$$U(c_t, c_{t+1}) = \mu(c_t) + \beta E_t[\mu(c_{t+1})])$$

$$\dot{k} = f(k) - c - (n + g + \delta)k$$

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ABSTRACTS

1 The Effects of Regional Cross Listing on Firm Value and Financial Performance: Drawing Lessons for Lesotho

By Moeti Damane[1]

Abstract

THIS RESEARCH determines the effects of regional cross listing on firm value and financial performance and draws policy lessons for Lesotho. Using event study methodology, financial ratio analysis and a regional case study of two Sub-Saharan African firms that cross listed on the Johannesburg Stock Exchange in 2015 and 2016, the results of the study reveal that cross listing leads to increased firm liquidity coupled with positive and statistically significant abnormal returns. These findings confirm the legal bonding theory, the signalling theory, the investor recognition theory and the liquidity theory. It is recommended that the empirical findings of this study be used by authorities to draw locally incorporated firms' attention to the potential benefits of cross listing. This should be done in conjunction with initiatives that identify and unlock any bottlenecks that act as deterrents for company listing on the Maseru Securities Market.

Keywords: Securities exchange, Cross listing, Financial ratios, Market segmentation, Event Study Methodology

JEL classification: G0, G1, G2, G4

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ABSTRACTS

2 The role of non-bank financial intermediation in Lesotho: Challenges and possible remedies

By Retšelisitsoe Simon Mabote[1]

Abstract

FINANCIAL INTERMEDIATION is the role that is traditionally dominated by the banking sector, with little or no space for the non-banks financial institutions. However, this is not the case in developing countries, either due to topology or relative development of the financial system. The purpose of this study is to evaluate the role and impact of the non-bank financial intermediaries in discharging their roles in Lesotho. These institutions have penetrated the country into the rural mountainous areas, and they offer healthy financial system by invoking competition with the banking sector, while also attending to the gap that is left unattended by the former. As a result, Lesotho ranks high on financial inclusion given that majority of services are offered by the informal and auxiliary establishments in the financial sector. However, the authorities have to consolidate on prudential supervision in order to minimise risk that may result from the aggressive offering from the NBFIs in all its various formations.

Keywords: Financial Intermediation, Financial Intermediaries, Financial Stability, Microfinance, Savings Investment

JEL classification: G21, G22, G23, G24, O16

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ABSTRACTS

3 Determinants of Poverty and Remedial Measures: Lessons for Lesotho

By Selloane Khoabane[1]

Abstract

LESOTHO HAS achieved solid economic growth and a seemingly positive shift in the output structure. Nonetheless, these have not translated into corresponding improvements in employment and poverty outcomes. The literature identifies a number of factors that explain this phenomenon. The empirical analysis and case studies included in this paper reveal that economic growth should be supplemented with employment generating economic structural transformation to have a meaningful poverty reducing impact. Effective economic transformation can be achieved when there is an effective institutional structure in place to support implementation of strategic development policies. Development of effective institutions could be the solution to Lesotho's sluggish implementation of strategic development policies. Lesotho needs to define the kind of institutions that have to be developed to address all impediments to effective implementation of policies that have the potential to transform the economy, generate employment and address poverty.

Keywords: Economic Development, Economic Growth, Poverty, Employment, Institutions
JEL classification: E24, E61, I32, O40, O43, O10

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ABSTRACTS

4 Estimating and evaluating measures of core inflation in Lesotho

By Realeboha Khamali[1]

Abstract

THIS PAPER estimates and evaluates the measures of core inflation in Lesotho for the sample period March 2009 to December 2017 using the CPI data. Using five exclusion-based measures and one limited influence estimator, the results reveal that the 30%-trimmed mean tracks trend inflation very well relative to other measures and using the one-month ahead forecasts only 30%-trimmed mean core inflation indicator has significant predictive power for the future headline inflation. Nonetheless, as the forecasting horizon increases some measures have significant predictive content for the future headline inflation but the 30%-trimmed mean surpasses all of the calculated core inflation indicators. It is therefore adopted as the ideal measure of core inflation for Lesotho.

Keywords: Headline inflation, Core inflation,
JEL classification: C13, C52, E3

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The Effects of Regional Cross Listing on Firm Value and Financial Performance: Drawing Lessons for Lesotho

Moeti Damane

1 INTRODUCTION

1.1 Background

PART OF THE Central Bank of Lesotho's functions, as outlined in the Central Bank Act of 2000, is to promote safe and sound development of the financial system as well as to monitor and regulate the country's capital markets. Lesotho's securities exchange is the Maseru Securities Market (MSM). The MSM is a non-profit making institution created for the fundamental objective of facilitating the centralised trading of financial securities in a secure environment that enhances confidence while at the same time does not suffocate market development in the country. The MSM was established by law in 2014 through the enactment of the Central Bank (Capital Markets) Regulations, 2014 and it was officially launched in January 2016. It forms part of Lesotho's capital market development framework as espoused under the Central Bank of Lesotho (CBL) Financial Sector Development Strategy (FSDS)[1], 2012.

The MSM operates under the Central Bank (Capital Markets) Regulations, 2014 as the legal and regulatory framework for stock markets in the country. The relative infancy of the securities exchange coupled with the fact that it currently does not have any companies listed on it[2], means that it is yet to prove its market efficiency in raising capital as well as its attractiveness to investors (retail and institutional). Inactivity in the MSM implies that Lesotho still has a long

[1] The FSDS follows from Lesotho's National Strategic Development Plan (NSDP) objectives for the financial sector. It was developed by the CBL in conjunction with the International Monetary Fund (IMF) and the World Bank through the financial Section Reform and Strengthening (FIRST) initiative.

[2] Some of the reasons companies have not yet listed on the MSM have to do with unclear and less than conducive listing requirements (PwC, 2017a and PwC, 2017b).

way to go in terms of capital market development and the broadening of access to finance. Molapo and Damane (2016) pointed out that in Lesotho, the supply of investment finance to firms in the country is dominated by commercial bank credit. This heavy reliance on bank credit as opposed to a mix of bank-based and market-based (equity) finance leads to higher costs of borrowing for the country's firms. The consequence is less corporate investment in the economy and economic rigidity in the transition from an economy dominated by the traditional agrarian sector to one that engages in modern industrial activities (Chakraborty and Ray, 2006 and Molapo and Damane, 2016). According to Adelegan (2008), in other African countries, equity finance plays a significant source of finance for firms. For example, between 1996 -2002, equity finance accounted for 39 per cent of total asset growth of listed companies in South Africa, 25 per cent in Zimbabwe between 1990 – 1999 and 40 per cent in Nigeria between 1990 and 2000. Adelegan (2008), UNCTAD (2014) and Onyuma *et al*. (2012) posited that greater access to finance and stock market development in smaller emerging countries can be attained if the development of the capital markets is done at the regional level through greater regional integration.

Capital market development, greater access to finance and regional integration are key deliverables under the strategic objectives of the FSDS. In light of this and the above, the objective of the study is therefore to fill the knowledge gap by providing policy makers, domestic firms, investors, advisors and other market participants with evidence on the effects of regional cross listing on firm value and financial performance. However, since the MSM is still in its nascent stage with no local firms listed on it at the time of this study, it is not possible to ascertain the benefits that can accrue to companies incorporated in Lesotho with a primary listing on the MSM and a cross listing on a relatively more developed regional stock exchange. To overcome this challenge, the study uses event study methodology, financial ratio analysis and a regional case study approach[3] to investigate the effects of regional cross listing on a sample of two non-Lesotho firms from Sub-Saharan Africa (SSA).

The remainder of the paper is divided into six parts. Section 2 presents the profiles and fundamentals of selected stock exchanges in SSA. Section 3 presents a review of relevant literature. Section 4 presents data and methodology. Section 5 offers a discussion of the results.

[3] Regional cross listings are used as a case study due to the proximity preference theory. The proximity preference theory is explained in Section 3 of this paper.

Section 6 lays out the conclusion and policy recommendations. This is followed by Section 7, which underscores areas of further research.

2 PROFILES AND FUNDAMENTALS OF SELECTED STOCK EXCHANGES IN SUB SAHARAN AFRICA

When a company cross lists into a smaller securities market that handles lower trade volumes and lower market capitalisation, the effect is not the same as when it cross lists into a more prestigious securities exchange with more stringent markets and relatively higher market capitalisation (Onyuma et al., 2012). Since our study uses a regional case study approach to determine the effects of cross listing on firm value and financial performance, it is necessary to first note the profiles and fundamentals of a select group of Sub-Saharan African (SSA) stock exchanges. The stock exchanges are chosen on the basis of them being from countries that are members of the Southern African Development Community (SADC). In addition, the stock exchanges are members of the African Securities Exchange Association (ASEA)[4] and the Committee of SADC Stock Exchanges (CoSSE)[5]. The exchanges that fit these criteria are: Botswana Stock Exchange (BSE); Johannesburg Stock Exchange (JSE), Namibia Stock Exchange (NSX); Mozambique Stock Exchange (BVM); Stock Exchange of Mauritius (SEM); Malawi Stock Exchange (MSE); and the Zimbabwe Stock Exchange (ZSE). The selected stock exchanges' profiles are presented in Appendix 1 while their respective fundamentals[6] are presented in Appendix 2.

