, inequality should decrease as the instantaneous age-earnings profile becomes flatter.

So far, attention has been focused on the effect of the baby boom on the structure of earnings. As noted by Easterlin (1987a and b), this change may, in turn, induce demographic responses to counteract the adverse shift in earnings. Thus baby boomers help restore their income status by remaining single, having few children, mothers' working, etc.... But, this has yet to be documented further.

On the basis of the existing evidence on earnings structure, age pyramid and complementarity in the labor market, Levine and Mitchell (1988) assess the impact of the baby boom on relative wages in the U.S.A. They simulate the earnings

[9] Assuming that the age-specific inequality does not increase with age. See above.

structure for the year 2020 and show that wages of prime-age workers will not deteriorate in relation to older workers as a result of the baby-boom cohort. Prime-age women are predicted to lose in comparison with older workers and with men, increasing rather than reducing wage differentials by sex. The latter result is in contrast to the previous ones because Levine and Mitchell take into account explicitly the supply side effects of an aging population.

3.3 The relative well-being of the elderly

In an aging population, the proportion aged 65 and over increases. What is the impact of such a shift on the well-being of this group whose income is on average lower and more dispersed that that of the other age groups? As most of the elderly are retired, this impact does not go through the labor market but rather through the returns of private savings and social security.

In a nutshell, the evidence seems to indicate that in most industrial countries the level of income of the current elderly has in general never been as high relative to other age groups and relative to previous and future old age groups. In the U.S. where the improved economic position of old age has been widely studied (see, e.g., Danziger et al. 1984; Boskin and Puffert 1986; Boskin and Shoven 1986; Hurd and Shoven 1982), the major explanation seems to lie in the large increase in real social security benefits in the early 1970's and their subsequent indexing. This evolution which has been noticed elsewhere (see, e.g., Ringen 1986) calls for several provisos.

First, the observed improvement in both the relative and the absolute economic position of the elderly is due to a favorable dependence ratio, crucial with a pay-as-you-go way of financing pension benefits. This is not likely to last as the population ages.

Second, a distinction has to be made between younger and older retirees; they did not experience the same career profile, they do not receive the same social security benefits, and finally they do not have the same needs particularly as to medical care.

Third, this evolution concerns the average elderly; as we see below, some particular groups of elderly, widows, minorities, and early retirees do not fare as well. Let us recall that the old age group is where the largest income inequality is generally observed.

Besides social security benefits, today's elderly people have accumulated important wealth of their own. They control a large part of national financial assets, real estate and durables, the returns of which, implicit or explicit, contribute further to their improved position. This is due to their higher than expected saving rate (Mirer 1979) including home-ownership (Venti and Wise 1988), as well as to favorable trends in stock-market and housing prices.

In contrast with the improved well-being of the elderly, one notes in the U.S. a substantial rise in the poverty rate of the children (see Smolensky et al. 1987; Preston and Kono 1987; Finnie et al. 1986). This is quite a reversal with respect to part trends; it seems to be largely due to two factors: improved government programs for the elderly and deteriorated labor market conditions of adults in family forming age (Easterlin 1987). Is this an inevitable trend in ageing democratic societies which is going to spread to other countries?

A comparison of eight countries (Smeeding et al. 1987) suggests that the relative economic advantage of the aged over the young is observed not only in the United States but also in Canada, Sweden and, to a lesser extent, Australia. In Norway, Switzerland, Germany and the United Kingdom poverty rates are still higher for the old than for the young.

4. Other demographic factors

4.1 Variable family size

Even though family size tends to be less dispersed in today's societies than in the past, there is still quite a lot of variance. What are the effects of such differentials on the welfare of households and particularly on the welfare of their children?

The first and the most obvious effect is that the pieces of the pie are likely to be smaller in a larger family in terms of consumption, parental attention and inherited wealth (see Clague 1977; Jenkins 1985; Straub and Wenig 1984; Bental and Wenig 1983; Pestieau 1984). This is particularly true in societies where children are not seen anymore as source of income for the family. In recent papers, Danziger and Gottschalk (1986) and Haveman et al. (1987) have measured the change over time in the level of income of families with children and compared these changes with those of other families. Overall families with children have not fared as well as the other groups, as evidenced by a variety of indicators of well-being per family or per child. In these indicators, besides income, wealth holding and parental time available to each child were introduced (see also Greenwood 1987; Greenwood and Wolff 1986).

