Modigliani's life-cycle theory
of savings fifty years later [*]

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1. Introduction

In the early 1950s Franco Modigliani, with Richard Brumberg and Albert Ando, formulated the life-cycle theory of consumption and savings that enjoyed a huge and undisputed success for at least three decades. It replaced Keynes's 'fundamental psychological law' of savings, according to which the marginal and average propensities to save grow as income rises. On the other hand, the life-cycle theory maintains that the level of savings depends on the age of consumers, and hence on the demographic structure of society rather than on the level of family income.

But, since the early 1980s, the life-cycle theory has increasingly come under attack, for at least four reasons. One reason is the existence of an important inter-generational transmission of wealth, to be imputed to motives that are exogenous to the life-cycle model. The second reason is the growing evidence that the rich continue to save more than the less fortunate, as Keynes in fact maintained. The third reason is that there is growing evidence, at least in Western Europe and Japan, that young families in their twenties and thirties save a positive and increasing proportion of their income, which is in sharp

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contrast with the original version of the life-cycle theory. Finally, a number of empirical works have found that pensioners put by a very high proportion of their income, a fact that is closely linked to the first reason. Even taking into account Modigliani's argument that pensioners' saving rate should include also the 'drawing down' of the capital stock of the pensions schemes, then the latter should be added to the saving rates of the active period. Quite apart from the 'non-liquidity' of such schemes, we may note that in so doing the 'hump' of savings might in many cases disappear, because of the mainly positive saving rate of the young cohorts of workers. The empirical evidence that has emerged in the last twenty years points in this direction, especially in Western Europe and Japan, but also, to some extent, in the USA. This requires a serious rethinking of the life-cycle approach. This has a bearing on economic analysis, as well as on economic policy. In fact the strong inter-generational nature of assets accumulation calls for a differentiated fiscal treatment of the life-cycle savings of Modigliani, Brumberg and Ando on the one hand, and of bequests of the other. Finally, economic policies aimed at stimulating consumption and saving ought also to consider this new evidence.

2. A historical overview

According to John Maynard Keynes the saving propensity of families may be linked to one, or a combination, of the following elements:

    1. to build up a reserve against unforeseen contingencies;

    2. to provide for an anticipated future relation between the income and the needs of the individual or his family different from that which exists in the present, as, for example, according to old age, family education, or the maintenance of dependents;

    3. to enjoy interest and appreciation, i.e. because a larger real consumption at a later date is preferred to a smaller immediate consumption;

    4. to enjoy a gradually increasing expenditure, since it gratifies a common instinct to look forward to a gradually improving standard

of life rather than the contrary, even though the capacity for enjoyment may be diminishing;

5. to enjoy a sense of independence and the power to do things, though without a clear idea or definite intention of specific action;

6. to secure a *masse de manoeuvre* to carry out speculative or business projects;

7. to bequeath a fortune;

8. to satisfy pure miserliness, i.e. unreasonable but insistent inhibition against acts of expenditure as such.

These eight motives might be called the motives of Precaution, Foresight, Calculation, Improvement, Independence, Enterprise, Pride and Avarice; and we could also draw up a corresponding list of motives to consumption such as Enjoyment, Short-sightedness, Generosity, Miscalculation, Ostentation and Extravagance (Keynes 1936, p. 108).

To these motives Browning and Lusardi (1996, p. 1798) add the "downpayment" motive "to accumulate deposits to buy houses, cars, and other durables".

The dependence of consumption and saving on present income is a fundamental proposition of *The General Theory of Employment, Interest and Money*; the consumption and saving functions are based on the simple notion that individuals' or families' consumption and saving behaviour in a given period is related to their disposable income of that same period. However, the precise form of this dependence has been the subject of a continuing debate. Keynes's 'fundamental psychological law' implies that the marginal propensity to consume is lower than the average propensity to consume; it is positive but less than unity. According to Keynes (1936, p. 96):

> "Granted, then, that the propensity to consume is a fairly stable function so that, as a rule, the amount of aggregate consumption mainly depends on the amount of aggregate income (both measured in terms of wage-units), changes in the propensity itself being treated as a secondary influence, what is the normal shape of this function?

The fundamental psychological law, upon which we are entitled to depend with great confidence both *a priori* from our knowledge of human nature and from the detailed facts of experience, is that men are disposed, as a rule and on the average, to increase their consumption as their income increases, but not by as much as the increase in their income. That is to say, if C_w is the amount of consumption and Y_w is income (both measured in wage-units) ΔC_w has the same sign as ΔY_w but is smaller in amount, i.e. dC_w/dY_w is positive and less than unity".[1]

Ever since Keynes, the saving and consumption behaviour of individuals, families, dynasties and classes has been the focus of attention of generations of economists. Despite the many qualifications he provided in chapters 8 and 9, most Keynesian scholars adopted some simple version of this relation. A number of new theories of consumption and saving were formulated at the end of the 1940s and in the early 1950s.

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[1] It is interesting to note what Keynes (*ibid*., pp. 96-97) adds:
"This is especially the case where we have short periods in view, as in the case of the so-called cyclical fluctuations of employment during which habits, as distinct from more permanent psychological propensities, are not given time enough to adapt themselves to changed objective circumstances. For a man's habitual standard of life usually has the first claim on his income, and he is apt to save the difference which discovers itself between his actual income and the expense of his habitual standard; or, if he does adjust his expenditure to changes in his income, he will over short periods do so imperfectly. Thus a rising income will often be accompanied by increased saving, and a falling income by decreased saving, on a greater scale at first than subsequently.
But, apart from short-period changes in the level of income, it is also obvious that a higher absolute level of income will tend, as a rule, to widen the gap between income and consumption. For the satisfaction of the immediate primary needs of a man and his family is usually a stronger motive than the motives towards accumulation, which only acquire effective sway when a margin of comfort has been attained. These reasons will lead, as a rule, to a greater proportion of income being saved as real income increases. But whether or not a greater proportion is saved, we take it as a fundamental psychological rule of any modern community that, when real income is increased, it will not increase its consumption by an equal absolute amount, so that a greater absolute amount must be saved, unless a large and unusual change is occurring at the same time in other factors. As we shall show subsequently, the stability of the economic system essentially depends on this rule prevailing in practice".

3. The life-cycle hypothesis of consumption and saving

The life-cycle theory assumes that individuals (or families, but not dynasties or 'overlapping generations') try to maximise the utility deriving from their entire life-cycle consumption. Therefore consumption must be continuous, even if income through the life-cycle is discontinuous; and saving is primarily (or even exclusively) done to finance consumption during the retirement period. Quite surprisingly for the pre-1950 economist or for the layman, such a stylized microeconomic profile of consumption and saving has, according to Modigliani, a number of macroeconomic implications:[2]

a) the saving rate of a country is entirely independent of its per capita income;

b) different national saving rates are consistent with an identical individual life-cycle behaviour;

c) between countries with identical individual behaviour, the aggregate saving rate will be higher the higher the long-run growth rate of the economy. It will be zero for zero growth;

d) the wealth-income ratio is a decreasing function of the growth rate, thus being largest at zero growth;

e) an economy can accumulate a very substantial stock of wealth relative to income even if no wealth is passed on by bequests;

f) the main parameter that controls the wealth-income ratio and the saving rate for given growth is the prevailing length of retirement (Modigliani 1986, pp. 300-01).

According to Modigliani (1986 and 2001) the 'basic' or 'stripped-down' version of the life-cycle hypothesis is based on the following assumptions:

1. income is constant until retirement, zero thereafter;

2. zero interest rate;

3. preferences: constant consumption over the life cycle;

4. absence of bequests.

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[2] According to Modigliani (1986, p. 300) such implications are "quite novel and surprising".

The graphic representation of income, consumption, saving and wealth, in a slightly modified frame,[3] is shown in Figures 1 and 2. In Figure 1 it is assumed that individuals start off with a negative saving rate; in other words individuals in their twenties and thirties do not save at all because their income is lower than their consumption; saving becomes positive in their late forties and fifties when income reaches its maximum. Then dissaving occurs as soon as individuals

FIGURE 1

THE 'STRIPPED-DOWN' VERSION OF THE 'LIFE-CYCLE THEORY' OF
MODIGLIANI, BRUMBERG AND ANDO WITH AN INITIAL NEGATIVE SAVING RATIO
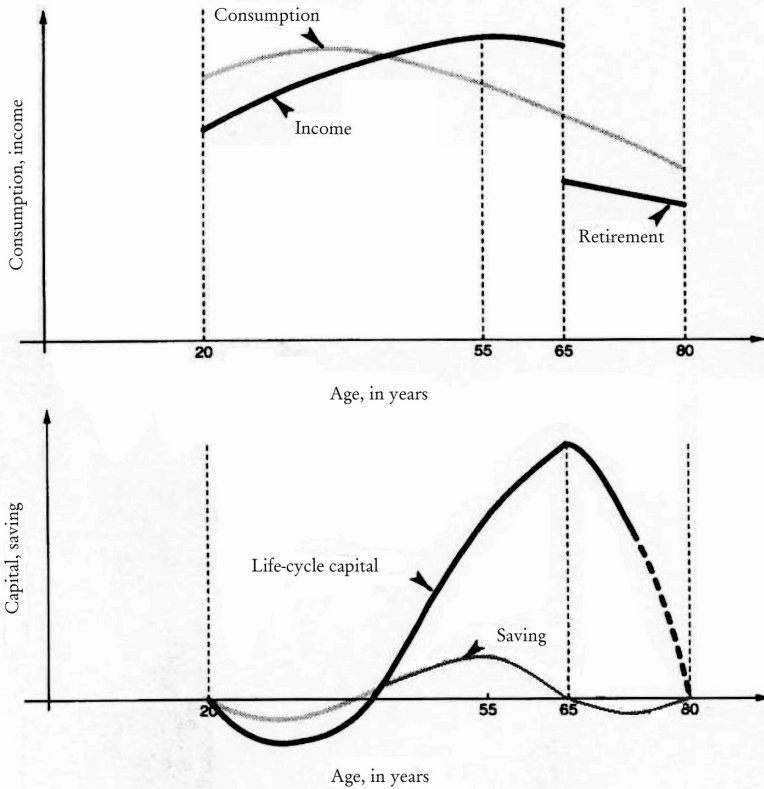
Source: author's elaboration.

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[3] For instance I assume, in Figure 1, that the pension rate is positive (although declining due to, for instance, non-indexation).

retire till the moment they die. In fact, as I shall point out below, Modigliani (1986, p. 304) argues that:

> "one might expect, and generally finds, a fairly constant rate of saving in the central age group, but lower saving or even dissaving in the very young or old. Thus [...] the wealth of a given cohort tends to rise to a peak around age 60 to 65".

For the sake of generality, in Figure 2 I assume that individuals, or families, start off with a positive saving rate. As Modigliani explains, because the retirement span follows the earning span, consumption smoothing leads to a humped-shaped age path of wealth holding, a shape that had already been suggested by Sir Roy Harrod (1948).

FIGURE 2

THE 'STRIPPED-DOWN' VERSIONS OF THE 'LIFE-CYCLE THEORY' OF
MODIGLIANI, BRUMBERG AND ANDO WITH AN INITIAL POSITIVE SAVING RATIO
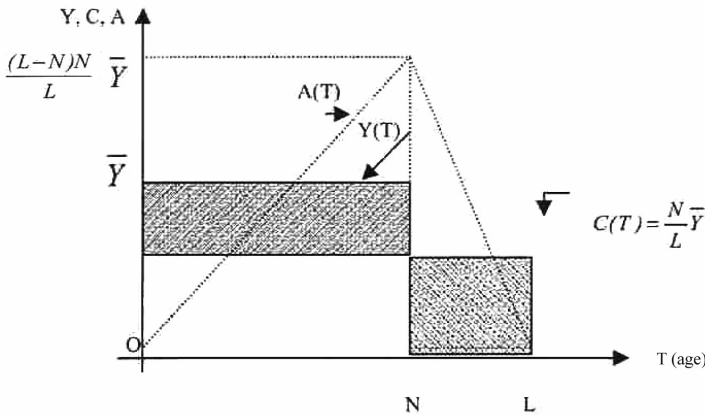
Source: Modigliani (1986, p. 300).