From Appendix 2, the JSE has the highest number of listed firms at 400 followed by the SEM at 88 while the MSE had the least number of listed firms at 3. In addition, the JSE has the highest market capital at US$998.3 billion followed by the NSX and the BSE with US$144.1 billion

[4] The African Securities Exchanges Association (ASEA) was established in 1993. It is the Premier Association of 27 Securities Exchanges in Africa, that have come together with the aim of developing Member Exchanges (achieving common listing requirements and disclosure standards applicable to advanced capital markets) and providing a platform for networking (integration of African exchanges through technology).

[5] The Committee of SADC Stock Exchanges (CoSSE) was established in 1997. It is a collective body of the various stock exchanges in the Southern African Development Community (SADC). Although CoSSE is essentially a private sector association, it forms part of SADC structures as it has a formal status under the SADC Finance and Investment Protocol (FIP).

[6] 2012 information is used in this case since 2012 data is the most recent and readily available market fundamental data per selected stock exchange obtainable from the ASEA yearbooks.

and US$53 billion, respectively. The lowest market capital is registered by the MSE at US$1.02 million. In 2012, the JSE boasted the greatest total value of stock traded at US$408.6 billion followed the NSX at US$494.5 million. Similarly, the highest total number of transactions were recorded by the JSE at 61.8 billion followed by the ZSE with 3.5 billion. According to Luo (2016), the turnover ratio can be used as a measure of stock market liquidity. If this ratio is considered, it can be concluded that the JSE followed by the ZSE and the SEM are by far the most liquid stock exchanges out of the group with turnover ratios of 40.9 per cent, 11.31 per cent and 4.97 per cent respectively. If a stock market has low or poor liquidity, this can be a significant deterrent to international investment and can also have the consequence of poor pricing of markets (JSE, 2018). The domestic market capitalisation as a per cent of gross domestic production (GDP) can be used to measure stock market development (Bayraktar, 2014; Anokye, 2016 and Ooi *et al.* 2017). Using this definition of stock market development, the three most developed stock exchanges in the group are the NSX, JSE and SEM.

The top five most active sectors in the selected group of stock exchanges for 2012 is reflected under Appendix 3. Pronounced stock market activity in the banking, insurance and financial services sectors was the most common among the select group of stock exchanges. The second most popular sector was mining which was reflected as an active sector on the JSE and BSE. It can therefore be argued that companies that participate in such sectors of production have a heightened chance of raising capital by cross listing in the relevant stock exchanges.

3 LITERATURE REVIEW

This section discusses the theoretical and empirical literature pertaining to cross listing. The theoretical review of the literature will focus on the value implications of cross listing and how theory explains these possible implications. The empirical review of the literature will cover studies on cross listing done in both developed and developing countries.

3.1 Theoretical Review of Literature

Cross listing is defined as the listing of a company's ordinary shares on a different stock exchange other than its original stock exchange. A company's decision to cross list its shares on a foreign

exchange is often underpinned by elements of market efficiency or inefficiency. Fama (1970, 1991), Chisadza, (2003) and Dodd (2011) elaborated that an efficient capital market is one whose prices always fully reflect available information. This characteristic makes it easy for investors to choose between securities that adequately represent firms' activities. Cross listings would be redundant if markets were perfectly efficient since investors would be indifferent where to invest and companies would be indifferent where to list their stocks in the absence of any investment barriers or home bias (Berg, 2012).

Based on work by Fama (1970, 1991); Merton, (1987); Serra (1999); Hargis (2000); Coffee (2002); Lang *et al.* (2003); Chisadza (2003); Smirnova (2004), Claessens *et al.* (2006); Cetorelli and Peristiani (2010), Dodd (2011); Onyuma *et al.* (2012); Berg (2012); Dodd (2013); and Cheronoh (2015), the theories that underscore a company's decision to cross list are summarised in Table 1 below. A detailed explanation of each theory is presented in Appendix 4.

Table 1 Summary of Theories that Underscore Cross Listing Decisions

Theory	Summary Explanation
The legal bonding theory	A company is able to effectively bond to the stricter legal environment of the target market through cross listing.
The signalling theory	Company managers are able to adequately convey information about the firm's quality and future prospects.
The capital market segmentation theory	Cross listing results in a wider investment base, wider risk sharing (lower risk) translates into lower cost of capital[7].
The information asymmetry theory	Cross listings mitigate against the adverse effects of information asymmetry on price discovery (determination of proper price of a security).
The liquidity theory	Transactions (buying and selling of shares) can be executed easily and with less of an impact on the share price. Liquidity in turn means lower risk.
The investor recognition theory	Wider recognition of a company's shares translates into access to a wider investor base and wider risk sharing. The consequence is lower risk and lower cost of capital.
The proximity preference theory	Investors and corporate decision makers often have a domestic bias (i.e.) they favour companies that are similar in terms of geography, economy, culture and industry.
The market timing theory	Corporate managers conduct listings during the hot market[8] periods in stock markets.
The business strategy theory	Cross listings can coincide with a company's need to raise equity and thus could be part of their globalization strategy that is expected to offer visibility and possible comparison with peers.

[7] The impact of cross listing on the cost of capital is enshrined in the Estimation Risk Hypothesis (ERH). The ERH asserts that the cost of capital is a function of the estimation risk such that the more accurate investors are able to assess the prospects for a company, the lower is its expected cost of capital (Brown and Warner, 1985).

[8] A situation characterised by unusually rising initial returns and high volume of initial public offerings (i.e.) increase in the size of market capitalization as a ratio of gross domestic product (Dodd, 2011 and Neneh and Smit, 2013).

From Table 1, it can be concluded that the legal bonding theory, liquidity theory and investor recognition theory each cite better quality host markets as a major benefit of cross listing. Interestingly, the market segmentation theory (and the investor recognition theory) when compared to the proximity preference theory both argue benefits of cross listing although from totally opposite perspectives. For instance, the market segmentation theory indicates that cross listing is beneficial to shareholders when the host market is least comparable to the home market. On the other hand, the proximity preference theory espouses that benefits of cross listing to shareholders arise when the host market is most familiar or similar to the home market.

The discussion above has articulated some of the main reasons why firms would choose to cross list their shares on a foreign exchange. In addition to the afore mentioned theories, Serra (1999); Hargis (2000); Lang *et al.* (2003); Chisadza (2003); Claessens *et al.* (2006); ASEA (2013b) and JSE (2018) indicated that cross listing can also mean broader competitiveness in regional financial systems coupled with greater impetus for financial sector reforms, capital market development and economic growth in the domestic market.

3.2 Empirical Review of Literature

Serra (1999) examines the effects on stock returns of dual-listings on an international exchange using event study methodology and a sample of 70 firms from 10 emerging markets that dually listed on the NYSE[9], NASDAQ[10] and SEAQ-I[11] (London) over the period 1991 – 1995. The study doesn't only assess the impact of dual listings on firm value and performance but it also compares the impact of a US listing against a London listing. The results of the study supported the market segmentation hypothesis. That is, firms in the sample experienced positive abnormal returns before listing followed by a significant decline in their returns after listing, a development that reflects better risk sharing.

Jayakumar (2002) investigates the impact of international cross listings on local stock exchanges by focusing on the experience of Chile. Using a generalized method of moments (GMM)

[9] New York Stock Exchange.
[10] National Association of Securities Dealers Automated Quotations Exchange.
[11] Stock Exchange Automated Quotation.

technique and a sample of 14 Chilean companies with domestically traded shares that undertook American Depository Receipts (ADR) listings, the results of the study reveal that there is no order-flow migration from the domestic market following the cross listings. The analysis also discovered that when market measures of size and liquidity are considered, the ADR market grew more than the domestic stock exchange. Therefore, the conclusion is that increased numbers of international cross listings appear to relegate the local stock markets to secondary players relative to the host exchanges. The implication is an adverse effect on domestic financial development.

Baker *et al.* (2002) examines the visibility of non-United States (US) securities listed on the New York Stock Exchange (NYSE) and non-United Kingdom (UK) securities listed on the London Stock Exchange (LSE). Visibility is measured in terms of (i) the number of analysts estimating the firm's annual earnings, and (ii) the number of citations a firm gets in an article title or lead paragraph appearing in the Wall Street Journal (WSJ) and Financial Times (FT). The results of the study confirm the investor recognition theory. International firms listing their shares on the NYSE or the London Stock Exchange (LSE) experience a significant increase in visibility, as proxied by analyst coverage and print media attention (The WSJ or FT). The increase in analyst following is also associated with a decrease in the cost of equity capital after the listing event.

Adelegan (2008) investigated the impact of regional cross listing of stocks on the depth of the stock markets in sub-Saharan Africa (SSA) using event study methodology (ESM) and data from 1990 to 2007 for a panel of 13 stock markets in SSA countries. Using market based measures of stock market development (market capitalisation, market capitalisation as a percentage of GDP and the number of listed firms), the results of the study discovered that regional cross listing had significant positive effects on stock market depth and that stock markets of countries with regional cross listings perform better than those without.

