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Reflections on the economics of the fertility decline in Europe[#]
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Summary

The economic and sociological (or psychological) approach to understand fertility decisions have long opposed each other. We propose a new synthesis of the two, and discuss its implications. Although both dimensions, economic and socio-psychological, are likely to have influenced the fertility decline since the advent of the demographic transition, we argue that there are very substantial economic reasons why fertility keeps decreasing, or remains very low, in the developed countries, and advocate the use of the economic lever to sustain it, and keep it not too far from reproduction level.

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References

[#] Preliminary version. Comments welcome, please do not quote.

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“It goes without saying that these issues are not just intellectually interesting for academics, but also for policy and government decision makers” (Shoenmaeckers and Lodewijckx, 1997)

Introduction

Human fertility has both a private (or micro) and a public (or macro) dimension. From the micro-demographic perspective, virtually everybody agrees that fertility can be considered as the outcome of some sort of rational reasoning, although opinions diverge markedly on the notion of rationality, and on the relative importance of the elements that may influence the reasoning. In particular, two mainstream lines of thought have emerged in the literature. On the one hand there is the economic paradigm, which interprets the perspective parents' demand for children basically as any other consumer demand, aiming at maximising utility, subject to biological limitations and resource constraints (of time and money), and given the price of the commodity (children) and the price of possible alternatives. On the other hand, the sociological paradigm has emphasised the idea that children are not ordinary market goods, and that, in particular, their “demand” depends on a very complex set of societal and individual dimensions, like for instance religion and ethics, familism, individualism, (post) materialism, etc.

Although various attempts have been suggested to try and reconcile the two approaches, we think that a unifying way of treating them is still missing, and we will propose one in the next section.

One of the implications of the approach that we will suggest is that, up to a limit, the ‘true’ causes of the fertility decline may be disregarded when the question becomes: ‘what should developed societies do to try to bring fertility back (or close) to reproduction level?’ In particular we will argue that the economic lever may be effectively used to influence fertility behaviour in most cases (section 2).

Not everybody agrees with the idea that governments should try to modify the ‘natural’ level of fertility: some may object that no intervention is really needed because fertility may ‘naturally’ get back to reproduction level, or immigration flows may compensate the baby bust; others doubt that active policies in this field may ever prove effective, or that western societies can afford them, given the already high level of public expenditure and, in most of western Europe, the tight budget criteria imposed by the Maastricht agreement; others still express worries about the possible negative consequences on the ‘quality’ of children that may ensue from an excessive interest in their ‘quantity’. We discuss some of these issues in section 3, and, although cautiously, we conclude that intervention is probably justified, or even needed, in several developed countries, and especially in Southern Europe.

In section 4 we try to show that, at closer inspection, the distinction between the economic and the sociological approach is not so clear as it appears at first sight. But, on the other hand, we will also express doubts on some of the measures that are frequently used to support the sociological interpretation of the fertility decline, and which appear to us as theoretically questionable, or of little empirical value.

In section 5, we concentrate on the economic causes of the fertility decline. We try to show that, in the course of the 20th century, several economic dimensions have evolved in such a way as to make children much more expensive, either directly, causing more out-of-pocket expenses, or indirectly, causing greater opportunity costs. Also, alternatives for several ‘services’ comparable to those that children may render (protection, economic security, labour supply, etc.) have become available, or anyway cheaper and more reliable than before. Taken together, these changes appear to be enormous, and, in our view, they can explain most of the fertility decline that has taken place in the developed countries, and justify current low birth rates. Gender issues, discussed in section 6, further complicate the picture, but their inclusion does not seem to subtract from the importance of the economic dimension.

Our main conclusion, presented in section 7, is that close-to-reproduction fertility is socially preferable to markedly low fertility, that the economic lever is virtually the only one available to governments to (try to) intervene in this field, and that proper fiscal policies could prove effective in raising fertility even if we were wrong in thinking that economic causes are at the root of the fertility decline.

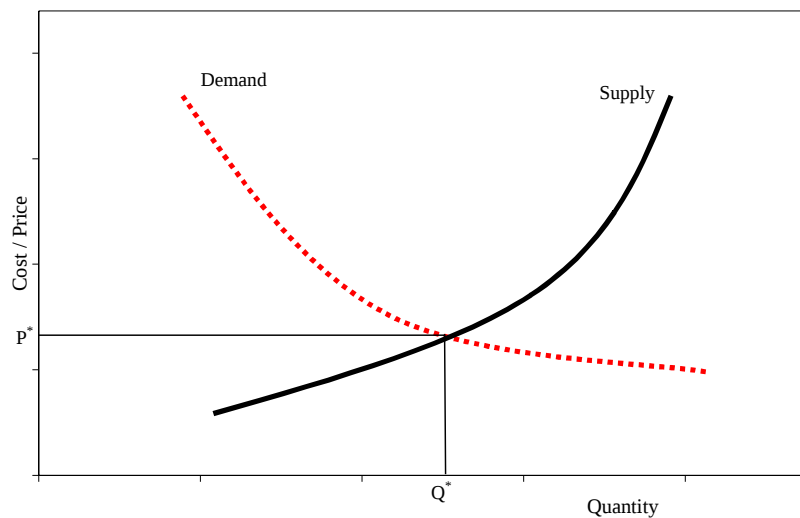
1. A theoretical interpretation of fertility decisions

As Robinson (1997) observes, under the influence of some authoritative population economists, economic concepts have started to be introduced in the demographic literature. Prominent, among these, are the notions of demand for, and supply of, children. Although the apparent similarity with the corresponding economic dimensions is appealing, we believe that there are also a few important discrepancies, and that these should induce demographers to slightly revise this approach to better suit the reality it is intended to describe.

Let us take a look at the standard economic analysis first, keeping in mind that the two basic questions it tries to answer are: how much of a given marketable good will be exchanged on the market (i.e. passed from the producers to the consumers), and at what price? When the study is confined to some ‘simple’ market good, like apples for instance, theoretical reasoning and econometric analysis show that the behaviour of each set of actors (producers and consumers) may be conveniently represented by a curve on a bi-dimensional plan, with quantities on the x -axis and prices on the y -axis. Figure 1 is one of the possible representations, with the supply curve that is normally upward-sloped (because producing more and more of a given good tends to have increasing marginal costs, at least beyond a certain threshold) while the demand curve is typically downward-sloped (because, psychologically, every additional amount of a given product reduces the consumer’s desire for it).

Figure 1

Figure 1. Supply and demand curves of a generic consumption good



Four aspects of this approach are worth noticing, in our opinion:

1. producers and consumers form two distinct groups;
2. producers do not derive any satisfaction from the mere act of producing: it is the money they think they can earn that makes them embark in the production process. Consequently, ‘supply’ is not the maximum amount that could be produced at each point in time, but is the quantity that producers will deem profitable (and will therefore be willing to produce), for each hypothetical level of the market price;
3. at least at the so-called ‘clearing’ point (Q^*) the equilibrium price P^* is unambiguously observable (and with a little experimentation, it can be varied, to analyse the sensitivity, or elasticity, of demand);
4. time is absent from this perspective: the idea is that, at least in the relatively short run, supply and demand are given. If exogenous shocks arrive in one of the curves, the other will (or is assumed to) remain substantially unaffected, and form the locus of possible combinations of future prices and quantities.

Do these considerations apply to children, too? Not exactly. Parents are both those who produce and those who demand children,¹ and, therefore, it appears difficult to disentangle their demand from their supply curve. For instance, they derive (at least sexual) satisfaction from the very act of (re)production, and normally, also from the product itself (children): is this part of their supply or of their demand curve? The monetary cost of children is very difficult to determine (see further in the text), and, in all cases, it is not readily observable in the market. Ambiguities surround the measure of quantity, too: should it be period or cohort fertility? If the former is the case, how should period measures be calculated, to keep tempo effects into account?

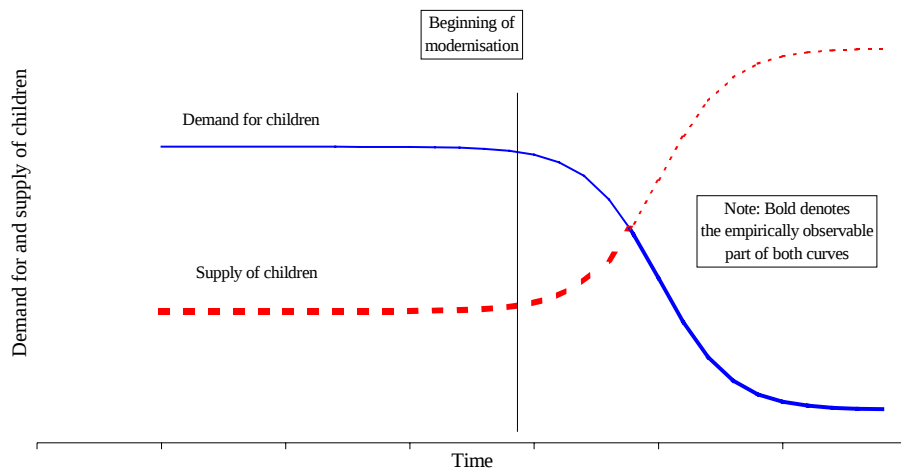
These difficulties are part of the reason why, traditionally, demographers have interpreted ‘supply’ as the parents’ (physical) reproductive capability, while ‘demand’ has become equivalent to the parents’ desire for children. In this interpretation, the resulting curves are of the kind sketched in Figure 2, with *time* on the x -axis

¹ With the further complication that their demand may be influenced by the ‘relevant others’, like relatives, clan, society, etc.

and (desired and actual) *number of children* on the y-axis. In the course of time, after modernisation sets in, supply rises, because improvements in nutrition, health care, working conditions, etc. enhance physical reproductive capabilities, especially those of the woman. On the other hand, demand, i.e., parents' desire for children, decreases for a variety of reasons, discussed below.²

Figure 2

Figure 2. Demand for and supply of children in the traditional approach



This approach has some merits: for instance it helps to explain why some developing countries at the beginning of the modernisation process experienced a temporary upsurge of fertility. But, in our view it does not fit perfectly well with the economic framework of demand and supply curves. In particular, this approach neglects the problem of the cost of children, which is dealt with separately, e.g. analysing contraception costs, (women's) opportunity costs, and so forth. (The same critique can be found in Robinson, 1997).

