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EUROPE'S DEMOGRAPHIC ISSUES: FERTILITY, HOUSEHOLD FORMATION AND REPLACEMENT MIGRATION *

Ron Lesthaeghe **

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**Interface Demography, Department of Social Research, Vrije Universiteit Brussel, Brussels, Belgium. The views expressed in the paper are those of the author and do not imply the expression of any opinion on the part of the United Nations Secretariat.

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<u>Outline</u>

This paper is meant to give a general overview of recent trends in fertility and in patterns of household formation, and to speculate about future demographic developments. We apologize for the fact that not enough attention is being paid to Eastern European changes, but the situation in this area is such that it really requires a special background paper.

Since the outcome of the fertility analysis is that sub-replacement fertility is not likely to disappear, we equally need to address policy responses that cope with the consequences of several decades of low fertility. This will inevitably bring us to discussing the issue of replacement migration. This topic will be analyzed both in terms of its own efficiency (or lack thereof) and in the context of other policy measures addressing the problem of an ageing labour force and of ageing in general.

PART 1 : FERTILITY

1.1. Trends in period fertility indicators

The historical fertility transition, i.e. "the first transition", was characterized by increased fertility control that predominantly manifested itself by fertility reductions at *older* ages. The degree of control typically followed a learning curve with contraceptive efficiency increasing monotonically with age (Coale and Trussell, 1974), with parity (Henry, 1953), or with marriage duration (Page, 1977). This reduction at older ages led to declines in the mean age at childbearing (MAC), a trend that was reinforced in Western countries by declining mean ages at first marriage (MAFM) as well. More recent elements contributing to this historical pattern were the adoption of efficient forms of contraception (hormonal, IUDs), which, particularly during the 1960s and 1970s, eliminated most unplanned pregnancies at older ages and further reduced fertility beyond age 30. In other countries, and especially in Eastern Europe, access to legalized abortion fulfilled a similar function.

The "second demographic transition", by contrast, is characterized by the adoption of efficient contraception at early ages and therefore by the overall *postponement of parenthood*. The contraceptive learning curve is now very steeply rising at young ages (typically before age 20) and has become much less a function of union duration or parity. Together with the postponement of marriage and the adoption of new living arrangements, fertility now declines prior to age 30. This general postponement is the hallmark of the second demographic transition as far as the fertility pattern is concerned. During this phase, period total fertilty rates (PTFR) decline below the replacement level and record low levels are being reached. As is well known (e.g. Ryder, 1980), such a tempo shift in fertility is a strong factor in producing an extra steep decline of period fertility indicators. Particularly when newly incoming cohorts postpone at a growing speed compared to their immediate predecessors, will there be an enhanced depressing effect on the PTFR. Once this trend is set in motion, two questions emerge that are of direct relevance for future trends:

(i) *to what extent and for how long will such a tempo shift be maintained by newly arriving cohorts?*

(ii) *to what degree will cohorts recuperate after age 30 for fertility forgone during their twenties?*

An end to the tempo shift, or even a reduction in the speed of postponement among younger cohorts, definitely has the potential of raising the PTFR (cf. Bongaarts and Feeney, 1998), but the magnitude of this "end of postponement"-effect strongly depends on the degree of fertility recuperation past age 30 (cf. Lesthaeghe and Willems, 1999). The adjusted PTFR proposed by Bongaarts and Feeney illustrates the effect of "pure postponement" calculated in the *absence of changes in parity-specific period total fertility rates* ($PTFR_i$). Inadequate recuperation at older ages will depress these parity-specific PTFRs, and this will add a quantum-effect to the tempo-effect. If postponement leads, to some degree, to a cancellation of a first or next birth, *the tempo-effect will feed a negative quantum-effect*. Consequently we need to inspect recent *cohort* patterns of fertility for clues regarding changes in the pace of postponement among younger women and regarding patterns of subsequent recuperation among cohorts that have reached the older ages. In a later section we shall concentrate on these issues in greater detail (see also Calot and Frejka, 2000, and Lesthaeghe and Moors, 2000).

During the second demographic transition the ages at first sexual intercourse have declined for both sexes. This was obviously a part of the "sexual revolution" and of the more general normative and ethical changes occurring since the 1960s. But the learning curves regarding contraceptive use-effectiveness do not exhibit the same steepness at young ages in all populations. In several countries distinct subpopulations with slower learning have emerged, and they exhibit high teenage pregnancy rates often followed by high teenage fertility as well. Already in the late 1960s a rise in prenuptial conceptions followed by precipitated ("shot gun") marriages occurred in many countries. Sex was learned faster than modern contraception. But, by the mid-1970s nothing of this bulge was left in many Western European nations. In others, though, this pattern has been maintained for much longer or has been on the rise. In such instances it has lead to a high incidence of teenage lone motherhood and it is associated with increased child poverty (cf. Bradbury and Jäntti, 1999). The presence of such subpopulations is readily detectable from a bump prior to age 25 in period age-specific fertility distributions (Chandola et al., 1999), from the presence of young lone mothers either living on their own (in the West) or in their own parental household (in the East), and from the proportions of children currently being raised in lone parent households typically headed by mothers younger than 25.

These features are furthermore contingent on two other demographic variables, i.e. the nuptiality patterns as it existed prior to the 1960s and evolved since then, and the path followed during the phase of contraceptive modernization.

With respect to the first factor, the old cleavage along the Hajnal-line dividing Europe in a western and an eastern half, is of significance again. In the West, the mean ages at first marriage (MAFM) rose after 1965, whereas they remained low in the East. Communist policies, reserving housing for married couples, stimulating female labour force participation, and eliminating unemployment, produced stable living conditions which contributed to the maintenance of the historical pattern of earlier marriage. At present, the issue is whether the features of the western second demographic transition are currently spreading to Eastern Europe as well: are ages at first marriage increasing as a result of the development of alternative and often temporary childless living arrangements? If so, these countries too would have a postponement effect over and above that caused by the events of 1989.

The second factor, i.e. the modernization of contraception, equally produces an East-West divide, with Eastern Europe relying much more on abortion and on traditional methods of contraception (non-supply methods). "Roller-coaster" policies with waves of liberalization and restrictions concerning access to abortion (e.g. Stloukal, 1998) combined with the lack of support for hormonal contraception have left the East with significantly lower contraceptive use-effectiveness and a considerable "unmet need" (Klijzing, 1999). Hence, during the 1970s and 1980s Eastern European countries still faced the problem of unplanned pregnancies for women at older ages, and still had ample room for fertility declines at ages above 30. Eastern European countries are typically more than a decade behind the Western ones in making the pattern shift in fertility: fertility rates after age 30 were still declining (and often these prior to age 30 increasing) before 1980, when western patterns had definitively shifted to the postponement and subsequent partial recuperation pattern (Lesthaeghe and Moors, 2000). At present, the question for Eastern Europe is again whether they will be following this western pattern. Since 1990, most eastern countries have had rapidly falling fertility at *all ages*, and only in Hungary, Slovenia and Croatia are there signs of fertility rises after age 30 (Ibidem).

A first synoptic picture of the current situation is offered in Table 1 and Figure 1 through a set of classic indicators: the period total fertility rate (PTFR), the mean age at first childbearing (MAC1), the teenage fertility rate, the number of abortions per 100 live births and the percentage of births out of wedlock. The data pertain to the period 1995-97. At present only 3 of the 35 countries considered are at replacement level fertility or close to it: Iceland, the USA and New Zealand. Of the 12 Eastern European populations, 9 have an early reproductive pattern with MAC1 below age 24, and all of them have such mean ages at first childbearing lower than 26. However, this early start of reproduction has not prevented them from having steep PTFR declines during the 1990s. Only 2 counties, Yugoslavia (comprising Kosovo) and Croatia, have PTFRs close to 1.7 or just above it. Eight Eastern European countries have PTFRs lower than 1.5 and 3 dipped below 1.3 children. In this set we have not included the former GDR, which had a PTFR-value of barely 0.95 in 1996.

The Western countries have developed much later ages at childbearing. There are only 3 countries for which MAC1 is below 26: Iceland, the USA and Portugal. The majority of countries is located within the 26-28 range, and 4 countries have MAC1-values above 28: Switzerland, France, Germany (FRG),and especially the Netherlands with the latest start of fertility of all (MAC1 close to age 30). The fertility levels, however, vary widely and are comprised between 1.1 and replacement level. On the whole, most Scandinavian countries and non-European western countries (USA, Canada, New Zealand and Australia) have the highest levels (above 1.6), whereas the Mediterranean countries all have the lowest levels (PTFR between 1.1 and 1.5). The general lesson to be drawn from figure 1 is that the earlier starters have by no means higher fertility during the 1990s, which is again an indication of the fact that recuperation at older ages can partially offset the effect of postponement.

Before turning to details, we also wish to attract attention to several other features indicated in Table 1 and Figure 1. The different symbols used in the figure indicate (i) teenage fertility levels (15-19 years olds) in excess of 20 per thousand and (ii) abortions per 100 live births in excess of 20 and above 60 respectively. The first indicator signals the presence of a young subpopulation with a slower contraceptive learning curve, whereas the second one indicates a slower contraceptive modernization for either a subgroup or the entire population. In a few cases, i.e. Ireland and Portugal, legal restrictions are the cause of low abortion rates, but these two countries exhibit a slower contraceptive modernization as well.