Modigliani was quite conscious that of all the 'stylised facts' mentioned above, the least convincing was the 'zero bequest' assumption. In fact he devotes a sizeable part of his 1985 Nobel lecture to an attempt to minimize the role of bequests in the life-cycle theory of savings. He (1986, p. 305) first maintains that:

> "The traditional approach took it for granted that bequests are a major source of the existing wealth, while the LCH suggested that they might not contribute appreciably".

And indeed Modigliani goes a long way to dispute the finding of Kotlikoff and Summers (1981) and of other authors still, according to whom the share of the inter-generational bequest in the total capital stock is well above half. In fact, he concludes, such share should not be higher than 20-25% both in the US and in the UK. He (1988a, p. 50) maintains that:

> "We have endeavoured to estimate the relevant measure of importance by calculations of the optimal accumulation path, carried out with the help of some simplifying assumptions. These calculations lead to the conclusion that the importance of bequests is far less than the share as defined by Kotlikoff & Summers, and only a little larger (around 20%) than the share as commonly defined. Thus, if all inheritance could be traced to the bequest motive, the measure of importance could be assessed at no more than one-quarter".

But Modigliani goes further and dismisses the relevance of the bequest motive as follows:

> "However, given the observed absence of effective annuity markets, in reality a large fraction of bequests must be attributed to be precautionary motive. The evidence suggests that only for a small fraction of the population, mostly in the highest income brackets, wealth-holding is significantly affected by a true bequest motive. This leads us to speculate that the importance of the wealth resulting from the bequest motive can be assessed as a rather low value, most probably below one-fifth" (*ibid*.).

4. Four obstacles on the path of the life-cycle theory of saving and consumption

In these last two decades three new elements have slowly come to the fore in the field of saving and consumption behaviour of individuals, families and dynasties.

1. The first one concerns the proofs of the relevance of the inter-generational bequests in the total capital stock.

2. Secondly, a large body of empirical evidence suggests that elderly people continue to save a non-irrelevant (at times sizable)

portion of their disposable income, and very often do plan to leave a bequest at their death. This comes now to be associated with the evidence that young people also do not dissave as may have been expected with the life-cycle hypothesis.

3. The third point concerns another set of proofs according to which the propensity to save increases as income increases. This is in stark contrast with Modigliani who (2001, p. 59) repeatedly stated,

> "I had never swallowed the theory that saving was the privilege of the rich and that the poor were destined to consume more than their income".

These facts do not necessarily lead to a premature weakening of the Life-Cycle Hypothesis (LCH) of Modigliani, Brumberg and Ando, but they call for a serious reappraisal.

We might say that a number of scholars had already been aware of this issue, and some increasingly became so; but their reactions have not always been far-reaching and coherent, since their main concern was the reconciliation of the classical version of the life-cycle theory with the new evidence.

For instance Ando, Guiso and Terlizzese (1994, p. 164) acknowledge that Carroll and Summers (1991) have provided enough empirical evidence according to which both young and old households do not dissave at all but often have quite a positive saving propensity. Similar evidence has been provided by a number of scholars; and even Ando, Guiso and Terlizzese (1994, Table 1, p. 166) find that in the late 1980s the 20-44 age groups in Italy and Japan exhibited a clearly positive propensity to save. All these findings lead the authors to put forward an interpretation that, according to them, is broadly consistent with the spirit of the life-cycle theory. They argue (*ibid*., p. 163) in fact:

> "We are thus faced with the question as to why young people do not dissave. This is a shift in emphasis from recent literature, in which much effort has been devoted to devising modifications to the life cycle theory that could accommodate the relatively low propensity to dissave by older, retired families. The mere lack of dissaving by very young households may be explained by the presence of liquidity constraints or myopia. The ingenious interaction of liquidity constraints with uncertainty recently proposed by Deaton (1991) can, within a buffer stock context, explain a limited

amount of saving; it is, nonetheless, probably inadequate to explain the significant saving by very young households with relatively low incomes".

One might expect that the authors, in these circumstances, would attempt to put forward a new approach or interpretation of the saving and consumption behaviour of individuals or classes, a sort of new paradigm that will not necessarily or simply reject the 'classical version' of the life-cycle theory. In other words one would expect instead a leap forward in the process of theorizing as well as incorporating new evidence.

But this is not an easy task. As Keynes (1936, p. XXIII) once wrote

> "The difficulty lies, not in new ideas, but in escaping from the old ones, which ramify, for those brought up as most of us have been, into every corner of our minds".

As a matter of fact the authors (Ando, Guiso and Terlizzese 1994, p. 164) go on to write:

> "We propose instead an explanation based on the hypothesis that, for very young households, due to the expectation of (future) consumption opportunities not available today, higher future income might be accompanied by larger needs. This creates a situation in which, at a later period, the marginal utility of income is higher even though the expected income is higher than the current income. The increase in current consumption induced by an expected increase in future income might then be small (or even be negative). According to this interpretation, consumption will then be concentrated in those periods in which the opportunities are better. In contrast with the smoothing of consumption, we obtain what might be called a 'consumption lumping' principle".

But if consumption is discontinuous, then one might ask whether the focus of attention should not be on the process of accumulation (of both life-cycle savings and inter-generational assets) rather than on consumption. We now turn our attention to the relevance of bequests.

4.1. *The relevance of the inter-generational capital stock*[4]

4.1.1. A historical reconstruction

The issue concerning the inter-generational transmission of wealth has occupied generations of economists. Josiah Stamp, in his Presidential Address given at the British Association in Oxford in 1926 under the title "Inheritance as an economic factor"[5] states that (p. 339):

> "It will probably not be disputed that one of the fundamental institutions of our modern life which is likely to come under criticism and challenge in the next twenty or thirty years is that of Inheritance. In the first place, it is considered to be inextricably bound up with the inequality of incomes and wealth; this inequality is said to be an offence against social justice; and this offence, in turn, is said to be a source of social unrest which is against the interests of the whole community. In the second place, it is said to be essential to the accumulation of capital resources which, irrespective of their ownership, are said to be vital to progress and, indeed, to the maintenance of industrial civilisation. In the third place, the satisfaction of fiscal needs, with the problems of the most suitable form of taxation, raises important questions as to the economic reactions of inheritance. And lastly, the theory of socialism, continually urged as a better and more advanced system for economic life, is demanding profound changes in this principle".

A vast research programme has branched out in various directions over the last three quarters of a century since Stamp's statement. A number of points may be made straight away. First, there are no overriding reasons for which the share of bequests in the total capital stock should have declined; on the contrary a number of factors may have acted in the opposite direction. Children have slowly become a

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[4] The inter-generational capital stock, often defined with the term of inheritances, is not easy to define with exactitude. Its broadest definition would include the so-called 'proper inheritances' (i.e. the wealth transmitted at the death of the donor), gifts *inter vivos*, trusts and human capital. A more narrow definition, which is generally used in analyses of this kind, includes the amount of wealth actually passed on from one generation to the next, plus *inter vivos* transfers. This means that only a part of the wealth transmitted from one generation to the other is actually taken into account. On this point see, for instance, Blomquist (1979, p. 43).

[5] Published in *The Economic Journal,* vol. XXXVI, no. 143, pp. 339-74.

'superior' good, and no longer a way of ensuring cheap labour for the family farm or the small family business, or assistance for old age. Parents spend a growing share of their income to provide them a good education, and are increasingly concerned about their future welfare. Secondly the number of children raised in the average family of the Western world has declined sharply, and this has led and still leads to a process of concentration of dynastic wealth in the hands of fewer heirs. It is true that during the last 75 years or so, inequalities in the distribution of income and wealth have tended to diminish; not because bequests have become less important, but because labour income has become less unequal, and because all kinds of direct and indirect transfers operated by the state have become more widespread. Thirdly, the share of estate duties in total public revenue has not increased much, never above one or one-and-a-half percent of GDP. In fact, instead of introducing more stringent rules related to the inter-generational transmission of wealth, a number of countries have increased the tax-free threshold, or simply abolished estate duties for next of kin (as is the case in Italy and Switzerland). And this, all other things being equal, has the implication of encouraging the inter-generational transmission of wealth. But Stamp was of course not in a position to anticipate these tendencies, and it is beyond the scope of this paper to study the dynamics of this process.

From the early 1950s up to the early 1980s, mainly due to the life-cycle theory of consumption and saving behaviour and accumulation of life-cycle savings initially formulated by Franco Modigliani, the prevailing idea was that life-cycle savings were the greatest part of the total national wealth, and that wealth decumulation by the elderly was an indisputable given. First Darby (1979), and then Kotlikoff and Summers (1981 and 1988) succeeded in shedding new light on this issue. The debate came to be known as the '20-80%' controversy,[6] since Kotlikoff and Summers came up with figures according to which over 80% of the total capital stock is of inter-generational nature, while Modigliani counter-argued that such a portion is not higher than 20-25%, at least in the US and UK. But there is more than this. In fact Modigliani (1986, p. 309) argues:

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[6] See, for instance, Blinder (1988).

"Allowing for a significant bequest motive raises the issue of its importance. How large a portion of wealth can be traced to this motive, as against true life cycle saving (i.e. hump plus precautionary)? Unfortunately, it seems impossible at present to give a well-founded answer to the question. We know that the share of wealth received through inheritance can be placed at 1/5 to 1/4 for the United States (and presumably the United Kingdom), but this information is of little help. On the one hand, we know that in a growing economy, if all the inheritance resulted from the bequest motive, the share would tend to *underestimate* its 'importance'. On the other hand the observed share is upward biased to the extent that it reflects not just the bequest motive, but also that portion of bequests which arise from the precautionary motive. We do not know how total bequests are split between the two. There is evidence suggesting that the bequest motive is not very important. Thus, in a 1962 survey ([D.] Projector and G. Weiss 1964), only 3 percent of the respondents gave as a reason for saving 'To provide an estate for the family'. However, the proportion rises with wealth, reaching 1/3 for the top class (1/2 million dollars and over). Similar, though somewhat less extreme, results are reported in a Brookings study (R. Barlow et al. 1966). Thus, the bequest motive seems to be limited to the highest economic classes. [...] My hunch, based on preliminary analysis, is that hum plus precautionary wealth is likely to account for well over half – but this is only conjecture, to be probed by future research".

At the same time, also the process of wealth decumulation by the elderly became controversial. If this were true, then the study of the saving behaviour based on the life cycle as the primary source of assets accumulation should give way to models that try to explain the genesis, the motivations, the forces and the implications of the dynastic accumulation of savings and wealth, as well as the whole set of issues related to the modalities of transfers – such as timing, distribution among the heirs and the taxing system. But time passes quickly and evidence accumulates fast, and in the 1990s and early part of the 21st century additional evidence of the relevance of the inter-generational wealth and of a positive saving ratio of the elderly has emerged. Even Fabrizio Barca, Luigi Cannari and Luigi Guiso, who have often been sympathetic towards the life-ycle theory and the strong stance of Modigliani inter-generational wealth is no higher than 20-25%, while

life-cycle saving account for 75-80% of the total wealth, at the end of their work (1992, p. 22) conclude that:

> "Two out of five Italian Households acquired ownership of their real estate through transfers from previous generations. The share of intergenerational transfers in the value of real estate, ranges from 35 to nearly 50 per cent depending on whether interest on bequests is excluded from or imputed to the stock of inherited wealth.
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> These figures can be interpreted as showing that bequests play a significant role in the accumulation of wealth. A deeper understanding of the inheritance process and of the policy implications of such widespread intergenerational transfers, however, requires closer study of the motives for leaving bequests. This is left for future research, and the magnitude of these figures surely indicates that research on the bequest motive is well worthwhile".

