

A THEORY OF CONSUMPTION, INVESTMENT, AND SAVING

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A THEORY OF CONSUMPTION, INVESTMENT, AND SAVING

(By Arnold Faden)

The problem is to predict the levels of consumption, investment, and saving for the various decision-making units of an economy--households, proprietorships, corporations, government and public bodies, and miscellaneous nonbusiness organizations. Existing theories are rather deficient as to scope (usually confining themselves to households, or to the aggregate of all units), as to precision (e.g. large "unexplained" variations in the saving-ratio), and as to theoretical adequacy (i.e. ability to derive results from fundamental principles, rather than from ad hoc propositions arrived at after peeking at the data). The following theory is not claimed to be satisfactory by absolute standards: but merely better than existing theories on the triple standard of scope, precision, and theoretical adequacy.

Concepts and Definitions

All measurements are in money terms, not physical terms (either current or deflated values will do, since only ratios appear in the theory.)

We first draw a distinction between wealth owned and wealth managed (including wealth in human beings). The distinction may arise via loans: here the creditor has a claim to part of the wealth under the management of the debtor, so that the debtor's wealth managed exceeds his wealth owned by the amount of the debt, and vice versa for the creditor. Equities in corporations may be regarded as a special case of a loan.. Tax liabilities decrease the wealth owned by the taxpayer below his wealth managed and do the reverse for government. Government transfer payments expected have the opposite effect. Examples: corporations per se may be regarded as owning

nothing, functioning merely as agents for stockholders, creditors and government; but the wealth they manage is considerable.

Human beings for the most part own themselves, with notable exceptions: children, debts based on personal credit, garnishees on wages, tax liabilities on labor income, the draft. The employer-employee relation is a loan of labor-power from the second to the first, the debt being discharged in the wage. A full exposition of the distinction between wealth owned and managed would probably involve most of the legal system of the economy. Nonetheless, it seems that pretty good estimates can be made from existing social accounts.

Since every debt is balanced by a credit, aggregate wealth managed equals aggregate wealth owned for a closed economy (and, more generally, exceeds it by net debts owed to foreigners).

Saving is the net increase of non-human wealth owned by a unit.

Investment is the net increase of non-human wealth managed by a unit.

Therefore, investment exceeds saving by the increase of net debt* (counting in changes of tax liability, of expected transfer payments, etc., as above. Saving and investment include net capital gains and windfalls.) Aggregate saving equals aggregate investment for a closed economy.

We would like to measure increases in human wealth, but such a measure is not now available; instead we make three progressively refined definitions of consumption:

Consumption I is spending on non-durable consumer goods and services including such imputed items as home-produced food and home-owner rentals. This is a standard social accounting definition.

Consumption II is consumption I plus such imputed items as are at

*true only if debt in human capital is unchanged.

present coming to be measured or measurable; for example, on-the-job consumption in the form of training, air-conditioning and pleasant surroundings, water-coolers, business libraries, lounges, parking lots, lunchrooms; the imputed value of education off-the-job (excluding paid education, which already enters into consumption I); possibly the imputed value of free clinics, school lunches, travel and shopping times, and some others.

Consumption III is consumption II plus all remaining forms of non-market investment in human beings plus capital gains in human wealth minus human maintenance costs. Consumption III, not at present measurable, then measures ^{net} investment in human beings. (Strictly, there are two such concepts, corresponding to investment and saving respectively; we ignore this refinement.

Income is consumption plus saving. (There are three income concepts corresponding to the three consumption concepts).

Spending is consumption plus investment. (There are, as above, three spending concepts.

Aggregate income equals aggregate spending for a closed economy.

Postulates

O M I T
a) cross-sectional. While income derives from wealth owned, spending derives from wealth managed. More specifically, investment is proportional to non-human wealth managed by a unit, and consumption III is proportional to human wealth managed by a unit:

I_i/K_i equals I/K and C_i/L_i equals C/L , where I_i , K_i , C_i , L_i are the values for unit i of investment, non-human wealth, consumption III, and human wealth, and I , K , C , L are the aggregates of same.

These equalities, and the ones below, are to be interpreted as expected values, round which actual values will fall.

Postulates

The following equalities are to be interpreted as expected values, round which actual values will fall.

While income derives from wealth owned, spending derives from wealth managed. More specifically, consumption III and investment are proportional cross-sectionally to the human and non-human wealth managed by a unit, respectively:

C_i/L_i equals C/L equals I_i/K_i equals I/K equals r ,

where C_i , L_i , I_i , K_i are the values of consumption III, human wealth managed, investment, and non-human wealth managed for unit i , and C , L , I , K are the aggregates of same. r is the relative rate of growth of the economy, which varies with the stage of the business cycle and averages perhaps 3 or 4% per year for the USA.

All these values are determinate once total income is given. This is determined by the stock of wealth and the stage of the business cycle.

Saving is determined merely as a residual between income and consumption.

Implications

In order to confront these postulates with the data we must find ways of estimating the not directly measurable quantities C and L . This involves further assumptions. To go from consumption III to the measurable consumption I involves two major changes: the addition of human maintenance expenditures and the subtraction of non-market production of human wealth. Let us call the net addition M : consumption I equals consumption III plus M .