The countries with high teenage fertility and/or high abortion figures are typically Eastern European and the cluster of "Anglosaxon" countries (i.e. USA, UK, New Zealand, Australia and to a lesser degree also Canada). The USA in particular has high fertility rates for teenage women (58 per thousand), and this cannot be explained by a history of early marriage as is for instance the case for Ukraine (54) or Moldova (53). Particularly high abortion figures are still prevailing in the late 1990s in a set of former Communist countries. Romania leads this group (213 abortions per 100 live births), closely followed by the Russian Federation (179) and Ukraine (153). But several other Eastern European or Baltic countries equally have abortion figures in excess of 100 live births: Bulgaria (130), Estonia (127) and Latvia (123). High abortion figures by western standards, i.e. above 25, are found in the USA (38), Australia (36), Sweden (34), Japan (29) and Canada (28). Evidently, not all western countries have "perfectly contracepting" populations.

1.2. Cohort fertility in Western countries and expectations for the future

The picture presented so far only gives a synoptic cross-sectional view of what is essentially unfolding at the cohort level. Also, recent cohort trends provide better clues about the more likely future developments. There are two ways of representing cohort fertility. The first one typically looks at *cumulative* cohort fertility, either directly or in the form of deviations from a benchmark cohort. The latter form brings out the postponement and recuperation features in a very telling way (e.g. Frejka and Calot, 2000). The second method focuses on the evolution of the separate age-specific fertility rates for each cohort without cumulation, and this is ideally suited to bring out acceleration in trends or period linked distortions. Such distortions show up in the diagonal location of peaks and troughs. In what follows we shall refrain from presenting long series of graphical representations since the first set (deviations from a benchmark cohort) is given and discussed in Frejka and Calot (2000, figures 3A through 3D), and the second set (cohort age specific rates) is presented and commented upon in Lesthaeghe and Moors (2000, figure 5 through 20). Instead, we will only present four indicators of cohort fertility change in Table 2.

The first indicator (A) captures the magnitude of the trough produced by postponement by measuring the cumulative deficit in the number of children by age 30 for the cohorts reaching adulthood (i.e. 15-19) in 1985 compared to the offspring at that age realized by the cohorts reaching adulthood in 1960. Using the graphical method of cumulative deviations from a benchmark cohort, this indicator corresponds to line A on Figure 2 (the Dutch example). The second indicator (B) measures the extent of *past recuperation* for the latest cohort reaching age 40, by measuring the distance to replacement fertility (CFTR = 2.08). This corresponds to line B on Figure 2. Obviously, these two indicators already give a more "historical" view of the western postponement and partial recuperation patterns.

The third indicator C measures how much further the cumulated deficit by age 30 has advanced in the cohorts reaching adulthood in 1985 compared to their predecessors of 1975. Large figures indicate a speeding up of postponement in the late 1980s and early 1990s. This indicator corresponds to distance C on Figure 2. The fourth indicator (D), finally, shows to what extent the younger cohorts reaching adulthood in 1990 (see line D in Figure 2) have slipped further back by age 25 compared to their predecessors of 1980. This indicator gives a higher relative weight to teenage fertility and its trend, but it also brings out whether the postponement trend has been accelerating or decelerating during the 1990s. This is of particular importance for understanding and even predicting the eventuality of emerging increases in PTFRs. As indicated earlier, such a slowing down of postponement among incoming cohorts, in tandem with even only partial recuperation among older ones, is capable of producing modest rises in period total fertility levels.

Obviously, the forecasting of future PTFRs is highly dependent on yet unknown degrees of recuperation past age 30 for cohorts reaching adulthood after 1985, and from this point of view their ASFRs in the age groups 30-34 and 35-39 need close monitoring as well.

The four indicators provide only a summary and are not a substitute for the full picture of cohort fertility experiences. But they are still useful in comparing and classifying the experience of western countries. Table 2 presents the results.

A first group that can be distinguished are the Scandinavian countries. The troughs (indicator A) are small (Finland) to modest (Sweden, Norway, Denmark) and the latest cohorts reaching age 40 have brought their CTFRs close to replacement level (Sweden and Norway) or leave a modest deficit only (about -.20 in Finland and Denmark). Also the indicators C and D of more recent postponement show modest levels, and this together with steadily rising fertility after age 30 are the main reasons why Scandinavian period fertility levels remained fairly high by European standards. Among these populations, the position of Sweden is special given the strong period distortion induced around 1990 (see section 5).

The second group is made up of Western European countries, but these exhibit quite a bit of heterogeneity. France and the UK, with almost diametrically opposed family policies, have been nearly identical twins as far as their PTFRs are concerned: in 1970 this indicator was 2.47 in France and 2.45 in the UK, and in 1997 both populations had a PTFR of 1.71. The largest difference in PTFRs was barely 0.12 children in 1975. From Table 2 it also appears that the cohort "trough" (A) was very similar, and that the latest cohorts reaching age 40 made it exactly to replacement level fertility in both countries (B). The main difference between them is that the UK could realize this at the expense of much higher teenage fertility. This shows up in indicators C and D as well: postponement during the 1990s has progressed faster in France than in the UK, and it could very well be that the PTFR in France could dip below the 1.70 level. The crucial element here is again future recuperation. Incidentally, the same could happen to the UK since the rise in the ASFRs past age 30 is slowing down more than in France.

The next set of twins is the two Low Countries, i.e. the Netherlands and Belgium: their PTFRs have not deviated from each other for more than 0.10 children since 1975. However, the Netherlands have had a massive postponement effect (indicator A = -.90) whereas that of Belgium was much more modest (A = -.55). But, the recuperation effect has been equally impressive in the Netherlands, and in both countries the latest cohorts reaching age 40 fall short of replacement CTFR by about .25 children. In the Netherlands, this record postponement did continue at a respectable speed for cohorts reaching adulthood around 1985 (C). In both countries the youngest cohorts still have lost ground by age 25, but at a much slower speed than before. Very recent PTFR-estimates for Belgium (Deboosere et al., 2000) indicate a modest rise (from 1.55 in 1995 to about 1.63 in 1999), which could partially be due to this reduced pace of postponement.

The third set of Western European countries is made up of Western Germany (former FRG), Austria and Switzerland. They all experienced a more moderate postponement induced trough (A), but compared to the other countries in group 2, the latest cohort reaching age 40 failed to recuperate at older ages to a much larger degree. These older cohorts were .33 to .50 children short of replacement CTFR (see B). The cohorts reaching adulthood in the 1980s nearly produced half of the overall postponement effect (compare A to C), and they would have to display a major recuperation effect to come even close to a CTFR of 1.60. In Germany and Switzerland, but not yet in Austria, the youngest cohorts have not significantly fallen back by age 25 compared to their predecessors that are 10 years older (D). Again, it is this delicate balance between a slowing down of postponement and the yet unknown degree of recuperation past age 30 that will determine whether the already low PTFRs in these countries will slide further down or stabilize.

Group 3 is made up of the Southern European countries, and they all had , although starting at different times, very large postponement effects with weak recuperation. The "pioneers" of the new fertility regime in group 3 were Italy and Spain, and they have the largest troughs (-.80 and -.87 respectively) after the Netherlands (-.90) and Ireland (-.88) (see A). Also the latest cohorts reaching age 40 had a weak recuperation, and the CTFR fell to about 1.80 in Spain and 1.70 in Italy for them. These figures are very likely to drop. Half or more than half of the trough is produced by cohorts reaching adulthood in the mid-1980s (C), and even more significantly, the very youngest cohorts, followed till age 25, are dropping further behind (D = -.26 and -.30 respectively). In Portugal and Greece, the evolution started later, and hence both the trough (A) and the deficit for the older cohorts relative to replacement level fertility (B) are smaller than in Italy or Spain, but the postponement among the youngest cohorts is still fully developing (see D). Already by age 25 Greek cohorts reaching adulthood in 1990 are 0.43 children behind the offspring realized at this age by their predecessors of 10 years before. Hence, in the absence of any miraculous recuperation effect, CTFRs in Southern Europe are very likely to drop considerably, and possibly to levels around 1.5 in Italy, 1.6 in Spain, and 1.7 in Greece and Portugal. Period total fertility rates are more likely to decline further than to stabilize, unless a rather spectacular recuperation at older ages occurs in the next decade.

The fourth group is a highly heterogeneous collection. Canada has a cohort profile that comes close to that of the Low Countries with modes recuperation for the oldest cohort (B = -.22) and a slowing down of postponement as well (D = -.09). Australia is more like the France-UK tandem, with a deeper trough but with strong recuperation in the past, even to the point of still exceeding the replacement fertility level (B). However, the recent postponement trend is stronger than in Canada and about equal to that of France. The Japanese experience fits that of Southern Europe in the past: a large postponement trough at age 30 (A), followed by inadequate recuperation and hence a recent CTFR of about 1.80 (B). Much of this postponement has occurred after 1985 (see C), but the lag produced by the youngest cohort reaching age 25 is much smaller than in Southern Europe (D = -.10 only).

