

Modelling Consumption Behaviour in Centrally Planned
Developing Countries - The case of Algeria 1963 to 1984

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PART 1

TO BE CONTINUED

1. Introduction

Although there is now an extensive literature available on the aggregate consumption function relating both to developed countries (DCs) and to less-developed countries (LDCs), there appears to be a distinct lack of research applying conventional consumption function analysis to centrally planned economies (CPEs).¹ This is particularly so with respect to Algeria which combines many of the structural features of an oil exporting developing economy, but whose government has, since the mid-1960s, been committed to a high degree of centralised macroeconomic planning.²

The picture is further complicated by the fact that although considerable trading of goods takes place within the public sector where the planning agency fixes prices, including the consumer expenditure deflator, consumer goods are largely traded by the private sector and price controls here are not very effectively enforced. It is therefore both possible to apply consumption function analysis to the Algerian economy and also important to do so in so far as the planners need to be able to comprehend private consumer behaviour and to quantify the impact of key policy variables on this sector. Not only is aggregate consumption the most important single component of final demand, averaging 52% of nominal GDP over the period 1963-1984, but the planners are committed to maintaining private purchasing power in line with the cost of living and to the elimination of excess demand in the consumer market.³ Although modelling the demand side of the market is not sufficient to be able to identify disequilibrium, since this would require an explanation of the supply side as well, it is clearly important as a pre-requisite to building a full disequilibrium model of the consumer market in Algeria.

In this article we consider the relevance of consumption function theory to an economy such as Algeria which combines the features of both a CPE and an LDC and estimate 12 aggregate consumption equations drawn from the theoretical and empirical literature on consumption functions. Our choice of equations was, of course, heavily constrained by data availability and our analysis is preliminary in the sense that we have not exhausted all the possible combinations of variables and functional forms. Nevertheless, our results do suggest that it is feasible to apply consumption function analysis to a CPE/LDC such as Algeria and to obtain results which conform to a priori expectations.

Section [2] briefly reviews the literature on the consumption function both with respect to DCs and LDCs. In section [3] we examine the pattern of income and expenditure in Algeria between 1964 and 1984. In section [4] we consider some data and methodological problems associated with our empirical work, specify the equations to be tested, and discuss the results. Finally, we draw together our major findings in the form of a conclusion.

[2] Modelling aggregate consumption behaviour

The consumption function is probably the best developed relationship in applied econometrics and is well rooted in economic theory.

The earliest consumption functions were based upon Keynes' (1936) absolute income hypothesis and made real personal consumption an increasing function of real personal disposable income, with all the effects on consumption summed up in current income. A variation on this theme included an extension for the direction of income change, as suggested, for example, by Friend (1946) and Mack (1948).

since then theoretical and empirical work has been stimulated by the need to obtain stabler parameter estimates suitable for forecasting purposes, especially during the 1970s when inflation began to have a marked effect on consumer behaviour.⁵ Similarly, considerable effort has been directed towards overcoming problems of misspecification arising from omitted variables such as wealth and liquid assets, and from an inappropriate choice of dynamic structure for the equations.

Tobin (1952), for example, added liquid assets to an absolute income hypothesis, and Klein (1947) included liquidity variables within an income change framework.

A further development was to replace the conception of current income as the major explanatory variable with some approximation to "normal"

income representing the stream of expected income over some time period. Examples of this include the life cycle model of Ando and Modigliani (1963), and Friedman's (1957) permanent income hypothesis. In the latter case, normal income can be approximated by including a lagged dependent variable in the equation representing a series of geometrically declining weights. Interpreted in this light, the permanent income hypothesis becomes indistinguishable from a model such as that used of Brown (1952) which introduces habit persistence into the Keynesian absolute income hypothesis.

Other models in the habit persistence tradition include Modigliani (1949) using lagged income, and more recently, Houthakker and Taylor's (1970) specification, which includes both lagged consumption and lagged income as explanatory variables.

An alternative approach pioneered by Kaldor (1960) was to distinguish between the consumption behaviour of workers and capitalists. An example of a reformulation of this idea is the model tested by Modigliani and Tarantelli (1975).

More recent developments in consumption function analysis have concentrated on a clearer specification of the dynamic structure of the equations and an explicit allowance for error correction behaviour. The rational expectations principle was applied by Hall (1978) to a life cycle model in the form of a random walk process. Osborn (1985) has experimented with models where seasonal factors are treated endogenously, and Davidson et al (1978) postulated an error correction

model which includes a short-run disequilibrium feature involving a simple feedback mechanism as well as a long-run steady state equilibrium path. The idea here is that consumers plan to spend in each quarter of a year the same as they spent in that quarter of the previous year modified by a proportion of their annual change in income and prices and by whether that change is itself increasing or decreasing. For example, during inflationary periods, consumers are hypothesised to postpone consumption and the average propensity to save (APS) would rise as a consequence. Feedback is introduced from the lagged consumption to income ratio which makes consumer behaviour consistent with some longer-run target consumption.

