SAVING AND GROWTH: ANOTHER LOOK
AT THE COHORT EVIDENCE

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Trying to account for the selection induced by the relation of headship with age opens a new line of research. The main point raised by DP is that the age-saving profiles of heads and individuals are very different, and the selection bias in estimating age-saving profiles can potentially account for a positive correlation between aggregate saving and growth. The paper raises important issues, with respect to modeling who is the household head, how resources are distributed within the family, and about transfers within the household. The accounting framework and the method to decompose household income and consumption in individual income and consumption are innovative. My main comments refer to assumptions required to impute income and consumption, and about the possibility of using microeconomic data on saving to study the relation between aggregate (national account) saving and growth.

The LCH in LDCs

The LCH is not in very good shape in LDCs countries, at least not as in good shape as it is in industrialized countries. In OECD countries a large part of wealth is annuitized. The hump-shape in saving and wealth depends mainly from the fact that in modern societies a great deal of saving occurs through mandatory retirement plans, such as social security and private pension funds, while dissaving occurs mainly through annuitized wealth. [For instance, in Italy private wealth for the 75-80 age group (75-80) is only about five times consumption, which is a small fraction of lifetime wealth.]

In most of the OECD countries pension arrangements “enforce” an LCH behavior. The existence of mandatory saving programs and the widespread implementation of retirement plans could be seen as social approval of schemes designed to ensure people with adequate reserves to spend during retirement. Private saving alone (and private wealth) is not a relevant indicator of retirement motives for saving in the OECD. This implies that the age-saving profile cannot be cited as evidence in favor or against the life-cycle model. Cross-country comparisons of private saving, as in Poterba, can be highly misleading if proper account is not taken of differences in mandatory saving.

On the contrary, in most LDCs countries only a small fraction of wealth is annuitized. Thus, the flat age-saving profiles that one sees in the data for Thailand, Taiwan and Indonesia are
much more damaging to the theory than age-saving profiles estimated with OECD data. And the task of reconciling the LCH with the data much more difficult.

**What is the model of individual consumption?**

DP assumptions are that:

1. **Households are a veil for the individuals who live in them**

Alternative approaches:
- The conventional approach is that the head acts in a paternalistic way.
- Or, one could try to model household allocations as the outcome of some interaction between household members with different preferences. Chiappori, Bourguignon and Browning have explored the empirical implications of this approach, based on a multi-utility model.

   [There is some evidence that income shares matter for saving (Browning). Individuals may have different saving targets and preferred portfolio allocations, because males and females have different time horizons. Testing different models of household behavior is outside the purpose of DP’s paper, and may not be feasible with the survey data they have.]

2. **There are no public goods within the family.**

   In the absence of public goods, in principle consumption can be divided between household members, provided there no economies of scale in consumption. But consider the opposite case that all consumption goods are public (for instance, heating). Then total consumption is also a measure of individual consumption, and individual consumption as estimated by DP is severely under-estimated. Arguably, many consumption goods in the household are public (for instance, all housing related expenditures, appliances), or public within a sub-set of individuals. Furthermore, the potential bias in age-saving profiles could be age-related, if the purchase and use of public goods depends on the demographic structure (age) of the household.

3. **There are no economies of scale in consumption.**

   If instead there are economies of scale, then increasing family size effectively increases total household resources. Thus, the individual consumption could depend positively on the size of the household where he lives. Also this potential bias could be age-related.

Neglecting public goods and economies of scale is not an innocuous assumption. In the absence of a theory, the decomposition of income and consumption provides mainly an accounting framework. It is not clear how different, and more realistic assumptions about preferences within the household, economies of scale and public goods would affect the individual age-consumption and saving profiles. It may well be that it is impossible to compute individual consumption profiles, given the difficulty of modeling household interactions,
estimating economies of scale and taking into account the public nature of several important consumption goods.

**Decomposing income**

DP main contribution is to impute individual income and consumption knowing only the age of the individuals, household income and household consumption. The computation relies on accounting rules. But different accounting definitions can affect the individual saving profiles, and the relation between saving and growth. In particular, the imputation crucially depends on the way one treats transfers accruing to individuals, either from other family members or from the government.

1. **Private transfers**

   Usually we look at transfers flowing between different households. But here there is a crucial issue as to how one should consider transfers within the family, both monetary and in-kind. The labeling of these transfers crucially matters for decomposing disposable income. There are several accounting conventions:

   - **Transfers are loans children**, who borrow from their parents and repay the loan in middle age to the previous generation. Children’s saving will therefore be negative. But how can one enforce children to repay their loans? The counterpart of this assumption is that feeding one’s children is a form of saving, not of consumption.

   - **Transfers are gifts to children**, that match exactly their consumption (so their saving is zero). Then one should impute an income to children that equals their consumption.

   - **Consumption of children is really consumption of the parents** until children are able to take meaningful economic decisions. From an accounting point of view, one can of course treat children consumption as their consumption, just as one can treat gasoline as “car consumption”, or pets food as “dog consumption”. But cars, dogs and children do not take economic decisions.

   Each of these accounting assumptions affects dramatically the age profile of income. Thus, they deliver different implications about the age-saving profile and ultimately about the relation between saving and growth. There are at least two reasons why one should prefer treating children’s consumption as consumption of parents:

   - The LCH is a theory of optimizing individuals.