For these reasons I shall first try to inquire into the reasons that are at the basis of the bequests, and expound part of the empirical evidence emerged so far. As said, the literature in this field has become vast. Barca, Cannari and Guiso (1992, pp. 5-6) meticulously reconstruct the way in which the inter-generational wealth came to be the focus of attention of a number of renowned economists of the end of the 19th century:[7]

> "The belief that bequest was *the* motive for saving enabled the French statistician Alfred de Foville to put forward in 1887 a simple but ingenious method for estimating the wealth of a nation. The idea was to use information on bequests received by the population in a given year to infer the value of the total stock of wealth. If bequests received are simply passed over to the next generation, and if the generational gap (i.e. the number of years between two subsequent transfers of wealth), and society's "demological laws" are not altered by rapid changes (Pantaleoni 1890), then the wealth of a nation is simply equal to the generation gap times the flow of bequests observed in a given year".

In the UK the theme of inter-generational bequests and inheritance was, during the first decades of the 20th century, the centre of attention of economists like John Maynard Keynes and Josiah Stamp. (Later on it was to be taken up by a new generation of first-class

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[7] The reference to Alfred de Foville was suggested to the authors by Ignazio Visco (*ibid.*, p. 5n).

economists like James E. Meade, Anthony B. Atkinson, John S. Flemming, Ian D. Little, David G. Champernowne, Henri Phelps Brown, James A. Mirrlees and Frank Cowell, to mention but a few.) The long essay published in 1926 in the *Economic Journal* by Stamp[8] is an excellent example of such growing interest in this issue.

Then in the early 1950s, with the works of Franco Modigliani, Richard Brumberg and Albert Ando, as well as other theories on saving and consumption behaviour, the attention shifted to the motivations and mechanisms operating behind the life-cycle accumulation of savings. As I said, the attention to the bequest component was suddenly resuscitated by the works of Darby (1979) and especially of Kotlikoff and Summers (1981 and 1988).

It is therefore important to reconsider the whole issue by taking into account the most recent contributions in this field, which seem to confirm the relevance of the inter-generational transmission of human and financial wealth. Quite recently Mariacristina De Nardi (2004, p. 743) in an article on "Wealth inequality and intergenerational links', published in *The Review of the Economic Studies,* has stressed that:

> "An extensive literature, both empirical and theoretical, shows that the transmission of physical and human capital from parents to children is a very important determinant of households' wealth and earnings ability (see, among others, Becker and Tomes (1979, 1986), Kotlikoff and Summers (1981), Mulligan (1997), Hurd and Smith (1999)). Moreover, many papers argue that households with higher levels of lifetime income have higher saving rates, keep substantial amounts of assets (even during old age), and leave very large bequests (among these, Dynan, Skinner and Zeldes (1996), Lillard and Karoly (1997), Carroll (1998))".

4.1.2. A 'dissection' of the bequest motive

The motive for bequest may be summarized as follows (on this point see, for instance, Pestieau 2002, pp. 5-6, Masson and Pestieau 1997, Meade 1966 and 1973).

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[8] Not surprisingly, Keynes was editor of *The Economic Journal* at the time.

1. *Pure altruism*. Parents care about their children's future, and provide for their education (often very expensive where only private education is excellent) and for their well-being. The existence of such altruism is confirmed by the fact that parents often (and intentionally) leave more assets to the children who are less fortunate and draw less benefit from their education: this is done in order to equalise their economic chances.

2. *The conservation of 'family's silverware', or 'biens de famille'.*[9] In many cases dynasties have held for many generations houses, land, firms or other assets, and other kinds of wealth. Quite often, in the case of family-owned firms who provide vital employment in rural areas, the members of the dynasty feel a sort of obligation or 'loyalty' to continue the activity by keeping the property of the firm within the family.

3. *Joy of giving, or paternalistic bequest, also called 'bequest-as-last-consumption'.* In this case a direct utility is associated with the act of giving to one's heirs.

> "This phenomenon, also referred to as 'warm glow' giving, can be explained by the virtuous feeling connected with sacrifice, a need to help one's children, or control their lives. Formally these bequests appear in the utility function as consumption expenditure incurred in the last period of life" (Pestieau 2002, p. 6).

4. *Strategic bequest*. It is a sort of unwritten 'gentlemen's agreement': the children take care of the old parents, providing all sorts of assistance until their death; the parents in return agree to bequeath all their wealth to them. According to Pestieau (2002), such exchanges:

– may involve many kinds of non-pecuniary services;

– may be part of a wider strategic game between parents and children; and

– do depend very much on the needs of the parents. In fact, in the case in which their health is particularly good and/or their standard of living is much higher than that of the children, such kind of bequest may not be considered.

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[9] I have found this expression in Barca, Cannari and Guiso (1992, p. 7).

Accidental bequest. This is an unplanned bequest, which is the result of an individual dying earlier than expected, and/or spending much less than planned in advance. Since it is well-known that individuals, on average, have a higher expectation of living than actually takes place, such a bequest might actually turn out to be quite important. However, from our point of view, it does not really matter what leads somebody to bequeath an estate; what is important is that the share of the inter-generational capital stock turns out to be much higher than previously thought.

Aversion to spend in old age. Still another element leading to a bequest may be represented by the aversion to spend that old people often demonstrate, and by their reluctance to show off a level of welfare higher than strictly necessary. This reason has been found to be quite important among very old people in Switzerland.

Bradford De Long (2001) argues that bequests, and especially large bequests, are left for three main reasons:

1. to make all our children better off at our death;

2. to use the promised 'bequest' as a carrot in order to coerce the children to behave well towards their elderly parents;

3. to provide a form of insurance for one's offspring, who end up less skilled and less lucky than their siblings, which implies an unequal distribution of the bequest. There are of course other reasons that are relevant in this context.

I have already mentioned that a bequest may be left to ensure that there is continuity in the consumption patterns between overlapping generations; this has been examined in great detail by Meade (1966 and 1973).

It is obvious that the presence of bequests in an economic system leads, all other things being equal, to the perpetuation of high levels of inequality in the distribution of wealth and hence, though to a lesser extent, of total income. This is one of the reasons for which (gross or pre-tax) income and wealth are less equally distributed in Western Europe and Japan than in North America or Australia and New Zealand, since in the latter the process of accumulation has been going on for few generations only. But there is one additional point. Estates bequeathed in general are far from being equally distributed among

heirs. As Kessler and Masson (1988b, p. 117) duly note, in France equal sharing is enforced by law since Napoleon's 1894 Civil Code, even in the presence of explicit wills; and this is the case of a number of other European countries that were influenced by Napoleon's Civil Code.[10] On the contrary, in the US equal sharing is required by law only in interstate cases when there is no surviving spouse.[11]

The existence of an important share of inter-generational bequests (in the total national wealth) coupled with an unequal distribution of estates is one of the causes of an unfair distribution of wealth and income from wealth. Hence appropriate measures might be necessary to counter-act such tendency. In this paper I shall not consider explicitly the still growing literature on the equal *vs.* unequal estate share: this has been considered in Kessler and Masson, (1988a, part II) and in many other works. Blinder (1973, p. 609), for instance, states that:

> "Still, inherited wealth may have a disproportionate effect on overall inequality because it is so unequally distributed. For example, the Gini coefficient calculated by the present author from the data by Lansing and Sonquist is about 0.973, not far from the perfectly inegalitarian value of unity".

and concludes (*ibid.*, pp. 624-25 and 626) that:

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[10] The inheritance tax in England was introduced in 1694 under the form of a flat-rate tax (we may recall that a number of cities and towns had already a sort of estate duty), then substituted in 1799 by a proportional tax, and finally restructured in 1884 with a fundamentally progressive tax. Italy adopted, at least partially, the French system in 1862 and made it progressive in 1902 (one hundred years later it would be scrapped for close relatives).

> "Germany's tax, which was based on the Prussian inheritance tax of 1873, was graduated in 1905. The federal government of the United States levied a temporary inheritance during the Civil War and the Spanish-American War, but the tax was already in use in many of the states before the modern, graduated estate tax adopted in 1916" (Pechman 1987, p. 856).

[11] In the industrialized world, inheritance tax may be levied on two different bases. The first one consists in the 'estate tax' calculated on the total estate of the donor, regardless of the income of the donor as well as of the number of heirs. Such a tax may be found in the UK and US; in the UK for instance there is a 'free quota' of about £ 270,000. Second, the inheritance tax may be levied on the share received by each donee: this is the case of most Continental European countries. In the latter case the number of children (or donees) is an important variable for the determination of the total tax. I might add the both approaches allow for a special treatment of the surviving spouse, different scales of tax and different 'free quota'. A number of countries, including Italy and a large number of Swiss Cantons, have recently abolished inheritance tax for spouses, children and grand-children (for 'close relatives'). See, for instance, Pestieau (2002, p. 3), Goody (1987) and Pechman (1987, p. 856).

"laws prohibiting primogeniture [preferential treatment] or encouraging equal division will be rather less egalitarian in their effect than policies that tend to break down economic class barriers in marriage. An example of the former might be progressive taxation of *inheritances received* rather than *estates bequeathed*. Since the empirical evidence on mate selection documents the fact that the educational levels of husbands and wives are more highly correlated than any other variable, perhaps policies that lead to equality of opportunity in education might be an example of the latter. [...]/[...] *with existing institutions*, the passing of generations can be expected to break down the inequality in wealth only very slowly. A heroic guess might be that inequality would be reduced 50 percent in a century".

We know that bequests play an important role in the determination of macro-economic aggregates (like total savings, government receipts, etc.) as well as, as I said, in the determination of the level of wealth, but also on income from wealth and hence on all income inequalities. Until a couple of decades ago little research had been done on the economic and extra-economic factors determining the amount of inheritance that a given individual or family will receive during his lifetime; or, even more importantly, on the factors determining the size of the bequest that he will leave to his heirs.

One of the first analyses in this field was that of Blomquist (1979) who has tried to introduce an explicit bequest utility function. He has come up with a model where the bequest of the parents is a function of *a*) the father's and mother's educational level, *b*) the social status of the family in which the donees were brought up, *c*) the economic and financial conditions of the same family, *d*) the number of siblings and *e*) the age of the donee. The author concludes (*ibid.*, pp. 54-55) that:

"Father's education seems to be of greater importance than mother's education. This is not surprising. Since it uses to be and still is the man in the family who normally works outside the home, the father's potential wage rate, for which father's education is a proxy, would be of greater importance for wealth accumulation and the bequest than the mother's potential wage. The mother's education is probably of greater importance for how much human

capital the individual 'inherits'.[12] [...]/[...] The variable indicating economic conditions in the family where the individual was brought up is also significant. [...] According to this model it is very unfortunate to have many siblings. Not only does one have to share the parents' bequest with one's siblings, but the bequest seems to be smaller too. This implies that of the two hypotheses presented earlier, the hypothesis that people with many children find it harder to accumulate wealth is supported".

The results obtained by Blomquist are original and throw additional light on the motivations and significance of the intergenerational wealth. Additionally it emerges that the dependence on age is strong; and it seems that most people receive the bulk of their inheritance late in life, often after the age of sixty.

In 2001 Hendrik Jürges published a paper with the title "Do Germans save to leave an estate? An examination of the bequest motive" in which he tries, among other things, to study the rationale for saving among all age groups (from 20-25, to 85+). His study uses data from the 1988 German socio-economic panel, which provides data on 'bequeathable wealth' for 4,500 West German households. Four different motives for saving were quoted in his questionnaires:

1. the life-cycle motive ("will use it to support myself");

2. the down payment motive ("will use it for something special and enhance my life-style");

3. the precautionary motive ("will save it in case of need or if I require nursing") and, finally,

4. the bequest motive ("will leave it in my will for my descendents or family").