It could be worthwhile to reconsider our way of conceptualising fertility and its determinants, with reference not to a supply-demand scheme, but, rather, to a cost-benefit approach, similar to the one economists use in the theory of production³, although, as we will argue below, with one important difference. We mentioned before that, ordinarily, producers do not derive any satisfaction from the production process, or from the product itself, which they will sell on the market. Only monetary costs and benefits affect their profit-maximising considerations, and because of fixed costs (which impact particularly at low levels of production) and because of growing marginal costs (which become particularly relevant at high levels of production), the curve of their net economic benefit is generally thought to be of the kind sketched in Figure 3. P^* is the income they derive from the production of any additional unit of good, typically the sale price of that good. This need not be a horizontal line (it is so only in perfectly competitive markets), but it needs to be higher than the minimum of the curve of marginal costs, so that producers can earn something out of their activity. If this is the case production will stop at the quantity Q^* , which maximises their profits. If, on the contrary, this is not the case (as it would happen in Figure 3, if the price were set at P^{**}), there will be no production at all of that particular good.⁴

Notice, once again, that time is absent from this representation.

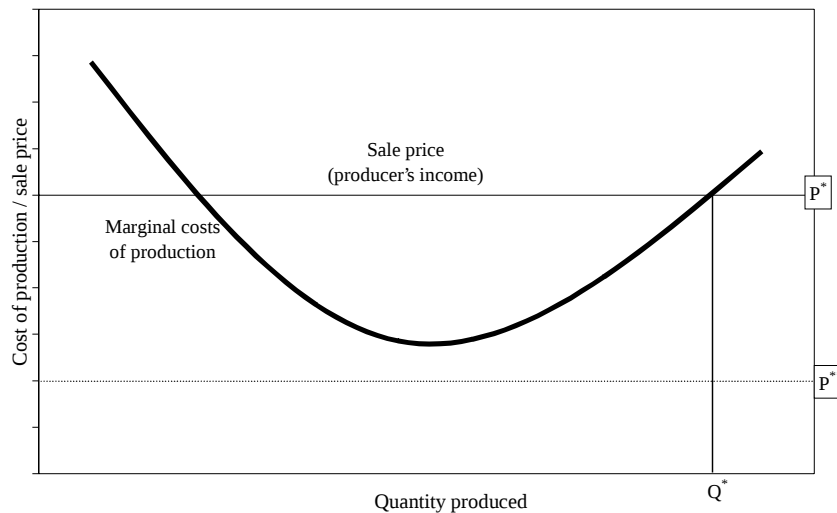
² See, among others, Schultz (1981); Bulatao and Lee (1983); Easterlin and Crimmins (1985). Along the same line, see also Caldwell (1994). Note, in passing, that, at each point in time, only the lower curve (bold in the figure) is empirically observable, the higher curve being just a theoretical abstraction.

³ We owe this idea to a conversation with L. Tronti, of the Brodolini Foundation, who criticised a previous attempt at theorisation, exposed in De Santis (1997a). The usual disclaimer applies.

⁴ For the sake of simplicity, we will not distinguish here between fixed and variable costs.

Figure 3

Figure 3. Production costs and sale prices for the representative producer



Some authors have implicitly used this reference scheme in their analysis. Caldwell (1976), for instance, assuming that marginal costs of re-production do not grow significantly, states that only two extreme demographic regimes are conceivable: one where economic advantages exceed costs (i.e., where ‘wealth flows upwards’, from the children to the parents), the other where the opposite is true. In the former, there will be as many children as physically possible; in the latter there will be none.

Several other analysts have argued that growing children is normally an economic disadvantage, or, in other words that the economic benefit of children is indeed lower than their cost (cf. again the P^{**} curve of Figure 3): this is surely the case in modern societies, but it may have happened, and may be happening today, also in pre-transitional contexts. Their conclusion is that economic reasoning does not apply to reproduction, which is governed by other criteria: individual preferences (or spirit of self sacrifice), social pressure, tradition, etc.: cf., e.g., Moheau (1778),⁵ Kiernan (1998), Dalla Zuanna and Righi (1999), Dalla Zuanna (2001), etc.

In all of these cases, the assumption is that children are valued only for the money they can generate, and are therefore considered basically as *investment* goods. But these drastic conclusions change considerably if one allows also for the psychological net benefits of children, or, in other words, treats them also as consumption (durable) goods⁶. The idea is that psychological benefits (like for instance mutual love and feeling of self-perpetuation), must be weighted against psychological costs, which include, among other things, worries, possible consequences on the health (or the body) of the woman, thinning of social contacts,⁷

⁵ ‘If only material interests were at stake, in none of the orders, occupations, or trades would the multiplication of children constitute an increase of wealth. ... among the labouring classes, a child, before he is able to be useful, has cost much more than the wages of a grown and able man. ... Thus, *logic and a calculating mind would not lead to the propagation of the species. Motivations that transcend interest, the renunciation of wealth and luxury, and a sense of principled responsibility must exist to persuade one to assume this domestic burden.* The love and obedience of children must also offer a prospect of happiness for parents in their old age. These feelings and dispositions are the result of morality’.(Moheau, 1778/2000, pp. 823-824; emphasis added).

⁶ This expression has been criticised by Blake (1968), but it can be used neutrally, simply to indicate that they procure joy and satisfaction to their parents. The psychological dimension, in this pages, encompasses the sociological one: social pressure (if any) translates into the way perspective parents think, feel, and evaluate the pros and cons of fertility and parenthood.

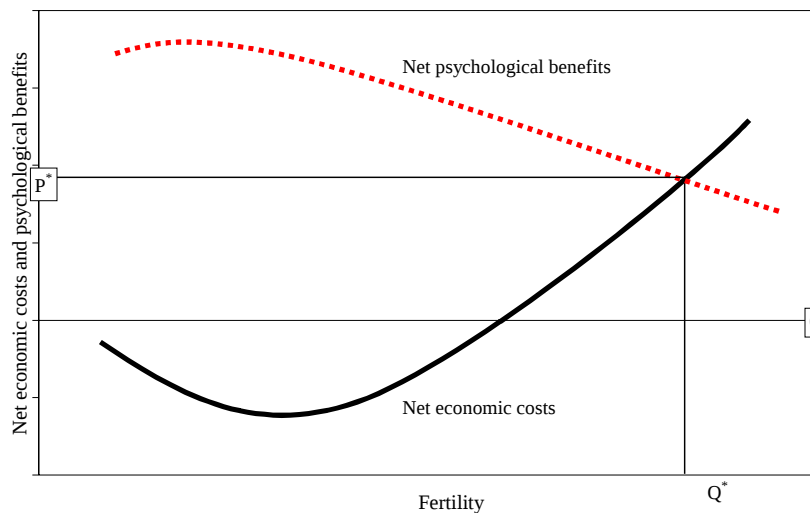
⁷ Although Schoen *et alii* (1997) contend that the contrary is the case: children, in their interpretation, favour social contacts, and this is part of the reason why they are born.

and the like. The net balance of all of these non-economic dimensions is one of the elements that influence fertility.

We don't know enough to draw a curve of the net psychological benefits of children with any degree of precision. But let us guess that it may be roughly similar to the dotted line of Figure 4, where psychological net benefits start to decline after the 'representative parents' have reached a given number of descendants, which implies that, at that point, the prospects of each additional birth give parents progressively less joy. The strong assumption in Figure 4 is that not only economic net costs (the continuous line), but also psychological net benefits may be drawn in a quantity/price plan: in other words, we are assuming that psychological net benefits may be somehow measured in monetary units.

Figure 4

Figure 4. Net psychological benefits and net economic costs of fertility



Notice that, once again, this representation does not include the temporal dimension: it simply says that, *at any given time*, it is reasonable to expect that parents will give birth to a number of children which is, in some sense, optimal, keeping into account both monetary and psychological factors.

2. Some practical implications

The approach outlined above is nothing but a purely theoretical speculation, thus far. To make it of more practical use, one needs to consider in greater detail what lies behind the notions of costs and benefits, both economically and psychologically. In so doing, as we will see shortly, it becomes necessary to reintroduce the context within which decisions are taken, or consequences evaluated.

What do we mean by 'net costs' of children? Technically speaking, this is a balance between economic costs and benefits. Both take place over a long, and largely uncertain, span of time and, therefore, both need to be actualised somehow, using proper discount rates. Costs include both expenses generated by the kid, and opportunity costs, that is income foregone because of the presence of children. The most classical example of the latter is the interruption in the woman's professional career (Turchi, 1986; Davies and Joshi, 1994; Dankmeyer, 1996; Joshi, 1998; Davies, Joshi and Peronaci, 2000), although other examples are also conceivable, like, for instance, the parents' tendency to move out of large cities, which are generally considered inadequate for children, but where earnings are potentially higher. Economic benefits may include various public subsidies to families with children (see, e.g., Gauthier, 1996a,b), and financial help expected from the children themselves when they grow up, especially during their parents' old age: in modern times this seems to be true especially for the developing countries (Caldwell, 1976, 1994; Jensen, 1990) although it should not be totally disregarded in modern contexts, as well (Cigno and Rosati, 1992; Rendall and Bahchieva, 1998).