Onyuma *et al.* (2012) investigates the effect of cross listing on three Kenyan firms' value and financial performance before and after they cross listed on securities exchange in Eastern Africa. Using an event study timeline of six years (three years before and after the cross listing) and financial ratio analysis (liquidity, profitability, gearing and investor ratios) the results of the study reveal low, yet positive financial performance of the firms in terms of liquidity upon cross listing.

In addition, the market confidence in each of the firms, as measured by the price per earnings ratio also improved. On the whole, the study concluded that firms may benefit from cross listing in terms of liquidity and confidence.

Makanga and Gateri (2014) used event study methodology, financial ratio analysis and correlation analysis to determine the effects of regional cross listing on a sample of East African firms that cross listed between the years 1997 to 2013. The study's event study timeline spans 36 months before cross listing and 36 months after cross listing. The results of the study confirmed the legal bonding theory and the liquidity theory as cross listing yielded increases in firm value and liquidity although this impact was not sustained two years after cross listing. Importantly, cross listing resulted in a decrease in firm leverage, growth and operational performance while the profitability increased.

4 DATA AND METHODOLOGY

The study population and sampling frame is a list of firms incorporated in any of the six SADC countries[12] (excluding South Africa) identified in Section 2 that have a primary listing on any of the six stock exchanges[13] (excluding the JSE) identified in Section 2 and a cross listing on the JSE. The JSE is chosen because it is among the top 19 stock exchanges in the world by market capitalisation and it is a member of the World Federation of Exchanges (WFE). (JSE, 2018) explained that being member of the WFE is important because institutional investors are mandated to invest only through exchanges that belong to the WFE. Out of the list of selected SSA exchanges, only the JSE and SEM are members of the WFE. However, according to WEF (2017), the JSE is ranked number 25 out of 137 countries when it comes to financing through local equity markets while Mauritius is ranked number 33.

According to National Treasury (2017), by the end of 2016, there were 387 companies listed on the JSE. Of the 387, 75 (about 20 per cent) were foreign domiciled companies while the remaining 312 (about 80 per cent) were South African companies. Table 2 presents a list of companies from the SADC region that were cross listed on the JSE in the first quarter of 2018.

[12] Botswana; Namibia; Mozambique; Mauritius; Malawi and Zimbabwe.
[13] BSE; NSX; BVM; SEM; MSE and ZSE.

During this period, there were a total of seven non-South African companies from the SADC region that were cross listed on the JSE.

Table 2 Names of Companies from SADC Region with Cross Listing on JSE in first quarter 2018

Name of Company	Country of Origin	Date of Cross Listing on JSE
Cafca Ltd.	Zimbabwe	11th March 1946
Hwange Colliery Ltd	Zimbabwe	24th November 1953
Mainland Real Estate Ltd.	Mauritius	9th December 2016
Go Life International Ltd.	Mauritius	23rd November 2016
Universal Partners Ltd.	Mauritius	11th August 2016
Choppies Enterprises Ltd	Botswana	27th May 2015
Wilderness Holdings Ltd.	Botswana	8th April 2010

Source: JSE

In light of data challenges, non-probability sampling (purposeful sampling) was used to select two firms from the sampling frame. Purposeful sampling is advantageous since it selects information-rich cases for the most effective use of limited resources (Palinkas *et al.*, 2015). Table 3 presents a list of the two firms selected into the sample. The sample comprises of one firm from Mauritius; Go Life International Ltd. (pharmaceuticals and biotechnology company) and one firm from Botswana; Choppies Enterprises Ltd. (food and drug retailer).

Table 3 General Information on the Sampled Firms

Country	Firm	Country of Origin	Country of Origin	Country of Origin	Date of Cross Listing on JSE
Botswana	Choppies Enterprises Ltd.	27th May 2015	CHOPP	DCIBT*	Food and Drug Retailers
Mauritius	Go Life International Ltd.	23rd Nov 2016	GOLI	SEMDEX**	Pharmaceuticals and Biotechnology

* The DCIBT (Botswana Gaborone Index) is a major stock market index which tracks the performance of the biggest companies traded in the Botswana Stock Exchange. It is a capitalization-weighted index.

** The SEMDEX is an all-share index designed to capture the price evolution of all the ordinary shares listed on the Official Market which met the SEM's free-float requirements as defined in the listing rules of the Official Market.

The instrument code for Go Life International Ltd. and Choppies Enterprises Ltd. on their primary listings are GOLI and CHOPP, respectively. The main market indices in the BSE and SEM are DCIBT and SEMDEX, respectively. An extensive profile of each of the two firms selected into the sample is provided in Appendix 5.

4.1 Data Description

The study uses a combination of annual and monthly firm data. Annual data is used to calculate firms' financial ratios while monthly data is used to calculate firms' stock returns and the market index returns[14]. For stock return data, monthly data is preferred over daily data because monthly stock return data relative to daily stock return data departs less from normality (Fama, 1976; Brown and Warner, 1985). In addition, estimation of model parameters using daily stock return data is vulnerable to the negative effects of non-synchronous trading[15]. Non-synchronous trading can cause bias and inconsistent model parameters following OLS estimation. Furthermore, non-synchronous trading is likely to lead to (a) lag 1-cross correlation between stock returns, (b) lag-1 serial correlation in a portfolio return and (c) negative serial correlations of the return series of a single stock (Brown and Warner, 1985; Strong, 1992 and Tsay, 2005). The type of data collected, its frequency and its sources are reflected in Table 4.

Table 4 Type of Data Collected and Sources

Type of Data	Frequency	Source of Data
Current Assets	Annual	Annual Reports – Group Financial Statements
Current Liabilities	Annual	Annual Reports – Group Financial Statements
Inventories	Annual	Annual Reports – Group Financial Statements
Total Assets	Annual	Annual Reports – Group Financial Statements
Sales / Revenues	Annual	Annual Reports – Group Financial Statements
Operating Income	Annual	Annual Reports – Group Financial Statements
Earnings Before Interest and Taxes (EBIT)	Annual	Annual Reports – Group Financial Statements
Profit After Tax	Annual	Annual Reports – Group Financial Statements
Common Equity	Annual	Annual Reports – Group Financial Statements
Total Shares Outstanding	Annual	Annual Reports – Group Financial Statements
Dividends per Share	Annual	Annual Reports – Group Financial Statements
Level of Long-term Debt	Annual	Annual Reports – Group Financial Statements
Market Price of Share	Monthly	www.investing.com
Market Index	Monthly	www.investing.com

[14] Firms' stock returns and the market index returns are calculated on data respective to the stock exchange where the company has its primary listing. This is because the stock exchange of the primary listing in our case has stock returns for before and after the company's cross listing on the JSE.

[15] Non-synchronous trading explains that different stocks have different trading frequencies and different trade intensities from hour to hour and from day to day (Tsay, 2005).

4.2 Data Analysis

Similar to Jayakumar (2002), Onyuma *et al.* (2012), Makanga and Gateri (2014) and Rani *et al.* (2016) the study makes use Event Study Methodology (ESM) and financial ratio analysis to determine the effects of regional cross listing on firm value and financial performance. The use of the ESM and financial ratio analysis is done with due consideration of the Modern Financial Theory[16] and the semi strong form of the Efficient Market Hypothesis[17].

4.2.1 Event Study Methodology (ESM)

ESM provides a way to empirically investigate the relationship between security prices and a market event, such as a merger, cross listing, hiring of a new chairman, launching of a new product, earnings announcement etc. (Coutts *et al.*, 1995; Adelegan, 2008 and Rani et al., 2016). A major advantage of ESM is that it bypasses the problems of accounting convention as well as the measurement associated with accounting returns. It does this by measuring the impact of an event (say; a cross listing) in terms of unexpected or abnormal return[18] on the underlying security. That is, it compares the actual return realised on the time of the event with the expected or normal return in the absence of the event (Brown and Warner, 1980; Strong, 1992; Cable and Holland, 1999; Adelegan, 2008 and Rani *et al.*, 2016).

In this study, the event is considered to be the month in which a firm's stock was cross listed. A combination of three ESM are used to calculate firms' abnormal returns. The three ESM are: (i) the Mean Adjusted Return model (MAR), the Market Adjusted Return model (MKAR) and the Risk Adjusted Return model (RAR). The three models are presented in equations 1, 2 and 3 below. Although the paper will make use of all three ESM methodology, Brown and Warner (1980), Strong (1992), Cable and Holland (1999) and Adelegan (2008) noted that the RAR has

[16] A company's stock price is a function of its current price and the summation of its expected future dividends. That is to say, the stock price takes into consideration all available information and expectations about the future. Owing to this theory, it is therefore possible to analyse the effect of an event (in this case; cross listing) on a firm by looking at the associated impact on the firm's stock.

[17] Asset prices already reflect all publically available information. As a result, it is not possible to earn abnormal (excess) return beyond the event period using fundamental or technical analysis. The validity of this hypothesis is tested or verified using Event Study Methodology (ESM).