The latter motive (i.e. the 'bequest motive') emerged as the second major motive across all age groups. In fact, according to Jürges (2001, p. 401):

"Across all age groups, 57.1 per cent of those holding assets or wealth declare having a bequest motive. Unsurprisingly, this pro-

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[12] Blomquist (1979, p. 55n) adds that:
"This hypothesis is confirmed in Blomquist (1976). Blomquist found that father's education has a negligible influence on a person's wage rate, while the educational level of the mother has some effect".

portion increases from about 45 percent for respondents younger than 40 to just under 70 percent for respondents older than 50. The other savings motives are also quoted by more than half of the respondents, with the precautionary motive as the most important reason (68.1 percent). The high incidence of precautionary saving compared to the other reasons is compatible with other data on saving motives; see e.g. Alessie et al. (1999). The down payment and life-cycle motive (55.3 and 54.7 percent, respectively) indicate a declared intention to dissave in the future. The former motive should be relevant for those who want to add resources to their pension wealth, while the latter indicates that respondents perceive their pension wealth as too low to provide the sole source of income during old age (this holds especially for self-employed respondents).

FIGURE 3

SAVING MOTIVES BY AGE GROUPS
BASED ON THE GERMAN SOCIO-ECONOMIC PANEL, 1988
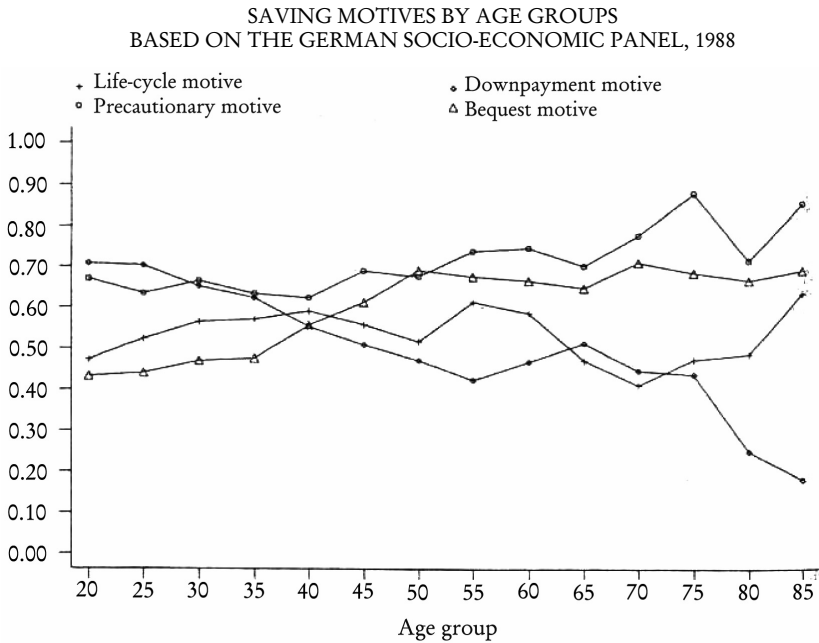
Source: Jürges (2001, p. 400)

These results are, to a certain extent, reinforced by the fact that 'having children' and 'saving to leave an estate' are strongly positively correlated. But the author (*ibid*., pp. 401-02) duly warns that:

> "Predictions of bequest motives based on knowledge of whether someone has children are far from perfect. About 33 percent of the childless household heads say they have a bequest motive, and more than a third of all household heads with children say they have no bequest motive (the latter figure is declining in age but still above 20 percent for households with a head who is older than 74). A somewhat similar result can be found in Laitner and Juster (1996), where 45 percent of retiree households with children think that leaving an estate to children (or charitable causes) is "quite" or "very important", as do 21 percent of the childless couples. Although one cannot be sure that this result carries over to other survey data used to study the bequest motive, it is strong enough to warrant more care in the interpretation of empirical findings based on information about children alone".

The author finally finds that the wealth profile of elderly households with children 'decline less or increase more' than the wealth assets of childless couples of the same age. In the case of a bequest motivated by 'the joy of giving', it may be argued that the bequest may be simply considered as a 'final consumption'; in fact Samuelson (1969), Merton (1969 and 1971), Atkinson (1974), and many others,[13] have considered it precisely in this way. But this approach needs at least two specifications.

First, it requires that bequests are explicitly intended, planned and carried out. This would imply a rejection of the hypothesis that bequests are often accidental rather than carefully planned. Accidental bequests have been described in the following way by Gale and Scholz (1994, p. 147):

> "In a world with uncertain life-span and imperfect annuity markets, life-cycle savers – that is, those who intend to die with nothing in their pockets – will sometimes die earlier than expected and end up leaving bequests (Davies, 1981; Abel, 1985)".

The second point is related to the fact that elderly people often tend to save as much as they can, precisely to leave the highest possible amount of assets to their children or even grandchildren. It is often a way in which parents, as well as grandparents, try to prolong their lives and help the future generations. I have shown in Baranzini

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[13] On this point see, for instance, Baranzini (1991a, p. 110).

(1991a, chapters 4 and 5) that if we were to consider only two periods for the life-cycle of equal length (say an active period and a retirement period), then it is possible to get some insights into the process of life-cycle savings and accumulation only by using a log-normal utility function. But it emerges that the use of the log-normal *u*-function (separable and additive) yields solutions that are independent of the size of the consumption of the active and retirement period, as well as of the size of the bequest. On the other hand, the use of other *u*-functions is severely limited by the absolute size of the variables taken into account.

4.1.3. Empirical evidence of the bequest motive

The relevance of the inter-generational capital stock may also be inferred from the empirical data on the total wealth owned by elderly people. Most of the studies are of a cross-sectional nature, and therefore, as I have already pointed out, refer to cohorts of individuals born at different times. In many cases, as for instance in Switzerland, very old people were born in families of three, four or more children; hence most inheritances received from parents or grandparents had to be divided up into smaller parts. Additionally the earning potential of these very elderly people was smaller than that of the younger generations; in fact they did not have the educational and earning opportunities of their younger colleagues. In particular, they were unable to take advantage of the social security system which came into full swing in the 1950s, 1960s and up to the 1970s. Finally a certain amount of *inter vivos* transfers might take place, so reducing the actual bequest at death.

Here below I shall provide empirical data of total net wealth for various age groups in Switzerland, Italy, Great Britain and the United States. As it may be observed, in most cases wealth starts to decline at a very old age (after 75 in most cases), and is still quite high for the oldest group. Italy represents an exception (see Table 2): here the amount of wealth owned by the 65+ age group seems to be 'only' about ¾ of the net wealth of the 50-65 age group. The data for the four nations considered show beyond doubt that the net wealth owned by old people is in any case relevant.

TABLE 1

PERSONAL WEALTH ACCORDING TO AGE GROUPS IN SWITZERLAND, 1990
(cross-section data)

Age group	Wealth in Swiss francs
Under 30 years	12,660
30-49	76,579
50-64	192,363
65-74	261,461
75-84	235,690
84+	183,225

Source: Cereghetti and Staffieri (2005, p. 54)

TABLE 2

INCOME AND NET WEALTH IN ITALY, 2001
(cross-section data)

Age group	Income	Net wealth	Wealth/Income
Under 30 years	26,497	118,310	4.5
30-49	26,760	120,008	4.5
50-65	30,952	227,233	7.3
65+	18,738	152,708	8.1

Sources: Taddei (2003) and data from Bank of Italy.

TABLE 3

AVERAGE NET CAPITAL OF ESTATES LEFT BY MEN AND BY WOMEN,
FOR AGE GROUPS AT DEATH

Great Britain (1972/73-1981/82)			USA (1969/70)	
Age group	Men (£)	Women (£)	Age group	Head of house-holds ($)
Under 25	4,349	2,837	Under 25	17,745
25-34	11,292	8,763	25-34	27,404
35-44	14,325	11,564	35-44	36,688
45-54	14,909	12,270	45-54	48,637
55-64	15,092	14,937	55-64	63,668
65-74	16,643	15,223	65+	64,798
75-84	17,525	14,795		
85+	19,237	15,068		

Sources: Great Britain, *Inland Revenue Statistics*, annual issues 1974-83; USA, Wolff (1983, Table 5). Quoted in Phelps Brown (1988, p. 443).

AVERAGE HOUSEHOLD NET WORTH AT SELECTED AGES
1995 BASE-CASE PARAMETERS

Age	Non-dynastic household net worth	Dynastic household net worth	Overall household net worth
20	0	1,106	92
25	0	3,477	290
30	0	10,471	873
35	1,111	28,266	3,375
40	10,267	68,052	15,084
45	66,852	161,454	74,739
50	138,403	344,627	155,595
55	204,771	623,045	239,642
60	246,880	1,010,905	310,576
65	231,846	1,464,889	334,643
70	221,226	2,122,170	379,705
75	209,734	2,772,003	423,347
80	181,234	3,181,128	431,331
85	136,147	3,331,539	402,543
90	88,396	3,637,942	384,317
95	44,001	4,090,848	381,381

Source: Laitner (2001a, p. 716)

Table 5 below provides a synopsis of a number of empirical works that have tried to assess the relevance of the inter-generational capital stock. It is not an exhaustive list, but it tries to sum up the results of the most recent papers appeared in this area.

Phelps Brown (1988, pp. 441 and 442) reports on the share of inter-generational assets in the total capital stock in Great Britain and observes:

> "[...] the proportion of one-half for lifetime savings can be accepted as the order of magnitude arising from a careful and well-founded estimate. It compares fairly closely with White's estimate for the United States. One significant finding from the Royal Commission model was that savings would form a much lower proportion of the big holdings than of the small. [...]/[...] Savings, it appears here, make up only a quarter of the top 1 per cent of holdings, but provide the whole of those of the bottom 80 per cent; although all these last are credited with no assets other than their savings, only because of inability to subdivide this range".

These data, which are about 25-30 years old, are in line with what Modigliani has often maintained, i.e. that the bequest motive applies to a minority of rich people. But things have slowly changed in the last

TABLE 5

ESTIMATES OF STOCK OF WEALTH RESULTING FROM TRANSFERS

Author (and date of publication)	Country	Method	Transfers/Total wealth ratio in %
Lenoci (2001)	Italy	A	43-65
Barca, Cannari and Guiso (1994)	Italy	B	35-50
Cereghetti and Staffieri (2005)	Switzerland	A	70-85
Gale and Scholz (1994)	USA	B	52-64
Dekle (1989)	Japan	B	48
Bradford De Long (2001)[14]	USA		43
Kotlikoff and Summers (1981, 1988)	USA	A, B	50-80
Modigliani (1988a)	USA	B	20-25
Laitner and Ohlsson (1997)	Sweden	A, B	51
Kessler and Masson (1989)	France	B	35
Darby (1979)	USA	B	About 80
Weil (1994b)	USA	A	52
Phelps Brown (1988)	UK	B	50

A: residual method; B: direct measurements.

three decades. On the one hand the number of children per family has consistently decreased, allowing families to save more on the one hand, and to divide their bequest among one or two children, and not three or four as was the case of the previous generation. Secondly, the recent increase in the value of houses has made the middle class more rich,[15] and in a fair number of developed nations parents sacrifice themselves in order to leave their house or flat to their children.[16] Third, the strong economic growth of the second half of the 20th century has made it possible, for the middle classes as well, to reach a higher level of welfare; this, coupled with much better pension

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[14] Bradford De Long (2001) estimates that for pre-industrial Eurasia 91% of aggregate wealth was inherited.

[15] "House prices surveys are often a source of rejoicing in most households; news that our home has increased in value makes most of us feel richer. But few of us stop to think that this surge in wealth could result in a large tax bill, because the rising value of our humble dwellings could make our estates subject to inheritance tax": this was the content of an article (with the title "How to take the sting out of a large demand for inheritance tax") by Suzanne Clarkson published quite recently in a British major newspaper. The author duly added that if the total assets, including the home value, add up to more than £ 263,000 (for the fiscal year 2004-05), the nil-rate band and any estate *in excess* of this amount would be taxed at a 'staggering' 40% in the event of death. The UK Inland Revenue estimates that at about 30,000 estates are subject to inheritance tax every year, yielding a total tax revenue of about £ 2½ billion.