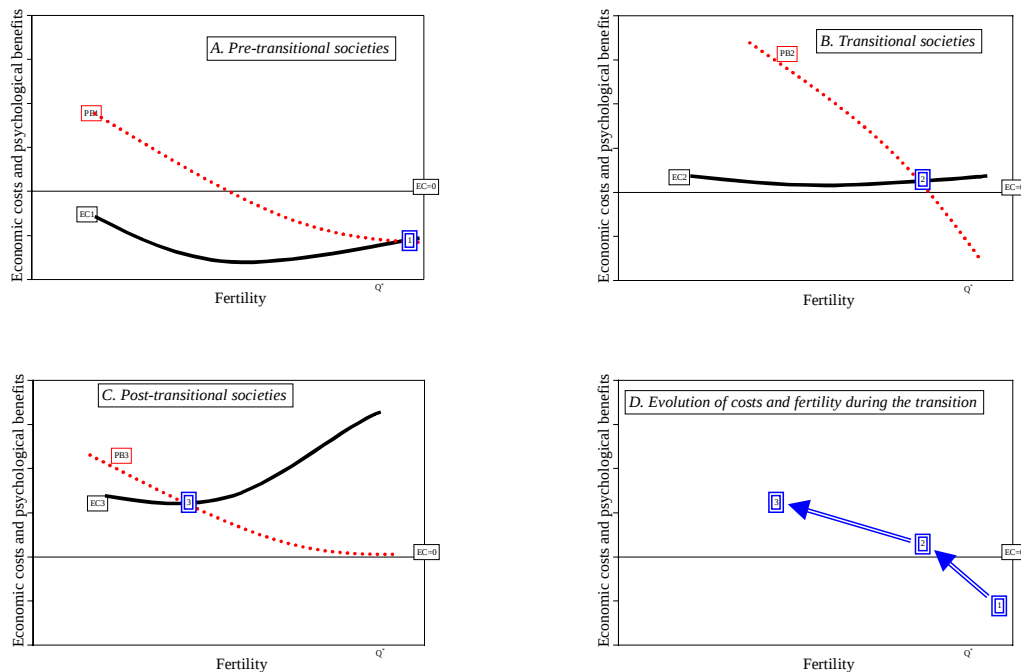
All this must keep into consideration the value of the services that children provide, and the cost of alternatives, where available. For instance, where robbery and violence are frequent, large families constitute a valuable form of protection, the alternative to which may be hiring professional soldiers (or, in modern times,

security staff and body guards). But if law and order start to prevail, the protection offered by a large family becomes progressively less important. This particular example may appear of scarce practical relevance, but the same line of reasoning holds for several of the services that children are generally thought to provide: pension benefits may become available, either through the state, or thanks to improvements in insurance and financial markets; if one runs a family business and needs workers, a dependable labour market may function better than bearing children (i.e. provide the needed services more timely, and offer a wider range of professional skills); etc.

In other words, it could be argued that modernisation depreciates most of the economic services that children may render, and, thereby, makes them more expensive indirectly. But it also makes them more expensive in very direct ways: children nowadays need to spend more years studying, and remain an economic burden for their families until later in life⁸; their care requires parental (especially mothers') time, and time is precisely what most adults, in contemporary economies, are short of; families live in increasingly urbanised environments, where space is expensive, and where leaving children on their own may be dangerous; etc. If our interpretation is correct, increasing net economic costs over time translate into an upward movements of our EC curves in Figure 5, from EC_1 to EC_2 to EC_3 .

Figure 5

Figure 5. Possible evolution over time of the net psychological benefits (PB) and net economic costs (EC) of fertility



On the other hand, the net psychological benefits that children provide are not given once and forever: Their value depends on what is considered important in any given culture. For instance, it is possible that, in ancient times, people attached less emotional weight to family relations: if this were true, it would translate in a relatively low PB_1 curve. Later, following Ariès's interpretation, there came a period when the importance of the child grew considerably, to the point that the whole family life was centred around it (Ariès, 1980). In Figure 5, this translates into an upward shift of the curve of psychological benefits from PB_1 to PB_2 . Later still, and this brings us to our days, individualism started to prevail: the importance of children declined in the collective value system, to the advantage of alternatives, like having free time, meeting friends, living conspicuously, etc. (cf. Lestaeghe and Surkyn, 1988; Lestaeghe and Moors, 1995 and 1996). This translates into a downward shift of the psychological benefits curve, from PB_2 to PB_3 .

Overall, this sketchy representation is compatible with what has been empirically observed during the demographic transition. In pre-transitional times (point 1 in Figure 5/A), fertility was high, and children were

⁸ This practice, among others, may enhance the child's 'quality' (although Robinson, 1997, criticises the notion), but this aspect need not concern us here.

probably, although not surely, a net economic benefit for their parents.⁹ In the course of the past 200 years or so, the marked decrease of fertility has been accompanied by increasing costs (Figure 5/D), both phenomena being determined by concurring economic and psychological (or sociological) factors. Obviously, this representation does not in itself solve the economic/sociological controversy of which set of causes more affected (and still affects) the fertility decline, but, in our view, it paves the way towards a possible solution. Ideally, one should try to independently measure the shift in each of the curves, so as to be able to assess the relative importance of each of the two factors; less ambitiously (and less correctly), but perhaps with more hopes of success, one could try to measure the change in just one of them (the economic one, we would argue), and, by difference, infer something on the characteristics of the other.

This approach, moreover, helps to explain why fertility need not be indefinitely high even in contexts where children are an economic advantage to their parents: it is because, psychologically, too many of them may become a burden, for instance because they impact negatively on their mother's health, or may conflict with social norms¹⁰. On the other hand, fertility need not be nil even in contexts where children are an economic burden: this happens when parents like children, and are therefore prepared to pay for them.

Most importantly, our approach highlights that, even if the main causes of the fertility decline were of a psychological, or sociological nature, the economic lever might still work. Indeed, as Figure 5 shows, for any given curve of psychological benefits (*PB*), reducing costs, i.e. shifting the *EC* curve downwards, reduces costs *and* increases fertility, although the overall effect depends on the inclination of the currently prevailing *PB* curve¹¹.

Later, we will argue that fertility needs to be sustained, and to be brought back not too far from reproduction level. Some scholars think that this requires, among other things, a profound reorganisation of society, including a change in the value system. Up to a limit¹², we tend to agree. But coming from a country where fertility has been extremely low for the past 20 years, we are also concerned of the time dimension. And while changing values is a complex matter, which can bring its fruits only in the long run, to introduce fiscal incentives (or to remove fiscal disincentives) may be done with relative speed.

3. Do (modern) societies need to influence fertility?

We mentioned in the introduction that, for a variety of reasons, several demographers disagree with the idea that governments should (try to) modify the 'natural' level of fertility. The basic question here is whether children are to be considered a totally private, or also a public good, and this is a debate that transcends the boundaries of demography to invest other disciplines, like economy, sociology, etc. - or, more simply, society at large.

If children were strictly a private good, there would indeed be little theoretical support for intervention. But we tend to believe that the reverse is the case: today's children are tomorrow's adults, and all that constitutes the very essence of our societies - from culture to language; from infrastructures to history - will be passed upon them, in a not so remote future. But even if we limited our reflections to the economic plan - less noble, but perhaps of more immediate interest - it would probably suffice to consider that our social security systems are largely based on pay-as-you-go criteria, which require a relatively orderly succession of generations to work smoothly. The main outlays are determined by health care and old-age and survivor pensions: these, in 1997, made up 35% and 45%, respectively, of the social security expenditure in the Eu-15. In both cases, expenditure is very much age-specific, and therefore painfully sensitive to twists in the age structure.¹³ Since social security expenditure reaches 27% of GDP in these countries, is not much lower in

⁹ At point 1 of Figure 5, negative net costs imply positive net benefits.

¹⁰ There are also possible economic reasons, the most important among them being probably liquidity constraint, i.e. a temporary lack of resources, when there are too many young children not yet in productive ages, and borrowing is impossible, or too expensive.

¹¹ Only for perfectly vertical *PB* curves does a policy of cost reduction prove ineffective in stimulating fertility.

¹² But keeping in mind that to try and influence people's preferences is more typical of totalitarian than of liberal states.

¹³ The tendency for age-specific public expenditure to grow is common to all of the developed countries (cf. Auerbach and Lee, 2001). This, together with population ageing, puts government budgets under serious strain, both currently and, even more so, in perspective.

other developed societies, and is everywhere on the rise, this gives, in our view, a formidably good reason for governments to try and keep the age structure under control.

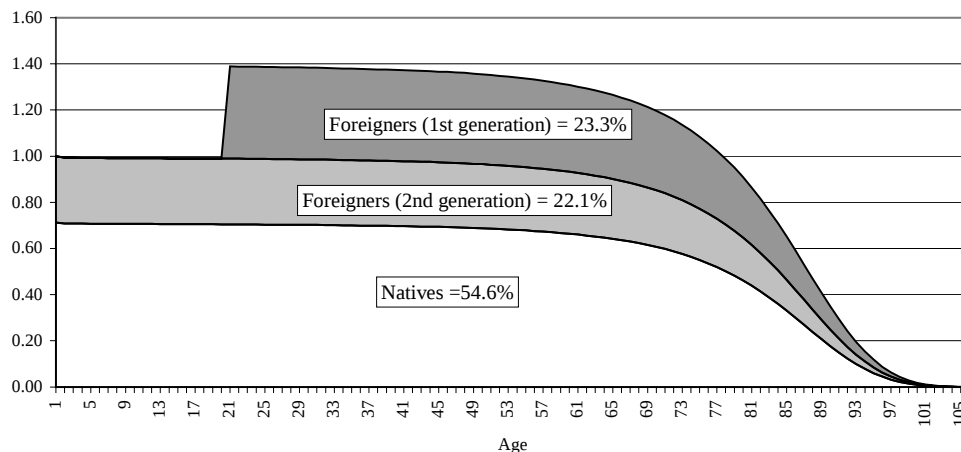
Obviously, fertility is not the only variable that affects the age structure. Mortality, however, is not a candidate for policy action: survival is an end in itself, and all societies do their best to grant their citizens the highest survival chances they can technically and economically achieve.

The only remaining alternative is migration, and indeed immigrants may appear good substitutes for births. This is an old topic (cf., e.g., Lestaege, 1988), a thorough discussion of which would take us too far. Let us just note, in passing, that if (net) immigration took place at exact age 0, immigrants would be indistinguishable from births. If immigration takes place at later ages, immigrants may be even better than births: receiving communities can spare the costs of raising and educating the new generations, and just ‘exploit’ them when they are adults.¹⁴ Economically, the advantage is at its highest if immigrants “disappear” (e.g. get back to their home country) when they get old, but even they spend their old age in the receiving country (i.e. migration is definitive), and accumulate the rights to a full pension, their presence is still a gain (cf. De Santis, 1997). The only problem is that, in this case, the economic advantage is typically low, while the proportion foreigners in the receiving country grows very rapidly - possibly beyond customarily accepted thresholds.¹⁵

This can be seen with the help of some simple simulations: Figure 6, for instance, shows one of the possible results, while some other very simple scenarios are displayed in Table 1 (the notes to which also give some details on the assumption of the simulation).¹⁶

Figure 6

Figure 6. End age structure of a ‘pseudo’-stationary population with immigration at age 20
($e_0=80$; $TFT=1.5$; $i(end)=0.4\%$; cf. notes to Table 1)



¹⁴ Although this vision is overly optimistic: some costs are simply shifted to later ages, when immigrants need to learn the language, and, possibly, some professional skills in the hosting country.