If M is proportional to consumption cross-sectionally, then consumption I is predicted to be proportional to L_i cross-sectionally.

To estimate L we need an estimate of the net product generated by human beings, and an appropriate discount rate. For the former we start with wages and salaries (including imputed proprietors' wages) and add to this imputed non-market production by human beings and subtract human maintenance. If non-market production ~~generally~~ by human beings equals non-market production of human beings, this correction amounts to subtracting the selfsame M defined above from market labor income. (But this is contradicted by the data.) For the discount rate one cannot, perhaps, do better than to use the same rate ~~was~~ for non-human wealth, of order of magnitude say 14% (before taxes).

If M, the correction factor for wages, is proportional to wages cross-sectionally, as well as M proportional to consumption, we arrive at the testable prediction that consumption I is proportional to wages (including imputed proprietors' wages) cross-sectionally. This route from postulates to (cross-sectional) data appears to be the one involving the least amount of special pleading, and so we adopt it.

If, furthermore, the proportionality of M to consumption and N to wages, respectively, holds over time as well, it follows from the postulates that the ratio consumption I/investment is proportional to the ratio wages/property income over time. Secularly, it is hard to tell in ~~which~~ if any, direction the fractions represented by M and N have moved, so we make the most direct assumption of constancy again.

Over a business cycle, however, we should not expect this. The ratio of aggregate human to non-human wealth, L/K , is not likely to change much over so short a period of time as a cycle. The postulates then imply that the ratio of consumption III to invest-

ment is approximately stable over a cycle, though each separately fluctuates considerably, of course. The ratio of consumption I to investment is the sum of the ratios of consumption III to investment and of M to investment. Now M is not likely to fluctuate as much as investment (it may even rise slightly in depression if non-market production falls off enough). The second fraction therefore rises in depression and, the first remaining stable, the ratio of consumption I to investment rises in depression. This is our third prediction.

(Incidentally, this approach affords a method for estimating M, viz, M equals consumption I at that point in the cycle where net investment would disappear entirely).

Verifications and Predictions

An examination will here be made of the gross consistency between our predictions and known results concerning consumption, investment, and saving. No detailed investigations will be made and no specific references given. The data come mainly from Kuznets and Goldsmith. The point of departure nowadays for theories in this field is the problem of reconciling cross-sectional studies which universally find the saving-ratio rising with total income with time series studies which find the aggregate saving-ratio to be more or less constant secularly.

Two questions arise: how well do the implications of this theory predict either or both of these well-known results? and, if it does predict them, how are they reconciled in terms of the theory?

The prediction is that consumption (we deal only with consumption I in this section) will be about proportional to labor-income cross-sectionally. It is well-known that labor income forms a smaller and smaller fraction of total income, on the average, as we go up the

income scale; therefore, consumption should decline as a fraction of total income as the latter rises--as indeed it does.

Let us introduce other variables besides total income. The income of proprietors is made up to a smaller extent than the income of laborers of labor income. We should therefore expect that with the same income proprietors should save more than laborers--as indeed seems to happen, at least for farmers.

Over time, the theory predicts that the saving-ratio will vary directly with the ratio of property-to labor-income. For the USA the latter ratio has been about constant, implying constancy for the former.

(Some investigators find a decline in the latter ratio. This trend, however, is not altogether clearly established, due to difficulties with proprietors' imputed income and ~~that~~ from government-owned capital. Furthermore, some investigators also find a slight secular decline in the saving-ratio.)

The two results are reconciled by the fact that over time a given income level will, in general, represent an ever greater proportion of labor income, and therefore more will be consumed from it.

(It may not be amiss at this point to compare the present theory with Friedman's permanent-income approach which reconciles cross-sections and time-series in a different way. As is well known, Friedman assumes strict proportionality, ceteris paribus, between "permanent" income and "permanent" consumption, the anomalous cross-section results being attributable to uncorrelated "transitory" additions to these to comprise current income and consumption.

Now the somewhat ill-defined concept of permanent income is certainly a better measure of the stock of wealth than income in any one year can be, and so would be the preferred measure of income in the present theory as well. However, no distinction is made as to the

source of that income as between human and non-human wealth. A test between the theories could then be made by comparing units with differing compositions of income sources. The case of farmers vs. laborers has already been mentioned. The most striking case would be very high income vs. low income receivers. All of the data adduced by Friedman lies in the \$10,000 a year and below income range. It is likely that no substantial part even of the higher incomes of this range consist of property incomes (except for proprietors). If the proportion of labor income in permanent income is stable throughout the range, the present theory also predicts a stable saving-ratio out of permanent income. However, the upward extrapolation would require us to believe that out of a permanent income of \$1,000,000 a year a person will consume, say, \$880,000; this is hard to swallow, even in the case of Texas millionaires; and more so if we remember to include corporate retained earnings (in part) in the saving of stockholders. Friedman states that a higher (non-human) wealth/income ratio should reduce saving out of a given income. Since this ratio is high in the upper income brackets, this seems to imply an actual decline in the saving-ratio with higher permanent income, which compounds the paradox.) One could, of course, still argue that the high savings of upper income groups is the result of transitory positive additions to income; but then one would have to assume an ever increasing variance of transitory income relative to permanent, and for this there seems to be no warrant.)