[16] This is typical of the Japanese society, where the house or flat is customarily left to the son.

schemes, had often led these classes to save more during their retire-ment in order to leave an inheritance to their children.[17]

TABLE 7

SAVINGS AND THE INTER-GENERATIONAL CAPITAL STOCK
AS A PROPORTION OF ALL ASSETS AT DIFFERENT LEVELS OF WEALTH

Quartiles	Life-cycle savings as % of total wealth	Inter-generational wealth as % of total wealth
Top 1%	25	75
96-99%	48	52
91-95%	63	37
81-90%	75	25
Bottom 80%	100	0

Source: Royal Commission (1977; Appendix K, para. 17), quoted in Phelps Brown (1988, p. 441).

4.2. *Keynes's 'fundamental psychological law' rehabilitated*

The second point relative to the foundations of the life-cycle theory concerns the body of evidence according to which the propensity to save increases as income increases. As I pointed out above, this

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[17] The strong aversion of pensioners (60+) to consume an unforeseen net inheri-tance may be gathered from Table 6n below. The Swiss economic review *Bilanz* has carried out a survey trying to assess how different age groups would invest or spend an unexpected inheritance of Swfrs. 250,000 (about € 180.000, or $ 200,000). For people older than 60 such 'manna from heaven' would mainly (60%) be invested in bonds, shares and deposit accounts, or used towards the purchase of a house (16.4%). Just 14.4% would be spent (or consumed) on holidays, cars and other entertainments.

HOW WOULD YOU SPEND AN 'OUT OF THE BLUE'
NET INHERITANCE OF SFR. 250,000?
(in %; Switzerland, 1999)

Age group	15-29 years	30-44 years	45-59 years	60-74 years	Weighted average
Financial investment (bonds, shares, deposit accounts, etc.)	42.8	41.6	41.6	60	44.4
Housing	21.2	26.8	26.8	16.4	23.6
Family business	5.2	6.8	6.0	2.4	5.2
Repayment of debts	3.6	5.6	6.4	5.6	5.2
Education and adult education	5.2	2.8	1.6	1.2	3.2
Holidays, cars, etc.	22.0	17.2	17.6	14.4	18.4

Source: *Bilanz*, May 1999

strongly contrasts with Modigliani's argument according to which "I had never swallowed the theory that saving was the privilege of the rich" (Modigliani 2001, p. 59).[18]

But in fact the evidence that the propensity to save increases as income increases is growing. This, of course, is not fully compatible with original life-cycle approach. Recently Dynan, Skinner and Zeldes (2000, p. 1) have written a paper with the title "Do the rich save more?" and maintain that:

> "We first consider the various ways in which life cycle models can be altered to generate differences in saving rates by income groups: differences in Social Security benefits, different time preferences rates, non-homothetic preferences, bequest motives, uncertainty, and consumption floors. Using a variety of instruments for lifetime income, we find a strong positive relationship between personal saving rates and lifetime income. The data do not support theories relying on time preferences rates, non-homothetic preferences, or variations in Social Security benefits. Instead, the evidence is consistent with models in which precautionary saving and bequest motives drive variations in saving rates across income groups. Finally, we illustrate how models that assume a constant rate of saving across income groups can yield erroneous predictions".

The main results of Dynan, Skinner and Zeldes's research are summarised here below.

TABLE 8

MEDIAN REGRESSION OF SAVING RATE ON CURRENT INCOME
UNITED STATES, 1984-88

Income quintile	Y-C(CEX)	ΔWealth (SCF)	Active+Pension (PSID)
Quintile I	−0.226	−0.015	0.086
Quintile II	0.151	0.095	0.129
Quintile III	0.269	0.087	0.163
Quintile IV	0.348	0.144	0.180
Quintile V	0.455	0.265	0.230

CEX: consumer expenditure survey; *SCF*: survey of consumer finances; *PSID*: Panel study of income dynamics.
Source: Dynan, Skinner and Zeldes (2000, p. 21).

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[18] Earlier on Modigliani (2001, p. 51), by introducing his work of the late 1940s, had this to say:
> "I had never really been convinced by the idea that the amount of saving would rise with income. I thought it was merely one of the fashions of the moment, and I set to work on the problem, pursuing the idea that the amount of saving might have variations, but not a rising trend".

These results have been found also for other nations. For instance Cereghetti and Staffieri (2005, p. 46) have calculated that in Switzerland the saving rate of families is as follows:

TABLE 9

THE AVERAGE PROPENSITY TO SAVE IN SWITZERLAND,
1998 AND 2000 AS % OF GROSS INCOME

Monthly gross income in Swiss francs	Average propensity to save (1998) in %	Average propensity to save (2000) in %
Under 2,000	−67.02	
2,000-3,000	−12.69	(Under 3,000) −25.87
3,000-4,000	−2.42	3.57
4,000-5,000	5.08	4.94
5,000-6,000	11.88	14.78
6,000-7,000	15.01	13.51
7,000-8,000	17.12	16.12
8,000-9,000	21.35	20.08
9,000-10,000	19.37	18.52
10,000+	27.92	30.04
Weighted average	13.58	15.40

Source: Cereghetti and Staffieri (2005, p. 53).

The above data may be represented graphically as below:

FIGURE 4

THE AVERAGE PROPENSITY TO SAVE ACCORDING TO THE LEVEL
OF DISPOSABLE INCOME IN SWITZERLAND, 1998 AND 2000
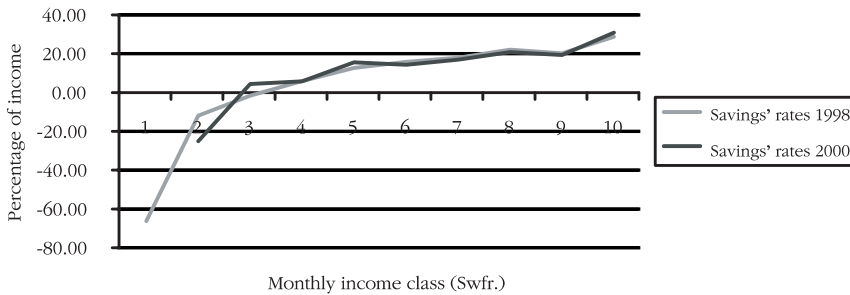
Source: Cereghetti and Staffieri (2005, p. 52).

Lenoci (2001) has calculated the rate of savings in Italy as follows:

TABLE 10

AVERAGE PROPENSITY TO SAVE OF ITALIAN FAMILIES
AS % OF GROSS INCOME

Yearly gross income millions of lire	Average propensity to save, in %
Under 20	−17.73
20-39	19.08
40-59	33.01
60-79	42.87
80 +	51.78

Sources: Lenoci (2001) and data from ISTAT.

The data shown above do not, of course, necessarily contradict the life-cycle hypothesis of Modigliani, Brumberg and Ando, for whom there is ample evidence that much of the accumulation (and decumulation) of wealth is 'hump shaped' according to age. But they do not also confirm Modigliani's (2001, p. 51) firm belief that saving does not necessarily rise with income. This is why I shall now turn our attention to the rather flimsy evidence that young people save very little (or dissave) and that old people dissave most of their accumulated life-cycle savings.

4.3. *The positive propensity to save of young people*

According to the 'stripped down' version of the life-cycle theory, young individuals and young couples should save negatively, or very little. According to Modigliani (1986, p. 304):

> "The life cycle of family size, at least in the United States, has a very humped shape rather similar to that of income, though with a somewhat earlier peak. As a result, one might expect, and generally finds, a fairly constant rate of saving in the central age group, but lower saving or even dissaving in the very young and old".

However, the empirical evidence for most countries (including to a lesser extent North America, Australia and the UK) is that singles or young families in their twenties and thirties do not dissave at all; on the contrary, in certain cases do even show a quite high propensity to save. But there is more than that; for example, if we were to take into account Modigliani's interpretation according to which:

> "If one makes proper allowance for participation in pension funds, then the dissaving (or the decline in wealth) of the old tends to be more apparent, and it becomes quite pronounced if one includes an estimate of Social Security benefits. But, when the saving and wealth measures include only cash saving and marketable wealth, the dissaving and the decline [in total wealth of the pensioners] appears weaker or even absent" (*ibid.*, p. 306),

marketable wealth, the dissaving and then the propensity to save of the young cohorts would appear even stronger than it is; in fact most data on the average saving rate of young cohorts refer to disposable income. If we were to take into account the 'obligatory' or 'forced' saving done for the various pension schemes,[19] the saving rate would be much higher.

However in my essay I shall not consider the 'forced' saving done by the active workers; nor shall I consider the decumulation process taking place during the retirement period. As I explain below, most pensions are a sort of 'insurance scheme' that cannot be 'cashed in' or sold. Therefore they do not enter the net wealth of individuals or families. Here below I reproduce some recent data on the saving behaviour of young people in various developed nations.

TABLE 11

PERSONAL SAVING RATES OF UNDER 40S, IN %
FOR US, CANADA, UK, ITALY, GERMANY AND JAPAN

Age group	United States	Canada	United Kingdom	Italy	Germany	Japan	Average
Under 30	−2.2	0	5	10	9.8	17.9	6.8
30-34	7.1	3	8	20	9.8	27.4	12.6
35-39	9.4	3	12	26	10.6	31.8	13.9

Source: Miles (1999, p. 5) from Poterba (1994).

TABLE 12

PERSONAL SAVING RATES OF UNDER 40S, IN %
FOR SWITZERLAND

Age group	Personal saving rate	
	1998	2000
15-29	16.45	16.47
30-39	12.04	16.67
Average through all groups (15-60+)	11.22	12.21

Source: Cereghetti and Staffieri (2005, p. 47).

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[19] Either public or private, both of the pay-as-you-go or of the 'capitalization' type.

As it can be seen, the propensity to save of the young (single or couples) is much higher than one may expect, except for case of the United States. Actually in Switzerland the saving rate seems to decrease monotonically with age: in 1998 it was 16.45% (under 29 years), 12.04% (30-39 years), 10.75% (40-49 years), 10.50% (50-59 years) and 8.31% (60+ years). The same trend is to be observed for the year 2000, with a lower rate of saving for elderly people (over 60 years). In this way the hump in savings seems to have disappeared, and more importantly, through the sample, no age group shows a negative rate of saving. The reasons for which young people (below 40) save substantially, and often more than average, might be due to:

– first, young people are better educated, and therefore draw higher salaries. More precisely, as Easterlin, Schaeffer and Macunovich (1993) have demonstrated in their excellent paper 'Will the baby boomers be less well off than their parents? Income, wealth, and family circumstances over the life-cycle in the United States', thanks to strong increases in productivity and better education the initial salary of the younger cohorts since 1945 has constantly progressed;

– second, they tend to marry and have children much later on, therefore are in a position to save more in their 20s and 30s;

– third, they can in general rely much more on their parents than the previous generation, and

– fourth, they have fewer children than their parents and grandparents, and in any case much later in life.

4.4. *The positive propensity to save of 60+*

The 'hump saving' qualification of the life cycle means that during the last years of their lives, which correspond more or less to the retirement period,[20] individuals are expected to dissave the whole (or greatest) part of the life-cycle savings put aside earlier on in their lives. This is what the 'stripped down' version of the life-cycle theory means for the saving rate and for the accumulation of wealth according to Modigliani (2001, pp. 74-75): "The saving rate rises moderately up to middle

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[20] One may note that, in general, dependent workers tend to retire much earlier than independent ones.

age, then falls rapidly, becoming negative after sixty-five". "Wealth reaches its peak around ages fifty-five to sixty, when retirement begins, and from then onwards it systematically diminishes" (*ibid*., p. 77).

However, at least since the early 1980s, most empirical data on the saving ratio of retired people show that the rate of saving is far from negative (in certain cases it is quite high indeed, as in the case of Italy, Japan, Germany and Switzerland).