¹⁵ Although nobody knows for sure whether these thresholds exist, and where they are. It is also possible that they adapt to circumstances, for instance growing with the proportion foreigners themselves, so that the notion may prove of little practical utility - outside the political arena.

¹⁶ Notice that the reference to a pseudo-stationary population (i.e. a population where the rate of growth r equals zero, but where migration is not ruled out - although it is assumed to have a fixed age-specific profile) is much less limiting than it appears at first sight. The proportions given in Table 1 are mere tendencies, which may materialise only in the very long run. With a virtually infinite time-span, every population's rate of growth is bound to be (practically) zero: the alternative is population explosion, or disappearance. Although 'in the long run we are all dead', as Keynes once wittingly observed, it is important to bear this term of reference in mind, because it acts as a pivoting point. In other words, a population with fixed mortality ($e_0=80$) which has, *on average*, a $TFR=1.5$ and does not want to disappear (i.e. will have, *on average*, $r=0$ in the very long run), will also have, *on average*, a share of more than 23% of first generation immigrants: some years less, but some years also more than this.

Table 1

Table 1. Proportion indigenous and foreigners (2nd and 1st generation) in a simulated 'pseudo'-stationary population

TFR	Proportions			End rates			
	Indigenous	Foreigners (2nd gen.)	Foreigners (1st gen.)	birth	death	immigration	growth
1.3	41.8%	26.1%	32.1%	0.85%	1.37%	0.52%	0.0%
1.5	54.5%	22.0%	23.4%	0.96%	1.34%	0.38%	0.0%
1.7	68.6%	16.2%	15.2%	1.06%	1.31%	0.25%	0.0%
1.9	84.0%	8.7%	7.3%	1.16%	1.28%	0.12%	0.0%

Source: authors' simulations.

Assumptions:

e(0)=80. Mortality and fertility are the same for everybody (with simulated age-specific curves).

Net immigration takes places exclusively at age 20.

Rates and proportions are calculated on the final population, where $r=0$ (but where immigration is present).

2nd-generation foreigners are the children of a foreign couple born in the hosting country .

Although all of the assumptions of the simulation may be questioned (fixed mortality, immigration taking place only at age 20, etc.) changing them does not alter the heart of the matter: the proportion foreigners tends to reach substantial levels fairly soon. Therefore, immigration is very unlikely to suffice to arrest depopulation and ageing when fertility is lower than, say, 1.8 or 1.7 children per woman, although much depends on the openness of the receiving country. Notice, also, that this scenario assumes that there will always be plenty of foreigners ready to immigrate: although this is probably going to be true for the next 50 years or so, it is questionable whether it will still be the case in some more remote future.

So, in short, our answer is: yes, immigrants are possible substitutes for births, but probably only up to a limit. They allow governments some degree of trade-off (and, therefore, flexibility) between opening frontiers and stimulating fertility, but not too much.

Will fertility 'naturally' get back to reproduction level, or at least close to it? But why should it? Opinion polls show that most people in the developed countries are scarcely aware of the detail and speed of the ageing process, and do not have 'reproduction standards' in their minds, like 2.1 children per woman, for instance. And, in all cases, very few deem it is their duty to 'give children to the country'.

People follow instincts, and react to stimuli. The desire for sex is surely embedded in our genes, but whether, apart from this, there exists a specific 'natural' desire for reproduction in itself is something that it may be difficult to prove.¹⁷ And, with the introduction and development of modern contraceptives (and with abortion as a last resort), sex is virtually immune from the risk of undesired reproduction.

As for stimuli: those of cultural nature which once induced high fertility, like tradition, religion, prejudices against women working outside the house, etc., have been progressively eroded (by major technical and economic progress, we would argue). In their place, subliminal indications, but frequently also explicit commercial messages, which are coherent with the way the economic sphere is currently organised, say that children are a hindrance to enjoying life, which is equated to being free to use one's time at one's own will, travelling around the world, going out to dinner with friends, keeping one's body in good shape, etc. Perhaps the single most important cultural factor that conspires against fertility is the (relatively) new idea of freedom that seems to be emerging: it implies that everything should be easily revertible with as few constraints as possible: jobs as easy to change as cars; partners as pairs of shoes; etc. And children, who cannot be easily disposed of, stand in the way.

¹⁷ Cf. e.g. Robinson (1997). On the other hand, there seems to be a genetic drive towards fertility (not only fecundity, but desire for fertility - cf. Kohler, Rodgers, Christensen, 1999). Besides, even with virtually perfect control over reproduction, even with reference to highly variable measures of period fertility, and even in times of hard stress, no population ever reached 0 - the lowest period total fertility rate ever recorded for large populations being about 0.7-0.8 (e.g. German Democratic Republic, in the early nineties). Some authors would therefore argue that there is a "lower limit" for fertility (e.g. Golini, 1998).

And, economically (or, in other words, in terms of a rational computation of advantages and disadvantages), as we will argue below, children are extremely expensive, and are becoming more and more so. So, in short, it seems to us that, in the developed countries, fertility is destined to remain low, and probably to become lower still, unless something changes.

Among the possible changes, fiscal policies are, in our view the best candidates. As we will discuss in section 5, we believe that economic reasons are prominent among the causes of fertility decline, and that the current disincentives could (and perhaps should) be countered with incentives. But even if economic reasons were only a marginal factor in the process of the fertility decline, with ideational shifts causing most of the change, our approach suggests that economic incentives could still prove effective in raising fertility. In the past, these have induced mostly short-term reactions, so that many observe doubt that they could have a permanent effect, or, at least, that their permanent effect could be significant (cf., e.g. Ermish, 1996; Blanchet and Ekert, 1994).

These lines of reasoning do not appear convincing to us, and, as we will argue below, we tend to believe that they are biased by the fact that pro-natalist measures, which are extremely difficult to translate into a monetary equivalent (Gauthier and Hatzius, 1997) are typically more than counterbalanced by other economic and societal changes which take place more or less at the same time, and which make children more, rather than less, expensive. But, if workers can be found for jobs which are unpleasant in themselves, provided the pay is sufficiently attractive, why couldn't individuals be recruited to act as parents - arguably a job with many more fringe benefits than can be customarily be found on the market?

We are not contending that societies will have to go that far:¹⁸ we are merely observing that there is no theoretical reason why economic incentives should not work. They may not be the best, or most effective way of achieving the desired result, but they are surely part of the package that governments should be prepared to use to sustain fertility. A prominent part, we dare say.

4. A few remarks on the sociological interpretation of the fertility decline

Let us get back to our schematic representation of Figures 4 and 5. We argued before that two sets of motives lie behind reproduction decisions: economic and psychological (the latter, as mentioned, including also the sociological dimension). But we admit that to distinguish between the two is not always straightforward. Economists generally take preferences as fixed, and try to show why, given constraints, certain choices are preferable to others: because they maximise utility. But the assumption of fixed preferences is probably untenable in the medium-long run, which is what matters in the demographic domain, including fertility.¹⁹ And if preferences vary because collective values change, or because old-fashioned tradition and religion crumble under the impulse of modernisation, the distinction between the sociological and the economic approach becomes much more difficult to draw, both theoretically and empirically.

But this should not prevent us from trying to answer the question of what are the 'true' causes of the fertility decline in developed societies. Now, the socio-psychological interpretation relies very much on measures of desired, or wanted, or intended fertility. The purpose is to show that desires and aspirations (preferences, as we called them before) do change in the course of time. The idea is ingenious, and the results sometimes appealing. Unfortunately, they also suffer from a few shortcomings.

For instance, let us consider the ultimately expected family size (EFS). Is it a good index of the 'demand' for children? We suspect that it is not: not only is it influenced by what has already happened, but also by stereotypes, and particularly by the two-child norm which generally prevails in our times, and which does seem to affect the answers of many of the surveyed individuals, typically, preferring a boy and a girl. This is probably why EFS very rarely falls below 2, is very uniform across countries, and varies relatively little between cohorts (whose members are interviewed in the same calendar year) or between socio-economic groups. Table 2 provides an example in this sense. It reports the expected family size (EFS) emerging from the 13 European Fertility and Family Surveys (FFSs) of the late eighties/early nineties, which vary surprisingly

¹⁸ Which, incidentally, could create, beyond costs (Demeny, 1986), several other problems: for instance of child quality (Cigno, 1991), or of governmental control on the characteristics of the new generations, for which the government is paying (Davis, 1937).

¹⁹ Obviously, this is particularly evident when major, sudden changes occur in the political or economic sphere, like in the countries of eastern Europe in the early nineties, for instance.

little, both across countries and across age groups. In the prime reproductive ages, only in one case, out of the tabulated 39 (Polish women aged 20-24 in 1991) does EFS fall below 2.

Table 2

Table 2. Ultimately expected number of children and cohort fertility in selected developed countries

	Year of survey	Age class of women							Cohort TFR		
		15-19	20-24	25-29	30-34	35-39	40-44	45-49	1955	1960	1965
		<i>Ultimately expected number of children (a)</i>							<i>Fertility (b)</i>		
AUSTRIA	1995/96		2.0	2.0	2.0	2.0	2.7	2.4	1.8	1.7	1.6
CANADA	1995	2.1	2.3	2.3	2.1	2.1	2.0	2.0	1.7	1.8	1.7
FINLAND	1989/90			2.3	2.2	2.1			1.9	2.0	1.9
FRANCE	1994		2.1	2.3	2.3	2.4	2.3	2.2	2.1	2.1	2.0
HUNGARY	1992/93	2.2	2.1	2.1	2.1	2.1	2.0		1.9	2.0	2.0
ITALY	1995/96			2.1					1.8	1.7	1.5
LATVIA	1995	2.2	2.1	2.2	2.3	2.1	2.0	2.0	1.9	1.7	1.5
LITHUANIA	1994/95	1.9	2.0	2.1	2.1	2.2	1.9	1.9	2.0	1.9	1.7
NORWAY	1988/89	2.5	2.5	2.4	2.2	2.2	2.3		2.1	2.1	2.1
NETHERLANDS	1993	2.3	2.3	2.2	2.1	2.0	2.0		1.9	1.9	1.8
POLAND	1991	2.0	1.7	2.1	2.3	2.2	2.3	2.3	2.2	2.2	2.0
SLOVENIA	1994/95	2.1	2.3	2.3	2.3	2.3	2.2	2.2	2.0	1.9	1.8
SWEDEN	1992/93		2.4	2.6	2.5	2.3	2.2		2.0	2.0	2.0
				2.2						1.9	1.8