The USA is very atypical in the sense that it is the country with the weakest marks of the western postponement syndrome. Its postponement trough at age 30 compared to cohort fertility at that age 25 years earlier is fairly small (A = -.51), the latest cohort attains replacement level fertility, and the cohorts reaching adulthood since the mid-1980s have exhibited virtually no postponement at all (C = -.03 and D = -.02). Behind this striking stability in cohort fertility profiles, however, large educational differences are to be found in the US (cf. Rindfuss et al., 1996), with the least educated not following the postponement-recuperation pattern of the most educated.

Finally, Iceland and Ireland still had PTFRs above replacement level in 1990 (2.3 and 2.1 respectively) and had modest declines since (to 2.0 and 1.9 in 1997). Nevertheless, past fertility levels were still sufficiently high for a large postponement effect (A =-.75 and -.88) not to treathen cohort replacement fertility: the latest cohorts reaching age 40 still had .37 and .38 children in excess of the replacement level. However, postponement is much more recent in Ireland (compare C with A) which explains the much faster decline of the PTFR from considerably higher levels than in Iceland during the 1980s. At present, postponement among the youngest cohorts is progressing at a similar speed in the two countries, but Ireland still had declining fertility rates at ages above 30 till 1994, whereas Icelands have been displaying a rise since 1985.

1.3. Cohort fertility in Central and Eastern Europe

As is well known, the sudden political changes of 1989 mark a decisive turning point in the fertility trends of former Communist countries. Of the 18 emerging nations, 15 had PTFRs above 1.80 in 1990 and 10 had PTFRs above replacement level. By 1993, 13 had PTFRs below 1.70 and 8 below 1.55. The PTFR drop was particularly pronounced in the former GDR (PTFR in 1993 of barely 0.78), the Russian Federation (1.39), Slowenia (1.34), Bulgaria (1.46), Estonia (1.45), Romania (1.44), Latvia (1.51), Croatia (1.52) and Ukraine (1.55). In several countries, however, and most noticeably in the former Yugoslav republics, the decline had started earlier. For instance, Croatia and Slovenia started a western-like postponement with the cohorts reaching adulthood after 1975. Also Bulgaria has declining fertility before age 30 starting with such early cohorts. Evidently, a number of Communist countries had initiated the postponement phase well before the events of 1989.

The magnitude of the cohort fertility declines in the former Communist countries can be appreciated from the indicators in Table 3. Indicator D (as in Table 2) gives the cumulated deficit of the cohorts reaching adulthood (ages 15-19) in 1990 compared to that of their predecessors of 1980 by the same age (see also line D in Figure 3 with the Bulgarian example). This youngest cohort has started procreation almost entirely after 1989, and it is being compared to the cohort that started mainly in the ten years preceeding the end of the old regime. Indicators C and E (see also lines on Figure 3) show the deficit for older cohorts who had their fertility both before and after the events of 1989, and each of them is being compared to their respective predecessors that are 10 years older and had most or all of their fertility before that date.

By age 25, large fertility deficits are recorded for the "post-Communist" cohorts in excess of .40 children in 5 countries: Romania (-.51), the Czech Republic and Slovenia (-.47), Bulgaria (-.44) and the Slovak Republic (-.41). Very often, they also have sizeable reductions by age 30 for the cohort that reached adulthood in 1985, and particularly Romania, Bulgaria and Slovenia stand out in this respect. The declines in cohort fertility in the former parts of the Soviet Union are generally more modest than in the other Central and Eastern European countries, but among the former Soviet republics, the declines for the youngest cohort are highest in the two Baltic states of Estonia (-.33) and Latvia (-.30). In the repubics of former Yugoslavia, there is a clear North-South gradation with the strongest reaction in Slovenia and the smallest in FYR Macedonia.

More generally, there seems to be a stronger reaction in countries that had higher standards of living and/or were more oriented toward the West, with Romania being the major exception. Hence, not so much absolute deprivation (i.e. actual living standards) but relative deprivation (measured against Western living styles and consumption aspirations) seems to account for the more pronounced fertility reduction of younger cohorts after 1989. Nevertheless, it is the overall postponement for all cohorts and at all ages that has driven down the PTFRs in these populations.

Future PTFR-levels are likely to remain depressed, but a rise could be envisaged when the younger "post-Communist" cohorts would decide to make up, at least partially, for currently postponed births. Given the historically rather narrow variance in the parity distributions (cf. Barkalov, 1999) and little progression beyond the second child, older cohorts are more likely to stop and take unrealized fertility for granted. A minor factor operating in the opposite direction -

but socially a felicitous one - is the decline in teenage fertility and the end of the "teenage fertility bulge" that many former Communist countries had experienced, roughly between 1975 and 1995 (e.g. early bulges in the Czech Republic, Hungary, Romania, Slovenia and Croatia, and a later bulge in the former Soviet republics).

1.4. Family policies (European Union) and experience with fertility policies (GDR, Russian Federation, Sweden)

The overview of family policies during the 1990s is unfortunately limited to the 15 EU-countries, and a set of indicators is given in Table 4. The first two indicators pertain to the length of maternity leave and the associated benefits expressed as a percentage of female wages. The second pair of indicators gives the amount of child allowance benefits and the use of child day care facilities for children between ages 3 and 5. The last pair gives the overall income transfers in euro (tax benefits included) per child for a household with three children and one earner and for a household with two children and two earners respectively.

The Scandinavian EU-members have a long standing policy of granting extensive maternity leaves (e.g. 65 weeks in Sweden and 44 in Finland) with benefits covering 75 to 90 percent of earnings. The maternity leave in Denmark is shorter, but still about twice the duration granted in the other EU-states (commonly 14-16 weeks). At the tail of the distribution are the UK and Greece where the maternity leave benefits only cover 45 and 50% of monthly wages. The modal form in the EU is, however, the income supplement provided by child allowances. These correspond to more than 7% of male wages in manufacturing in Austria (11.3), Belgium (10.4), Luxemburg (8.3), the Netherlands (7.4), Sweden (7.2) and France (7.1), but such income supplements have remained substantially below the EU-average in Ireland (3.0), Spain (0.3) and Italy (0.0). Use and availability of day care facilities for pre-school children (age 3-5) are high in Belgium and France (96% of children), Italy (86), Denmark (85) and Sweden (80), but still low in the Netherlands and Luxemburg (55), Finland (50) and particularly in the UK and Portugal (35). Taking also into account tax benefits for children and various other subsidies for families with children, single earner families with three children and an income at 50% of the male average are benefiting most (provided that they pay taxes) in France (517 euro), Sweden (514), Luxemburg (510), the UK (484) and Belgium (463), and least in Spain (43), Portugal (32) and particularly in Greece where they suffer a loss (-238). In most countries such transfers remain positive for dual earner families with 2 children and an income at par with 150% of male average earnings. In Luxemburg they benefit even more than much poorer families (766 euro) and in Greece their loss is smaller (-155). In the Netherlands, Ireland, Italy and Portugal such children-related transfers have become negligible for such better-off families.

A simple multiple regression indicates that these incentives and transfers are related to the PTFR. In this regression we have used the duration of maternity leaves weighted by the proportion of guaranteed income (MATPAY) and the average of the transfers paid to the two types of families used in Table 4 (TRANF). The regression equation is:

100*PTFR	= 138.3 +	0.06 TRAN +	0.14 MATPAY
Beta-coeff.	=	.55	.07
t	=	2.27	.27
signific.	=	.03	ns

adjusted R square = 0.21

The addition of the percentage of children 3-5 in day care did not produce any positive effect. Since the ranking of countries according to PTFR and their family policies has almost remained the same since the mid-1980s, these regression results for 1996 measurements have a more general validity. Despite an overall significant correlation, an extra monthly transfer of 100 euro would increase 100*PTFR with 6 points only and and extra 10 weeks of maternity leave at full pay only by 1.4 points. These calculations are of course simply illustrative since the populations in the various countries are accustomed to their national policies and individuals do not yet compare themselves across national boundaries in the EU.

Experiments with actual policy interventions produce more convincing results. The former GDR, Russia and Sweden provide examples. The effects can be followed in Table 5 in the cohort age-specific fertility rates (see diagonal values in italics).

In the former GDR, a clear dip in fertility was produced immediately after the liberalization of abortion in 1972, showing that a substantial proportion of pregnancies was unintended. In 1976 this policy was reversed and pronatalist legislation was passed that prolonged maternity leaves and increased maternity payments of up to one year for working mothers with at least two children (cf. Büttner & Lutz, 1990). This had a positive effect of a considerable magnitude, but by the beginning of the 1980s the cohort fertility profiles simply resumed their downward trend. Immediately after the "Wende", this trend accelerated and produced record low PTFRs with the absolute trough of 0.77 being reached in 1994.

In the USSR there is a clear effect of the pronatalist policies of 1981 as well. Then, the equivalent of 30 to 60 percent of the average salary was granted at each new birth, maternity leave was prolonged to up to a full year with partial salary (20% only) or longer without renumeration, and access was given to favourable loans (Avdeev & Monnier, 1994). At that time cohort ASFRs rose on average by 13 percent (see Table 5) and PTFRs stayed above replacement level for 7 years. After 1989, however, this effect was simply wiped out, and a steep decline in PTFRs had started.

