Determinants of Real Private Consumption Expenditure in Lesotho

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A B S T R A C T

Using the Autoregressive Distributed Lag (ARDL) approach to cointegration, an error correction model (ECM) is estimated for real private domestic consumption in Lesotho. Lesotho is one of a number of countries with low gross domestic product (GDP) per capita, that are landlocked and of which the national currency is pegged to that of a highly dominant trading partner. Analysis of consumption pattern in such countries is scant in the literature. This paper finds evidence of a long-run relationship between private consumption, income, interest rates, and inflation. The empirical findings suggest that higher income is associated with higher private consumption, higher inflation reduces private consumption and that higher interest rates reduce private consumption, implying that the substitution effect outweighs the income effect in Lesotho in the long term. Although the model is not designed to evaluate consumption theories, the estimated parameters to some extent support the absolute income hypothesis (AIH), relative income hypothesis (RIH), life-cycle hypothesis (LCH) and permanent income hypothesis (PIH).

1. INTRODUCTION

Private sector consumption is an important driver of every economy. Aside from being a key measure of overall welfare, it significantly influences aggregate demand through the multiplier effects of spending. As a result there are many studies that have estimated private consumption functions for many individual countries and groups of countries (such as monetary unions) around the world, especially for developed countries like the United States (US), Europe and United Kingdom (UK). In recent years, the number of such studies have grown in respect of developing countries as well such as those in the African continent. In the context of African countries many studies of this nature have been done in Nigeria. However, these studies are very limited in the case of small, landlocked, currency pegged countries that are economically characterised by poverty and close ties with dominant trading partners. In countries with these

characteristics(such as Lesotho), where econometric studies of consumption exist, they are often carried out by central banks as part of the development of macroeconometric models and are focused primarily on forecasting ability rather than developing understanding of underlying determinants.

Therefore, the purpose of this paper is to contribute to the general body of knowledge on the determinants of real private consumption expenditure in these countries. In particular, it seeks to unpack factors driving private consumption spending in Lesotho, with a hope that the results may be generalizable to some extent to other countries that have the same characteristics. To do this the paper applies autoregressive distributed lag (ARDL) bounds testing approach to cointegration and estimates an error correction model (ECM) on Lesotho's annual time series data ranging from 1982 to 2013. Lesotho's economic characteristics possibly have the potential to lead to private consumption patterns different from those explored in larger, richer countries that do not share these characteristics. For example, much consumption in Lesotho is in the form of imports, therefore consumption patterns also influence the external sector position to a large extent. In general better understanding the drivers of real private sector consumption would assist policy makers in Lesotho to assess its potential future path in the context of the broader macroeconomy. This would provide valuable information which can be used to guide broader macroeconomic policy in terms of economic growth.

Following this introduction, the rest of the paper is structured as follows: Section 2 sets out the key theoretical considerations in modelling consumption and broadly reviews empirical studies on private consumption. Section 3 provides summarises the methodology employed; Section 4 sets out the results and Section 5 concludes.

2. LITERATURE REVIEW

2.1 Theoretical Background

Given the importance of consumption in macroeconomic analysis, there is a substantial body of theoretical and empirical work that analyses consumption behaviour. There are four theories of consumption behaviour which tend to guide much of the literature. These are the Absolute Income Hypothesis (AIH) of Keynes (1936), the Relative Income Hypothesis (RIH) of Duesenberry (1949) and Modigliani (1949), the Life-Cycle Hypothesis (LCH) of Modigliani and Brumberg (1954) as well as Friedman's (1957) Permanent Income Hypothesis (PIH).

Keynes' AIH is an early theory that proposes that current household consumption is a linear function of current disposable income[1]. It proposes that the marginal propensity to consume (MPC)—the derivative of consumption with respect to income—is positive but less than one, and that the average propensity to consume (APC) declines as the income of an individual increases. Therefore, the AIH implies people adjust their consumption instantaneously as their income changes. Although this theory does not account for the trade-off between present consumption and future consumption, it provides a good first approximation of consumption in cases where the economy was stable (Keynes, 1936).