It seems that the labor supply of married women decreases when they have children. They may decide to definitely withdraw from the labor force. Consequently, the income of larger families is likely to be ceteris paribus lower than thay of smaller size families (see Deville (1985) for the case of France).

When differentials in fertility are linked to income, in particular when fertility falls as income rises, then one expects increasing inequality as shown by Pryor (1973). Yet, Lam (1986) has shown that such a pattern observed in Brazil as compared to a counterfactual pattern with constant fertility across income causes an increase in the coefficient of variation but a decrease in the variance of the logarithms of income. As Lam notes, this raises serious concerns about measuring inequality variations.

Turning to the intergenerational distribution of wealth, Smith and Orcutt (1980) underline the importance of the number of siblings on the level of inherited wealth. On then basis of a microsimulation of the U.S. society over the period 1960–1972, they show that 94% of persons who received $ 18000 or more were either only children or had one sibling[10].

Another effect of family size which has long been noticed by psychologists is that on schooling attainment and on measured I.Q. This effect concerns the lifetime well-being of children and not just their well-being as children. There is

[10] Note however, that total inherited wealth can increase with the number of children as it appears in France according to Kessler and Masson (1987).

Table 4. Negative effect of birth order and number of siblings on economic success

Studies	Dependent variable	Related demographic variables
Duncan (1968)	Occupational status	siblings
Bowles (1972)	Schooling, income occupational status	siblings
Leibowitz (1974)	Schooling	siblings, birth order
Lindert (1976)	Schooling, occupational status	siblings, birth order
Watchel (1975)	Schooling and ability	siblings
Behrman et al. (1977)	Schooling, occupational status	siblings

indeed consistent evidence that family size is negatively correlated with these two variables, and hence with most indicators of economic success (see Table 4). This negative effect is open to two competing interpretations: either family size is correlated with unobserved parental variables such as a strong demand for high achievers in single child families, or it reflects differential inputs to children.

In many countries, there are specific family allowances related to the number and the age of children. Such transfers may represent a sizable share of large families income and tend to reduce inequality.

Finally, when combined with intergenerational transfer schemes such as public debt and pay-as-you-earn social security, differentials in family size may have other distributive implications. Suppose for example that the government decides to finance public consumption expenditures through public borrowing rather than through taxation, and that the debt so contracted is expected to be redeemed by the next generation. It is clear that childless households would benefit from such an operation (see Cremer and Pestieau 1987; Cremer et al. 1987).

4.2 Differential mortality

An increasing number of studies now recognizes the simple fact that differential survivorship is an important feature of our populations and is not a pure result of hazard but of sex, race and occupation. Such differences in mortality rates have clear distributive effects. First, if one gives a positive value to longevity, differential mortality is a factor of inequality.

However, the best known incidence of differential mortality or, to put it in another way, of premature death is that on saving. A pay-as-you-go pension system combined with longer life expectancy of professional, managerial, self-employed relatively to unskilled workers is clearly disequalizing (Aaron 1977; Kessler and Masson 1987). For all other types of savings which are perfectly transferable, heirs, that is most often, children and spouses are those who can suffer or benefit from early mortality. From their viewpoint, the "ideal" age if that of retirement when wealth accumulation is supposed to reach its peak (see also David and Menchik 1986). As shown for example by Wolfson (1980), the age difference between decedents and their heirs is a crucial variable in the transmission of inequality over generations.

Current income dispersion depends also on differential mortality rates. Imagine that only high income earners survive past 65 and that all low income earners die at 65. The corresponding income distribution would be quite different from

the one that would result from random mortality. The same types of problems arise with wealth distribution (Shorrocks 1975).