In Sweden a similar fertility rise occurred in the late 1980s bringing the PTFR back to 2.14 in 1990. This was the highest level since the 1960s. The direct cause of it was an extra prolongation of the already long maternity leave. It enabled women to cumulate two maternity leaves by closely spacing two successive births. Cohort ASFRs then rose on average by 20 percent and these rises are rather similar for all age groups (see Table 5) (Hoem & Hoem, 1997; Anderson, 1999). Subsequent cutbacks in social provisions and rising unemployment - a novelty in Sweden - produced a backslash (B. Hoem, 1998). Also, many couples had reached their desired final family size a bit earlier than otherwise anticipated, and all cohorts irrespective of age curtailed fertility after 1990. The Swedish PTFR then dropped steadily to 1.53 in 1997. In Swedens nordic neighbours such a policy induced bulge in absent, and their PTFRs continued to increase steadily to levels of at least 1.80 in the mid-1990s, mainly as a result of strong recuperation effects at older ages.

These three cases illustrate that policy interventions in either direction can have very noticeable effects on period total fertility, but that these seldomly last for more than five years. Cohorts adjust to such period stimuli by either postponing births or by moving them forward, only to resume a more stable long term fertility trend thereafter. Clearly, the other societal changes of a socio-economic or cultural nature are far stronger determinants. The lesson learned by other countries is that pronatalist fertility policies are costly given their temporary effect. To sustain fertility for a substantially longer period such incentives would need to "snowball" for the next 15 years or so until the expenditure becomes so large that it runs directly into competition with the increasing costs of ageing. Beside this, there are of course interventions that were never tried before. One of them is to make pensions in the pay-as-you-go system partially dependent on procreation as well as on production, i.e. on the number of children as well as on past earnings. But whether western publics or politicians are ready to accept this logic of unfunded pensions is highly questionable.

PART 2 : HOUSEHOLD FORMATION

2.1. Home leaving and household formation: destandardization and diversity

The most salient characteristics of Europe's "second demographic transition" are all associated with the destandardization of patterns of home leaving and household formation. Destandardization refers to the fact that the classic ordering of transitions during the life course, and particularly in the age bracket between 18 and 30, has been altered. The sequence of first finishing school, subsequent entering into the labour force, then home leaving via marriage and finally becoming a parent, is being reordered in ever larger segments of the population. New phases of single living, sharing dwellings with age mates, premarital cohabitation and parenthood prior to marriage with or without a partner have been added, and these can occur before the end of education or before the entry into the labour force as well.

The destandardization is predicated on both structural and cultural factors (cf. Liefbroer, 1999), but these tend to act differentially on the various ingredients of the new patterns. Moreover, historical context matters quite a bit and developments are strongly path dependent. Diversity should therefore not come as a surprise. A list of determinants would include the following:

(i) *The prolongation of education and the "democratization" of access to higher education*. Advanced education has a mechanistic effect in postponing home leaving or marriage, but it produces also a cluster of additional effects such as raising female economic autonomy and less reliance on economic support from male partners, a longer search on the marriage market in systems with educational homogamy (cf. Oppenheimer, 1988), and shifting value preferences.

(ii) *The emergence of a more libertarian culture with greater tolerance for alternative life styles,* which followed in the wake of the overall weakening of authority and trust in institutional regularization. As such, this feature is a correlate of the cohortwise progression of the so called "post-materialist" value orientations which stress grass-roots democracy, self-actualization, tolerance and ethical autonomy (cf. Inglehart, 1970; Lesthaeghe and Surkyn, 1988). The innovators of premarital cohabitation have often been persons with sympathies for the "new left" during the 1960s and 1970s (Lesthaeghe and van de Kaa, 1986), and even today premarital cohabitation has remained a correlate of secularism, tolerance for minorities, relativism in ethics, gender-equality, non-conformist education values, and a preference for leftist or green parties in countries such as Germany, France, the Netherlands and Belgium (Lesthaeghe and Moors, 1995, 1996).

(iii) *The expansion of the welfare state,* which has fostered earlier partial or complete economic independence of younger people via income supplements (e.g. study allowances, reduced tuition, guaranteed minimum incomes or other social security benefits) or via specific services and facilities often destined for particular groups (e.g. students, lone mothers). Earlier independence and premarital cohabitation have to some degree been state subsidized and have expanded most in nations with advanced welfare systems (Scandinavia, the Netherlands) and least in nations where young adults are mostly dependent on parental resources (Southern Europe). This also implies that the spread of early single living and cohabitation is more dependent on the type of development of the welfare state than on the growth of economic prosperity in general.

(iv) *The intergenerational transmission of family instability* has also repeatedly been identified as a crucial factor associated with earlier home leaving, single living, cohabitation and lone motherhood. Not only the actual experience of problems in the parental household, such as divorce or remarriage, is a correlate of these phenomena (e.g. Kiernan, 1992; Cherlin et al., 1995), but also weaker familistic values in the parental generation seem to be transmitted across generations (e.g. Axinn and Thornton, 1991). As a consequence certain social strata can generate subcultures in which family instability becomes a characteristic trait.

(v) *Growing labour market flexibility* leading to less secure and less structured career development also seems to be associated with the destandardization of the life course in young adulthood. Premarital cohabitation and the postponement of parenthood are responses to periods of job insecurity or interim phases during the period of career development (e.g. Easterlin et al., 1990; Kravdal, 1999).

To this basic list another set of features can be added which are of importance in more specific settings:

(i) *Cycles characterized by weakened economic opportunities for new cohorts*, with increased youth unemployment leading to prolonged economic dependence on the parental household (e.g. in Southern Europe during the 1980s).

(ii) *Unfavourable housing conditions*, caused by either a structural housing shortage or by high rents or purchase prices (e.g. Miret-Gamundi, 1997)

(iii) *Rising consumerism* leading to higher aspirations with respect to material comfort and to higher minimal material standards for establishing a new household (Easterlin, 1976; Crimmins et al., 1991).

(iv) *Mechanisms of social diffusion* that either foster or inhibit the spreading of alternative life styles or patterns of household formation from the early innovators to other strata of the population. These factors are often tied to the social stratification system (e.g. Kohn, 1977) and to parameters of social cohesion.

(v) *More ideosyncractic or culture specific factors*, such as the survival of three generation households in Eastern Europe, or the rise of individual and autonomous partner choice replacing arranged marriages in Japan (cf. Ogawa et al., 1993; Tsuya and Mason Oppenheim, 1995; Rutherford et al., 1996).

2.2. The household position of young women in Europe

The differences in patterns of household formation across countries can be documented by comparing the household positions of women aged 20-24. It is in this age group that the unfolding of the life course starts. In what follows we shall make use of the results of the Fertility and Family Surveys (FFS) for the 1990s and various other sources that give orders of magnitude of premarital cohabitation (Kiernan, 1999a, 1999b).

First of all, the plot of the percentage of non-marital births to all births against the proportion of young women cohabiting, as shown in Figure 4, reveals that there are essentially four patterns:

(i) *Low extra-marital fertility coupled with a low incidence of premarital cohabitation:* this pattern is found in the Mediterranean countries, in Poland and Japan. In these instances the proportion of extra-marital births is below 15 percent and there are fewer than 5 percent of women 20-24 currently cohabiting. However, in Spain and even more in

Portugal, the percentage of non-marital births has steadily increased to Western European levels. Italy is the most striking counter-example: despite rapid rises in female education, premarital cohabitation has hardly followed the European trend. However, the mean ages at first marriage in all Mediterranean countries have risen quite substantially as in the other Western nations.

(ii) *Low prevalence of cohabitation but high non-marital fertility:* this pattern is typically the lone mother variant and it is encountered in Eastern European countries, but also in Portugal, Ireland, the UK and the US. However, not all lone mothers must show up in their own separate household; they can also be coresidents in their parental household, which then comprises three generations. The FFS published data do not permit the identification of such arrangements, and it may well be that the lone mother phenomenon in Eastern Europe is underestimated as a result. The bulges of teenage fertility, referred to earlier, further fuel the suspicion that such three generation households with lone mothers may be more common in Eastern Europe. Also, women may pass through the lone mother stage for a shorter time span and then move into marriage at an earlier age. This would equally lead to a combination of higher non-marital fertility and low premarital cohabitation in tandem with earlier mean ages at marriage.

(iii) *High prevalence of cohabitation but low non-marital fertility:* this combination is typical for the more conservative Western European populations where cohabitation has risen but where parenthood is postponed until after a formal marriage. This pattern is found in Switzerland, where a quarter of young women are currently cohabiting but in combination with less than 10 percent of births being out of wedlock. Belgium, the Netherlands and West Germany also tend to follow this pattern, but extra-marital fertility has risen well above the 10 percent level during the 1990s. These countries are gradually moving toward the next type.

(iv) *High prevalence of cohabitation combined with parenthood:* this combination has been typical for a long time now in the Scandinavian countries, with Sweden, Denmark and also Iceland being outliers with more than 40 percent of young women currently in a cohabiting union. A number of other western countries, such as France and Canada, and a Baltic country, Estonia, have followed in this direction at a respectable pace. In these cases, most non-marital fertility occurs to cohabiting couples, and these tend to be either more stable or are quickly succeeded by partner changes and transitions to a next consensual union.