Alternatively, the RIH proposes that consumption does not depend so much on consumers' absolute income (Keynes' view), but rather on their relative income, both current income relative to previous income and current income relative to the income of the consumer's peers in society. Hence, an individual maximizes utility subject to a weighted average of the population's consumption. In addition, the proponents of this theory believe that consumption behaviour tends to be habitual in that once individuals become accustomed to a certain standard of living; they attempt to maintain it regardless of a decline in income.

A further theory is the LCH, which proposes that an individual's consumption depends on their stage in life, since income fluctuates substantially depending on age, and that the average consumer attempts to smooth consumption over their lifetime. Specifically, in the young adulthood and retirement phases of the life-cycle, consumption in excess of income may be maintained through borrowing or by drawing down past savings. However, in the middle phase of life-cycle when income tends to be relatively high, only a proportion of income is consumed, with savings being built up or debt reduced. In addition to labour income, LCH also postulates significant influences of wealth, which earns income and can be drawn down and consumed over the remainder of an individual's life, thus influencing the individual's level of permanent income. For example, the higher an individual's starting wealth, the lower their net savings is likely to be, as consumption will be boosted by the availability of wealth (see Singh, 2004; Matlanyane, 2005; Saad, 2011; Kazmi, 2015).

Finally, Friedman's (1957) PIH postulates that individuals adjust their consumption mainly in response to changes in expected future income (or "permanent income[2]"), rather than

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[1] It is referred to as AIH because it emphasizes that an individual's consumption decisions are based on their absolute amount of current disposable income.

[2] This is the level of income that can be expected to persist in the long run, which is normally generated by an individual's total wealth(consisting of human capital which is the stock of inborn physical and mental capabilities, knowledge and training that enables an individual to earn labour income).

responding only to changes in current income. It is based on the assumption that people prefer to maintain smooth consumption over time, and thus will only change consumption in response to a permanent change in income rather than a temporary change. There are various possible ways of estimating a consumer's permanent income, including using LCH concepts. In initially testing his theory, Friedman (1957) assumed that on average people base their idea of permanent income on what had occurred over the past several years. This formulation of the theory introduces lags in the consumption function, and implies that the effect of an increase in income may be gradual, rather than taking effect immediately and fully.

Based on these theories, many studies have been undertaken to further understand the determinants of the optimal level of consumption. For example, Hall (1987) combined the LCH and PIH theories with an application of the rational expectations hypotheses (REH)[3]; Flavin (1981) revisited Hall's hypothesis using a structural econometric model of consumption; and Davidson, Hendry, Srba and Yeo (1978) developed an error correction model describing consumption patterns. In addition, other studies attempted to analyse consumption paths under conditions of uncertainty, extending analysis to account for multiple assets and risk, liquidity constraints and buffer stock models (see Hall, 1978).

These various studies on consumption find that, in addition to income, a number of other variables may also influence consumption patterns. These variables include wealth, interest rates, inflation, and consumer prices, as reflected by Saad (2011) for Lebanon, Johnsson & Kaplan (1999) for Sweden, Singh (2004) and Kumar (2009) for Fiji and Habeeb (2015) as well as Kalumbu (2014) for Namibia. In addition, other variables have also been identified as determinants of private consumption, such as unemployment as a measure of income uncertainty (Johnsson & Kaplan 1999), public consumption, terms of trade, the old-age dependency ratio, financial development, the share of employment in service sector, the real effective exchange rate, and external financing (see Guo & N'Diaye, 2010).

Furthermore, tax rates, money supply, or government expenditure (see Raut & Virman, 1990 and Habeeb, 2015), transfer payments (see Kazmi, 1994) and personal saving or savings rates (see Habeeb, 2015 & Horioka, 2012) have also been identified as affecting consumption behaviour.

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[3] In this theory, Hall (1978) argued that individuals only alter their consumption in the presence of new information, which forces them to revise their future expectations of income. In this case, both consumption and wealth evolve as a random walk.