   - Transfers to children are rather different from bequests and major gifts that we usually consider. Except for investment in human capital, transfers to children go to pay for current consumption, and do not represent any addition to the assets of the recipient or society.

2. **Public transfers**
If there are pension arrangements, it is inadequate to use disposable income to compute age-saving profiles. For instance, in equilibrium one should consider pension contributions as part of total saving, not taxes, and benefits as depletion of accumulated wealth (i.e., repayment of past loans). This alters dramatically the profile of personal saving in OECD countries.

It is puzzling that in both Taiwan and Thailand earnings (individual and household) are so high in old age given that there are no pension arrangements and that there is not much wealth accumulation in middle-aged, so that capital income cannot be that large (see figures 9 and 13). This implies either high labor force participation even among the very old; or it could reflect the importance of other government transfers.

In Taiwan people can receive up to 7 or 8 years of yearly salary as a bonus payment at retirement. This may be a sizable fraction of retirement wealth. Ideally, one should add to current earnings the implied “contribution” (3 months of income) that accumulates in the retirement bonus, rather than considering the bonus as one-shot transfer. This would increase substantially the saving of the middle-aged.

Decomposing consumption

1. Alternative methods

There are several ways to impute individual consumption. Kotlikoff et al perform an exercise that is similar to DP (but closer to the standard LCH). They impute consumption and income for US males and females from age 18 to 100 to study the effect of the demographic transition on national saving. Before age 18, children consumption is assigned to parents. They use information about specific consumption items, such as clothing expenditures, alcohol. Housing expenditures is allocated evenly between head and spouse, food evenly between the household. If the data are sufficiently detailed, future research could compare the method used by Kotlikoff et al (which also neglects public goods and economies of scale) with DP’s results.

2. Males vs. females

DP show that the individual age-consumption profile is increasing, perhaps even more than the household profile. Leaving aside the question of who is the head, one generally thinks that the individual profile is concave because of the effect of mortality. Since mortality is about 4-5% for men around 65, and if the interest rate less the discount rate is also 4-5%, one would expect a concave consumption profile. To what extent does the absence of concavity in the individual profile reflect genuine behavior or the imputation method? Is it possible that the procedure to decompose consumption overestimates the consumption of the elderly?

It would be interesting to have separate pictures for males and females. Females live longer, and for females one should expects a steeper consumption profile that reaches a maximum at
later ages. Also one could expect higher saving rates for females in middle age, given that females must provide for a longer retirement.

**Estimating the age-saving profile**

1. **Cohort dummies**

DP assume that log(y) and log(c) be decomposed into an age effect, independent from cohort, and a cohort effect, regardless of age. There is a further crucial assumption: cohort effects in disposable income and consumption are identical.

As DP state, this assumption is not implied by the standard LCH model under certainty. Developments in the labor market (for instance, changes in labor force participation, hours worked, contractual retirement age) and in education (for instance, introducing compulsory education) could explain why cohort effects in consumption are not equal to cohort effects in income.

The fact the statistical restriction that cohort effects in income are different than cohort effects in consumption is an indication that the “standard” LCH is violated. But one would like to know how strong this violation is, i.e. if the assumption is approximately consistent with the data (report F-test against an unrestricted model).

Cohort dummies to model cohort effects are an admission of ignorance. One alternative that I find promising is to try to model cohort effects in a way that is consistent with the LCH. Kapteyn et al have been quite successful in absorbing a large part of the effect of cohort dummies or cohort polynomials using additional information. They measure the increase in productivity growth between generations directly constructing a productivity index with national account data.

2. **Log Approximation**

\[ \ln(y) - \ln(c) \]

is not a good approximation for saving rates when saving rates are large (negative) numbers - say for saving rates greater than 0.4 or 0.5 in absolute value. If I understand correctly, the saving rates for the very young, whose income is constrained to be zero, tend to minus infinity. Very large negative saving rates are also found for the old.
The saving-growth link (micro vs. macro data)

Is the positive relation between saving and growth that we see in the macro data also present in the micro data? From Paxson’s (1996) Table 1 I take survey and national account estimates of personal saving rates in Taiwan, Thailand, the US and the UK. The tracking of national accounts of survey data is far from perfect. For instance, the survey shows mostly negative saving in Thailand in 81-86-88, and divergent patterns of saving in the UK in 1984-88.

I then regress the two measures of saving against the growth rate of real GDP. Results are similar whether I use yearly data or 4-years averages. The relation between saving and growth is positive and significant when I use the national account definition of personal saving. The relation is absent, or slightly positive when I use the survey definition of personal saving.

Can we really use micro-data to learn something about macroeconomic relations, such as the aggregate relation between saving and growth? The micro data suggest no relation between aggregate saving and growth. Perhaps the absence of correlation between saving and growth that DP have identified in previous work is entirely consistent with the “aggregate” evidence that comes from survey data. Instead, the positive relation that they discover using individual profiles is inconsistent with the absence of a saving-growth relation obtained with “aggregate” survey data. One should then look for other reasons that account for the positive association between saving and growth in macro data.

Alternative definitions of household head

The definition of head is different in the two surveys.

- in Thailand the head is the person responsible for the household;
- in Taiwan the head is the primary earner.

One may want to compare household profiles using the same definitions. For instance, defining the head as the primary earner in Thailand. Or, one could use alternative assumptions, defining the age of the household as:
- the age of the older household member;
- the average age of household members (perhaps, weighted by income shares).