[18] A stock's abnormal return is the return generated by the stock (during an event) that is different from the expected or normal return (Brown and Warner, 1980).

more power[19] over the MAR and the MKAR. The RAR results in smaller variances between the abnormal returns and relative raw returns. Moreover, there are smaller correlations across security abnormal returns under the RAR, making it conform closer to standard statistical tests.

a) Mean Adjusted Returns Model (MAR)

The MAR is presented in equation 1. Equation 1 explains that the abnormal return of a particular stock at time t is equal to the difference between the observed return of the stock at time t and the average return on a particular stock over the estimation period.

$$AR_t = R_t - \bar{R}_t \qquad (1)$$

Where:
AR_t is the abnormal return at time **t**.
R_t is the stock return at time **t**.
$\bar{R}_t$ is the average return on stock over the estimation period.

One criticism of the MAR is that it assumes no change in normal returns in the absence of an event (Cable and Holland, 1999).

b) Market Adjusted Returns Model (MKAR)

The MKAR is presented in equation 2. Equation 2 is also known as the Index Model (IM). It explains that the abnormal return of a particular stock at time t is equal to the difference between the observed return of the stock at time **t** and the expected return on the market portfolio at time **t**.

$$AR_t = R_t - R_{Mt} \qquad (2)$$

Where:
AR_t is the abnormal return at time **t**
R_t is the stock return at time **t**
R_{Mt} is the average return on stock over the estimation period

[19] The RAR has less likelihood to commit a Type I error (Brown and Warner, 1980).

c) Risk Adjusted Returns Model (RAR)

The RAR is presented in equation 3. Equation 3 is also known as the Market Model (MM). It explains that the abnormal return of a particular stock is the difference between the return on the stock at a particular time and a systematic component that is linearly related to some market index at time **t**.

$$AR_t = R_t - (\hat{a} - \beta R_{M.t}) \quad (3)$$

Where:
AR_t, R_t and $R_{M.t}$ are as previously defined.
$\hat{a}$ and β are parameter estimates from a regression of the stock against the market index.
β is also known as the volatility[20] or the systematic risk of the stock in comparison to the market as a whole. It represents the risk that cannot be removed by diversification. Therefore, it is the only form of risk for which investors are entitled to receive an expected return higher than the risk free rate of return.

The RAR is a regression based model that can be estimated with ordinary least squares (OLS)[21]. Under this approach, the appropriate unit root tests[22] and relevant residual diagnostics[23] are conducted to satisfy that the model variables are stationary and that the residuals are white noise. In addition, the model is subjected to specification error tests using the Ramsey RESET to make sure that it is not misspecified. Draper and Paudyal (1995) indicated that the market model also has to be tested for stability. Suitable tests in this respect are the CUSUM and CUSUM of Squares tests.

[20] If a security has a beta of 1.00, this indicates that it will move in tandem with the market on an even basis. A beta less than 1.00 means the security is less volatile than the overall market or that it is volatile and has its price movements less correlated with the market. Conversely, a beta greater than 1 means the security is volatile but tends to move up and down with the market.
[21] In accordance to Strong (1999), the estimation of the RAR using OLS assumes that the sample securities have no unrepresentative exposure to extra-market factors and that the event dates are diffusely spread out in calendar time for the sample securities.
[22] The Augmented Dickey and Fuller (1979, 1981) and the Phillips and Perron (1988) unit root tests are used.
[23] The Breusch-Godfrey test for autocorrelation, Jarque-Bera test for normality of residuals, Breusch-Pagan-Godfrey test for heteroscedasticity.

d) *Calculating Stock Returns*

Before either the MAR, MKAR or RAR can be calculated, stock returns have to be calculated. From equation 1, R_t can be calculated either in discrete terms or logarithmic terms as follows:

Discrete returns:

$$\frac{P_{jt} + D_{jt} - P_{jt-1}}{P_{jt-1}} \tag{4}$$

Logarithmic returns:

$$\log\left[\frac{P_{jt} + D_{jt}}{P_{jt-1}}\right] \tag{5}$$

Where:
P_{jt} is the share price of company **j** at the end of period **t** adjusted for any capital changes in order that it is comparable to P_{jt-1}
D_{jt} is the dividends paid during period t adjusted for the sample capital changes described above
P_{jt-1} is the share price of company **j** at the end of period **t - l**

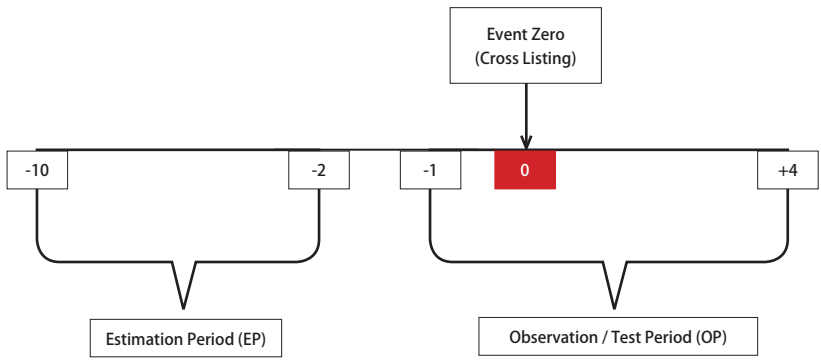
The study will calculate and make use of the logarithmic return. Strong (1992) explained that logarithmic returns are more suited to the assumptions of standard statistical techniques used under ESM since they are more likely to be normally distributed. In addition, logarithmic returns are easier to work with when linking together sub-period returns to form returns over longer intervals since one can simply add up the respective sub-period returns.

e) *The ESM Timeline*

The event study timeline in months is presented in Figure 1. The timeline is chosen as -10, through 0, to +4. Here, 0 corresponds to the month of cross listing. A 14-month event study timeline has been used with the assumption that no other significant event could have affected share price movements in that period (the problem of confounding events). Rani *et al.* (2016)

explained that having long event study timelines is discouraged since they can undermine the power of the test statistic and lead to false inferences. Moreover, long timelines can increase the likelihood of contemporaneous and inter-temporal correlations of residuals which can underestimate standard errors.

Figure 1 The Event Study Timeline in Months



Source: Authors' Illustrations

The event study timeline is divided into the estimation period (EP) and the observation period (OP). The EP will be used to estimate the parameters of the benchmark expected return ($\boldsymbol{R}$, $\boldsymbol{R_{M,t}}$, $\hat{\boldsymbol{a}}$ and $\boldsymbol{\beta}$, respectively). As indicated in figure 1, the EP spans from ten months before event zero (cross listing) to two months before the event. Strong (1992) and Coutts *et al.* (1995) explained that the EP is arbitrarily chosen in such a way that it is close to the OP yet further away from it that the specific event is expected to have no impact on stock prices. Therefore, the EP represents a period in which there are no persistent abnormal returns. On the other hand, the OP spans from one month before event zero to four months after it. The calculation of the abnormal returns is done within the OP.

Considering the event study timeline, if abnormal returns occur on event zero, then the conclusion is that the market is responding appropriately to the quality of information around the public event (cross listing). However, if abnormal returns are observed persistently two months to four months after event zero, then the validity of the semi strong form of the efficient market hypothesis with respect to this event should be questioned. The lingering of

the abnormal returns in this case implies that the market is not efficient since it is not quickly incorporating the new information in the pricing of the stock. Conversely, if abnormal returns are observed prior to event zero, say two months before event zero, this could be the result of market anticipation of the public event triggered by legitimate sources of information, namely, rumours in the media about the possibility of the event occurring (Borges and Gairifo, 2013).

f) Testing the Statistical Significance of the RAR Abnormal Returns

Given the abnormal returns based on the RAR, the statistical significance of the abnormal returns for each observation under the OP (including event zero – the cross listing) is assessed using the parametric t-test. This approach is similar to the one used by Brown and Warner (1985). The test statistic is described as the ratio of the month '0' abnormal return to its estimated standard deviation (SD); where the standard deviation is estimated from the respective share returns under the EP.

The null hypothesis H_0: Abnormal Returns = 0 (i.e. Cross listing on the JSE has no effect on the returns of the share)

The alternative hypothesis H_1 : Abnormal Returns ≠ 0 (i.e. Cross listing on the JSE has an effect on the returns of the share)

Abnormal returns are deemed statistically significant if the test statistic is greater or equal to 1.96[24].

4.2.1 Financial Ratio Analysis

Information gathered from the group financial statements of the two firms under study will be used to calculate each firm's respective financial ratios[25]. The financial ratios used in this paper are a mix of liquidity, profitability, gearing and investor ratios. Barnes (1987) explained that the liquidity, profitability and gearing ratios convey a sense of a company's operational performance while the investor ratios provide a general sense of how the value of the company was affected

[24] 1.96 is the approximate value of the 97.5 percentile point of the normal distribution.
[25] The financial ratios used in this paper are presented and explained in Appendix 6.

(increased or decreased) pre and post the cross listing. The financial ratios will be calculated over a 3-year period (inclusive of the year of cross listing with one year before the year of cross listing and one year after the year of cross listing). Therefore, the financial ratios of Choppies Enterprises Ltd. will cover the period from 2014 to 2016 while those of Go Life International Ltd. will cover the period from 2015 to 2017.