More detailed data for 20 FFS countries are brought together in Table 6. For these countries we are able to make a distinction between the following household positions of women 20-24:

(i) *resident in the parental household*, which is mostly as a single person in Western Europe, but could also be as a lone mother or as a married person in Eastern Europe;

(ii) *living alone,* i.e. without partner or children;

(iii) *cohabiting without children,* i.e. not currently married but with a partner;

(iv) *cohabiting with children;*

(v) *lone mother*, i.e. without partner but with children and living in a separate household;

(vi) *married without children,* and forming a separate household;

(vii) *married with children*, also forming a separate household;

In Table 6, averages are also calculated for each of the geo-political areas, and these reveal the differences between four "families" of countries. The Southern European group is characterized by very high proportions of women 20-24 (around 80%) still coresident in the parental household, by a direct move into marriage, and by few women passing through the intermediate stages of living on their own or cohabiting. These are also countries where students of either sex (15-24) depend for more than 90 percent on parental support and more rarely draw supplementary incomes from scholarships (less than 5%) or from jobs (less than 20%) (OECD, 1999).

The Eastern European group also has a predominant pattern of home leaving via marriage, and given a long tradition of early marriage, this cluster has the highest proportion of young married mothers as well. The percentages in the intermediate living arrangements, i.e. living alone or cohabiting or being a lone mother, are slightly higher than in Southern Europe. It seems that these features may be spreading more rapidly eastward than southward.

The Western European cluster has a pattern of home leaving that is essentially as early as in Eastern Europe, but the transition is not to marriage but into the alternative living arrangements. In these countries the prevalence of cohabitation with or without children is often higher than that of marriage for women 20-24 (e.g. in the Netherlands, France, Austria or Switzerland). In these countries the late ages at marriage and at parenthood are strongly related to the extra time spent in these intermediate household positions. Moreover, economic dependence on parents among young adults is much lower than in Southern Europe: a quarter to half derive supplementary incomes from jobs (e.g. Germany 41% and UK 46%) and 10 to over 40 percent of students (e.g. Netherlands 44%) have state fellowships (OECD, 1999). Only Belgium has a more conservative pattern of stronger reliance on parents (88%) as its fellowship programme withered away during the 1980s and as part-time jobs remained rare until the mid-1990s.

Finally, the Northern European populations are characterized by the earliest home leaving pattern of all, and by transitions to either living alone or to cohabitation. Moreover, procreation has been detached from the preconditions of marriage, and as a consequence fertility postponement during the last two decades has not been as strong as in many Western European countries. Such early independence has also been fostered by social policies. Among students large proportions benefit from state fellowships (35% in Finland, 46% in Denmark) and many get income supplements in the large part-time job market (Sweden 30%, Finland 37% and Denmark 59%) (OECD, 1999).

The pattern above indicates that the growth of alternative living arrangements is not only predicated on historical traditions but also on welfare state policies towards youths and young adults (state fellowships, subsidized housing and/or transportation) and on an earlier deregulation of the labour market (availability of part-time jobs). These policies may not have been intended to stimulate the growth of alternative living arrangements, but over the years they did produce such a result.

To sum up, policies that were clearly intended to change fertility trends have so far not been able to do so in the longer run, but more general policies supporting students have, combined with educational expansion, provided an extra prop for the growth of alternative living arrangements.

PART 3: REPLACEMENT MIGRATION

3.1. Old lessons from basic demography

The issue of replacement migration is by no means a new topic in formal demography. In 1972, for instance, A.J. Coale started with the reverse problem for the US: assuming an initial stationary population and a fixed number of immigrants (with a fixed age composition), he asked by how much native American fertility would have to decline in order to offset the impact of immigrants and their fertility, the aim being the maintenance of a stationary population with the same annual number of births. At that time the US was obviously worried about rapid population expansion and zero population growth (ZPG) was viewed as a national target. Replacement migration deals with the mirror image of Coale's problem, and the application of his calculations yields the results presented in Table 7. In this table we have computed (Lesthaeghe et al., 1988, 1991) what the fertility of native women (TFR_n) would need to be, given three levels of fertility of immigrants (TFR_f) and four levels of immigration, expressed as a percentage of the fixed birth stream (I/B). The current birth stream of the EU is 3.89 million, and an annual immigrant intake of 10 percent of that number would suffice to maintain a stationary population if immigrant women had replacement fertility (TFR_f = 2.1) and native women had a TFR_n of 1.94. If TFR_n drops to 1.84 children, while TFR_f stays at 2.1, the immigrant intake needs to be 20 percent of the birth stream. Obviously, if fertility of immigrants is higher and remains at that level, the TFR_n of natives can be lower. For instance, with a I/B ratio of 20 percent and a constant TFR_f of 3.0 children, the TFR_n is allowed to drop from 1.84 to 1.75. Applied to the EU, if the TFR_n is 1.59, a stationary population could be maintained if foreign women have a constant TFR_f of 3.0 and if the annual intake of immigrants is slightly over 1 million per year. Similarly, with a TFR_n of 1,62, the EU would need an annual intake of just over 1.5 million immigrants if these have replacement fertility. Incidentally, this theoretical outcome is very close to the simulation results of the UN (1999; see also Table 8, column 1): around 2040 about 1.42 million immigrants per year are needed to maintain the EU population size at its present level. The orders of magnitude are hence quite clear: *the annual number of immigrants in the EU will have to rise and then stay well above 1 million in order to compensate for sustained low native fertility corresponding to a* TFR_n *of about 1.6 children, given that immigrants themselves maintain their own fertility at replacement levels or slightly higher (up to* $TFR_f = 3.0$*).* For this immigration to be cut down to 20 percent of the birth stream or to about 0.8 million per year, the EU native TFR would have to rise to about 1.8 children. From the previous section on cohort fertility, it is clear that this is not likely to occur in the next decade.

So far, total population size has been the only criterium. Other authors have looked at different constraints imposing *age structure criteria* as well. From then onward, more serious problems are encountered, as for instance already signaled by Bodart et al. in 1977 and by Blanchet in 1988. The latter author showed how the criterium of a fixed ratio of persons aged 20-60 to persons 60+ leads to exploding cyclical net migration rates. For instance, the French migration rate would have to increase first to about +20 per thousand by 2010 till 2030, then decline to about -15 per thousand by 2040 and then rise again in 10 years to +30 per thousand in 2050. With a cycle of about 35 years, a new peak would be produced in 2085, but with a net migration rate of +50 per thousand. For comparison, the French net migration averaged only 0.9 per thousand in the 1990s and at peak level, it was only 3.5 per thousand in 1970. Furthermore, the French population would expand to about 120 million by 2080 as well, which is more than twice its current size. For the EU as a whole, the outcomes of the UN simulation with a constant "*potential support ratio*" (PSR = pop. 15-64/pop. 65+) is of necessity in line with Blanchet's prediction (see Table 8, series C): the annual number of immigrants oscilates between 6 and 20 million during the next half century for the EU and between 6 and 22 million for the other European countries combined. Moreover, the populations of the EU and of the rest of Europe would have more than tripled by 2050. In the UN simulation this is exacerbated by the hypothesis that migrants instantaneously adopt the low fertility of the host population (UN, 1999: 15), so that this scenario corresponds indeed to the filling of the "*tonneau des Danaïdes*" (Leridon, 2000). From this it is clear that an instantaneous reaction via immigration to maintain a constant PSR at all times is plainly impossible.

As already indicated by Blanchet (1988) and supported by simulations for several countries (Wattelar and Roumans, 1990), the only feasible way of tackling the problem is to focus on a *long term* demographic objective and to abandon any attempt at equilibrating age structure characteristics on an annual basis. Hence, one could envisage the longer term maintenance of the volume of the potential active population or aim at a PSR of the order of 2.5 or 3 potentially active persons per person 65+ via a constant immigration rate. This would avoid such irrealistic population growth rates, but would still imply annual migration intakes that are substantially larger than the ones witnessed in the EU over the last four decades. As a consequence, the two other projections performed by the UN - but unfortunately those that did *not* capture the media attention - are less irrealistic. We are refering here to the simulation with constant population size (projection A in Table 8) and with a constant size for the age group 15-64 (projection B).

Aiming at a constant population requires the smallest intake of immigrants, but the numbers still increase to a total of 1.4 million for 2040 for the EU and to 1.25 million per annum for the rest of Europe. Furthermore, these numbers would continue to increase given the UN's hypothesis of migrants' instantaneous adopotion of sub-replacement fertility upon entry. Obviously, such a further increase can be avoided if immigrants maintain a TFR_f above 2.1 (see Table 7). The drawback of this scenario is that the PSR for the EU drops from 4.1 in 2000 in the EU to 3.1 in 2020 and further to 2.2 in 2050, and concomitantly that the percentage aged 65+ rises from 16.5 in 2000 to 21.0 in 2050. Ageing of the total population and ageing of the labour force itself cannot be stopped, but they can be limited. In the absence of migration, the EU would reach 30 percent in the age group 65+ assuming a relatively optimistic course of fertility corresponding to the UN "Medium variant".