4.3 Household formation and dissolution

Among the most significant changes in family structure observed in many countries over the past decades, one can primarily quote the explosive growth in the number of families headed by women as a consequence of marital instability. The women and the children of these families constitute a disproportionate share of the poverty population and of welfare recipients (see Duncan and Hoffman 1985; Beller and Graham 1985).

Marital instability is clearly a source of inequality as most men who divorce or separate are immediately better off because they retain most of their earnings, do not generally pay large amounts of alimony and child support to their ex-wives and no longer have to provide for the level of needs associated with their former families. On the other hand, women and children involved in divorce are often worse-off particularly when their predivorce incomes were above the median. Their economic status seems however to improve over time (see, however, Burkhauser et al. 1986).[11]

Another source of income inequality the importance of which has increased is widowhood. Although as noted above the economic well-being of the elderly has improved substantially over the past decade, a high fraction of aged widows are still in poverty[12]. Hurd (1988) estimates the future economic status of American widows taking into account increased life expectancy, increased pension coverage and social security benefits. He shows that this fraction is going to remain steady up to the year 2000.[13]

Widowhood is not the sole source of economic decline among the elderly. There is also the type of living arrangement they have elected. Börsch-Supan (1988) shows the importance of demographic determinants of the decision to live independently versus to share an accommodation. An decreasing fraction of the elderly lives with their adult children with clear effects on both age groups. One of the major reasons for this trend lies in higher incomes and generous social retirement. On the other hand, Kotlikoff and Morris (1988) show that those they call the vulnerable elderly have less contact with their children than the non vulnerable elderly.

Housing is an important part of the elderly's wealth and also a major impediment to their mobility. Stähl (1988) compares housing patterns and mobility of the aged in the United States and West Germany. He concludes that the potential for adjusting housing consumption by moving is much greater in the United

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[11] Instead of taking of the effects of divorce on inequality, one could also talk of the effects of marriage or remarriage. See, on that, de Singly (1987, 1988) and Blinder (1973).

[12] See Smeeding (1988), Smeeding and Torrey (1988) who note: "improving the income of the aged in general still may not address the twin problems of the distribution of benefits and poverty levels among the aged, particularly single elderly women", see also Fuchs (1986).

[13] See Wertheimer and Zedlewski (1978) who measure the effect of family stability on the distribution of earned income and the welfare benefits in the United States for the period 1975–1985, see also Duncan (1983) and David and Fitzgerald (1987).

States than in Germany, since elderly Americans are approximately four times as more likely to move as are their German counterparts.

4.4 Inheritance rules

Very rarely can someone transfer an income stream to someone else. The most noticeable case is related to social security and pension benefits. As a matter of fact, survivor benefit rules are in most instances mandatory.

Inheritance essentially concerns wealth. Upon death, wealth is usually split among heirs. In certain countries such as France and Germany, people are forced by law to share their estate almost equally among their children whereas in others they are free to bequeath (e.g. United Kingdom and United States). In the first case, the number of children is the dominant factor to explain the dilution or the concentration of wealth. Where primogeniture is possible, inheritance tends to imply more inequality than under an equal sharing rule (see, e.g., Stiglitz 1969).

In countries where there is no constraint on estate sharing, equal sharing is still widespread (Menchik 1980). In the United States most people do not make a will and let the equal sharing rule be enforced. But even when a will is made, estates are usually shared quite evenly among heirs. When this not the case, there are "good reasons": e.g., the presence of handicapped child whom parents want to support. It would seem that laws imposing equal sharing are not a real constraint on most households' choices.

Inheritance rules, demography and inequality are variables which interact on each other. If we assume that about half of total physical wealth is transmitted over generations, one can infer that indeed inheritance can account for a large part of wealth inequality. We also know that with fertility differentials such an unequalizing trend is likely to be reinforced. Apart for these two obvious connections, two other ones, lesser known, are noteworthy. Recently, Brenner (1985) argued that toward the end of Middle Ages, England had to adopt egalitarian inheritance rules as a consequence of shorter life expectancy and increasing remarriages. These two factors resulted in a significant number of stepchildren threatened of being disinherited by "wicked" stepparents. On the other hand, in France, there is some evidence that the shift from primogeneture to equal sharing induced many rural families to have less children in order to protect the integrity of their estate (see also for the case of the Northern United States, Easterlin 1976).