5 DISCUSSION OF RESULTS

5.1 Choppies Enterprises Ltd.

First, the results of the unit root tests, residual diagnostics, model specification tests and model stability tests with respect to the components of the RAR for Choppies Enterprises Ltd. are presented in Table 5.

Table 5 Results of unit root tests and diagnostic tests

Unit Root Tests		Residual Diagnostics		Model Specification Error Test		Model Stability Tests	
Type of Test	*Results of Test*	*Type of Test*	*Results of Test*	*Type of Test*	*Results of Test*	*Type of Test*	*Results of Test*
ADF	Variables are stationary at levels	***Jarque-Bera test for normality***	Residuals are normally distributed	***Ramsey RESET test***	Model is well specified	***CUSUM***	Model is stable
PP	Variables are stationary at levels	***Breusch-Godfrey test for autocorrelation***	Residuals are not auto correlated			***CUSUMQ***	Model is stable
		Breusch-Pagan-Godfrey test for heteroscedasticity	Residuals are homoscedastic				
*A detailed presentation of each test is not included in this paper but it can be made available upon request.							
Source	Author						

Table 5 indicates that the logarithmic returns of the DCIBT and CHOPP are respectively stationary at levels when tested with the ADF and PP tests. In addition, the Jarque-Bera test for normality, the Breusch-Godfrey test for autocorrelation and the Breusch-Pagan-Godfrey test for heteroscedasticity confirm that the residuals are white noise. The Ramsey RESET test for model specification coupled with the CUSUM and CUSUMQ stability tests endorse that

no misspecification was identified in the model and the model is stable, respectively. The data generation process (DGP) of the model can therefore be trusted.

Table 6 reflects the abnormal returns for CHOPP as calculated from the MAR, MKAR and RAR models during the OP, April 2015 to September 2015. The mean return is 0.01 while the measure of volatility or the systematic risk of the stock relative to the market ($\boldsymbol{\beta}$)is calcuated as -0.24. This shows that CHOPP had less volatility relative to the market throughout the EP. On the other hand, the standard error value of 0.01 is low and suggests that the sample mean is an adequate representation of the population mean.

Table 6 Abnormal Returns for CHOPP during the OP

Month	MAR	MKAR	RAR	t stat*	Decision*
Apr 2015	-0.02	-0.05	-0.02	-2.02	significant
May 2015	0.09	0.05	0.10	11.41	significant
Jun 2015	0.07	0.06	0.07	8.44	significant
Jul 2015	0.02	0.01	0.03	2.97	significant
Aug 2015	0.04	0.05	0.04	4.60	significant
Sep 2015	-0.22	-0.19	-0.23	-26.00	significant

EP: August 2014 – March 2015. **OP**: April 2015 - September 2015. $\boldsymbol{R_t}$: *0.01* $\hat{\boldsymbol{a}}$: *-1.23* $\boldsymbol{\beta}$: *-0.24* $\boldsymbol{SD}$: *0.01*

*Parametric t-statistics and corresponding decisions on significance are calculated on the RAR only.

Source Author

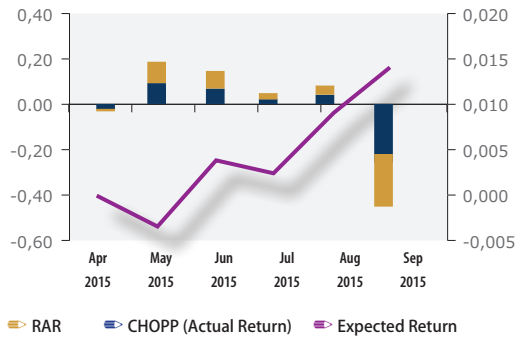
During the OP, all three abnormal return models (MAR, MKAR and RAR) indicate that CHOPP experienced statistically significant and negative abnormal returns a month before the month of cross listing. According to Borges and Gairifo (2013), this could be proof that the market was already anticipating the event. However, the actual returns a month before the month of cross listing fell below the expected returns. Conversely, during the month of cross listing, May 2015, the MAR, MKAR and RAR show that CHOPP enjoyed positive abnormal returns ranging from 0.05 to 0.10. This underscores the market's favourable response to the listing of Choppies Enterprises Ltd.'s shares on the JSE. The abnormal returns under the RAR model are positive, statistically significant and the highest out of the three abnormal return models at 0.10. This result signifies that the cross listing of Choppies Enterprises Ltd.'s shares on the JSE had a positive impact on the firm's value. The findings are in line with those by Serra (1999), Baker et al. (2002), Coffee (2002), Adelegan (2008), Onyuma et al. (2012) and Makanga and Gateri

(2014) in that they confirm the legal bonding theory, the signalling theory and the investor recognition theory.

Subsequent to the month of cross listing, the abnormal returns from the RAR model remain statistically significant and positive (although relatively lower) for three months, before they turn negative in the last month of the OP. This brings into question the validity of the semi strong form of the efficient market hypothesis. The fact that abnormal returns are found to be lingering after the event could allude that the market was not quick to incorporate the cross listing information of CHOPP in the pricing of the stock.

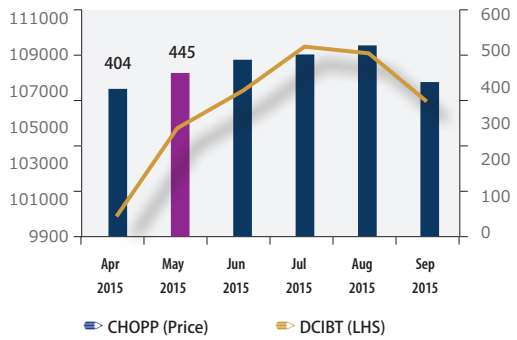
Figure 2 provides graphical representation of the expected return, actual return and risk adjusted abnormal return of CHOPP during the OP. Figure 3 indicates the price of CHOPP in Botswana Pula (BWP) as well as the value of the market index, DCIBT during the OP.

Figure 2 CHOPP Expected Return, Actual Return and RAR during OP



Source: www.investing.com and Authors' calculations

Figure 3 Price of CHOPP in Botswana Pula (BWP) and Value of DCIBT during OP



Source: www.investing.com and Authors' calculations

From Figure 2, the expected return on CHOPP in the month of cross listing was -0.003, while the actual return during the same period was 0.10. This symbolises that during the month of cross listing, CHOPP experienced an abnormal return of 0.10. The average abnormal return on CHOPP throughout the OP was -0.001 while the average actual return on CHOPP over the same period was -1.00. This suggests that on average, CHOPP had lower returns than what was expected. In Figure 3, the price of CHOPP in the month of cross listing was BWP 445.00. This was a 10.1 per cent increase from the price of BWP 404.00 registered a month before the event. In addition, the price of CHOPP and the value of DCIBT had a strong and positive correlation of 85.4 per cent during the OP.

The financial ratios for Choppies Enterprises Ltd. that cover the years ended June 2014, June 2015 and June 2016 are presented in Table 7.

Table 7 Financial Ratio Analysis of Choppies Enterprises Ltd. for 2014, 2015 and 2016

Financial Ratio	Before Cross Listing	Year of Cross Listing	After Cross Listing
	2014	2015	2016
Profitability Ratios			
Operating Margin	22%	22%	20%
Net Profit Margin	4%	3%	1%
Operating Cash / Sales	6%	2%	4%
Return on Equity	15%	15%	8%
Liquidity Ratios			
Current Ratio	1.03	1.76	1.22
Quick Ratio (Acid Test)	0.39	0.94	0.45
Gearing Ratios			
Debt to Equity	18%	21%	32%
Investor Ratios			
Market Price (BWP)	420.00	481.00	400.00
Dividend Yield (BWP)	0.03	0.03	0.02
Earnings per Share (BWP)	0.15	0.15	0.08
*Price to Earnings Ratio (BWP)**	2783.73	3149.87	4924.94

*The price of the share is taken as at the year ended June 2014, June 2015 and June 2016, respectively as these periods coincide with the end of year financial statements used in the study.

Source Authors' calculations based on data gathered from www.investing.com and from company financial statements.

From Table 7, the profitability ratios of Choppies Enterprises Ltd. in the three-year period under review generally reflect a low level of profitability for the company. The net profit margin declined from 4 per cent in 2014 to 3 per cent in 2015 before declining further to 1 per cent a year after. On the same token, the company's operating cash to sales ratio declined from 0.06 to 0.02. This means that the company went from being able to convert sales into cash 6 per cent of the time to only being able to do this 2 per cent of the time. The firm's operating margin and return on equity during the year of cross listing remained the same at 22 per cent and 15 per cent, respectively before each of them declined in 2016.