The UN scenario aiming at a constant size for the age group 15-64 requires a far more rapidly rising intake of immigrants to a very high level of 2.8 million p.a. in the period 2025-30 for the EU. Thereafter the numbers drop to just over a million in the middle of the century, but they would increase very substantially again when the record intake of the years 2020-29 crosses the age boundary of 64 about 40 years later. Here we are again forcefully encountering the problem of self-perpetuating and ever amplifying cycles. The gain in terms of the PSR are minimal compared to the previous set aiming at a constant overall population size: the PSR still declines from 4 in 2000 to 3.17 (compared to 3.07) in 2020 and to 2.41 (compared to 2.21) in 2050. The percentage 65+ stabilizes at 24.7 in projection B compared to 26.3 in projection A in Table 8. Also, in the former scenario there is a modest overall population increase by 2050 of 12.4 percent. To keep the PSR with the UN definition at 4 for the EU, the minimum actual age at leaving the labour force would have to rise to about 74 years in scenario A and to about 72 years in scenario B. With zero migration this age would be 76 years (UN, 2000: 143).

Once more it becomes obvious that immigration cannot stop ageing and that there is a steep price to be paid for all the past years of subreplacement fertility. Also, record numbers of immigrants between 1.0 and 2.5 million per year in the EU can only *modestly* alleviate the ageing problem.

3.2. More detailed simulations of total labour supply

P. McDonald and R. Kippen (2000) provide different scenarios in which not only the migration parameter is allowed to vary but also fertility and labour force participation. We have summarized their results in Table 9 by means of index = 100 for the current levels of the total labour force supply (TLFS) and the total population size (TPOP) respectively.

In scenario A all three parameters are held constant at the current levels: the total fertility rate (TFR), the annual number of immigrants (ANM) and the labour force participation rates (LFPR). In each of the other scenarios one of these three parameters is allowed to vary. In scenario B the annual intake of immigrants leads to a net migration rate equivalent to 0.5 percent of the present population size and is kept constant thereafter. For the EU as a whole this corresponds to an intake of no less than 1.86 million p.a. Hence, the hypothesis squarely falls in the category of record immigration assumed by the UN (cf. Table 8, hypothesis B) and the intake is even larger than the numbers needed to maintain a stationary population with low native fertility (cf. Table 7). Nevertheless, an annual intake of 0.5 percent of current population size corresponds approximately to the immigration stream of Canada or Australia. We also suspect that the authors assume instant adaptation of immigrant fertility to that of the host country.

In scenario C the labour force participation rates are increased over a period of 30 years. For men this implies a rise in LFPRs after age 35 to the levels that prevailed in 1970. For several EU-countries (e.g. Belgium, France, Finland) such a return means a very substantial drop in non-activity rates for men older than 55, but in a number of other countries (e.g. Denmark, Sweden, Norway or Switzerland) this is a rather "light hypothesis" (cf. Punch and Pierce, 2000: 55). For women, the LFPRs increase to the current Swedish levels, equally over a period of 30 years. In full-time equivalents, this implies a substantial rise of female labour force participation for countries such as Italy, Spain, Greece, Belgium or the Netherlands, but also for the EU as a whole when compared to the US (Ibidem: 68). Scenario D, finally, assumes a TFR rise to the level of 1.80 children over a period of 10 to 15 years. This is a strong assumption for European populations that have at present TFR-levels below 1.50.

A number of conclusions are already clear before turning to the results. Obviously, the rising fertility hypothesis can only produce results in the longer run: it takes 20 years for children to enter the labour force. The immigration and labour force participation scenarios are by definition more important in the shorter run, but the latter can only have a temporary effect. Once the labour force participation benchmarks are reached there are no further gains from this intervention, and the demography of low fertility will simply take over. Hence, it comes as no surprise that rising participation rates are often offered as a solution, particularly if the time horizon is restricted to 2020 or 2025 (e.g. Feld, 2000), but one is quite mistaken to assume that this factor can prevent a decline in the labour supply thereafter. The *time path* of the effect of each intervention is therefore of major importance as well.

The results of the McDonald and Kippen scenarios are presented for selected countries grouped according to their past fertility levels, since the outcomes equally illustrate the price to be paid for sustained low fertility. With all three input parameters maintained at current levels (scenario A in Table 9), the labour force supplies in countries such as Italy, Spain, Germany or Japan would fall to about 85 percent of their current level by 2025 and to about 65 percent by 2050. In Italy and Spain the reduction would be larger still (index = 60 and 59 respectively), reflecting their very low fertility. Also the overall population size would be reduced to about three quarters of current size by 2050. The immigration scenario B prevents much of such a drop in the labour force supply, but can stop it entirely only in Japan where it would also lead to a 12 percent population growth. Hence, in this group Japan is the only case for which a slightly lower fixed migration intake could suffice. In scenario C the rises in labour force participation rates produce the expected shorter run effect by 2025, but no longer thereafter, and then least of all in Japan. Also the population decline can obviously not be avoided by this intervention. Rising fertility, finally, would fail to produce an effect before 2025, but would limit the damage by 2050. Population sizes would still be smaller too, given that the TFR of 1.80 is inadequate for replacement.

In the next group, comprising the UK, France, Sweden and the Netherlands, the outcomes of scenario A are less dramatic: until 2025 there would only be small reductions in the labour force supply, and by 2050 the fall would be limited to about 15 percent of the current level. The immigration scenario with a fixed intake of 0.5 percent of current population size is also overshooting the target since it would produce an increase both in labour force supply and in population size. Clearly, this parameter could be scaled down below the 0.5 percent assumption. Rising LFPRs would also correct the situation and actually do so till 2050, except in Sweden where these rates are at present already high enough. Rising fertility would also limit the drop in labour supply to 5-10 percent, but compared to the LFPR rises of the previous scenario, it would be less efficient by 2050 in France, the UK or the Netherlands, and more efficient in Sweden or other EU-countries with a current high level of labour force participation.

Finally in the US no interventions are needed: even at fixed current parameter values the labour supply will expand and so will the total population. The US therefore maintains a considerable demographic advantage over the EU or Japan. Furthermore, the US could even benefit from raising current LFPRs and from less immigration since this would lead to a larger labour force relative to overall population growth. Also, even if fertility drops from replacement level at present to a TFR of 1.80 children, both American labour supply and total population size would continue to expand over the next half century.

To sum up, rises in LFPRs are clearly the most beneficial in the shorter run for maintaining the labour supply at acceptable levels in most EU countries, and particularly in those where such participation rates were allowed to shrink for men older than 50 and/or where female participation rates expressed in full-time equivalents are still too low. On the other hand, this policy is likely to be detrimental for reversing the fertility trend, so that rising LFPRs are not all a remedy for overall population ageing and for containing its costs. Also, in the longer run the marginal benefits of raising LFPRs will decline and then the sheer dynamics of a shrinking and ageing population will take over. In order to prevent these longer term effects, the remedies will need to be demographic and take the form of increased immigration and/or rising fertility. Since below replacement fertility proved to be difficult to reverse, the EU will have to envisage a gradual increase of its immigrant intake to a level of about 1.0 million p.a. from about 2025 onward. This is less than envisaged by the UN or by the McDonald & Kippen simulations, but still substantially higher than the recent migrant flows into the EU. The actual number of immigrants needed will furthermore strongly depend on foreign born fertility levels as well, and from this point of view migration of couples or families is to be prefered over migration streams of singles or with a strong sex inbalance. Also from the point of view of migrants' skills, European immigration policies need to become more flexible and more responsive to specific needs. This favours the "green card" approach, as for instance adopted in Germany (as of August 2000).

The situation in Eastern and Central Europe is considerably more precarious than in the EU. Of the 17 countries, 11 already have negative rates of natural increase and 9 have negative net migration rates for the period 1990-1997 as well. In fact, only the Russian Federation and Slovenia have managed to correct their natural deficit at least partially through a positive migration balance during the 1990s. Given the economic situation in Eastern and Central Europe, the demographic picture is not likely to be substantially altered in the near future, and also a potential entry into the EU for some of them is likely to produce more emigration in the short run. Only a major economic recovery can then stem the tide.

CONCLUSIONS

The analysis of recent developments in cohort fertility profiles indicates that a return of European fertility levels to, or close to, replacement level is not in the making. Even if the pace of postponement in western counties slows down or stops altogether, only a modest rise in TFRs is to be envisaged. This rise, furthermore, strongly depends on the amount of fertility recuperation at older ages (i.e. past age 30), and except for the Scandinavian countries, this recuperation has been inadequate, and strongly so in a number of large EU-countries (Spain, Italy, Germany). In Eastern and Central Europe the steep fertility decline is predominantly a feature of the 1990s, and caused by a fertility reduction in all cohorts, irrespective of the stage of family building or age. Also in these countries the degree of fertility recuperation, particularly for the post-Communist generations, will be crucial in establishing more acceptable levels of period fertility. Finally, policy measures directly aimed at influencing fertility have had clear, but only temporary effects, and also sustained policies producing sometimes large income transfers in favour of families with children have not had any substantial effects either.