As far as LDCs and CPEs are concerned, data problems present a serious impediment to the application of the more sophisticated versions of the aggregate consumption function and to the testing of alternative hypotheses about consumer behaviour. The procedure has generally been, therefore, to apply conventional DC models where possible, based upon a simple dynamic structure, a limited number of explanatory variables, and an estimating technique such as ordinary least squares. Wealth and liquidity variables are seldom used in the absence of appropriate data, although this poses less of a problem in countries where capital markets and consumer credit facilities are highly imperfect in any case. In this sense, the major impact of consumer behaviour might well be captured by a simple model incorporating only current income.

As a rule these relatively simple models perform quite well in real per capita terms. The marginal propensity to consume (MPC) is, as one might expect in the LDC context, usually high, with a range of about

0.82 to 0.84.

Two particular problems, however, have been discussed extensively in the literature on the consumption function pertaining to LDCs and are also relevant to CPEs such as Algeria. The first concerns differences between the pattern of consumption within a given country reflecting geographical, social, or economic "dualisms"; and the second relates to the effects of industrialisation and rural to urban migration on the average propensity to consume.

Evidence for significant differences in savings behaviour and habits or tastes between the rural and urban sectors in LDCs is based upon budget studies and the observation that people in rural areas are generally employed in low productivity agriculture, often deriving their livelihood from a single crop. For a review of evidence in this area, see Lluch and Williams (1975).

One response to this problem has been to use conventional consumption function analysis, but to estimate separate equations for the rural and urban sectors. Choudhury (1968), for instance, used Indian data for 1950/51 to 1962/63 to calculate a MPC of 0.92 for the rural sector and 0.33 for the urban sector, yielding an overall MPC of 0.72. Evidence of dualistic consumption behaviour is further supported by the findings of Kelley and Williamson (1968) using Indonesian data, Williamson (1969) for the Philippines, and Lluch and Williams (1975) for South Korea.

An alternative has been to follow Kaldor (1960) and to distinguish

between workers and capitalists. Song (1981), for example, tested a Kaldor-type hypothesis with South Korean data. He obtained a MPC out of wages of 0.94 and a MPC out of property income of 0.76. The latter, however, is probably biased upwards since property income was derived as a residual and the series included income received by those who were unemployed and whose MPC is likely, therefore, to be close to unity. After adjusting for this bias by defining labour income as the sum of the income of workers plus imputed labour income from property, the MPC out of property income fell to 0.57.

Song also tested a further model which distinguished between rural farmer income, urban labour income, and urban property income. Surprisingly the results contradicted the other models by suggesting a MPC for farmers of 0.85 which was below that of urban workers (0.91). Clearly some care needs to be taken when interpreting these more disaggregated models.

finally, the need to allow for the effects of changes in unemployment on the average propensity to consume (APC) is also important in LDCs (whether centrally planned or not) which have experienced significant industrialisation and rural to urban migration.⁷ The changes associated with the shift in resources from the rural to urban sector are bound to influence the pattern of personal disposable income in as much as the share of labour incomes rises and unemployment declines secularly. One would expect in this case a fall in the APC over time. An example of a model which includes an allowance for unemployment is that of Modigliani and Tarantelli (1975) using a life cycle framework and Italian data.

(3) Income and expenditure in Algeria 1963 to 1984

In the mid-1960s Algeria adopted a strategy of centrally planned industrialisation with considerable priority given to capital goods and intermediate goods industries with respect to public investment.³ This was bound to have negative effects on real consumption, at least until the supply of consumer goods was forthcoming. Hence although real per capita consumption increased by about 4.4% per annum over the period 1963 to 1984, as table 1 indicates, overall personal income in real terms grew faster than real consumption expenditure. Indeed, the ratio of personal consumption to GDP declined from 62% in 1963 to 50% in 1984.

Personal savings also grew rapidly over the period and especially from 1963 to 1973 when inflation rates were fairly low and property income was relatively high before the nationalisation programme of the 1970s. The overall average propensity to save (APS) has also been quite high since independence, fluctuating around 18% since 1970 and growing fast between 1963 and 1973 at about 21.5% (see table 1). After 1973 accelerating inflation took its toll and the growth rate of the APS was actually negative between 1974 and 1984. This largely reflects the fact that government rationing of consumer goods was most effective between 1963 and 1973.

Table 2 examines the structure of personal income in 1963, 1970, 1977, and 1984. The data suggest a steady rise in the share of wages in total income from about 50% in 1963 to 63% by 1984. This was at the expense of both property income and transfers. These figures reflect

1963-73 1974-84 1963-84

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Real per capita consumption ¹	2.5	4.1	4.4
Real per capita income	5.1	3.7	4.9
Real consumption	6.0	7.1	7.5
Real personal income	8.4	6.9	8.0
Real personal savings	30.0	5.72	14.0
Average propensity to save	21.5	-11.3	5.9
Average propensity to consume	-2.4	0.3	-0.5
Consumer price index (1969=100)	1.9	10.7	6.1

1. Growth rates are calculated using a semi-log trend

model: $\log x_t = a + bt$; where b is the annual average

growth rate.

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