2.2 Modelling Techniques

Studies that analyse consumption behavior in a single country often tend to employ time series techniques; namely cointegration and error correction model approaches (see Davidson, Hendry, Srba and Yeo, 1978; Guisan, 2004; Singh, 2004; Saad, 2011; Ibrahim, 2014; Apere, 2014; Ezeji & Ajudua, 2015; Vasilev, 2015). On the other hand, studies that examine a group of countries often utilise panel cross-country regression (see Tapsin & Hepsag, 2014; Sutherland & Craigwell, 2011; Dreger & Reimers, 2012; Ianole & Druică, 2015; Wang, 2011). However, other analytical techniques are also used such as ordinary least squares (OLS), fully modified least square (FMOLS) and instrumental variables (see Manitsaris, 2006; Paz, 2006; Nwala, 2010, and Osei-Fosu et al, 2014)

2.3 Geographic Focus

A large strand of the extensive theoretical and empirical literature on private consumption or consumer behavior addresses industrialised countries, particularly the United States (US), Euro Area (EA) and United Kingdom (UK). Examples of such studies include Flaven (1981), Cambell and Mankiw (1990), Davidson et.al (1978), Molana (1991), Johnsson & Kaplan (1999), Byrne & Davis (2003), Guisan (2004), Dreger & Reimers (2012), Horioka (2012), Ianole & Druică (2015). In addition, several studies on this issue have also been carried out in the context of emerging markets economies such as India and China (see Guo & N'Diaye, 2010; Avazalipour, 2011; Gandhimath, Amibigadevi & Sundari, 2012).

The number of empirical studies on consumption in developing countries has increased in recent years. Among these countries, many studies have been conducted in Nigeria in particular (see Uwujaren, 1977; Nwabueze, 2009; Akekere & Yousuo, 2012; Thomas, 2013; Apere, 2014; Ezeji & Ajudua, 2015; Alimi, 2015). In addition, many studies of consumption expenditure have been carried out by central banks in the course of developing macroeconometric models (see for example Smal et al, 2007; Tjipe et al, 2004).

The focus of this paper is on patterns of aggregate consumption in Lesotho, a landlocked country that is economically characterised by its poverty and its close relationship with South Africa, a more economically developed country. Specifically, not only is South Africa Lesotho's dominant trading partner, the Lesotho Loti is pegged to the South African Rand.

Lesotho is one of a number of countries exhibiting these characteristics. Other examples include Bhutan, Nepal, and Swaziland[4].

This combination of traits arguably has the potential to lead to consumption patterns different from those noted in larger, richer countries that do not share these characteristics. Some econometric studies of aggregate consumption in the above-noted countries have been carried out, such as Akano (1998), Matlanyane (2005) and Dobbelaere & Lebrun (2010) for Lesotho, Dhungel (1999) and Ra & Rhee (2005) for Nepal and Chhoedup (2013) for Bhutan. However, empirical work in this area is currently lacking relative to the extent of such analysis in respect of many other countries. This paper therefore analyses private consumption determinants in Lesotho, yielding insights which may be paralleled in other countries possessing the aforementioned characteristics.

3. METHODOLOGY

In building real private consumption model in Lesotho, this paper employs the bounds testing approach to cointegration and error-correction modeling based on the Autoregressive Distributed Lag (ARDL) procedure developed by Pesaran et al. (2001). An error correction model with a differenced dependent variable is an alternative mathematical expression of a standard ARDL model with the same dependent variable in levels. This alternative, in cases where a cointegration relationship has been identified, offers a more intuitive interpretation by separating the long-term equilibrium relationship from the short-term adjustment dynamics. This is useful in analysing consumption patterns, in particular in view of the various predictions made by the dominant theories of consumption.