Another salient feature of European demographic development is the growth of "unconventional" household types and the destandardization of the sequence of life course events in young adulthood. In this respect strong national and even subnational differences prevail, and these have, at least in western countries, been enhanced, intentionally or not, by social policies in favour of the expanding student populations. With respect to the growth of such "intermediate stages" in household formation, two features warrant particular attention: teenage fertility and the growth of lone parent households. Compared to the US, European countries have managed either to contain the incidence of these phenomena or to reduce the negative social effects. The UK, however, provides the most important exception to this observation. In Central and Eastern European countries the incidence of lone mother households may not yet be measured adequately, possibly because of co-residence of such mothers with their own parents. But, virtually all of these countries have experienced a teenage fertility bulge, earlier in Central Europe and more recently in the CIS-countries. Fortunately, also in the latter current teenage fertility rates have been falling since the middle of the 1990s.

The prospect of long term subreplacement fertility had to revive the issue of replacement migration sooner or later. In this respect the UN-report (2000) drew widespread media attention all over Europe, but the unfortunate feature was that the media zoomed in on the results of only one simulation, i.e. the one maintaining a constant PSR at all times till 2050. Much earlier formal demographic analysis (e.g. Blanchet, 1988) had indicated that such age structure equilibration leads to impossible outcomes, in contrast to longer term views with less stringent constraints. However, the latter still lead to record immigration intakes of over 1.0 million p.a. from 2025 onward for the EU as well as for the remainder of Europe. Moreover, the efficiency of such a replacement migration remains limited if not complemented by other measures such as the rise of labour force participation rates. The latter is particularly needed in countries, both in and outside the EU, that had a considerable reduction in male activity rates above age 50 or have a small female labour force participation expressed in full time equivalents. Finally, replacement migration into the EU needs to be directed especially toward the countries with the largest fertility deficit, including Italy and Spain who have only more recently become immigration countries. Hence, the million or so extra immigrants should by no means be spread evenly within the EU territory.

To sum up, replacement migration is not to be viewed as the sole solution for Europe's ageing problem, nor is it to be relegated to oblivion altogether. It can be an ingredient in a far more diversified approach in which numerous other measures have their place, but also more time specific effects. In this respect, economic measures or measures that restructure social security arrangements are powerful pain releavers, but their effects do not last. One cannot raise activity rates beyond 100 percent, nor can one increase the age at leaving the labour force much beyond 65 years in economies where globalization means increased flexibility and where fast technological evolution is synonimous to greater reliance on younger labour vintages. One can disconnect the evolution of pensions to some degree from that of productivity or economic growth, but not to the extent of creating new poverty. In other words, we can buy time for another quarter of a century or so by implementing economic measures - which are necessary at any rate - but in the longer run we still have to envisage the inevitable consequences of not altering the demographic recruitment parameters, i.e. fertility and migration. With a time horizon beyond 2025 one has to realize that the effects of economic measures - if taken in time - will gradually wear off and that the laws of formal demography - just like those of gravity - will simply continue to operate.

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Table 1: Current indicators of fertility in industrialized countries (1995-97)

		PTFR	MAC1	1000*fertility rate 15-19	abortions/ 100 live births	% non-marital births
A. Southern						
ITA	Italy	1.22	27.9	7	25	8
SP	Spain	1.15	27.8	8	13	13
GRE	Greece	1.32	26.6	13	12	3
POR	Portugal	1.46	25.8	21	na	20
B. Eastern						
BUL	Bulgaria	1.09	22.8	45	130	30
CRO	Croatia	1.69	25.2	20	29	7
CZR	Czech Republic	1.17	24.1	18	51	18
EST	Estonia	1.24	23.4	29	127	52
HUN	Hungary	1.38	23.4	28	73	25
LAT	Latvia	1.11	23.5	21	48	35
LIT	Lithuania	1.39	23.1	32	71	17
MOL	Moldova	1.60	22.4	53	89	17
POL	Poland	1.51	23.1	20	2	11
ROM	Romania	1.32	23.1	41	213	22
RUS	Russian Fed.	1.28	22.8	40	179	25
SLO	Slovenia	1.25	25.6	9	54	32
MAC	Macedonia	1.90	na	39	45	9
YUG	Yugoslavia	1.80	24.7	30	72	18
SLK	Slovak Republic	1.47	na	31	41	14
BLR	Belarus	1.39	na	39	81	15
UKR	Ukraine	1.40	na	54	153	14
GDR	Germany (East)	0.95	27.3	8	32	44
C. Western						
AUS	Austria	1.36	26.7	15	25*	29
BEL	Belgium	1.59	27.5	9	10	18
FRA	France	1.71	28.3	7	21	39
FRG	Germany (West)	1.39	28.4	10	14	14
IRL	Ireland	1.92	27.0	17	10*	27
LUX	Luxemburg	1.71	28.5	7	10	17
NL	Netherlands	1.55	29.0	4	11	19
SWI	Switzerland	1.48	28.3	4	na	8
UK	United Kingdom	1.71	26.7	30	24	37
D. Northern						
DK	Denmark	1.75	27.7	8	25	46
FIN	Finland	1.74	27.7	9	26	37
ICE	Iceland	2.04	25.0	25	19	65
NOR	Norway	1.86	27.0	13	23	49
SWE	Sweden	1.53	27.4	7	34	54
E. Non-European						
CND	Canada	1.64	26.8	25	28	30
USA	United States	2.06	24.8	58	38	32
AUL	Australia	1.77	26.8	21	36	23
NZ	New Zealand	2.04	na	34	24	41
JPA	Japan	1.44	27.9	4	29	1

Sources:
- Council of Europe (1998), tables T3.2, T3.3, T3.4 & country tables xx-2,
- UN Demographic Yearbook (various years); personal communications H. Kojima, P. McDonald
- A. Monnier (1998)
- *: estimates based on FFS (Austria) and D. Coleman (1999, Ireland)

Table 2: Indicators of postponement and recuperation of cohort fertility in Western countries

	past trend (A,B)		recent postponement (C,D)	
	A. Trough produced by postponement: cumulated deficit by age 30 for cohort reaching 15-19 in 1985 relative to predecessor of 1960	B. Recuperation: cumulated deficit by age 40 for cohort reaching 15-19 in 1975 relative to replacement fertility (=2.08)	C. Recent postponement: cumulated deficit by age 30 for cohort reaching 15-19 in 1985 compared to predecessor of 1975	D. Youngest cohort: cumulated deficit by age 25 for cohort reaching 15-19 in 1990 compared to predecessor of 1980
1. Northern Europe				
Sweden	-.66	+.02	-.11	-.09
Norway	-.55	-.04	-.15	-.12
Finland	-.33	-.19	-.13	-.21
Denmark	-.65	-.22	-.14	-.12
2. Western Europe				
2.a. France	-.71	+.02	-.36	-.25
UK	-.76	+.01	-.25	-.09
2.b. Netherlands	-.90	-.25	-.31	-.10
Belgium	-.55	-.22	-.19	-.11
2.c. Germany (FRG)	-.58	-.50	-.24	-.04
Austria	-.58	-.36	-.27	-.20
Switzerland	-.64	-.35	-.24	-.04
3. Southern Europe				
Spain	-.87	-.27	-.53	-.30
Italy	-.80	-.36	-.44	-.26
Portugal	-.53	-.23	-.32	-.30
Greece	-.42	-.18	-.21	-.43
4. Other				
Australia	-.82	+.12	-.35	-.16
Canada	-.73	-.22	-.20	-.09
USA	-.51	-.10	-.03	-.02
Japan	-.74	-.25	-.45	-.10
Ireland	-.88	+.38	-.85	-.22
Iceland	-.75	+.37	-.18	-.23

Source: calculated from series of age-specific fertility rates in Council of Europe (1999), country specific tables x-3, and UN Demographic Yearbooks, various years.

Note: multiplication by 100 gives the deviations in number of children per 100 women.

Table 3: Indicators of cohort fertility declines in former Communist countries

	D. Youngest cohort: cumulated deficit by age 25 for cohort reaching 15-19 in 1990 compared to predecessor of 1980	C. Middle cohort: cumulated deficit by age 30 for cohort reaching 15-19 in 1985 compared to predecessor of 1975	E. Oldest cohort: cumulated deficit by age 35 for cohort reaching 15-19 in 1980 compared to predecessor of 1970
1. Central & Eastern Europe			
Germany (GDR)	-.33	-.24	+.06
Poland	-.36	-.24	-.08
Czech Republic	-.47	-.25	-.11
Slovak Republic	-.41	-.23	-.11
Hungary	-.39	-.13	+.05
Romania	-.51	-.58	-.28
Bulgaria	-.44	-.31	-.19
2. Former Soviet Union			
Russia	-.20	-.20	-.11
Ukraine	-.23	-.16	-.16
Belarus	-.19	-.23	-.15
Moldova	-.22	-.30	-.13
Estonia	-.33	-.21	-.01
Latvia	-.30	-.12	+.01
Lithuania	-.18	-.17	-.11
3. Former Yugoslavia			
Slovenia	-.47	-.39	-.10
Croatia	-.33	-.24	-.06
FR. Yugoslavia	-.24	-.21	-.03
FYR. Macedonia	-.14	-.13	-.10
Bosnia-Herzegovina	na	na	na

Notes: - indices D and C are the same as in Table 2.
- multiplication by 100 gives the diviations in number of children per 100 women

Source: calculated from series of age-specific fertility rates in Council of Europe (1999).