To this Modigliani (*ibid*., pp. 77-78) counterargues that:[21]

> "The conclusions reached above are in flat contrast to those re-
> ported in various studies in recent years, which claim to have
> found no evidence of the hump. For example, in introducing a col-
> lection of writings on the subject[22] a well-known expert on saving,
> James Poterba, concludes that for the countries studied in the col-
> lection, households, on average, continue to save at all ages, even
> the most advanced. Since wealth at any age represents the amount
> of saving accumulated up to that age, as long as saving is positive

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[21] We reproduce here the Italian version since it is more meaningful than the English translation:

> "Le conclusioni raggiunte sopra sono in forte contrasto con quelle riportate in diversi studi di anni recenti, che sostengono non trovare evidenza della gobba. Ad esempio, un noto esperto del risparmio, James Poterba, nel presentare una raccolta di scritti in materia, conclude che per i paesi presi in esame nella sua raccolta, le famiglie, in media, continuano a risparmiare a tutte le età, anche le più avanzate. Visto che la ricchezza a ogni età rappresenta il cumulo del risparmio fino a quell'età, fintanto che il risparmio è positivo la ricchezza deve crescere e questo esclude la gobba. Pertanto Poterba conclude che gli scritti del volume "danno scarso appoggio al modello del ciclo vitale". Ma in realtà questi studi, e diversi altri, soffrono di un vizio fatale, e cioè errano nella interpretazione del concetto di reddito e quindi di risparmio, che è alla base del CVR, secondo il quale il reddito rilevante è quello *prodotto* e il risparmio è la differenza fra questo e il consumo, come abbiamo detto *supra*. Gli autori di quegli studi hanno travisato questi concetti, identificando il reddito con quello che abbiamo chiamato sopra il *reddito disponibile* e il risparmio con il nostro *risparmio privato*. Ma, come si è visto, questo equivale a *sottrarre dal reddito prodotto e dal risparmio totale tutto il risparmio obbligatorio*. Poiché nella formulazione originaria del CVR non si faceva menzione esplicita del risparmio obbligatorio, allora di poca importanza, le due misure del reddito e del risparmio coincidevano. Ma una volta introdotto il risparmio obbligatorio avrebbe dovuto essere evidente a tutti che esso andava considerato componente essenziale del risparmio e quindi del reddito" (Modigliani 1999, pp. 85-86).

We might however counterargue that, symmetrically, the saving rate of the active period should be increased by the same amount. And since the saving rate of the 20-45 age-cohorts is already non-negative, it would turn out to be even more consistent; which is not in line with the savings profile of the life-cycle theory.

[22] Poterba (1994).

wealth must increase, and this rules out the hump. Poterba there-
fore concludes that the writings in the volume provide very scant
support for the life cycle model. But in reality those studies, and
sundry others, suffer from a fatal blemish – that is, they err in their
interpretation of the concept of income and thence of saving,
which underpins the LCH model, according to which the relevant
income is the one *produced* and saving is the difference between this
and consumption, as we said above. The authors of the studies have
misinterpreted these concepts, identifying income with what we
called above disposable income and saving with our *private saving*.
But as was seen, this is tantamount to *subtracting from the income
produced and from total saving all the compulsory saving*. Since in the
original formulation of the LCH no explicit mention was made of
compulsory saving, which was then of small importance, the two
measurements of income and saving coincided. But once compul-
sory saving was introduced, it should have been plain to all that it
must be considered as an essential component of saving and there-
fore of income".

One might of course say that if Modigliani's argument were right,
then the propensity to save at the very end of one's life-time would
asymptotically tend towards zero. But this is not what happens: in fact
the 1988 data for Switzerland unmistakingly show that the propensity
to save increases during the retirement period: it was –7.60% between
65 and 70, 0.87% between 70 and 75 and 11.51% above 75 years of
age.[23] As I have already said, this might also be due to the incapacity of
elderly people to get out and spend their income, or it may be due to
their often strong *aversion* to spend it. On the other hand, if bequests
were simply the result of premature death or of accidents, individuals
would not take specific steps to avoid that their heirs will have to hand
over a part of the inheritance to the state. As pointed out in footnote
15, in the UK the inheritance tax is at present charged at 40% on estates
worth more than £ 263,000 for the tax year 2004-05. But most account-
ants, according to the specialist quoted in *The Observer* article here
below, Helen Monks, consider the tax as, in effect, voluntary because
of the myriad of ways of dodging it.

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[23] It is worth noting that, for all pensioners, with monthly incomes of less than
Swfrs. 2,000 the average propensity to save was –18,69%, rising to –1,63% for
monthly incomes between 2,000 and 3,000; to 5,43% for monthly incomes between
3,000 and 4,000, and finally to 12,69% for monthly incomes higher than 4,000.

In a recent article published in the *Observer* of 14th November 2004, with the title "It's a middle-class dilemma – avoid inheritance tax and leave it to your offspring", Helen Monks notes that:

> "Many families feel it is only natural to boost the amount they hand on to the next generation by taking whatever legal steps they can to avoid inheritance tax. By not paying, these families might argue, they are boosting the life chances of their successors, increasing their ability to afford deposits on homes, avoid debt, meet the cost of university fees and higher education, or invest in their own businesses. Another point of view, however, is that by avoiding tax on wealth they are subscribing to a system that undermines the life chances of an entire generation. John Whiting, accountant of Pricewaterhouse Coopers, says: 'The question of whether, if you have saved away for years, this should be returned to the pot is part of a broader philosophical argument'".

The arguments put forward are predictable. For instance parents wish that their children can have a 'good start in life'; or they simply think that they have worked so much that their children are entitled to fully benefit from their success.[24] Other still propose that the in-

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[24] A modern theory of accumulation of savings and capital cannot overlook the issue of inter-generational transmission of wealth. It is so important that families try with every possible legal instrument to avoid the estate duty (or Inheritance Tax = IHT). Eammon Butler of the Adam Smith Institute maintains that

> "Public policy should be in line with human nature, and human nature is about making sacrifices for your children. Also, under IHT there is less of an incentive to build up family assets. It is anti-wealth, destroys jobs and destroys businesses. It does not do the job of getting people out of poverty".

For these reasons most legal advisors recommend that the inheritance issue is to be raised, within dynasties, rather sooner than later. It may be remembered that in 2004-05 the individual tax-free allowances for both spouses is of £ 263,000. It is possible to reduce the size of one's estate by *inter vivos* gifts, but it is necessary to do them seven years before one's death. *The Observer* at this point adds that:

> "If you don't have much in the way of liquid assets but are determined to avoid the tax, you could consider using trust arrangements, which can work to protect certain assets from the Inland Revenue. Specialist advice is likely to be required to establish the right trust for your needs, as this can be a hugely complicated area".

The aversion to pay inheritance tax is so strong that the above quoted research informs their readers that if you do not want to pay IHT, but want your wealth to benefit others as well as your family after you die, remember that any gift to charities falls outside the IHT net. Additionally one may reduce the size of the total estate by making 'wedding gifts' of up to £ 5,000 to each of one's children, £ 2,500 to each grandchild, and £ 1,000 to anyone else, plus other gifts. Even if one dies within seven

heritance tax should be paid individually by the heirs receiving the bequest; the tax rate should depend on how much the recipient earns and owns, and not on the size of the overall estate.

The relevance that families attach the inter-generational transmission of wealth is underlined by other steps taken to avoid the inheritance tax. Such concerns have been extensively treated by Kopczuk and Slemrod (2001, pp. 17-18) in their paper "Dying to save taxes: evidence from estate tax returns on the death elasticity": the authors conclude that evidence from estate tax returns suggests that some people will force themselves to survive a bit longer if it will enrich their heirs.

> "To be sure the evidence is not overwhelming. Nevertheless, our central estimate is that, for individuals dying within two weeks of a tax reform, a potential tax savings (using 2000 dollars) increases the probability of dying in the lower-tax regime by 1.6%. That there is any effect at all adds to the large body of evidence that taxes affect behavior, and particularly the timing of behaviour, including activities such as marriage and childbearing which are not generally thought to respond to financial incentives".

There are a number of points that may be raised here:

1. If the data are based on 'cross-sections', the 'hump' of wealth may be explained by at least three points that are not directly connected with the life-cycle approach. First, the number of children in families founded in the first part of the XX century was higher than it is now; this has led to a greater dispersion of wealth among heirs, and hence the 'hump'. Secondly, the younger cohorts have benefited less from the strong economic growth of the 1960s and 1970s, and hence their rate of accumulation has been lower than that of the younger generations; thirdly, the former classes have not benefited from the social security system that have been set up during the last decades. Therefore much of the 'hump' of wealth may be explained without the life-cycle theory.

2. The second aspect concerns the nature of the pensions, both of the 'pay-as-you-go' and of 'capitalization' type. In most cases in Europe and Japan pensions are of the 'pay-as-you-go' type: this means

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years of making them, these gifts will be considered outside your estate for IHT calculations. Furthermore anything given to one's spouse is free of inheritance tax.

the younger cohorts pay indirectly to the pensions of the oldest cohorts. In fact in most cases, even with the personal 'capitalization' type, it is not possible to withdraw the entire (or even part of) the capital as one retires. There it is not, as Modigliani argues, a transfer from the active period to the retirement period. It is a sort of insurance: you pay(-as-you-go) when you work, and you cash in when you retire. If you are lucky you will cash in for a very long period; if you are not you will lose almost everything.

3. But there is more than this. Börsch-Supan and Reil-Held (2001) have considered the role of 'insurance' and that of 'transfers' of the German public pension system (based on the 'pay-as-you-go' scheme). They argue (*ibid*., p. 505) that:

> "Estimating these shares is important because they are indicative of taxation-related deadweight losses and influence public acceptance of the pension system. We also disentangle intra-generational from inter-generational transfers. Although our estimate of intra-generational transfers is smaller than recent semi-official estimations, such transfers create substantial deadweight losses. Inter-generational transfers are much larger, thereby contributing to strong negative participation incentives for the younger generation".

This conclusion means that the inter-generational issue arises even in the context of most of the pay-as-you-go systems, even if this time the causality is reversed, since the younger generation will have to pay for the older generation when the latter retires.

4. The fact is that many pensioners reduce drastically their consumption for various reasons: first they want to leave to their children as much as possible (possibly avoiding the estate duties where they still exist); secondly they have a strong aversion to consumption; thirdly their physical fitness often does not allow for much consumption.

5. The fifth point concerns the fact that very old people, who receive very little pensions, continue to save well into their eighties and nineties. This applies also to people who enjoy revenue from capital only, and which cannot be considered as 'transfer recipients' in the sense pointed out by Modigliani. The very fact that pensioners or elderly people save is a clear indicator that individuals plan to leave wealth to their children or heirs.

6. Finally, as I have already mentioned above, if we were to take into account Modigliani's argument that the saving rate of the pensioners should include also the 'drawing down' of the capital stock of the pensions schemes, then in any case it should be added to the saving rates of the active period. Leaving aside for a moment the argument relative to 'non-liquidity' of such schemes, we may note that in so doing the 'hump' of savings might in many cases disappear, due to the mainly positive saving rate of the young cohorts of workers.

Table 13 provides estimates of age-specific saving rates from surveys undertaken in six major industrialised economies (for various periods between 1969 and 1990; for more details see Miles 1999, p. 5, and Poterba 1994). As Miles points out, there are some differences across the six nations in the definitions of income. By and large the savings definition is the flow of income less all forms of consumption as a percentage of income.[25] Miles (1999, p. 5) argues that:

> "What is striking from the table is that in no country is the average saving rate of any of the three cohorts aged over 65 (65-69, 70-74, and > 74) negative. The cross country average of the typical saving rate of the 65-69 cohorts is over 15%. This is marginally higher than the average saving rate for the cohort aged 40-44 (the period in which labour earnings is near its peak for many workers and where the life cycle theory suggests saving should be high). It may be that the 65-69 cohort contains significant numbers of people who are still working which would account for some of these results. But the data in the table also show an average saving rate of the 70-74 cohort which is virtually the same (15.1% against 15.4% for the 65-69 group)".[26]

Numerous micro-data seem to confirm that the elderly do not dissave significantly, questioning one of the pillars of the life-cycle theory (see, for instance, Poterba 1994; Weil 1994a; Wachtel 1984; Bosworth, Burtless and Sabelhaus 1991). Table 13 also shows that

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[25] Income is measured as the sum of labour income, income from pensions and other benefits, and income from assets.