When the liquidity ratios are considered, the current ratio and the acid test increased during the year of cross listing and were at their highest levels during this time relative to the other two years. The current ratio was greater than 1 in the year of cross listing. The implication is

that, in 2015, Choppies Enterprises Ltd. had more short term assets than short term liabilities. Therefore, the company was sufficiently able to pay off its short term obligations with cash in hand and other short term assets. These results are consistent with the liquidity theory (Dodd 2011; Onyuma et al., 2012; Berg, 2012 and Dodd, 2013) and show that cross listed firms attract greater liquidity since their stock trades at lower costs, high volatility and increased trade volumes. On the other hand, the Acid test was less than 1 in the year of cross listing. Therefore, for the firm to have met its current liabilities during that period, it would have had to sell off its inventories. Although high levels of firm liquidity can be interpreted as a good thing, it can also be counterproductive, especially if it is viewed in light of the profitability ratios discussed above. A high liquidity ratio against a low profitability ratio could be critiqued to imply that a firm is not using its cash in hand productively to expand the business, improve equipment and thus create value for its shareholders (Onyuma *et al.*, 2012).

The debt to equity ratio was used to measure the effects of cross listing on the company's gearing. Choppies Enterprises Ltd.'s debt to equity ratio increased from 18 per cent to 21 per cent in the year of cross listing. This shows that around 79 per cent of the company's capital structure was equity in 2015, relative to 82 per cent in the previous year. In addition, in the year after cross listing, the company's debt to equity ratio increased from 21 per cent to 32 per cent. However, even in this case, the level of equity continued to outweigh the debt level in the company's capital structure.

When the investor ratios are considered, Choppies Enterprises Ltd.'s dividend yield and earnings per share remained unchanged at 0.03 and 0.15, respectively in the year of cross listing relative to their values a year before. Conversely, a year after the cross listing, the company's dividend yield and earnings per share dropped to 0.02 and 0.08, respectively. This was on the back of a lower profits after tax (BWP104 million in 2016, relative to BWP197 million in 2015), lower dividends per share (BWP8.48 in 2016, relative to BWP15.70 in 2015) and lower market price of the share (BWP400.00 in 2016, relative to BWP481.00 in 2015). Despite the lack lustre performance of the dividend yield and the earnings per share in the year of cross listing, the price per earnings ratio increased from BWP2783.73 in 2015 to BWP3149.87 in 2016 and to BWP4924.94 in 2017. This result indicates that the market had increased confidence in the firm and its healthy future profit projections. For this reason, investors were willing to pay more

(a premium) for Choppies Enterprises Ltd. stock in the year of cross listing and in the year after the event based on this metric.

5.2 Go Life International Ltd.

Table 8 provides a summarised version of the results of the unit root tests, residual diagnostics, model specification tests and model stability tests with respect to the components of the RAR for Go Life International Ltd.

Table 8 Results of unit root tests and diagnostics tests.

Unit Root Tests		Residual Diagnostic Tests		Model Specification Error Test		Model Stability Tests	
Type of Test	*Results of Test*	*Type of Test*	*Results of Test*	*Type of Test*	*Results of Test*	*Type of Test*	*Results of Test*
ADF	Variables are stationary at levels	***Jarque-Bera test for normality***	Residuals are normally distributed	***Ramsey RESET test***	Model is well specified	***CUSUM***	Model is stable
PP	Variables are stationary at levels	***Breusch-Godfrey test for autocorrelation***	Residuals are not auto correlated			***CUSUMQ***	Model is stable
		Breusch-Pagan-Godfrey test for heteroscedasticity	Residuals are homoscedastic				
*A detailed presentation of each test is not included in this paper but it can be made available upon request.							
Source	Author						

Table 8 indicates that the ADF and PP unit root tests reflect that the logarithmic returns of the SEMDEX and GOLI are both stationary at levels. In addition, the Jarque-Bera test for normality, the Breusch-Godfrey test for autocorrelation and the Breusch-Pagan-Godfrey test for heteroscedasticity confirm that the model residuals are white noise. The Ramsey RESET test for model specification coupled with the CUSUM and CUSUMQ stability tests respectively indicate that no misspecification was identified in the model and the model is stable. Therefore, the model's data generation process can be trusted.

Table 9 presents the abnormal returns for GOLI as calculated from the MAR, MKAR and RAR models during the OP, October 2016 to April 2017. For the duration of the EP, the mean return

is -0.04 while the measure of volatility or the systematic risk of the stock, $\boldsymbol{\beta}$ is -2.76. This shows that the security had less volatiliy relative to the market. Last, the standard error is calculated as 0.10. It is low and this signals that the sample mean adequately represents the population mean.

Table 9 Abnormal Returns for GOLI during the OP

Month	MAR	MKAR	RAR	t stat*	Decision*
Oct 2016	0.04	-0.03	0.15	1.49	insignificant
Nov 2016	0.32	0.29	0.36	3.55	significant
Dec 2016	0.04	0.00	0.08	0.81	insignificant
Jan 2017	-0.25	-0.33	-0.11	-1.04	insignificant
Mar 2017	-0.37	-0.43	-0.26	-2.52	significant
Apr 2017	0.04	-0.04	0.19	1.87	insignificant

EP: June 2015 – June 2016. **OP**: October 2016 - April 2017. $\boldsymbol{R_t}$: *-0.04* $\hat{\boldsymbol{a}}$: *-0.07* $\boldsymbol{\beta}$: *-2.76* $\boldsymbol{SD}$: *0.10*

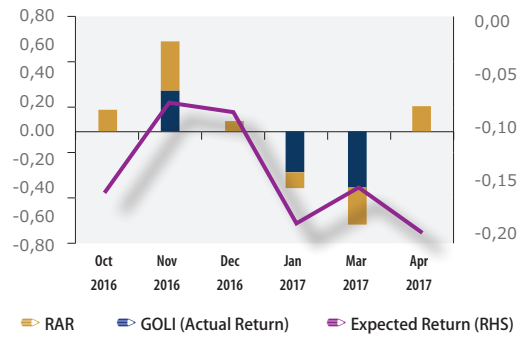
*Parametric t-statistics and corresponding decisions on significance are calculated on the RAR only.

Source Author

In the month before cross listing, October 2016, the RAR model indicates that GOLI experienced positive abnormal returns. However, these results are not statistically significant. Conversely, in the month of cross listing, November 2016, the MAR, MKAR and most importantly, the RAR, reflect positive and statistically significant abnormal returns for GOLI. The conclusion is that the market responded appropriately to the quality of information around the cross listing of Go Life International Ltd.'s shares on the JSE. In addition, the RAR abnormal returns are the highest out of the three abnormal return models at 0.36. This provides evidence that cross listing on the JSE increased the share value of Go Life International Ltd. The findings are similar to those of Serra (1999), Baker *et al.* (2002), Coffee (2002), Adelegan (2008), Onyuma *et al.* (2012) and Makanga and Gateri (2014) as they confirm the legal bonding theory, the signalling theory and the investor recognition theory. In the months following the cross listing, the RAR abnormal returns are broadly statistically insignificant. This gives credibility to the semi-strong form of the efficient market hypothesis and indicates that the market was quick to incorporate the cross listing information of GOLI in the pricing of the stock.

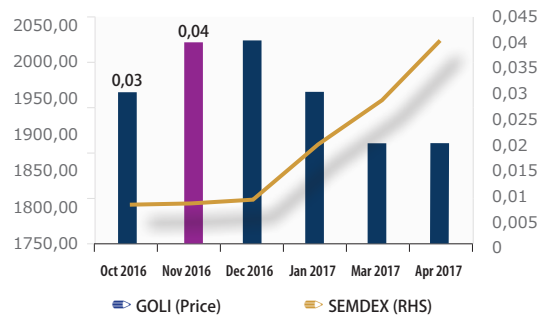
Figure 4 offers a graphical representation of the expected return, actual return and risk adjusted abnormal return of GOLI during the OP. Figure 5 presents the price of GOLI in US Dollar (USD) as well as the value of the market index, SEMDEX, during the OP.

Figure 4 GOLI Expected Return, Actual Return and RAR during OP



Source: www.investing.com and Authors' calculations

Figure 5 Price of GOLI in US Dollar (USD) and Value of SEMDEX during OP



Source: www.investing.com and Authors' calculations

In Figure 4, the expected return on GOLI was -0.07 in the month of cross listing while the actual return was 0.29 during the same period. This translated into a positive abnormal return of 0.36. The average actual return on GOLI for the duration of the OP was -0.07 while the average abnormal return during the same period was 0.07. Resultantly, on average, GOLI showed returns that were higher than what was expected. Figure 5 reflects that the price of GOLI in the month of cross listing was USD 0.04. This was a 33.3 per cent increase from the USD 0.03 registered a month before the cross listing. On the other hand, the price of GOLI and the value of SEMDEX had a strong and negative correlation of -86.4 per cent during the OP. This means that GOLI

stock is counter-cyclical to the market and can there be understood as a defensive stock[26], which will outperform the market in an economic downturn.

The financial ratios for Go Life International Ltd. that cover the years ended December 2015, December 2016 and December 2017 are presented in Table 10.