More generally, the question is whether the family helps perpetuate inequality through the transmission of abilities, physical and human capital. In a recent paper, Becker (1988) disputes the claim about family causing growing inequality and indicates that few advantages or disadvantages survive three generations.

4.5 Migration

Migration is undoubtedly an important determinant of demographic change in our societies. What is the effect of both international and national migration on income and ultimately on wealth distribution? In the case of international migration, this question is generally dealt with in terms of the impact of new immigrants on the labor market and of their own performance in terms of earnings and employment.

Research conducted in the United States shows that the estimated impact of immigrants on the wages of native Americans seems to be relatively small. As to their own performance on the labor market, it seems that the earnings of immigrants upon their arrival in the United States are significantly lower than the earnings of comparable natives. Over time, there is some convergence between immigrants' earnings and natives' earnings. Yet, this convergence is becoming much slower for the recent waves of migrants (see Borjas 1987; Abbot and Beach 1987). With that type of migration, that is, an inflow of low skill workers with low wages, one would expect an increase in inequality. Yet, this is also one case where standard indicators of inequality given conflicting signals (see Stark and Yitzhaki 1982).

National migration is often viewed as an equalizing device as poor people tend to move where they can get higher wages or higher social benefits. This has been widely studied in the United States where there are important wage and welfare benefits differences across states (see, e.g., Gramlich and Laren 1984). In developing countries, internal migration is often studied along with remittance. Rosenzweig and Stark (1987) show that in India migration jointly with marriage contributes significantly to a reduction in the variability of household consumption.

5. Conclusion

In this paper, we have considered a number of issues where demographic factors seem to have some impact on the degree of economic inequality. Table 5 summarizes the main findings. There is not much dispute over these issues even though one would like more evidence for most countries outside the United States. There is indeed a natural tendency to assume that countries lacking evidence behave like the United States.

The real difficulty one encounters is that of quantifying the specific effect of demographic variable on some index of inequality. Some progress should be made in that direction. Yet, one could wonder whether such an endeavor is at all possible. In a real world model, not just demographic variables influence the level of individual's well-being; there are many factors which all interact in a complex way.

Table 5. Some observed distributive effects of demographic variables

Demographic variable	Distributive effect
Baby boom	Lower wages and higher unemployment for the baby boom cohort entering the job market
Ageing population	Higher relative income of the elderly
Variable fertility	Unequalizing
Variable mortality	Unequalizing
Nuptiality	Ambiguous
Divorce and widowhood	Unequalizing
Internal migration	Equalizing
Externa migration	Unequalizing
Inheritance	Unequalizing

This latter point is important. When reading Table 5 one has the feeling that over the past two decades most population factors have implied increasing inequality as conventionally measured. Yet, in reality, inequality has not increased everywhere over that period. This means that other factors such as unemployment, savings, inflation, ... have had a countervailing effect which was more important than that of population factors.

A big issue we have assumed away here is whether demographic factors are exogenous or influenced by economic variables. In the latter case, one should talk of the demographic effects of inequality as well as of the distributional effects on demographics. Resolving this issue is crucial from a conceptual viewpoint but also and more importantly from a policy viewpoint.

Taking the example of changing cohort size, two polar approaches can be adopted. It fertility is taken to be exogenous, public policy at best should try to adjust to alternation of baby booms and baby busts. On the other hand, if fertility is endogenous and can somehow be controlled, part of public policy efforts should be aimed at its stabilization.

To sum up, the big challenge for further research is to progressively bring together the conceptual and methodological considerations evoked in Sect. 2 and the reality of empirical works reviewed in Sects. 3 and 4. To meet this challenge, one cannot but rely on the development of income panel data which allow one to distinguish between cross-sectional and longitudinal evidence, to develop alternative income concepts and to account for various demographic changes within the family.

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