[26] These results are confirmed by a number of studies. Weil (1994a, p. 61) states that

> "Bosworth et al. (1991) find positive saving for people over 65 in both Canada and Japan. Lydall (1955) finds slight dissaving of the elderly in data from the United Kingdom, and Statistics Canada (1973) and Börsch-Supan (1992) find positive saving for people over 65 in Canada and West Germany, respectively".

1. the maximum saving rate is normally reached by the age-group 55-59, and this is true for the US, Canada, UK and Japan; but it is reached by the 60-64 age group in Germany and surprisingly by the 65-69 age group in Italy. Since the actual retirement age in Italy, when the survey was carried out (1978 and 1983), was on average not much higher than 54-55, we might conclude that there the maximum saving rate was reached more than 10 years into the retirement period.

TABLE 13

AGE-SPECIFIC PERSONAL SAVING RATES (%), OECD NATIONS 1970-90

Age group	United States	Canada	United Kingdom	Italy	Germany	Japan	Average
Under 30	−2.2	0	5	10	9.8	17.9	6.8
30-34	7.1	3	8	20	9.8	27.4	12.6
35-39	9.4	3	12	26	10.6	31.8	13.9
40-44	9.8	5	12	22	10.2	31.8	15.1
45-49	11.2	5	11	23	10.2	28.5	14.8
50-54	13.9	8	10	31	10.4	31.5	17.5
55-59	16.6 (max)	11 (max)	13 (max)	32	11.0	34.5 (max)	19.7 (max)
60-64	8.6	9	6	34	12.2 (max)	31.7	16.9
65-69	7.1	6	2	36 (max)	9.2	32.0	15.4
70-74	1.1	6	9	31	9.7	33.8	15.1
74+	n.a.	8	n.a.	n.a.	10.2	31.1	16.4

Source: Miles (1999, p. 5) from Poterba (1994).

2. Apart from the US, generally speaking the drop in the rate of saving during the retirement period, after the peak has been reached, is slight. In the case of Japan and Italy the 'hump' is quite small, and in any case much shifted towards old age.

Finally I might mention Weil's (1990, 1994a, 1994b) works, which on the one hand confirm the absence of significant dissavings among the elderly, and on the other confirms that there is an important *inter vivos* transfers between overlapping generations. In particular he uses a cross section of households of the US 1985 *Consumer Expenditure Survey* and concludes that "contrary to the prediction of the life-cycle model, there is no sign of dissaving by people of 65 and over" (Weil 1994a, p. 63). This leads him to summarise his work as follows (*ibid*., pp. 55 and 76):

"Examination of household (micro) data on the elderly has generally concluded that they do not dissave significantly, whereas estimates using aggregate (macro) data have shown that the presence of

a large elderly population leads to a lower saving rate. This paper shows that if interactions between generations are important, one would not expect these estimates to be the same. [...]/[...] From the fact that these estimates differ, I conclude that there are relationships between households that are not taken into account by the micro-data, but are present when all of the households in the economy are aggregated. There are many possible relationships between households. Here I examine the potential effects of one such relations – the receipt of bequests – that has already attracted the attention of economists studying capital accumulation, saving, and intergenerational relations. I find evidence that the receipt of such bequests has an important effect on the saving of the young".

The conclusions drawn by Weil, among other things, confirm the absence of dissaving among the elderly, but at the same time also provide support for the often under-rated role of *inter vivos* transfers and bequests in the United States. The same tendency is confirmed by the analysis of Rob Alessie, Annamaria Lusardi and Arie Kapteyn in their paper "Saving after retirement: evidence from three different surveys" published in *Labour Economics* in 1999. Their work focuses on the Netherlands, and is based on longitudinal wealth data from the Socio-Economic Panel, consumption and income data from the *Consumer Expenditure Survey*, and subjective data from the Center data-panel. These data are used to study, among other things, the saving behaviour of the elderly. The authors estimate savings as first differences of wealth, by subtracting consumption from income, and by using self-reported data. They conclude that (*ibid.*, p. 284):

> "When considering financial wealth, we find that retired households keep accumulating wealth. Since, however, net worth is falling slightly, some decumulation of housing wealth does appear to take place. In other words, some downsizing appears to be going on. However, if one does not remove unrealized capital gains, both measures show a continued accumulation of the retired. In contrast to Hurd (1987), we therefore find only very limited evidence that the retired decumulate their bequeathable wealth".

We might then conclude that the evidence emerged in the last 10-15 years seems to suggest that very little decumulation of wealth occurs during the retirement period, and when it occurs it happens to a very limited extent very late in the life-time, at the age of 75-70 years,

or even later. In most cases about 4/5 of the maximum value of all net wealth (life-cycle as well as inherited) is left at death.

5. Rethinking the life-cycle theory and towards an 'inter-generational' theory of savings and consumption

The above analysis has demonstrated that further work is required in order to assess the motivations, the mechanisms of transmission and the implications of the existence, in our societies, of a relevant 'dynastic' capital stock. This would be necessary even if the bequest/total wealth ratio was as little as ¼; but I am convinced that in certain cases it is well above ½, and in certain cases even equal to ¾. The laws of transmissions of bequests, and their multiple and important implications for the functioning of modern economic systems cannot be left aside for a long time to come. As Keynes (1936, pp. 372 and 374) has pointed out:

> "The outstanding faults of the economic society in which we live are its failure to provide for full employment and its arbitrary and inequitable distribution of wealth and incomes. [...] Since the end of the nineteenth century significant progress towards the removal of very great disparities of wealth and income has been achieved through the instrument of direct taxation – income tax and surtax and death duties – especially in Great Britain. Many people would wish to see this process carried out much further [...]/[...]. For my own part, I believe that there is social and psychological justification for significant inequalities of incomes and wealth, but not for such large disparities as exist today. There are valuable human activities which require the motive of money-making and the environment of private wealth-ownership for their full fruition. Moreover, dangerous human proclivities can be canalised into comparatively harmless channels by the existence of opportunities for money-making and private wealth".

One of the aims of my research programme of the last thirty or so years has been that of grafting into a post-Keynesian model of accumulation and distribution the issue of the inter-generational transmission of wealth. More precisely I have tried to introduce a

modified version of the life-cycle hypothesis into the traditional Keynes-Kaldor-Pasinetti two- or multi-class growth model. I must confess that such an attempt was also suggested to us by Samuelson and Modigliani (1966) who, concluding their, in a certain sense, masterly essay on "The Pasinetti paradox in neoclassical and more general models", expressed their uneasiness with the assumption of permanent classes of capitalists and workers ("pure profit and mixed-income receivers" in their terms) with given and unchanging saving propensities on which most neo-Ricardian, post-Keynesian, as well as their models are based. To quote the two MIT economists (Samuelson and Modigliani 1966, p. 297):[27]

> "This assumption completely disregards the life-cycle and its effects on saving and working behavior. In the first place with a large portion of saving known to occur in some phases of the life cycle in order to finance dissaving in other phases, it is unrealistic to posit values for (s_c, s_w) which are independent of n. This shortcoming is probably not too serious and could be handled without changing our results drastically".

As anticipated above, in Baranzini (1991a, chapters VI and VII) I have considered the significance and relevance of the inter-generational bequest in a two- or multi-class model of economic growth and income distribution. The aim of the analysis has several aims.

    – The first is to build up a simple model that would reconcile the micro-decisions of individuals (or indeed dynasties) with a macro-economic framework, allowing for the study of the mechanisms which define the process of economic growth, capital accumulation and income distribution. The model set up is quite simple, since it includes the simplest version of a two overlapping generations life-cycle model; but it does however provide a number of insights into

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[27] The main part of the research was carried out while I was staying at The Queen's College, Oxford, for the period 1971-85. The debts accumulated in the writing of this vast research are numerous, and I would like to mention them. First of all Pietro Balestra, then at the University of Fribourg in Switzerland, encouraged me to take up this field of research while I was a graduate student there. At Oxford my thesis supervisors David W. Soskice, John S. Flemming (who sadly passed away in 2003), Walter A. Eltis and James A. Mirrlees gave generously of their time and ideas and continuously forced me to rethink and defend my position on numerous issues. On moving to Cambridge for a year in 1976 I met there Luigi L. Pasinetti with whom I was associated ever since.

the laws which regulate the relationships among the main economic variables.

– The second aim of this analysis is to provide a general framework within which the relevance of the historical dimensions of the inter-generational capital stock or bequest could be studied. In other words the distinction between life-cycle savings and inter-generational bequests, founded on a simple bequest utility function and on few additional assumptions, allows the relative strength of both kinds of capital or accumulated assets to be determined.

The results obtained allow us to focus on the relevance in equilibrium of the inter-generational bequest and on the relative strength of the classes at stake. They may be summarized as follows. In a steady-state model where the transmission of inter-generational financial assets is a prerogative of the entrepreneurial class, it is shown that the value of the capitalists' bequest discount rate hovers around 1-3% (yearly) and is not very sensitive to changes in the equilibrium rate of interest, in the rate of growth of population and in the consumption discount rate of all classes of the system. Additionally the value of the bequest discount rate obtained shows that for an active and retirement period of twenty-five years each, a rational dynasty of capitalists will accumulate capital (as well as life-cycle savings) at the required equilibrium rate (g) for a surprisingly low value of the bequest discount rate.

In other words this means that, in order to maintain their relative share of the total capital stock, the entrepreneurs must manifest a rather strong desire to leave a bequest to the next generation. This is an interesting result, especially because little is known about the value of the bequest discount rate (on this point see, for instance, Blomquist 1977 and 1979). The interested scholar is referred to Table 5.1 in Baranzini (1991a, p. 121). Here I show that by setting the yearly rate of interest of the system at 4%, the yearly rate of population growth at 1%, the yearly consumption discount rate at 1% and the share of the inter-generational bequest at 36.4% (a reasonable low value indeed), the entrepreneurs will retain their share of capital (and therefore their relative share of income) only if display a bequest discount rate equal to 1%, a very low value indeed. This means, in other words, that balanced growth is ensured if, and only if, the entrepreneurial class has a strong willingness to bequeath financial capital to the next generations. This result is quite interesting, since it means that class rigidity

will continue to exist only under fairly restrictive conditions; as soon as the middle classes start having their own 'dynastic capital', they will be able to make a dent in such a rigid system.

For these reasons, and in order to generalise the model, I have extended the analysis to the case in which all classes may pass on a financial bequest (excluding education[28]) to their children. In this context, in order to have a steady-state path, the capitalists or pure-entrepreneurs must have a much stronger will to bequeath capital to their children than the other dynasties or classes. It is only in such a situation that all classes will hold a positive share of the total capital stock. Can this analytical result be reconciled with economic reality and common sense? To a certain extent the answer may be positive, since

– the workers' class, by definition, derives a high proportion of its income from the human capital stock, so that the class may be inclined to discount its inter-generational bequest at a rate lower than average (on this point see Flemming 1979); and

– it is not unrealistic to posit a situation where, in general, low income families give higher priority to life-cycle consumption and, consequently, a lower one to the inter-generational capital stock;

– on the other hand those classes that derive a high proportion of their income from inter-generational wealth (and the remaining part from life-cycle savings) in a long-term perspective are bound to give weight to the accumulation of such a wealth, by discounting it at a rate higher than average.