One of the advantages of the bounds testing procedure is that it can confidently be applied in the context of the small sample sizes typical of empirical macroeconomic studies. This contrasts with the predominant use of asymptotic properties by other cointegration tests. In addition, the level variables being tested may be integrated of order 0 or 1, i.e. they may be either I(0) or I(1). Many other approaches require the variables to be I(1), which must be established by pretesting for unit roots in the variables used. Under the bounds test approach, pretesting is still

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[4] For this list, poverty was defined by a maximum for 2014 gross national income (GNI) per capita (World Bank Atlas method) of $4,125, consistent with the upper limit of the World Bank's lower-middle-income country classification. A dominant trading partner was defined as accounting for more than 50% of the international trade value of the country in question in 2014. Only landlocked countries were considered.

necessary, but only to ensure that the variables are not integrated of order 2 or greater, which would invalidate the procedure.

To carry out the bounds test an ARDL model is estimated as follows:

$$\Delta c_t = \beta_0 + \sum_{i=1}^{p} \beta_i x_{i,t-1} + \sum_{j=1}^{q} \gamma_{0,j} \Delta c_{t-j} + \sum_{i=1}^{p} \sum_{j=0}^{q} \gamma_{i,j} \Delta x_{i,t-j} + v_t \tag{1}$$

In Equation 1, Δ is the difference operator, c_t is the dependent variable, x_t is a vector of endogenous variables excluding the dependent variable, p is the number of explanatory variables, and q is the maximum lag length. After estimating the above model, where differenced variables at particular lags have insignificant coefficients, they are removed (subject to pragmatic judgement), and dummy variables are applied as appropriate to account for outliers and improve the fit of the model.

To assess the existence of a long-run relationship between the variables of interest, the bounds test uses the Wald or F-test to examine the joint significance of the coefficients of the one-period-lagged levels of the variables in Equation 1 above. That is, the null hypothesis $H_0: \beta_0 = \beta_1 = \beta_2 = \beta_3 = \beta_4 = \beta_5 = \beta_6 = 0$ is tested against the alternative hypothesis; H_1: At least one of (β_0, β_1, β_2, β_3, β_4, β_5, β_6) $\neq 0$. The calculated F-statistic is compared with the critical value bounds for small samples tabulated in Narayan (2005).

For the bounds test for cointegration, upper and lower bounds for the critical value are specific to the sample size and number of cointegrating variables. If the calculated F-statistic is lower than the lower bound, the null hypothesis of no cointegration cannot be rejected. If the calculated F-statistics is higher than the upper bound, the null hypothesis can be rejected, indicating cointegration. In cases where the calculated critical value falls between the two bounds, the results are inconclusive.

Having established the existence of cointegration, the long-run and error correction models are estimated using the ARDL framework as follows:

$$c_t = \alpha_0 + \sum_{i=1}^{p} \alpha_i x_{i,t} + \varepsilon_t \tag{2}$$

$$\Delta c_t = \beta_0 + \eta ECT_{t-1} + \sum_{j=1}^{q} \gamma_{0,j} \Delta c_{t-j} + \sum_{i=1}^{p} \sum_{j=0}^{q} \gamma_{i,j} \Delta x_{i,t-j} + \omega_t \qquad (3)$$

Equation 2, the long-run model, is estimated by Fully Modified Least Squares (FMOLS), advocated by Phillips and Hansen (1990). The use of this method to produce the error correction term (ECT$_t$) in Equation 3 is an attempt to improve the robustness of the long-run elasticities in Equation 2.

In Equation 3, ECT_t is set equal to ε_t from Equation 2. The coefficient of this error correction term, η, measures the speed of adjustment towards the long-run equilibrium following a shock to the system. ω_t is the white noise error term for Equation 3. Similarly to the procedure used to establish the ARDL model, where differenced variables at particular lags have insignificant coefficients, they are removed (subject to pragmatic judgement), and dummy variables are applied as appropriate to account for outliers and otherwise improve the fit of the model. The model generated is tested based on statistical diagnostics, as well as forecast accuracy statistics.

4. DATA AND EMPIRICAL RESULTS

This paper uses yearly data for Lesotho's economy (except where otherwise stated) from 1982 to 2013 on period average consumer price index (CPI) inflation (π_t), natural log of real private domestic consumption (c_t)[5], natural log of real gross domestic product (y_t)[6], natural log of real gross national income (GNI) (y_t')[7] and natural log of real household disposable income (y_t'')[8]. Other variables include real prime lending rate (r_t), which is nominal interest rate adjusted for CPI inflation, natural log of nominal narrow money supply ($m1_t$) as well as natural log of nominal broad money supply ($m2_t$). The "t" subscript on each variable refers to the year. These data was obtained from the Central Bank of Lesotho (CBL), Ministry of Finance (MoF) and Bureau of Statistics (BoS).