Source: a) FFS, reported by van de Kaa (1998)

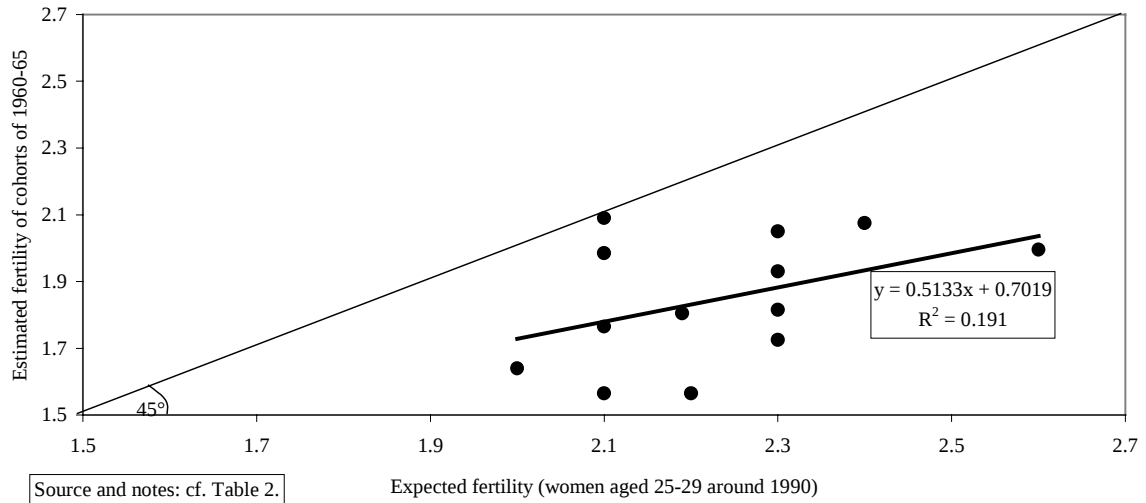
b) Sardon, 2000 (except for Latvia, unavailable, and estimated 0.1/0.2 lower than Lettonia - same as TPFR; Data for Italy in 1965 come from the Council of Europe. Canada: authors' estimates.

Notes. TFR for Finland, France, the Netherlands: 1964 instead of 1965.

Besides being scarcely variable, measures of EFS appear to be of little help in forecasting fertility. Figure 7, the data for which derive from table 2, compares EFS for the ages 25-29 (these are cohorts born approximately between 1960 and 1970, since the FFS surveys have been taken between 1989 and 1996) and estimated TFR of the cohorts 1960/5. Admittedly, these are just estimates, and completed fertility may turn out to be slightly different, so that the following considerations are subject to verification. Now, EFS exceeds estimated TFR by an average of 0.38 points representing more than 20% of the average of the estimated TFR's (1.80), and despite the fact that these women had very likely already expressed about 50% of their overall fertility. Similar results emerge if one uses alternative measure, like DFS (desired) or IFS (ideal), instead of EFS (expected family size). Besides, the correlation between the two indicators of fertility (estimated vs. expected) is rather weak (R^2 is less than 0.2), thus casting further doubts that expectations represent with good approximation the real 'demand' for children. And expectations - much more than DFS or IFS - ought to get closer to cohort TFR as women age, and move well into their childbearing ages.

Figure 7

Figure 7. Expected and estimated number of children



This is not an exception: in the Eurobarometer survey of 1989, for instance, a comparatively similar measure, the *desired* family size (DFS) ranged between 2 and 2.3 in 8 cases out of 12, and only in one case did it fall below 2.

Somewhat more variation (between 2.2 and 3) can be found for the *ideal* family size (IFS) of the 19 developed countries of the World Value Survey (Table 3). Also in this example, however, in 14 cases out of 19, IFS remains in the narrow range 2.2-2.6. Similarly homogeneous are the within-country preferences of women holding materialist/post-materialist values, or (not shown in the table) with different degrees of education. And, again, the correlation between IFS and cohort fertility proves negligible.

Table 3

Table 3. Reported ideal number of children in selected developed countries around 1990 (women aged 25-34 years, of materialistic and post-materialistic orientation)

	Children considered ideal, 1990			Cohort TFR 1960
	materialist	post-mat	average	
AUSTRIA	2.35	2.33	2.34	1.69
BELARUS	2.41	2.56	2.49	1.90
BELGIUM	2.46	2.68	2.57	1.84
BULGARIA	2.14	2.41	2.28	1.95
CANADA	2.58	2.63	2.61	1.75
CZECH REP	2.09	2.19	2.14	2.02
DENMARK	2.43	2.41	2.42	1.89
FINLAND	2.83	2.52	2.68	1.95
FRANCE	2.86	2.76	2.81	2.10
GERMANY W	1.97	2.50	2.24	1.59
HUNGARY	2.37	2.25	2.31	2.02
ICELAND	2.57	2.93	2.75	1.99
IRELAND	2.89	3.17	3.03	2.41
ITALY	2.40	2.53	2.47	1.65
LITHUANIA	2.64	2.52	2.58	1.85
NETHERLANDS	2.75	2.62	2.69	1.85
NORWAY	2.14	2.20	2.17	2.09
PORTUGAL	2.11	2.39	2.25	1.90
RUSSIA	2.56	2.43	2.50	2.02
SLOVENIA	2.21	2.23	2.22	1.88
SPAIN	2.19	2.35	2.27	1.75
SWEDEN	2.73	2.81	2.77	2.04
SWITZERLAND	2.42	2.68	2.55	1.77
UNITED KINGDOM	2.40	2.68	2.54	1.96
USA	2.52	2.55	2.54	2.02
Average	2.44	2.53	2.49	1.92
- Mediterranean Europe	2.23	2.42	2.33	1.77
- France + Scandinavian countries	2.59	2.61	2.60	2.01

Source: World Value Survey, 1990, as reported by van de Kaa (1998).

It is true that differential fertility has fallen considerably in the last decades, but variability across populations, age classes, and socio-economic groups appears to be considerably larger than variability of reported preferences. Relative homogeneity of preferences may, of course, reflect a true homogeneity of ideals, but it may also signal the inadequacy of these indicators to measure ideals. And, indeed, their validity has been often questioned, basically along that we have just discussed (cf., e.g. Shoenmaeckers and Lodewijckx, 1997).

But, using our scheme of section 1 (Figures 4 and 5, in particular) we would like to raise a more radical objection to the use of these measures. We contend that questions like 'How many (more) children would you like to have?', or 'What is your ideal number of children?' so common in fertility surveys, may make little sense if they are not linked to the concept of *costs*, either economic (as we would prefer), or psychological. In a sense, it would be much the same as asking 'How many (more) cars would you like to have?' or 'How many rooms make up your ideal house?', which very few market analysts would find useful. Indeed, there must be some implicit assumption, or scenario, to give these questions a sense. For instance: 'How many (more)

children would you have, if you didn't have to pay for them?, or '..., if you were extraordinarily rich, and could live without working?'. Unfortunately, this underlying assumption is rarely made explicit, and we think that this gives an extra, theoretical reason to look at these measures with suspicion: answers may reflect mere stereotypes, and not constitute any reliable guide of people's true preferences or intentions for the future

In theory, some progress could be achieved by trying to link these answers to explicit counterfactuals: 'How many (more) children would you bear, if you got paid an amount x for each of them?'; or, 'if you could easily leave them in good (and cheap) child-care centres during your working hours?'. We suspect that, even in this case, extreme caution would be needed in interpreting the responses, because one thing is to give an immediate answer to a purely hypothetical (and indeed highly complex) situation; another, and totally different, thing is to directly experience that situation, and react to it in practice.

But, of course, since no imagined counterfactual ever turned true (not to our knowledge, at least), the possibility of usefully comparing between stated and actual behaviour remains a matter of purely theoretical speculation.

5. Economics

In general terms, everybody agrees that the economic dimension is one of the causes of the fertility decline. Recently, however, the economic sphere seems to have implicitly been considered less and less important by several demographers. This may depend, in part, on the increased emphasis that demographers put in the analysis of micro data, where individual peculiarities can easily emerge, but where macro changes, affecting society as a whole, may go unnoticed. And several of the variables that, in our view, have had an impact on the fertility decline act at least as much at the macro as at the micro level.

We will not give a complete list of relevant variables, or precise measures of each of them. But we think it is worthwhile to stop and consider at least some of them: hopefully, in a not so distant future, somebody will be able to complete the picture that we are just trying to sketch here.

5.1 Monetary cost of children: opportunity cost.

Children, as everybody knows, cost in two main senses: they cause out-of-pocket expenditures, and they may keep their parents, especially their mother, out of work, thus creating opportunity costs. Let us concentrate on these.

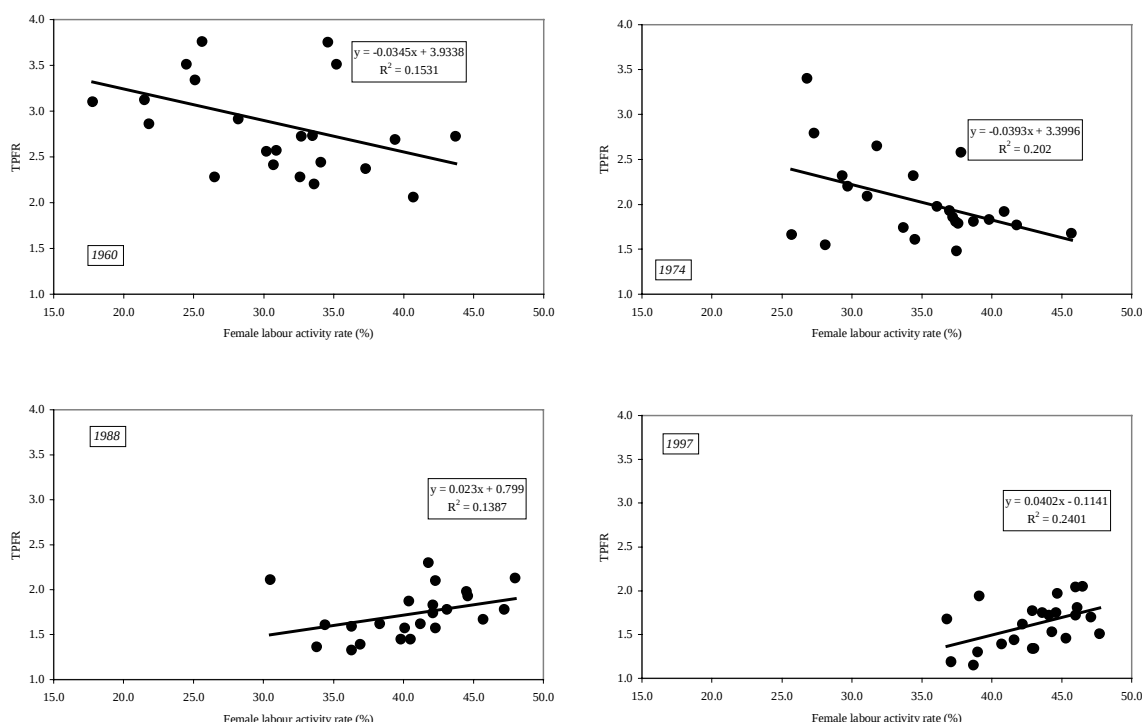
Theoretically, one could think of three extreme situations. In a 'complete segregation environment', no woman ever works for the market, regardless of her fertility history. Here, opportunity costs are, by definition, nil: no labour earning is lost because of fertility. The opposite extreme is 'complete integration': an ideal world where all women are perfectly free to work for the market, and maternity leaves, working hours and child care services are all so well organised that having children does not interfere at all with professional life. Here, once again, opportunity costs are nil.