Notwithstanding this different approach to the inter-generational bequest, there exists a real possibility of a balanced growth of the system, where the classes maintain a constant relative economic strength and a constant share of the total capital stock of the system. Obviously the system may well leave such a path: this would happen if the capitalists were to show a too low propensity to pass on bequests to their children, so diminishing their relative strength in the system; similarly a much stronger desire to transmit inter-generational wealth

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[28] Expenses for children's education are usually not taken into account in this literature. Kotlikoff and Summers (1981) include part of the expenses for education above a certain age (18 or 20 years). This was, not surprisingly, disputed by Modigliani (1988a) in the same volume edited by Kessler and Masson.

by the workers would eventually achieve the same result, squeezing out partially the other classes from the model. Within this framework it is also possible to consider the possibility and implications of a double capital market, i.e. of a remuneration of savings according to ownership.

A number of conclusions expounded above are confirmed, at least to a certain extent and in a slightly different context, by Wolff's (1988, pp. 261-80) analysis of the 'life-cycle savings and the individual distribution of wealth by class'. Wolff in fact develops a similar life-cycle model for the workers' class, but supposes that capitalists save a fixed proportion of their income. In particular he focuses on the significance of modifications in steady-state wealth inequality of the system resulting from changes in the following six parameters: *a)* changes in productivity growth, *b)* changes in the capitalists' propensity to save, *c)* changes in the life-span and retirement age, *d)* changes in the relative size of the capitalists' class, *e)* changes in the covariance of earnings with age and *f)* changes in the social security system. As the author points out, some of these factors may have played an important role in the historical decline in wealth inequality during the last one hundred years. And Wolff (*ibid.*, p. 276) concludes that:

> "Two principal theoretical results emerge from the model developed in this paper. First, the specification of a life-cycle savings model for workers in a two-class model is found to be consistent with the Pasinetti results regarding the rate of interest and productivity growth in steady-state equilibrium. Second, in steady-state equilibrium, wealth inequality among individuals is found to remain constant over time".

These conclusions enhance the merits of the introduction of the micro-economic foundations into the two- or multi-class fixed savings model. But as a matter of fact Wolff stresses that he has not proved that there is always a two-class solution.

> "In particular, it is possible that under certain conditions (parameter values) the workers' savings propensity is so high that they accumulate wealth faster than the capitalists. In this case, the only equilibrium which results is a one-class worker economy" (*ibid.*, p. 277).

One may note the similarity with my model (Baranzini 1991a, chapters 5 and 6), although I have *explicitly* considered a life-cycle function for the capitalists as well. Finally the results that I have obtained in Table 5.2 (*ibid.*, pp. 140-42) may be compared with the following long-term properties of the Wolff's (1988, p. 278) model:

> "Various factors were adduced which might help to explain the observed reduction in personal wealth inequality over the last 50 years or so. Of these, the increased life expectancy and reduction in work life and hence increase in the number of years of retirement seems the strongest force leading to increase wealth inequality. Second, a slowdown in productivity growth and a decline in the profit (or real interest) rate may have led to greater wealth equality. Third, an increasing size of the capitalist class may have contributed to a decline in personal wealth inequality. Fourth, a decline in the rate of return to age or experience on wages may have led to reduced wealth inequality. Fifth, the increase of the social security tax rate from zero % in 1934 to 7% or so today has probably led to increasing inequality".

In a certain sense Wolff's inequality in personal wealth distribution may, in my model, be partially replaced by the distinction between workers' and capitalists' inter-generational capital stock, while a number of his other conclusions coincide with those indicated above (on these points see also Baranzini 1991a, chapter 5).

6. Conclusions

A non-negligible body of evidence seems to indicate that some features of the 'stripped down' version of the life-cycle theory are no longer recognizable. This recent empirical evidence relating to Western Europe and Japan (and increasingly to North America and Australia), taken with due care, seems to suggest that the 'hump shape of life-cycle saving' and also the 'hump shape of life-cycle wealth', where they still exist, are just a minor component of total savings and total wealth. Inter-generational wealth indeed absorbs a large share of total wealth. Hence the excitement of many fellow economists who in the late 1940s and 1950s thought that Keynes's 'fundamental psychological

law' was dead might lose some of its force. For these reasons Modigliani's (1986, p. 298) optimistic conclusion that:

> "In this early phase [i.e. Keynes's interpretation] the dominant approach could best be characterized as crudely empirical: little attention was given to why rational consumers would choose to 'allocate' their income to saving. The prevailing source of substantial saving was presumably the desire of the rich to bequeath an estate (Keynes's "pride" motive, p. 108). Accordingly, the main source of the existing capital *stock* could be traced to inheritance"

may have to be carefully reconsidered.

In other words, even if the inter-generational transmission of wealth is a (private) matter of the richest 20% of our society, as Modigliani[29] puts it, it is more important to study the reasons why dynasties hold and then hand down a high proportion of wealth than the reasons behind the 'optimal life-cycle allocation of consumers' resources'. For all that, the life-cycle hypothesis need not be set entirely aside; it still helps to explain life-cycle savings. Nonetheless, it must be integrated with a new theory explaining the reasons and implications of the presence of the inter-generational bequest. This new frame of analysis must also provide an explanation for the so-called 'life-cycle consumption lumping', with its profound repercussions on the consumption profile of individuals and dynasties.

More precisely, the empirical evidence that has emerged in the last twenty years clearly points out that:

1. first, the share of the inter-generational wealth in the total wealth of individuals and families is much higher than previously thought, probably between 50% and 80% in certain cases. These results are particularly representative for Western Europe and Japan, and to a lesser extent for the US (where its share is probably around 50%). The share of bequests out of the total personal wealth is particularly important for individuals older than 50-60 years, when they inherit from their parents. As a matter of fact, while between the ages of 20 and 55 most wealth is of a life-cycle nature, between 55 and the date of death most of it turns out to be of an inter-generational nature.

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[29] See, for instance, Modigliani (1986, p. 310).

2. This argument calls for the maintenance of an efficient estate duty. We are well aware that such a tax *a*) is highly controversial and *b*) has recently been totally or partially abolished in various countries.[30] Keynes pointed out more than once that individuals should be equal, at least in their cradle. But the evidence of the last fifty years points to quite the opposite: according to Blinder (1973, p. 609), the distribution of bequests seems to be highly concentrated (reaching a Gini coefficient equal to 0.93); and income from wealth is in any case more concentrated than wealth itself. But we may go further. One might argue that for those countries where a comprehensive wealth tax exists (as in Germany, Switzerland and in parts of the US), life-cycle savings should, if possible, be taxed differently from intergenerational assets. In fact, life-cycle savings are the outcome of 'abstinence from consumption', while bequests are not. Economic policies aimed at stimulating consumption ought to take this new evidence into account.

3. The empirical evidence gathered seems to show that the 'hump' of life-cycle savings in many countries tends to vanish. This is due to the fact that the young and old cohorts save positively, sometimes quite a high percentage of their income. Even if we were to take into account Modigliani's argument that the saving rate of pensioners should include the 'drawing down' of the capital stock of the pensions schemes, then this should be added to the savings rates of the active period. Leaving aside the argument relative to the 'non-liquidity' of such pension schemes, we may note that in so doing the 'hump' of savings might also in many cases disappear, because of the mainly (quite) positive saving rate of the young cohorts of workers.

4. I dare say that the life-cycle theory of Modigliani, Brumberg and Ando has been a path-breaking, but typical, by-product of the American vision and interpretation of the economic context in the aftermath of World War II. It was an economic period characterised by equal opportunities, and by high earnings matched by equally high consumption. Consumers' decisions were confined to the short term as was the case with maximization of utility from life-cycle consumption; moreover, the degree of solidarity with the next generation was

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[30] Among the countries that have recently abolished it we might quote Italy and numerous Swiss cantons (fiscally independent from the central government of Berne).

not a top priority. Dynasties were relatively unimportant, and 'the bequest motive [seemed] to be limited to the highest economic classes' (Modigliani 1986, p. 310). Finally, the micro-economic constraints seemed to matter much more than the whole macro-economic framework. A far cry comes from the Western European and Japanese realities, where since the first Industrial Revolution the focus had been on the long-term accumulation of physical and financial wealth, and where dynasties played an important economic and social role as mentioned above. Here, historically, the social, institutional and geographical rigidities were (and still are) much greater, and a very progressive tax-system had been devised to redress the huge inequalities caused by such an institutional framework. The future will tell whether these differences will remain, or whether the two different set-ups will converge.

Modigliani's contribution in the field of the accumulation of savings has surely been an important step for the understanding of the way in which individuals and overlapping generations behave; but far from being a 'final' contribution it requires additional work. Therefore a number of arguments concerning *a*) the short-run stabilization policies and *b*) the long-run propositions put forward in Modigliani (1986, pp. 310-11) may be questioned. In particular the Modigliani's conclusions according to which:

> "(i) *The Monetary Mechanism*: The fact that wealth enters importantly in the short-run consumption function means that monetary policy can affect aggregate demand not only through the traditional channel of investment but also through the market value of assets and consumption" (*ibid.*, p. 310)

might be replaced by the following proposition:

> (i) *The Monetary Mechanism*: The fact that the main share of wealth is in all circumstances inter-generationally transmitted, and only in part of a life-cycle nature, means that monetary policy can only marginally affect aggregate demand through the traditional channel of investment, as well as through the market value of assets and consumption.

Instead, we might retain Modigliani's further argument:

"(ii) *Transitory Income Taxes*: Attempts at restraining (or stimulating) demand through transitory income taxes (or rebates) can be expected to have small effects on consumption and to lower (raise) saving because consumption depends on a life resources which are little affected by transitory tax change (empirically supported). (See the literature cited in my paper with Charles Steindel, 1977, and my paper with Sterling, 1986.)" (*ibid*).

We might also retain the substance of Modigliani's first 'long-run proposition':

"(i) *Consumption Taxes*: A progressive tax on consumption is more equitable than one on current income because it more nearly taxes permanent income (quite apart from its incentive on saving)" (*ibid*).

But I feel that it ought to be completed as follows:

(i) *Consumption and Inheritance Taxes*: A progressive tax on consumption is more equitable than one on current income because it more nearly taxes permanent income. A progressive tax on income from wealth may also be applied, if possible on inherited wealth and not on life-cycle savings. Since dynasties have a very strong propensity to pass on a bequest to their heirs, and since the distributions of wealth and of inheritance are highly concentrated, a progressive inheritance tax should be levied on each *donee* (according to kinship), and not on the whole estate. A tax-free threshold will be introduced, below which no inheritance tax will apply.

The second long-run proposition concerns the so-called 'Ricardian Equivalence Theorem', according to which parents in particular, and the private sector in general, will save more in order to offset the burden of public deficits on future generations. In particular Modigliani reaches a conclusion sharply in contrast with such a theorem, and states that:

"*(ii) Short and Long-Run Effects of Deficit Financing*: Expenditure financed by deficit tends to be paid by future generations; those financed by taxes are paid by the current generation. The conclusion rests on the proposition that private saving, being controlled by life cycle considerations, should be (nearly) independent of the government budget stance (myself and Sterling), and therefore private wealth should be independent of the national debt (my 1984 paper). It follows that national debt tends to crowd out an equal

amount of private capital at a social cost equal to the return on the lost capital (which is also approximately equal to the government interest bill)" (*ibid.*)".

Such a statement might be replaced by the following one:

(ii) *Short and Long-Run Effects of Deficit Financing*: Expenditure financed by deficit will only partially be paid by future generations; those financed by taxes are paid by the current generation. The first part of this conclusion rests on the evidence that dynasties will save more in order to offset the negative effects of public deficits on future generations; in other words they are concerned that the real value of the dynastic wealth will not be affected by the unfavourable effects of the public debt (interests plus repayments) charged to the next generation.

I might conclude that the relevance of the inter-generational transmission of wealth goes to confirm, at least partially, the Ricardian Equivalence Theorem.

I would like to leave you with this thought: Modigliani's contribution to the theory of saving and consumption behaviour has been fundamental in identifying and tackling a number of issues that could not find a fully satisfactory answer in pre-existing theories. Now, 50 years later, the life-cycle theory requires a serious rethinking; but we must pay tribute to the ingenuity, indefatigability, tenacity, not to say obstinacy, of Franco Modigliani, demonstrated in this important field of inquiry of our discipline.

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