Table 1: Results of Unit Root Tests Performed on Differenced Variables

	Augmented Dickey-Fuller Test	Phillips-Perron Test

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[5] Final private consumption (BOS) less acquisitions by basotho workers in SA
[6] Deflator used: GDP deflator for GDP component, SA CPI (Statistics SA) for factor income from abroad, Lesotho CPI for factor income paid to other countries.

[7] This is based on GNI with adjustment for domestic taxes net of subsidies and transfers. It is deflated by the implied GNI deflator.

Variable	No trend	Trend	No trend	Trend
$\Delta\pi_t$	-5.02***	-4.90***	-18.02***	-18.50***
Δc_t	-4.55***	-4.66***	-4.58***	-4.64***
Δy_t	-6.80***	-1.22	-6.64***	-6.53***
$\Delta y'_t$	-1.80	-7.74***	-8.13***	-8.01***
$\Delta y''_t$	-8.88***	-8.88***	-8.96***	-8.97***
Δr_t	-7.59***	-4.31**	-13.58***	-16.82***
$\Delta m1_t$	-3.87***	-3.97**	-6.72***	-6.62***
$\Delta m2_t$	-5.61***	-5.66***	-5.61***	-5.66***

Note: ***, ** and * represent the rejection of the null hypothesis of the unit root at 1%, 5% and 10% level of significance, respectively. The null hypothesis is that the variable is non-stationary against the alternative hypothesis that the variable is stationary. For Augmented Dickey-Fuller tests, the Akaike Information Criterion (AIC) is used to choose the number of lags. For Phillips-Perron tests, the Newey-West bandwidth is used with the Bartlett Kernel estimation method.

As mentioned in Section 3, it is necessary to ensure that the variables used in the ARDL approach to cointegration are either I(0) or I(1). In Table 1 unit root test results for tests performed on differenced variables are presented. Since the null hypothesis of a unit root is rejected for all variables tested, these results indicate that no variable is integrated of order 2 or above, and the ARDL bounds-testing approach to cointegration can therefore be used.

The results of the ARDL bounds tests of cointegration are set out in Table 2. In this table, combinations of variables were tested by using the automatic variable lag selection feature offered in the Eviews 9 software package, using the Akaike Information Criterion (AIC) as the selection criterion. Impulse dummy variables were used to ignore outliers. The combinations of variables shown in Table 2 are those that, when combined in an ARDL equation, did not exhibit statistically significant serial correlation up to four lags, using the Breusch-Godfrey test. The remaining models all produce significant ARDL bounds-test F-statistics, and pass other standard diagnostic tests.

M1 and M2 are not used in the models shown in Table 2. Although such data could in theory improve the models by acting as proxies for households' real net wealth in Lesotho, unfortunately such data series for the current study period are inconsistent due to different data compilation methodologies used before and after 2009. Therefore M1 and M2, when used within ARDL models of consumption, resulted in model parameters that were materially inconsistent with theory and basic intuition. M1 and M2 were therefore excluded from the analysis in this paper.

Table 2: Results of ARDL Bounds Test for Cointegration

Variables (Δc_t as dependent variable)	k	Calculated F-statistic	95% critical bounds^		99% critical bounds^	
			I(0)	I(1)	I(0)	I(1)

c_t, y_t, r_t	3	12.50***	3.71	5.02	5.33	7.06
c_t, y'_t, r_t	3	11.67***	3.71	5.02	5.33	7.06
c_t, y''_t, r_t	3	5.44**	3.71	5.02	5.33	7.06
c_t, y_t, π_t	3	20.09***	3.71	5.02	5.33	7.06
c_t, y''_t, π_t	3	9.08***	3.71	5.02	5.33	7.06
c_t, y_t, r_t, π_t	4	7.59***	3.35	4.77	4.77	6.67

*, ** and *** denote significance at the 10%, 5% and 1% levels, respectively.^ Critical bounds taken from Narayan (2005) using n = 30.