Between these two extreme cases there is another extreme one: 'complete dichotomization'. In their early teens, women are asked to decide whether they want children or not, even in some remote future. If they opt for fertility, they are out of the labour market; if they renounce to it, they are in, on an equal footing with men. In this hypothetical situation, opportunity costs are at their highest: 100% of a woman's lifetime salary, which, since women earn as much as men, means also 100% of a salary *tout court*.

Although reality never conform to models - especially when these are very extreme, as in our case - it does not seem too far from reality to think of the evolution of developed societies as a movement from somewhere near complete segregation to somewhere not too far from complete dichotomization, with, possibly, a further progress towards complete integration - although the latter passage has started to take place only recently in several developed countries, and slowly. An indication in this sense seems to come from representations like those in Figure 8, with dichotomization prevailing in the developed countries until about 1974 (as testified by the negative correlation with female employment rate), and some kind of integration emerging later, in 1988, and, more so, in 1997.

Figure 7

Figure 8. Female labour activity rates and total period fertility rate (TPFR) in selected developed countries, 1960-97



Source: Oecd and Eurostat.

If this representation is correct, we should expect opportunity costs to grow over time, reach a maximum, and then, perhaps, go down again, as societies evolve toward more parent-friendly arrangements. Unfortunately, measuring opportunity costs is a complex task, which requires a lot of data, and several assumptions.²⁰ It is not only a matter of measuring how much a non-working mother is not earning now: it is also a matter of estimating how much she will lose in the future, in terms of lower earnings (due to less experience) and lower pension benefits (due to discontinued careers). Such calculations cannot be done for all possible cases, only for selected types of women, who are not always representative, either in static or dynamic terms. And the results are subject to sudden changes: imagine the introduction of a measure which grants pension rights to childbearing women: since, as mentioned, all future earnings enter the calculation of opportunity costs, childbearing becomes all of a sudden less expensive in comparative terms - although to measure the change with any degree of precision one needs to go into the details of the legislation.

But although great uncertainties surround these estimates, all indications we have say that opportunity costs are extremely high: typically something like 50% of a woman's lifetime potential earnings is foregone if she has children. Moreover, the few dynamic and comparative indications we have suggest that opportunity costs decrease, relative to a woman's average earnings, when societies evolve, and that, within a given society, they are relatively lower for the highest sector of the population, because well educated mothers are less likely to remain out of the labour market, and have more frequent recourse to child care services, either public or private (Dankmeyer, 1996); Davies, Joshi and Peronaci, 2000).

The order of magnitude of these estimates is such that it dwarfs the economic impact of most of the measures that are sometimes put forth to "alleviate the burden of childbearing" - surely of those that exist in Italy, or, more generally in the countries of Mediterranean Europe. Therefore, it does not come as a surprise, to us, if analysts frequently find a scarce reaction of fertility levels to the introduction of some relatively minor

²⁰ Unobserved heterogeneity is but one example: is a non-working mother losing money (because she would have worked, if she hadn't had the child) or is she not (because she wouldn't have worked, anyhow)? And, in case, just how much money is she losing by being out of the labour market, or, in other words: how much could she earn?

pro-natalist measures, like extensions of parental leave, of the introduction of a few months of pension rights for each additional child.

5.2 Monetary cost of children: direct expenses

Families may save some of their own time by purchasing services on the market. When it comes to child care, this implies that they may trade opportunity with direct costs. Therefore, a partial estimate of costs could be biased (even in terms of ranking), and it would be preferable to include in the analysis all kinds of cost. However, this is only rarely done (see, e.g., Gustafsson and Kjulin, 1994) because of major practical and theoretical difficulties. But, without expecting too much in terms of precision, and just to get a general idea, how high may direct costs of child-rearing currently be, in the developed world?

Here, again, estimates are controversial, both on the theoretical and on the empirical plan. While some scholars prefer to estimate the so-called direct (or out-of-pocket) expenses, others object that this is empirically impossible, and theoretically incorrect, because of collective goods²¹, threshold effects,²² diversion of expenditure (within a generally fixed overall budget constraint),²³ etc. The alternative is to estimate standards of living, with the use of proper indicators, and to infer by how much the presence of children reduces a family's standard of living (or, more precisely, how much the family should be given - almost as a sort of 'compensation' - to be brought back to her previous standard of living - this is sometimes also called the 'theoretical' cost of children).²⁴ This approach too, is not exempt from theoretical weaknesses, the most important of which is: why 'compensate' a family for her free and conscious choice of having children, which,

²¹ Goods which can be used by more people, without (or, at least, with less-than-proportional) cost increase.

²² A collective good may work for up to $n-1$ users (think of a 4-seat car, for instance), but when the n -th arrives, a new collective good needs to be purchased. It is the n -th member that causes the outlay, but data limitation, typically cross-sectional, normally prevents the identification of the threshold and of the costs.

²³ Because of the presence of children, parent may change their consumption habits: for instance, spending less money on cinema, but more on home video. How should a correct calculation of costs account for this?

²⁴ The most general formula linking the two is measures:

$$\alpha) D = \frac{T}{1+T} (1+y), \text{ where } D \text{ is the direct cost of the child, } T \text{ its theoretical cost, and}$$

$$\beta) y = \frac{H(1+h) + W(1+w)}{H+W} \text{ is the post-child variation in the couple's income, which, in turn, depends on } H$$

and W , the earnings of husband and wife, respectively, and on h and w , which stand for the *variation* that the presence of the child causes in the earnings of husband and wife, respectively.

The simplest case is $h=w=y=0$: the presence of the child does not cause any variation in incomes. In this case, $D=T/(1+T)$. If T (theoretical cost) is somewhere around 25% (see further in the text), D amounts to 20%. In other word, parent who earned and still earn 100, now spend 80 for themselves and 20 for the child (but readers will remark that this outlay of money does not fully compensate the parents, who now have only 80% of the previous resources at their disposal).

When incomes change, however, the picture is more complicate. In a typical couple, the wife may earn about 80% as much as the husband (US Council of Economic Advisers, 2000). If the birth of the child brings about a 50% reduction in the wife's income (see previous section) while the husband's income increases by, say 20%, because he typically works more for the market after the baby is born, and because he may receive some support through the state, eq. [β] tells us that the couple's income decreases by about 11%. Overall, therefore, $y=-11\%$ (lower income), $T=25\%$ (theoretical cost) and $D=18\%$ (direct cost). Notice, however, that the couple used to earn and spend 180 (100 he; 80 she); they now earn 160 (120 he, 40 she), of which 32 go to the child ($32/180=18\%$). Therefore, the parents must get along with $160-32 = 128$, which represents a mere 71% of their previous income (180). Therefore, with exactly the same data, it would not be incorrect to say that the child costs 29%, which is substantially higher than the 18% most observers would calculate.

Notice that all of these calculations are base on the so called Base-Independence assumption, i.e. that theoretical costs do not depend on how rich the family is. This assumption can hold for relatively small variations, but closer inspection inevitably reveals that, for richer families, theoretical costs are lower in proportion, and higher in absolute terms.

by definition, cannot worsen her welfare, and very reasonably increases it? Besides, this approach has a variety of empirical applications, unfortunately producing widely diverging results. Moreover, for these and for other reasons,²⁵ it appears virtually impossible to trace an evolution of the cost of children over time.

But what little indications we have (selecting those which most persuade us on a theoretical plan) suggest that children are extremely expensive also in terms of direct (or theoretical) expenses: somewhere around 25% of a couple's budget, for each unit of time.²⁶ In Italy, for instance, in 1998, an average couple used to spend about 4 million lire (2,000 Euros) per month. An average child would therefore theoretically cost about 500 Euros per month, or 6,000 per year. Without discounting, and imagining that a child stays with his or her family for 20 years (but cf. the next section), this makes 120,000 Euros. Again, this amount, which adds to the opportunity cost discussed in section 5.1 (cf. again footnote 21), is about two orders of magnitude higher than any child benefit measure we know of, either existing²⁷ or proposed in the literature. And, again, we are not too surprised that these timid measures do not impact very significantly on fertility levels and trends.

5.3 Monetary cost of children: more years of economic dependence

For how long do children remain with, and live at the expense of, their families? The survey data we have suggest that leaving one's parental house takes place later and later in recent years: up to the age of thirty for males, and not much earlier for females. This appears to be very late by historical standards, and would probably already suffice to explain a good part of the fertility decline: as an immediate cause, because the young postpone marriage and parenthood,²⁸ but also, as a more remote cause, because perspective parents perceive that children will be an economic burden for possibly 30 years (at perhaps as much as 25% of their budget, per year - cf. section 5.2).

It could be argued that not all those who live with their parents are an economic burden to them: some children work and contribute to the expenses of the house, or, at least, cover their own needs, and do not need financial support. Is it true? The recent surveys we are aware of say that this is rarely the case, and that it is more frequent for parents to keep on supporting their grown-up children, not only as long as they co-reside, but also after they have left. This may take various forms, lumps sums for special occasions being the most frequent,²⁹ but the essential point is that for much more years than in the past, probably well even after they have started living on their own, parents support their children, instead of receiving support from them.