Table 4: Overview of family policy indicators in the EU

	Duration maternity leave in weeks	Maternity leave benefits (% salary)	children allowance (% male wages manufacturing)	% children 3-5 in day care	Net monthly contribution per child in euro	
					a) 3 children 1 earner	b) 2 children 2 earners
	1996	1996	1990	1988	1996	1996
Sweden	65	75	7.2	80	514	151
Finland	44	80	6.2	50	389	210
Denmark	28	90	5.2	85	191	128
Germany	14	100	4.9	65	323	184
Netherlands	16	100	7.4	55	178	-2
Belgium	15	80	10.4	96	463	266
Luxemburg	16	100	8.3	55	510	766
Austria	16	100	11.3	na	332	199
France	16	84	7.1	96	517	229
UK	18	45	6.3	35	484	119
Ireland	14	70	3.0	na	389	8
Spain	16	100	0.3	65	43	13
Italy	20	80	0.0	86	210	-68
Portugal	14	100	4.9	35	32	36
Greece	16	50	3.2	65	-338	-155

Sources: Ditch et al. (1998), Gauthier (1996), De Santis (1999), van Solinge et al. (1998)

Table 5: Cohort age-specific fertility rates (columns) in three countries with fertility policy interventions

	ASFR at age	Cohort aged 15-19 in: 1960	65	70	75	80	85	90	95	ASFR max/ASFR previous cohort
1. <u>GDR</u>										
	15-19	42	79	43	*33*	*39*	31	23	8	1.18
	20-24	184	187	*144*	*183*	158	135	55		1.27
	25-29	112	*88*	*114*	110	100	66			1.30
	30-34	*30*	*42*	39	36	28				1.40
	35-39	*42*	39	10	9					-
	40-44	2	2	2						-
										mean = 1.29
2. <u>Russian Federation</u>										
	15-19	27	25	30	35	44	*47*	56	46	1.07
	20-24	148	153	159	158	*166*	157	114		1.05
	25-29	116	108	102	*118*	93	67			1.16
	30-34	60	52	*63*	48	30				1.21
	35-39	22	*25*	19	11					1.14
	40-44	*4*	4	2						-
										mean = 1.13
3. <u>Sweden</u>										
	15-19	35	49	34	29	16	11	*14*	9	1.27
	20-24	141	120	115	96	82	*99*	66		1.21
	25-29	129	123	124	132	*156*	126			1.18
	30-34	64	71	89	*110*	99				1.24
	35-39	25	30	*41*	44					1.37
	40-44	6	*7*	7						-
										mean = 1.20

<u>Note</u>: ASFR per 1000 women; period distortions in italics.
<u>Source</u>: Council of Europe (1999), country specific tables X-3

Table 6: Distribution of women aged 20-24 according to household positions, FFS-countries in the 1990s

	Resident with parents*	Living alone	Cohab. no children	Cohab. with children	Lone mother (not coresiding)	Married no children	Married with children
A. Southern Europe							
Italy	87%	1	1	0	0	4	7
spain	71	1	3	1	2	6	13
Portugal	75	1	3	0	4	8	18
Mean	*79*	*1*	*3*	*0*	*2*	*6*	*13*
B. Eastern & Central							
Bulgaria	50	1	2	2	5	8	33
Poland	55	1	0	0	3	14	37
Latvia	54	7	5	4	11	7	29
Lithuania	51	6	2	1	5	14	38
Slovenia	54	3	8	9	4	4	25
Hungary	46	3	4	3	4	12	34
Mean	*52*	*4*	*4*	*3*	*5*	*10*	*33*
C. Western Europe							
Belgium/Flanders	54	3	10	2	1	23	9
Netherlands	44	15	20	1	1	10	6
France	41	17	19	5	4	6	8
Canada	37	9	13	3	7	9	10
Austria	38	12	20	7	6	4	8
Switzerland	36	17	24	1	1	8	7
Germany former GDR)	30	15	8	8	6	5	27
Germany (former FRG)	37	22	11	1	2	7	12
Mean	*40*	*14*	*16*	*4*	*4*	*9*	*11*
D. Northern Europe							
Norway**	16	18	21	12	5	9	16
Sweden**	8	27	32	12	5	4	19
Mean	*12*	*23*	*27*	*12*	*5*	*7*	*17*

Source: FFS country reports, appendix tables 4

Note: * For those residing with parents we do not know whether they are single or not (i.e. couples with or without children, lone mothers). As a result of this column the row totals are not equal to 100%.

** at ages 23 rather than for the age group 20-24

Table 7: Fractions of the annual birth stream that would need to be filled by immigrants (I/B) in order to maintain a stationary population, given various total fertility rates of locally (TFR_n) and foreign born (TFR_f) women

TFR_f fertilty foreign born women	TFR_n fertility native women	I/B required number of immigrants as % of birth stream	Implied annual number of immigrants to EU in order to maintain current birth stream (3 892 000)*
2.1	1.94	10%	389,200
3.0	1.90	10	
4.0	1.85	10	
2.1	1.84	20%	778,400
3.0	1.75	20	
4.0	1.64	20	
2.1	1.73	30%	1167,600
3.0	1.59	30	
4.0	1.44	30	
2.1	1.62	40%	1556,800
3.0	1.44	40	
4.0	1.24	40	

Source: Lesthaeghe, Page & Surkyn (1988)

Note: * in order to maintain a stationary population for the EU of its current size (i.e. 372 million) and with a life expectancy for both sexes combined of 80 years, the birth stream would need to be 4,655,500 p.a. instead of the 3,892,000 births used here. With this assumption for life expectancy and the latter birth stream, the EU stationary population would only be 311 million instead of 372.

Table 8: Average annual number of immigrants (*1000) needed to meet three demographic criteria, and resulting population sizes, Europe 2000-2050

Criteria:	A. Constant population size		B. Constant size age group 15-64		C. Constant ratio 15-64/65+	
	Annual number of immigrants needed*	Index population size**	Annual number of immigrants needed	Index population size	Annual number of immigrants needed	Index population size
1. European Union						
2000	263	100.0	396	100.0	6171	100.7
2010	663	100.0	1596	100.3	9012	123.8
2020	869	100.0	2424	103.5	12947	151.9
2030	1216	100.0	2407	108.9	20346	200.9
2040	1416	100.0	1063	112.2	16483	266.5
2050	-	100.0	-	112.4	-	329.8
2. Other European						
2000	800	100.0	-396	100.0	6239	100.8
2010	487	100.0	2046	96.7	8222	103.4
2020	1010	100.0	2423	101.7	16870	137.0
2030	1155	100.0	1104	104.9	9764	183.6
2040	1249	100.0	2467	106.4	22380	227.1
2050	-	100.0	-	111.4	-	318.6

Source: United Nations (2000): Tables A.18 & A.20.

Note: * average number per annum during the next 5 years (in thousands)

** index=100 corresponds to 372 million in the EU and 351 million in the rest of Europe.

Table 9: Evolution of total labour force supply (TLFS) and total population size (TPOP) in selected industrialized countries with 4 projection scenarios; current levels = index 100

		A. TFR ct ANM ct LFPR ct	B. TFR ct. ANM = 0.5% pop. LFPR = ct	C. TFR ct ANM = ct LFPR rise to 1970/Swed. benchm.	D. TFR rise to 1.8 ANM = ct. LFPR = ct.
1. Low fertility countries					
Italy	TLFS 2025	82	96	112	83
	TLFS 2050	60	82	82	78
	TPOP 2050	*77*	*98*	*77*	*96*
Spain	TLFS 2025	88	102	118	90
	TLFS 2050	59	85	81	76
	TPOP 2050	*74*	*102*	*74*	*94*
Germany	TLFS 2025	86	94	103	88
	TLFS 2050	69	86	83	83
	TPOP 2050	*83*	*100*	*83*	*99*
Japan	TLFS 2025	82	104	99	89
	TLFS 2050	68	100	78	75
	TPOP 2050	*76*	*112*	*76*	*87*
2. Medium level fertility countries					
UK	TLFS 2025	100	116	112	100
	TLFS 2050	89	121	101	92
	TPOPO 2050	*97*	*129*	*97*	*100*
France	TLFS 2025	98	117	114	98
	TLFS 2050	84	123	102	89
	TPOP 2050	*102*	*136*	*102*	*103*
Sweden	TLFS 2025	98	111	100	98
	TLFS 2050	86	109	87	95
	TPOP 2050	*93*	*117*	*93*	*103*
Netherlands	TLFS 2025	93	104	119	94
	TLFS 2050	86	103	109	92
	TPOP 2050	*100*	*119*	*100*	*106*
3. High fertility country					
USA	TLFS 2025	115	122	124	114
	TLFS 2050	126	143	136	116
	TPOP 2050	*135*	*151*	*135*	*122*

Source: McDonald and Kippen (2000), computed from graphs and tables.

Note: The "current levels" refer to 1995 for France, Sweden, Germany, and Italy; to 1997 for the UK; to 1998 for the Netherlands, and to 1999 for Japan and the USA.
TFR = total fertility rate; ANM = annual migration rate; LFPR = labour force participation rate.