Table 10 Financial Ratio Analysis of Go Life International Ltd. for 2015, 2016 and 2017

Financial Ratio	Before Cross Listing	Year of Cross Listing	After Cross Listing
	2015	2016	2017
Profitability Ratios			
Operating Margin	-20.6%	13.1%	42.7%
Net Profit Margin	51.1%	13.9%	35.2%
Operating Cash / Sales	0.4%	0.4%	18.5%
*Return on Equity**	0.1%	0.1%	0.1%
Liquidity Ratios			
Current Ratio	3.394	3.709	3.933
Quick Ratio (Acid Test)	3.337	3.050	3.187
Gearing Ratios			
Debt to Equity Ratio	0%	0.9%	0.3%
Investor Ratios			
Market Price (USD)	0.030	0.040	0.010
*Dividend Yield (USD)***	-	-	-
Earnings per Share (USD)	0.001	0.001	0.001
*Price per Earnings Ratio (USD)****	23.71	38.58	16.30

* Information on the number of preference shares issued was not available for the period under review. Thus, the study assumed that total shares issued comprised of ordinary shares only.

** No dividends were paid to shareholders in the review period. The Company notified shareholders that it will be reinvesting profits into growth of its operations by way of acquisition, which investments are expected to increase the future prospects of the Group in the medium to long term.

** The price of the share is taken as at the year ended December 2015, December 2016 and December 2017, respectively as these periods coincide with the end of year financial statements used in the study.

Source Authors' calculations based on data gathered from www.investing.com and company financial statements.

Table 10 shows that Go Life International Ltd.'s operating margin increased from -20.6 per cent in 2015 to 13.1 per cent in 2016 before increasing further to 42.7 per cent in 2017. This is

[26] Branger *et al.* (2013) explained defensive stocks as stocks whose returns are least correlation with the economy or the business cycle.

reflective of continuous improvement in the operating efficiency of the company in the year of cross listing and in the year after. However, in 2016, the company's net margin declined to 13.9 per cent from 51.1 per cent in 2015 before increasing to 35.2 per cent in 2017. This signals that Go Life International Ltd.'s profitability was low in the year of cross listing compared to the year before and the year after the event. In 2016 and 2017, Go Life International Ltd. experienced high levels of liquidity as reflected by the respective current ratios and quick ratios that were well above 1. As a result, the company could comfortably service its current liabilities with its short term assets during this period.

Go Life International Ltd. had a debt to equity ratio of 0.09 in 2016 (up from 0.00 in the previous year) before it registered 0.03 in 2017. The results show that over 90 per cent of the company's capital structure was made up of equity in the year of cross listing and in the year after. Considering the investor ratios, the earnings per share in the year of cross listing and in the year after the event remained unchanged from the 2015 position at 0.001. Conversely, the price per earnings ratio increased from USD23.71 in 2015 to USD38.58 in 2016 before declining to USD16.30 in 2017. The market was more confident about the company's performance in the year of cross listing and investors were willing to pay more for Go Life International Ltd. stock during this time than in any other year under review.

6 CONCLUSION AND POLICY RECOMMENDATIONS

The objective of this research was to determine the effects of regional cross listing on firm value and financial performance and to draw policy lessons for Lesotho. Using event study methodology, financial ratio analysis and a regional case study of two Sub-Saharan African firms (Choppies Enterprises Ltd. and Go Life International Ltd.) that cross listed on the JSE in 2015 and 2016, respectively; the results of the study reveal that the two firms experienced increased value and liquidity during their respective periods of cross listing together with elevated levels of market confidence. These findings are consistent with the legal bonding theory, the signalling theory, the investor recognition theory and the liquidity theory. The study also provides proof of the market timing theory. Each firm's decision to cross list on the JSE was because it saw

itself as a high value firm that could bond to stricter regulatory standards. This information was internalised by the market and led to an increase in the demand for each firm's shares. The rise in share demand pushed share prices higher resulting in increased returns for shareholders in the form of elevated capital gains.

In light of the above, this study provides impetus for the expeditious facilitation of company listings on Lesotho's securities exchange; the MSM. It is therefore the recommendation of this investigation that first; the empirical findings of this study may be used by authorities to draw locally incorporated firms' attention to the potential benefits of cross listing. This should be done in conjunction with initiatives that identify and unlock any bottlenecks that act as deterrents for company listing on the MSM. The benefit is higher of levels of liquidity and trading activity. Last, locally incorporated firms are advised to strengthen the implementation of policies that promote transparency, more information disclosure and enhanced corporate governance. This will place them in an ideal position to list on the MSM (as well as on relatively much more developed exchanges) and to attract more willing investors, higher liquidity and decreased leverage for their firms. It will also mean they stand a chance to cross list on relatively more sophisticated regional securities exchanges and thus enjoy the potential benefits of such an exercise.

7 AREAS OF FURTHER RESEARCH

Future research on cross listing can investigate whether or not regional cross listing facilitates stock market development and stock market deepening. This can be explored by looking at the impact of growth in regional cross listings on stock market development and economic growth with the use of either ESM or the Latent Growth Curve Modelling (LGCM) technique. This would prove useful for purposes of informing targeted policy formulation.

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APPENDIX

Appendix 1	Profiles of Selected African Stock Exchanges
Name of Stock Exchange	**Profile of Stock Exchange**
Botswana Stock Exchange (BSE)	The BSE is a statutory body that was created and operates under the Botswana Stock Exchange Act Number 11 of 1994, which provided for the establishment of an independent exchange and made provisions for the running of the exchange. However, the BSE is in the process of Demutualization. The BSE Transition Act commenced on 1st December 2015 paving way for the Demutualization of BSE into a public company to be registered in terms of the Companies Act. The Demutualization of the BSE is expected to strengthen corporate governance practices and enhance competitiveness of the exchange in line with other exchanges around the world that have undergone significant changes and transformation from being member-controlled to demutualized entities.
Namibia Stock Exchange (NSX)	The NSX is an association of members, formed in 1992 and licensed annually by the "Namibian Financial Institutions Supervisory Authority (NAMFISA)", in terms of the Stock Exchanges Control Act of 1985 and acts as a self-regulating organisation. As most of the services are outsourced, the NSX operates with a small staff complement. Further, due to the small Namibian economy and the legacy development by South Africa, the majority of listed companies comprise South African holding companies of Namibian branches or subsidiaries.
Mozambique Stock Exchange (BVM)	In 1997, the Government of Mozambique, through the Ministry of Planning and Finance (currently the Ministry of Economy and Finance), created the "Installing Commission of the Mozambique Stock Exchange", whose mission was to promote the organization of the capital market in Mozambique, specifically the creation of the necessary institutional and legal structures and the establishment of a stock exchange. As a result of the Installing Commission's activities, the Council of Ministers approved the legal instruments for the operation of the Mozambique Stock Exchange, particularly Decrees 48/98 and 49/98, both dated September 22, regarding the regulation of the Securities Market as well as the creation of the Stock Exchange and its internal regulation. The Stock Exchange is a public institute created in 1998, endowed with administrative, financial and patrimonial autonomy. The Stock Exchange is responsible for the creation and maintenance of premises and systems equipped with the necessary means for the operation of a free and open market directed to the purchase and sale of securities. The Exchange also provides the registration, clearing, settlement and disclosure of information on transactions.
Source	Author

Appendix 1	Profiles of Selected African Stock Exchanges (continued)
Name of Stock Exchange	**Profile of Stock Exchange**
Stock Exchange of Mauritius (SEM)	The SEM was incorporated on March 30, 1989 under the Stock Exchange Act 1988, as a private limited company responsible for the operation and promotion of an efficient and regulated securities market in Mauritius. With the coming into force of the Securities Act 2005 in 2007, the SEM has converted to public company status and operates a securities exchange licensed and regulated by the Financial Services Commission (FSC) of Mauritius.
Malawi Stock Exchange (MSE)	The MSE has been in existence since 1994 but started equity trading in November 1996 when it first listed National Insurance Company Limited (NICO). Prior to the listing of the first company, the major activities that were being undertaken were the provision of a facility for secondary market trading in Government of Malawi securities namely; Treasury Notes and Local Registered Stock. The Stock Exchange is licensed under the Financial Services Act 2010 and operates under the Securities Act 2010 and the Companies Act 2013.
Zimbabwe Stock Exchange (ZSE)	The first stock exchange in Zimbabwe opened its doors shortly after the arrival of the Pioneer Column in Bulawayo 1896. It was however only operative for about 6 years. Other stock exchanges were established in Gwelo (Gweru) and Umtali (Mutare). The latter, also founded in 1896, thrived on the success of local mining, but with the realization that deposits in the area were not extensive, activity declined and it closed in 1924. After World War 11 a new exchange was founded in Bulawayo and dealing started in 1946. Zimbabwe has a fully developed Capital markets with an active and equally developed institutional base. As a result of a long tradition of investing on the Market, an entire industry has been created. Zimbabwe has a Pension Fund industry, an insurance industry, and local asset management industry supported by a number of registered stockbroking firms.
Johannesburg Stock Exchange (JSE)	The Johannesburg Stock Exchange (JSE) was formed in 1887. It is Africa's premier exchange, it connects investors and issuers to new opportunities through South Africa's developed financial market. With more than 129 years of trusted heritage, the JSE is recognised globally for its regulatory standard and is one of the world's 20 largest securities exchanges by market capitalization. The JSE is a service exchange providing secure capital and debt raising as well as connecting buyers and sellers across a diverse range of securities which includes equities and derivatives (equities, interest rate, currency and commodities). As part its holistic offering, it provides electronic trading, clearing and settlement in its equities and derivatives markets enabling transparency in all that it does and guaranteed settlement in all markets.
Source	Author