Similarly, employment statistics in general can be useful as a measure of future income security and perceptions thereof. However, in Lesotho such data is scarce, with comprehensive employment data only being available less frequently than yearly. More regularly updated employment data only covers a small portion of Lesotho's workforce.

A number of error correction models were formulated and subjected to diagnostic testing. Key decisions included selection of variables for inclusion in the long-run cointegration relationship based on the options in Table 2, selection of lagged differenced variables based on significance and the trade-off between model fit versus parsimony, and inclusion of dummy variables to account for outliers and improve the fit of the model. The best model based on these tests is shown below, with diagnostic test results presented in Table 3.

$$\Delta c_t = \underset{(0.016)}{-0.026} - \underset{(0.000)}{0.501}(c_{t-1} - 5.872 - 0.375 y_{t-1} + 0.027 r_{t-1} + 0.008 \pi_{t-1}) + \underset{(0.003)}{0.371} \Delta c_{t-3}$$
$$+ \underset{(0.008)}{0.629} \Delta y_t + \underset{(0.000)}{0.009} \Delta r_{t-1} + \underset{(0.001)}{0.006} \Delta r_{t-2} + \underset{(0.001)}{0.072} D_{198788} - \underset{(0.007)}{0.063} D_{1998}$$
$$+ \underset{(0.001)}{0.042} D_{2008onwards}$$

Table 3: Error Correction Model Diagnostics and Forecasting Accuracy

R^2	0.861
SIC	-4.341
SC: Breusch-Godfrey F-statistic p-value (2 lags)	0.684
Heteroskedasticity: Breusch-Pagan-Godfrey p-value	0.481
Normality test: Jarque-Bera p-value	0.526
RMSE, in-sample	1.62%

SIC = Schwarz information criterion, SC = serial correlation, RMSE = root mean squared error. *, ** and *** denote statistical significance at the 10%, 5% and 1% levels of confidence respectively. Eviews 9 statistical software package used.

The estimated error correction model uses income, interest rates, and inflation as determinants for consumption growth, using GDP as the measure of income. This is consistent with the

cointegration test results in Table 2, which imply that either or both of inflation and the interest rate are required in order to obtain a significant cointegration test result.

In respect of the long-run response of private consumption to its observable determinants, the estimated cointegration relationship suggests the following:

- Higher income is associated with higher private consumption, with an estimated marginal propensity to consume of 0.375 in equilibrium in the long term. This is discussed in light of the key theories of consumption below.
- Higher inflation generally leads to less private consumption. This corresponds to the notion that higher inflation is associated with higher uncertainty regarding future inflation.
- Higher interest rates lead to less consumption. This may indicate that the substitution effect dominates the income effect in respect of the choice between saving and consumption in Lesotho in the long term. Thus households defer more of their consumption when the opportunity cost of immediate consumption—the interest rate— is higher.

Outside of the long-run cointegration relationship, the model identifies some significant short-term influences of private consumption determining variables on changes in private consumption. A large and positive influence of the short-term change in GDP in period t is present, indicating the possibility that short-term increases in income are often consumed rather than saved. The short-term effects of changes in interest rates (in periods t-1 and t-2) are also positive and statistically significant, apparently contradicting the long-term observed negative effect of higher interest rates on consumption. This may signify that the strength of different influences of interest rates on consumption varies through time. For example, the income effect of higher interest rates may lead to greater consumption in the short term. Alternatively, the positive coefficients of interest rate changes terms may capture some of the effect of GDP growth on consumption growth, if interest rates are positively correlated with general economic activity due to the monetary policy process.

