

## CHAPTER 6

### CONCLUSION

#### 6.1 RESTATING THE OBJECTIVE OF THE STUDY

The principal objective of this study was to derive a model for private consumption expenditure in South Africa, in order to test a hypothesis comprising three components. First, it was tested whether consumers are forward-looking with respect to prices when considering consumption expenditure decisions. Modelling the price expectations formation process of consumers was therefore central in this study; citing Begg *et al.* (1991:568) in this regard: “Most economists accept that beliefs about the future are an important determinant of behaviour today”.

Second, the hypothesis that consumers learn through a Kalman filter-based (boundedly rational learning) process when updating their expectations was tested. Learning as expectations formation mechanism implies intelligent economic agents who, although not fully informed, are able to assimilate information and learn about their environment as time progresses. It is therefore accepted that consumers have knowledge about the structure of the expectations rule, but do not know the parameters. The unobservable component in the model of price expectations formation is thus taken to be the coefficient vector of the expectations rule.

Third, the theoretical specification of the behavioural equations based on the forward-looking theories of consumption, in particular the life-cycle model of Modigliani and Brumberg, and Ando and Modigliani, and the permanent-income hypothesis of Friedman, was tested empirically. In practice, these theories express the notion that consumers are forward-looking and consider not only current disposable income when making consumption expenditure decisions – as dictated by Keynes’s absolute-income hypothesis – but income over their entire life span. This implies that a wealth variable as well as an interest rate variable should enter the long-run equilibrium equation, in addition to the income variable.

## 6.2 THE STUDY

Consumption expenditure, for purposes of this study, was disaggregated into durable consumption, non-durable consumption and expenditure on services. The study commenced with an assessment of the socio-economic profile of the average South African consumer, whose profile bears important implications for *a priori* theorisation on consumer behaviour and price expectations formation. The most pronounced characteristic of the socio-economic profile of South Africa as depicted in Chapter 1, is an unequal income distribution, with the wealthiest 10 per cent of households' share in total income equal to 53 per cent. A large portion of the population is consequently living in poverty – 57 per cent of the population's income is less than an income level of US\$1.80 per person per day. A contributing factor to this is the high unemployment level, partially due to the poor growth performance of the economy, but also to a relatively unproductive, unskilled labour force.

The above holds implications for consumer behaviour. *A priori* it was expected that total private consumption expenditure would, in the long run, be dependent upon personal disposable income as well as financial wealth. This would also be true for durable consumption expenditure, while non-durable consumption would in the long run be guided only by personal disposable income. This conviction was motivated by the assumption that a large portion of the population constrained by very low income levels, would spend virtually all their income on consumption and mostly on non-durables, with very little left to be utilised for wealth accumulation. Wealth was therefore *a priori* expected to play an insignificant role in their consumption expenditure decisions.

These consumers would also be subjected to liquidity constraints due to low income levels and limited or no access to credit. These consumers also normally have no savings; interest rates changes therefore were not expected to influence their consumption expenditure decisions. Liquidity constraints further disqualify these consumers from increasing current consumption to hedge against expected price increases. For this reason, interest rates and price expectations were not expected to be significant in explaining non-durable consumption, although they were considered important determinants for durable and total consumption expenditure. Lastly, variables reflecting labour market conditions were considered explanatory of consumption expenditure levels, particularly non-durable

consumption, since adverse developments in the labour market often affect the unskilled workforce first. These workers' wages are likely to be low and mainly directed towards non-durable consumption.

The above, then, constituted the *a priori* theorisation on the information set of the behavioural equations. Price expectations were considered an important determinant of the short-run dynamic structure of durable private consumption expenditure as well as total private consumption expenditure.

In order to test the significance of price expectations in explaining consumption expenditure, and the hypothesis that consumers learn about price changes through a boundedly rational learning process, an expectations rule first had to be derived. The expectations rule was formulated in an attempt to capture the psychological learning process of intelligent economic agents as accurately as possible.

In setting up the expectations rule in this case, the application of price expectations to wage behaviour of countries in the global econometric model (GEM) (Barrel *et al.* 1994:174) was followed. The dependent variable in the expectations rule was taken to be the one-period-ahead consumer price level. The information set included consumer prices, lagged by one period, lagged interest rates and the exchange rate, lagged by one period. The only deviation from the GEM specification was the exclusion of the capacity utilisation variable. The motivation of this theoretical specification used in a South African context was the following: the specification, including lagged prices, interest rates and the exchange rate is an attempt to model the psychological expectations formation process of the (often unsophisticated) consumer. Given that 19 per cent of the population is illiterate (has not completed primary school) (Stats SA 1998), the adjustment of parameters of an expectations rule based on variables like capacity utilisation, the terms of trade, money supply and so forth, probably implies an unrealistically sophisticated consumer. Information about price changes and changes in interest rates and the exchange rate is perhaps more accessible to the average consumer than any other economic variables influencing price changes.

The Kalman filter was applied to the expectations rule to obtain the time-varying parameters of the rule. Each of the coefficients, assumed to evolve according to a random walk with drift process, displayed a reasonable degree of variation over the period. The most important variable in the explanation of price expectations was the lagged price variable. This coefficient also displayed the largest degree of variation, an indication of a fairly rapid rate of learning with respect to this variable. An interesting observation regarding the evolution of the time-varying coefficient of lagged prices, was that it mimicked the actual price trend to a certain extent. The interpretation of this could be that in periods of high and rapidly increasing price levels, consumers continuously adjust this parameter of the rule upwards and, as soon as they realise that price levels are declining, they start adjusting the parameter downwards, leading to lower expected price levels.

The one-period-ahead price level obtained with the Kalman filter estimation process was the variable that was incorporated into the learning model of consumption expenditure. The Kalman filter result represented price expectations, which allowed the hypothesis that consumers consider price expectations when making consumption expenditure decisions to be tested empirically.

Total private consumption expenditure, durable consumption expenditure and non-durable consumption expenditure were determined stochastically while expenditure on services was determined as the residual of the total and the other two categories. Estimation was conducted by means of the Johansen technique, a multivariate cointegration technique. Empirical estimation of the behavioural equations proved that consumption, non-human (financial) wealth and current disposable income constitute a long-run equilibrium relationship in the case of total consumption expenditure. The same holds for expenditure on durables. In the case of non-durable consumption, a long-run cointegration equation included only current disposable income as an explanatory variable. Variables that contributed towards explaining the short-run dynamics of the system include wealth stock, the return on wealth, current disposable income, interest rates, relative prices and a variable reflecting labour market conditions, namely the employment rate in the non-agricultural sector. Interest rates proved to be significant in the explanation of durable consumption only, while the employment rate variable was only included in the non-durable consumption function. Apart from the above, the one-period-ahead price expectations

variable (the result from the Kalman filter estimation) was included in the behavioural equations to test for the role of forward-looking inflation in consumption expenditure decisions. This variable proved significant in the case of durable and total private consumption expenditure.

### 6.3 CONCLUSION

The hypothesis that South African consumers consider price expectations when making consumption expenditure decisions has been validated. The fact that consumers may be regarded as intelligent agents who are able to assimilate information and learn from their environment as time progresses has been proven. The forward-looking theories of consumption further proved to be the appropriate model to use for modelling private consumption expenditure in South Africa, including personal disposable income and financial wealth as well as interest rates in the information set.

The large portion of the South African population that consumes at a subsistence level and the consumption of which is mainly directed towards non-durable consumption, accounts for the fact that non-durable consumption is not in the long run guided by financial wealth. Liquidity constraints on poor consumers also explain the insignificance of any interest rate or price expectations effect on non-durable consumption.