The predicted positive relation between the aggregate saving-ratio and prosperity is a well-attested phenomenon.

Several kinds of international comparisons suggest themselves.

What is the relation between the labor/capital ratio and the consumption/investment ratio among the different countries and/or

times? The present theory predicts a positive relation (though the correlation will be reduced by differing relative proportions of M and N, stemming from differences in the extent of the market, national customs, and the definitions and accuracy of the national accounts.)

Kuznets finds that in the normal course of economic development, the aggregate saving-ratio first rises and then falls, but not to as low a level as it began from. If the present theory is correct, this should imply either corresponding changes in the labor/capital ratio, or in the relative values of M and N. This may be testable some day.

Theory

So far we have carried forward the implications of the postulates. However, the postulates themselves are very much hanging in the air, and it is pertinent to inquire whether they may be given a firmer footing in theory.

The principle of natural selection in human society dates back at least to Lucretius, but acquired popularity as an explanation of social evolution only in the later 19th Century with Spencer and Darwin and their followers. In the world of nature natural selection operates exclusively by differential reproduction. In human society, while this mode is still operative, it is much overshadowed by the operation of imitation and learning, and by shifts in wealth, status and political power.

Recently, Alchian and Becker have revived this approach to reconcile the presumed co-existence of "rational" markets and "irrational" individuals. Here it is necessary to remark only that the same arguments apply with equal force in the sphere of non-market behavior. Suppose that consumption spending and household behavior is deter-

mined by custom, or caprice, or the pursuit of happiness or what you will. So long as there is some variability among households, there will be differences in the rates at which they accumulate wealth, human or non-human--accidental differences in the case of completely "irrational" behavior, and non-accidental differences in favor of the more "rational" individuals, if any. This involves a gradual shift of wealth toward households with more efficient behavior patterns--efficiency measured by the rate of accumulation of wealth. The only point of long-run equilibrium (if one may use such a term) would be one of completely rationalized consumption as well as production : a situation where all behavior was such that the overall rate of wealth accumulation was maximized (relatively to current knowledge, which is also accumulating).

These considerations supply the ground for regarding consumption itself as a form of investment. The adaptation process in non-market behavior is apt to be slow, however, measurable in decades if not centuries. The reasons lie in the "backward art of spending money":

- a) lack of a price system in the non-market sphere; hence lack of good measures of profitability.
- b) the dominance of custom- religious sanctions, "gentility".
- c) no free market in wives, etc.
- d) more "rational" individuals devote their energies to business, leaving more "irrational" ones to manage the non-market sphere
- e) perhaps more lack of publicity in household accounts and behavior, interfering with imitation.

Also, the rapid changes in status in recent decades, in income and leisure, will have introduced strong disequilibrating forces requiring large and long-drawn-out adaptations.

Other sources of inefficiency are the small size of the family unit for certain functions: food purchasing, cooking, cleaning perhaps--and various Veblenite effects. All these factors help to explain the rather large value of M (if estimated as suggested on p.6). (It should be mentioned for clarity that maintenance costs, the positive component of M, include not merely the costs of maintaining the population in good health--a very small item, according to subsistence studies--but the cost of uprearing replacements for the older generation, of maintaining social position; and of doing these things not according to the recommendations of efficiency experts, but as they are actually done.) Still another component which we have bracketed with M is consumption pure and simple. That this exists follows from the disparity between rates of return on capital and the rate of growth of the economy.

As for the postulates, it will be noticed that if they held exactly the economy would expand equiproportionally: all units would expand their wealth holdings parri passu; the proportions between human and non-human wealth are stable for each unit; debts and credits expand at the overall rate of growth. While of course this does not happen in detail we are dealing here only with expected rates of investment in human and non-human capital; in the absence of knowledge of large scale shifts in the proportions of human and non-human wealth held by the different units, the expected rate is the proportional rate.

The whole theory is, as one sees, rather crude, and only shines, if at all, in comparison with other theories.

General Observations

Since consumption (in part) no less than "investment" is a form of investment, it is not necessarily true that rates of growth are increasing functions of the saving-ratio in the aggregate. One can easily think of cases where growth rates will rise if "consumption" rises. (This fact has of course been long recognized in the phenomenon of productive consumption, but appears to be overlooked in most contemporary growth theories.)

The theory predicts that redistribution of income will have no effect on the saving-ratio in the aggregate.

The rate of interest loses its classical role as determinant of the aggregate saving-ratio. It still regulates the relative profitability of long-term vs. short-term investments, but this continuum does not seem to be clearly related to the human vs. non-human investment dichotomy. The weakness of the interest rate in influencing the saving-ratio has long been recognized, but either as an empirical fact only, or by an entirely different analysis (e.g. Fisher).

The conception of income which emerges from this approach is that of net investment--diametrically opposite to that of Fisher.

The social accounting definition of income may be regarded as an approximation to overall net investment insofar as consumption is taken to be an estimate of investment in human beings.