Three dummy variables were used to improve model fit. The D_{198788} variable, which is 1 in 1987 and 1988 and 0 otherwise, may result from poorer data quality since it pertains to a relatively early period within the dataset. The D_{1998} variable—1 in 1998, 0 otherwise— coincides with the violence and unrest experienced in Lesotho following the elections that year, with its negative coefficient providing one estimate of the impact on overall consumption

growth in that year. The $D_{2008onwards}$ variable, which is 1 for years after and including 2008 and 0 otherwise, is likely to relate to the impact of the global financial and economic crisis of 2008 and 2009.

The model is not specifically designed to evaluate the theories of consumption discussed earlier—AIH, RIH, PIH and LCH. However, some limited conclusions can be drawn about their validity in Lesotho's context based on this model. The intuition behind AIH that consumption should rise with income in the same period is reflected in the model, as all coefficients of GDP variables are positive, in particular the coefficient of the change in GDP in the current period. However, the presence of GDP in both the short term and long term parts of the model imply that the relationship is more complex than postulated by the AIH.

The model is particularly limited in its ability to evaluate the RIH. However, this hypothesis is supported to some degree by the positive dependence of consumption growth on its past value, reinforcing the notion that individuals may attempt to maintain past consumption levels.

Similarly, while it is difficult to thoroughly assess the LCH using the estimated model, one macro-level implications of this hypothesis that are observable in the model is the influence of interest rates on consumption, which may imply the presence of consumption smoothing or the influence of net wealth on consumption as per the LCH.

The PIH does lend itself more readily to evaluation at the macro level. As such, this model offers mixed evidence pertaining to its validity in Lesotho's context. The existence of a long-run equilibrium relationship, and reversion to this equilibrium throughout time, is consistent with a relatively stable and growing permanent income. Any changes in income, such as the gradual increase in income experienced in Lesotho over the period covered by the data, may not be permanent or perceived as such. This leads to deviations from the equilibrium. However, as time progresses, it becomes more and more probable that the change is permanent, and thus consumption is able to adjust accordingly. In the above model, the coefficient of the error correction term is -0.501.

However, if the cointegration relationship largely captures the effect of permanent increases to income, then we might expect its coefficient of GDP (0.375 in the estimated model) to be closer to one, based on the PIH. Further, the relatively large coefficient of Δy_t in the model suggests that short-term changes in income are often consumed rather than saved. This weakens the case for the PIH to the extent that the short-term changes are transient rather than permanent.

5. CONCLUSION

This paper seeks to understand the determinants of real private domestic consumption in Lesotho with a view to contributing to the general body of knowledge on private consumption in countries with low gross domestic product (GDP) per capita, that are landlocked and of which the national currency is pegged to that of a highly dominant trading partner. Using the ARDL approach to cointegration, a number of cointegration relationships were identified that all produced significant ARDL bounds-tests and passed other standard diagnostic tests. Following those results, many ECMs were formulated and the best ECM model was chosen. The chosen model builds upon the long-run relationship identified between private consumption, income, interest rates, and inflation in Lesotho.

The long-run results suggest that higher income is associated with higher private consumption and that higher inflation is associated with reduced private consumption, potentially due to higher uncertainty of price movements. In addition, higher interest rates also negatively affect private consumption due to the substitution effect, which appears to outweigh the income effect in Lesotho in the long term. Therefore, households defer more of their consumption when the opportunity cost of immediate consumption is higher. In the short-term, the paper finds that increases in income may often be consumed rather than saved. The positive and statistically significant effects of changes in interest rates in previous periods appear to contradict the observed negative effect of higher interest rates on consumption in the long-term.

Although this model is not specifically designed to evaluate the theories of consumption, some limited conclusions can be drawn about their validity in Lesotho's context based on this model. The positive coefficient of the change in GDP in the current period reflects the AIH, although there is evidence of a more complex relationship than postulated by AIH due to the presence of GDP in both the short term and long term. The positive dependence of consumption growth on its past may also support the RIH, while the LCH may be backed by the influence of interest rates on consumption. In addition, the existence of a steady state equilibrium relationship and reversion to this equilibrium throughout time supports the PIH. However, support for the PIH this may be weakened by, amongst others, the finding that short-term changes in income are often consumed rather than saved.

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