But let us consider an indicator which, in our view, has been overlooked in the demographic literature on the causes of the fertility decline: the percentage of young people in the labour market. This can be considered as an indirect measure of the degree of the financial autonomy of the young, and also of their possibility of financially helping their parents.

Table 4 and Figure 8³⁰ give a rough idea of what has happened in Italy (and, very likely, also in most other industrialised countries) in the course of the 20th century. From 1901 to 1991 this proportion has kept declining constantly, with major discontinuities due to World War II, and the 1963 reform, raising the minimum working age from 10 to 14 years. Overall, in less than a century, the proportion of time they young spend working has more than halved, from 40 to 20%, and this variation very likely underestimates the true

²⁵ In all applications of all methods, what one needs is access to micro data of a detailed consumer survey, but these surveys have a relatively short tradition, especially in terms of release of micro data. Besides, they change frequently over time. Finally, prices and incomes are never constant, but the effect of these changes on the cost of children is not well understood, yet.

²⁶ E.g. Ekert-Jaffé (1994); De Santis and Maltagliati (2000, 2001).

²⁷ Although it should be mentioned that state support is generally higher for low-income families.

²⁸ For Italy, cf., e.g., Billari and Ongaro (1999).

²⁹ E.g. purchase of a new house (or some cases directly passing a family-owned house to the child, as a marriage gift, for instance), or of some expensive item. Some economists include bequests among costs.

³⁰ Let sL and sL_x be the proportion of time individuals of sex s spend working, overall and at age x , respectively. Figure 8 traces the value of $L = \frac{\sum_s \sum_x {}^sL_x}{50}$, the calculation extending over the first 25 years of life for the two sexes. For the sake of simplicity, Figure 8 ignores mortality (up to age 24), and implicitly assumes that there are as many males as females in the 0-24 age range.

decline in their financial autonomy, because unemployment, and notably youth unemployment,³¹ has skyrocketed. For instance, according to 1991 census data, as many as 45% of the young aged 15-24 and active on the labour market were unemployed, more than twice as much as in pre-war times.

Table 4

Table 4. Activity rates of young people in Italy, 1901-1991

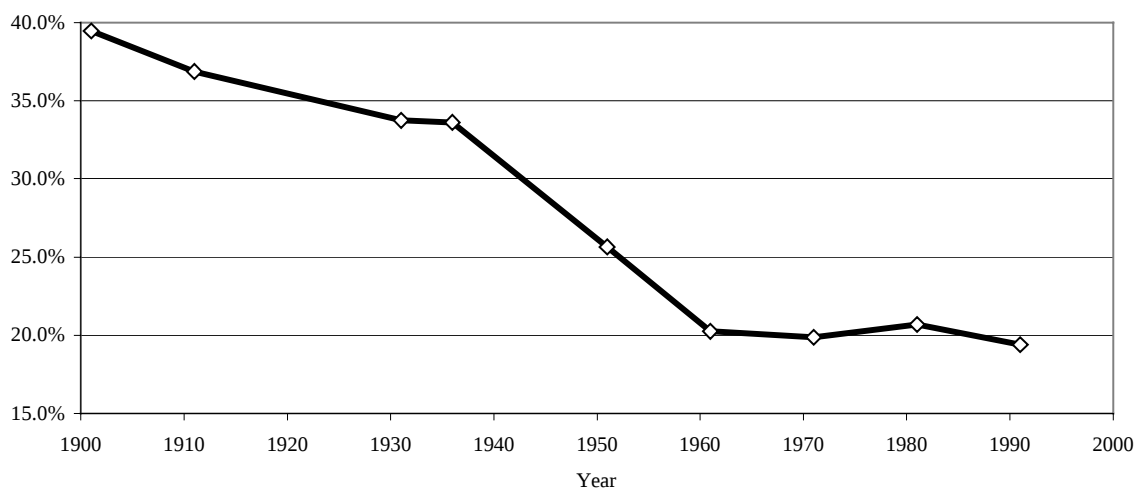
	Males		Females	
	Age class		Age class	
	10-14	15-24	10-14	15-24
1901	638	894	409	556
1911	530	902	316	518
1931	333	908	223	502
1936	275	966	184	485
1951	231	755	121	352
1961		660		353
1971		614		379
1981		573		462
1991		527		442

Source: Up to 1961, Livi Bacci, 1969.
Later, Population census, various years.

Interpolated data

Figure 9

Figure 9. Proportion of time spent actively on the labour market (0-24 years)



Admittedly, census data may not be particularly good with regard to employment and work status: some productive activities may go unreported (e.g. child and youth labour for the family), while others may be systematically misclassified (e.g. women may be considered housewives almost by default - cf. Joshi, 1998). But very likely, these distortions were more important in the past than nowadays, so that, if anything, they tend to hide the amount of the change. An indirect confirmation comes from the analysis of educational levels, which have grown dramatically among the young: on average, each one of those aged 25-29 in 1991 had spent

³¹ Especially self-declared, and practically unchecked, youth unemployment resulting from census data.

10 full years at school, whereas this activity had barely absorbed 2 years of life (out of the first 27.5) for the same age group in 1901 (table 5).

Table 5

Table 5. Education level of people aged 25-29 in Italy, 1901-1991

	1901	1991	Years at school
PhD	-	2 242	21
University	-	251 127	18
High school	-	1 792 207	13
Junior high school	-	2 114 189	8
Elementary (5 yrs)		405 494	5
Elementary (3 yrs) (a)	1 704 958	52 964	3
Illiterate	734 059	26 322	0
<i>Total</i>	<i>2 439 017</i>	<i>4 644 545</i>	

Average number of years spent at school

2.1 10.1

a) or (in 1991) literate, but with no formal title.

Source: Population census, various years.

In short, these data confirm, and somehow measure, what everybody knows: in the developed countries, the young work less and less, and study more and more, as time goes by. And, in view of the comparatively small part of the public budget devoted to children (see section 5.4), families are those who must pay most of the costs of these radical changes. And the figures indicate, albeit grossly, that the financial burden of bearing children has enormously increased for an average family in the course of the 20th century, in Italy and, very likely, in all of the developed countries.

5.4 Public pension provision, and other public transfers

It has often been claimed that one of the reasons why parents have children is that they want to secure a non-miserable old-age for themselves. This is especially true for the developing countries (Cain, 1985; Jensen, 1990), but it has been argued with reference to modern economies, too. Lee (1994, 2000) argues that, in spite of this, the main direction of the transfer of resources may have been downwards in pre-transition times: this means, that, on average, parents spent on their children more than they received from them. But Lee himself admits that this does not disprove the old-age security motive: if there are no alternative sources of income past a given age, people may well decide to 'invest at a loss', i.e. to pay, say, 100 when they are adults, in order to receive only, say, 80 when they are old. They lose some money, but the alternative is to live better in one's adulthood, and to starve in one's old age - and the apparent irrationality of the choice immediately vanishes.

Now, the whole argument revolves around whether there are alternatives to childbearing to secure one's old age. Before the introduction of modern public pension systems (and without any reliable private annuity market) the answer was very likely negative. But since the end of the 19th century, for some countries (starting from Germany), and for some categories of worker (civil servants, military personnel, etc.) public pension systems came into being, and gradually increased, both extensively (coverage) and intensively (average amount of pension benefit). Table 6 shows how things stood in 1997 in the European Union: old age was the most important item of social security expenditure in most of the states, and very relevant in all of them. Its weight on GDP ranged from a low of 4% in Ireland (but with relatively few elderly, and emphasis on private pension plans), to a high of 16% in Italy, with an unweighted average of 12%.³²

³² Considering only public pension provisions may make sense in those countries (especially of continental Europe) where private annuity markets are scarcely developed. This appears to be more and more an exception, though, and already today, several countries rely very heavily on the private sector for pension

Table 6

Table 6 - Social security expenditure in the European Union, in 1997 (%).

	Social security expenditure / GDP	Average annual variation 1990-97	Composition of social security expenditure				Total
			Sickness / health care / disability	Old age Survivors	Family Children	Unemployment Housing / other	
Belgium	26.8	0.8	32.7	43.0	8.8	15.4	100
Denmark	30.6	0.8	28.9	39.4	12.6	19.0	100
Germany	28.8	2.4	36.1	41.9	10.1	12.0	100
Greece	22.7	0.1	31.3	51.4	8.2	9.1	100
Spain	20.9	1.0	36.5	46.2	2.0	15.2	100
France	29.3	1.5	34.0	43.6	10.0	12.4	100
Ireland	16.8	-1.1	40.7	25.0	13.2	21.2	100
Italy	24.9	1.2	29.5	65.1	3.5	1.8	100
Luxembourg	23.9	1.3	38.0	43.5	13.2	5.2	100
Netherlands	28.9	-1.0	45.9	37.7	3.7	12.7	100
Austria	27.9	1.1	34.1	48.4	10.5	6.9	100
Portugal	19.8	5.4	46.0	42.8	5.3	5.9	100
Finland	29.1	2.4	36.6	33.9	12.6	17.0	100
Sweden	33.1	0.3	34.2	39.6	10.8	15.4	100
UK	25.9	2.2	38.3	40.7	9.1	11.8	100
Eur-15	27.1	1.5	35.3	45.0	8.4	11.2	100

Source: Istat, 2000, p. 116.

It is difficult to say whether pension provision are adequate, and each country has its own story to tell. In Italy, for instance, average pensions are relatively low (about 500 Euros per month), but they are extremely numerous (almost 22 million in 1997; Istat, 1998), because, until recently, it was relatively common for an elderly individual to benefit from more than one pension treatment, and because disability pensions were used essentially as an alternative first to unemployment benefits and later to early retirement (Prinz, 2001). Besides, pension benefits in themselves do not tell the whole story: public health expenditures, for instance, are basically directed towards the elderly, and table 6 shows that they are another major expenditure category in Europe (and, more generally, in all of the developed countries). Also housing assistance, may be partly used to favour the elderly. It is not by chance, then, that all recent measures on the diffusion and intensity of poverty tell us that the elderly - traditionally highly exposed to this scourge - are not poorer than the rest of society, in our days, and in several instances (including, notably, those who retired only recently), they are even better off.

The link between poverty in old age and previous fertility has not vanished, yet, but is getting thinner and thinner: pension provisions, in Italy and in most of the other industrialised countries, depend very little on past fertility, or not at all.³³ In short: living conditions in one's old age have less and less to do with past fertility.

To the contrary, public expenditure favouring the young is becoming progressively less important, in relative terms. The alarm was first ringed by Preston (1984), and later confirmed by what has come to be known as 'generational accounting' (Auerbach, Gokhale, and Kotlikoff, 1994). Their general profile is of the kind depicted in Figure 9: the young and the old receive more in benefits and services than they pay in taxes; for the adults, the reverse is true. While the general profile is obvious, and common to all countries and epochs, the relative levels of the various parts of the curves may vary substantially, and may make a substantial difference. It emerges, in particular, that, on average, the elderly receive much more than young do, not only in Italy, but in all of the countries covered by a recent, and very broad study of this kind (European Economy, 1999). Notice that, in Italy at least, and, more generally, in all of the Mediterranean Europe, most of the transfers accruing towards the young go through public education: this is surely a very important item, and we are not downplaying it. But the implication is that other transfers towards families with children, including

provisions. Obviously, every serious intercountry comparison on the connections between fertility and old-age security should take this element into account.

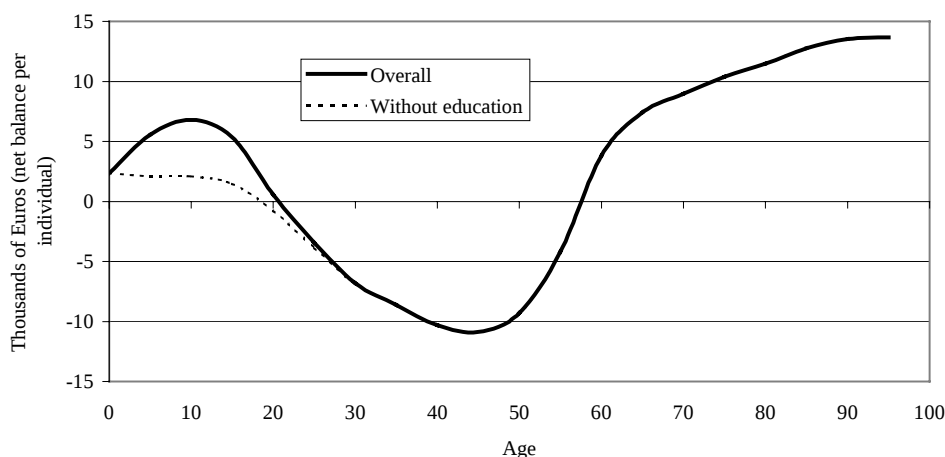
³³ In some cases, means-testing even discriminates against those who did have children and who are, therefore, excluded from special forms of assistance, like admittance to nursing homes.

direct transfers, are very low: basically free health assistance (which is available to anybody, anyway) and some child benefits to very poor families.

Figure 9

(Source: Cardarelli and Sartor, 2000)

Figure 9. Generational accounting in Italy, 1998
(net balance benefits-taxes, per year, per individual; thousands of Euros)



Two further observations are in order: first, although no reliable time series of these studies is available, as yet, the general perception is that, at least until recently, the profile of the curve has kept changing, with progressively fewer resources available for the young, and more for the elderly; second; generational accounts are very often unbalanced:³⁴ this implies that, in the future, either some expenditure will have to be cut, or some tax raised, or both. Depending on the delay of the adjustments, the elderly may not be there to 'pay the bill', but the adults and the young will. It is not clear just how much people realise the implications of imbalances in generational accounting, but according to some interpretations they do, and discount future welfare decreases: in short, families realise, at least in part, that they are living 'beyond their means', and may prefer to start saving now, as a cushion against possible future worsening of their living standards. This, in turn, may conflict with fertility decisions.

6. Gender issues

Gender issues are more and more frequently cited as an important element in this field of study: conflict of roles, marital instability, and scarce support in homework on part of the men are but a few examples of the allegedly underlying causes of low fertility. We share the general view that these issues are important, but, once again, we would like to stress particularly the economic side of the story.

We basically contend that women (correctly) perceive that their economic security is at risk, and that marriage can no longer guarantee it, because of the increased likelihood of divorce.³⁵ In this respect, cohabitation is even worse, and is therefore a poor substitute in terms of financial security. In short, women

³⁴ Although it is just fair to add that public budgets are much more under control now than they used to be up to some ten years ago.

³⁵ A complete analysis would need to consider also what happens after divorce of the economic exchanges between former spouses: do former husbands have to contribute to their former wives? How much and for how long? This study is exceedingly difficult, because several variables interplay (presence of small children, sickness, employment/unemployment status of both partners, etc.) but the general tendency seems to be that of severing all bonds between former spouses as soon as possible - which also implies according less and less protection to those who do not work for the market (for Italy, cf. Maggioni, 1997). Also, an increasing proportion of partners seem to celebrate their marriage knowing that this could be but a temporary experience, and therefore, in some ways, preparing for a possible divorce from the very beginning (Barbagli, 1997).

need to work: the more so, the higher the risk of marital (or couple) dissolution: this is what one would expect theoretically, and what empirical evidence suggests (Tanda, 1994).

And, indeed, women do work more and more for the market³⁶: the well educated, unmarried and/or childless work more than the others, but trends are on the increase for all groups. At the same time, women's average labour earnings are approaching those of men, currently averaging about 80%. This suggests that, unless major changes take place in the organisation of society, opportunity costs (cf. section 5.1) tend to increase dramatically.

But this description also gives a clue to understand the apparent paradox that several commentators have noted in recent times (and partly emerging in Figure 8, years 1988 and 1997): fertility is lower in southern European countries, despite their relatively low levels of marital instability and the limited participation of women in their labour market. Apparently, most of the advantage of northern Europe comes from out-of-wedlock fertility (mostly deriving from cohabitation): therefore, some observers argue, it is the cultural norms against 'illegitimate' fertility that operate, and prevent fertility to reach the 1.6-1.8 mark of the rest of Europe.

Our interpretation is slightly different: women in these countries feel that they can no longer derive sufficient economic protection from marriage, or cohabitation. Therefore, they need to work, but since these changes have taken place in a relatively short lapse of time, these countries are scarcely prepared to reconcile woman's work and fertility, and, when it comes to choosing between the two, women prefer to try and secure a sound economic basis first, and postpone, or give up fertility.

In northern European countries, with a longer tradition of women having economic rights of their own (not deriving exclusively from their husbands) because of their traditionally greater work participation, and, consequently, with a better organisation of services which help to reconcile motherhood and working careers, the impact of the forces we have described is less dramatic, although by no means negligible.

Incidentally, we would like to mention here that the role of formal marital arrangements as an independent variable (to understand fertility, for instance) may have been overemphasised in some cases: at a first look, a marriage is a marriage, today or a hundred years ago. But with the introduction of divorce, with the increase in the likelihood of a divorce, and with less and less economic support granted to the former partner in case of divorce, the very meaning of marriage may change in the course of time: from a fortress granting life-long protection and security (but also limiting freedom considerably) it becomes but a harbour, ensuring a temporary and relative calm, but from which one can be forced, or freely decide, to leave. In this sense, the economic differences between marriage and cohabitation become thinner and thinner, and it does not come as a surprise that so do differences in separation risks, labour market participation and fertility behaviour of married and cohabiting women.

7. Conclusions

Our main conclusion is that fertility might well persist being low in the developed countries, and might even decrease further. Of this we are not sure: we are simply contending that we cannot find any absolutely valid measure of the 'desire for children': if this is low enough, or if costs grow enough, or if people actually appreciate certain facets of life (like sexual pleasure, or economic security, or company) that were once inextricably linked to fertility, but that no longer are, the 'demand' for children may well fall to extremely low levels.

In countries where fertility is low, and this includes in particular, but not exclusively the countries of southern Europe, governments must decide what to do. One possibility is not act at all: after all, people declare that their ideal is about 2 children per woman, so that current low levels may be due exclusively or mainly to postponement, and replacement fertility might eventually re-emerge. The risk is that this will not turn true, and that late intervention will not solve all the problems (e.g. troughs in the age structure) and might prove more problematic than early measures.

A possible alternative, which we would strongly encourage, is to stimulate fertility by lowering its costs - although somebody would probably prefer to call this 'removing the obstacles which prevent people from fulfilling their fertility desires'.

³⁶ Cf. Figure 8. Over longer time spans, the change is even more impressive: for instance, in the US, the labour force participation of women aged 25-44 increased from less than 20% in 1900 to more than 70% in 1999, with, understandably, more labour force participation observed for more educated women (US Council of Economic Advisers, 2000).

What to do, then? Folbre (1997), McDonald (2000) and others argue that the main problem is to find a way to equitably share between the sexes the load of time that fertility brings about. This is surely part of the story, but it may not be all. If fertility costs (in terms of time, or money, or both) more than it is considered worth (in terms of economic or psychological returns) men and women may agree that there are better ways of using their time. But if fertility becomes sufficiently appealing - ideally in itself, but more likely with the help of *ad hoc* incentives - men and women need no longer argue on who will spend time with the children.

The main problem, it seems to us, is that the economic costs of fertility fall on those who have children (and more often than not on the woman) while the economic benefits (essentially in terms of long run viability of most of the current institutions, like social security, health care, etc.) accrue to society at large. The essential point is, then, to redirect some of these benefits precisely towards those who have children and care for them.

Legislative intervention can help, of course, in terms of maternity and paternity leaves, etc. But these measures cannot be pushed too far or they'll block the working of the labour market, stimulate free riding (e.g. employers will prefer people without children or past childbearing age), etc.

At the moment, it is not clear whether, for any given amount of money, services (like subsidised, flexible child care centres) are more or less effective than direct payments to parents; whether, and by how much, lump sums affect fertility behaviour more or less than, say, monthly instalments; whether immediate payments are preferable to deferred ones (which take place, for instance, when pension payments are made to depend also on past fertility), etc. But we tend to believe that attaching economic security to fertility will have to be part of the answer: this, as suggested, may require substantial use of resources, which, in turn, may require scaling down public intervention in other fields. And the 'excessive' absorption of resources on part of the elderly - (see, e.g., Preston, 1984; Auerbach, Gokhale, and Kotlikoff, 1994; etc.) - is probably one of the candidates for reduction.

Whether societies will have the capability of putting such drastic changes of direction in practice, is another story.

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