Appendix 2 Market fundamentals for Selected Sub-Saharan African Stock Exchanges in 2012

Fundamentals	Botswana Stock Exchange	Namibia Stock Exchange	Malawi Stock Exchange	Zimbabwe Stock Exchange	Mozambique Stock Exchange	Stock Exchange of Mauritius	Johannesburg Stock Exchange
No. of Listed Firms	30	33	14	79	3	88	400
Local firms	21	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available
Foreign firms	9	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available
Market Cap (US$)	53bn	144.1bn	10.5bn	3.96bn	1.02bn	7.1bn	998.3bn
Domestic Market Cap as % of GDP	23.84	1184.00	19.95	42.83	0.01	63.66	252
Total value of stock traded (US$)	135.5mn	494.5mn	16.1mn	448.2mn	18.7mn	352.8mn	408.6bn
Total Volume Traded	465.7mn	110.9mn	667.2mn	3.5bn	18.7mn	304.5mn	61.8bn
Turnover Ratio (%)*	0.26	0.34	0.15	11.31	1.83	4.97	40.93
Automated Trading system	Yes	Yes	No**	No**	Yes	Yes	Yes

* Turnover Ratio (%) = Total value of stock traded/Market Capitalisation
** Manual Trading System

Source ASEA Yearbook (2013a)

Appendix 3 Top 5 most active sectors in Selected Sub-Saharan African Stock Exchanges in 2011 – 2012

Name of Stock Exchange	Botswana Stock Exchange	Namibia Stock Exchange	Malawi Stock Exchange	Zimbabwe Stock Exchange	Mozambique Stock Exchange	Stock Exchange of Mauritius	Johannesburg Stock Exchange
Name of Sector	Financial services and insurance	Financial	Information Technology	Beverages	Brewery	Banks, Insurance and other finance	Mining
	Banking	Basic materials	Real Estate and Property	Technology	Energy	Investments	Banks
	Retail and wholesaling	Consumer goods	Financial Sector	Retail	Banks	Not Available	Life Insurance
	Mining and materials	Consumer services	Investment Vehicle	Insurance	Telecommunications	Leisure & Hotels	Real Estate Investment & Services
	Property and property trust	Industrial	Manufacturing	Property	Construction and Materials	Commerce	Financial Services

Source ASEA Yearbook (2013a)

Appendix 4	Detailed Explanation of Theories that Underscore Cross Listing Decisions
Theory	**Detailed Explanation**
The legal bonding theory	Firms that choose to cross list their shares on foreign exchanges are likely to face more scrutiny from investors, auditors and from the host regulator. For instance, in cases where companies are incorporated in a jurisdiction with less efficient legal systems and poor shareholder protection, cross listing opens up the company to commit itself willingly to higher standards of corporate governance and reporting. This implies that cross listing on a foreign market acts as a bonding mechanism for the firm binds itself to an increased level of disclosure, scrutiny and better corporate governance practices. The benefits are twofold: (i) firms will be able to attract investors who would otherwise be reluctant to invest and (ii) a credible and binding commitment by the share issuer to protect the interests of minority shareholders is developed and there is less likelihood of diversion of a firm's cash flow to managers and controlling shareholders.
The signalling theory	This theory is closely linked to the legal bonding theory in as far as the cross listing effects on shareholders' wealth. Signalling theory espouses that voluntary bonding to higher levels of disclosure, scrutiny and better corporate governance by a firm provides a way for the firm's managers to communicate information to the market about the firm's quality and future prospects. The choice to cross list on an exchange with strict disclosure requirements therefore signals superior operating performance in the future and is met with a strongly positive market reaction.
The capital market segmentation theory	Cross listing is a way to reduce market segmentation[27] and as a result reduce a stock's systematic risk. This is because the capital market segmentation theory postulates that (ceteris paribus) higher gains (in terms of reduced cost of capital) should be realised when firms decide to list on exchanges where asset returns are least correlated with the home market.
The information asymmetry theory	Information asymmetry affects asset prices. The information asymmetry theory assets that market segmentation that is due to lack of access to information can be reduced by cross listing. The result is an increase in media coverage coupled with increased analysts follow ups. This provides investors with more and better information about a company and its shares. More and better information about a company and its stock can also translate into a more efficient price discovery for the stock. In addition, the benefits include a larger investor base and higher demand for the stock considering lower information gathering costs.
Source	Author

[27] Describes how a country's capital market can be separate from the capital markets of other countries. An often related term is barriers to capital flow. Under market segmentation, there are barriers to investment such as legal restrictions, discriminatory taxation, and lack of information. These things restrict the ability of foreign investors from purchasing domestic stocks (Serra, 1999 and Hargis, 2000).

Appendix 4	Detailed Explanation of Theories that Underscore Cross Listing Decisions (continued)
Theory	**Detailed Explanation**
The liquidity theory	Cross listing allows companies to trade in multiple time zones and in multiple currencies as well as to have increased pick-up in trading volumes in both the foreign and home stock market. This suggests that cross listing could resulting in order flow migration[28] leading to increased competition for order flows for the cross listed stocks between the home market and the host market. As a consequence, the market with the lowest trading costs will attract the most order flows. The benefit is increased liquidity for the issuing company since it is able to raise capital from foreign and domestic investors. In addition, the increased participation improves domestic market liquidity by reducing the sensitivity of prices to order flow in the domestic market. This can be seen in the narrowing of the bid-ask spread. Increased trade volumes mean that the stock can easily be sold as and when the investor wants and at any given time. This is because there are sufficient buyers and sellers with the same economic interest in the stock.
The investor recognition theory	It can be argued that the chief reason why domestic firms and stock exchanges choose to cross list on foreign exchanges is to increase their visibility. On the one hand, increased visibility of stock exchanges has the potential to boost local stock market marketing efforts through the broadening of product identification among investors and consumers in the host country. On the other hand, increased firm visibility could lead to enhanced firm value through its effect on the firm's information environment. When a company cross lists their security issues, this acts as a tool to signal their transparency and private information as well as commitment to deliver a positive signal of their value to investors. Companies can use cross listing on markets with strict disclosure requirements to indicate their quality to foreign investors and to supply better information to potential suppliers and customers. In addition, greater information transparency across markets and competing market makers in the foreign market can improve the domestic market liquidity and analyst forecasts about cross listed shares. Analyst forecasts are more accurate for firms that disclose more. Firms with accurate forecasts enjoy lower implied cost of capital. That is to say, the more investors are able to accurately assess the cross-listed firm's prospects, the more the firm's cost of capital is reduced.
Source	Author

[28] Order-flow migration refers to the transfer of (some) trading activity in the cross-listed stocks from the local stock market to the host exchange. Order-flow migration describes the situation where some trade orders that would have been conducted previously in the domestic stock market will now be shifted to the international exchange, following cross listing (Domowitz et al. 1998 and. Jayakumar, 2002).

Appendix 4	Detailed Explanation of Theories that Underscore Cross Listing Decisions (continued)
Theory	**Detailed Explanation**
The proximity preference theory	Corporate financing decisions such as portfolio investment decisions are often bias in favour of domestic assets. In this context, geographical, economic, cultural and industrial proximity measures are significant deciding factors of the corporate decision to cross list. Evidence suggests that wealth benefits for shareholders are much higher for cross listings on foreign markets that are already familiar with the domestic company's products and that are relatively geographically close (measure by the distance between the capitals).
The market timing theory	The decision by a corporate manager to cross list a company's shares is a timed one. The timing of the decision tends to coincide with a strong stock performance on the home market as well as a "hot" market period in the host market. The latter is done to take advantage of soaring market valuations.
The business strategy theory	The decision to cross list is a function of a company's global corporate strategy. In this case, the cross listing destination is a market with listings of the firm's market peers. The decision to list in such a market is a way for the firm to strengthen their competitive position in their industry.
Source	Author

Appendix 5	Profiles of Go Life International Ltd. and Choppies Enterprises Ltd.
Name of Company	Company Profile
Go Life International Ltd.	Go Life International PCC is created with the express purpose of establishing a distribution vehicle for Go Life Health Products Ltd. to structures established to market those products in countries other than South Africa, on the global stage. The products that are distributed by the company address a wide variety of conditions briefly summarised as follows: • Skin conditions, muscular fatigue and-pain. • The re-introduction of Magnesium into the bodies of chronically ill people. • The absorption of L-Carnitine at cellular level (releases energy at cellular level and greatly assists with the combating of many debilitating diseases and ailments). • A very effective laxative. • A combination of natural ingredients designed to assist increased sexual sensations.
Choppies Enterprises Ltd.	Choppies Enterprises Ltd., an investment holding company, operates as a grocery retailer in Botswana, South Africa, and Zimbabwe. The company operates superstores, hyper stores, and value stores under the Choppies brand name. Its stores offer fruits and vegetables, bakery, butchery, and takeaway products. In addition, the company distributes meat.
Source	Author

Appendix 6 List of Financial Ratios Used in the Study

Type of Financial Ratio	Definition of Financial Ratio	Implication of Financial Ratio Result	Formulaic Depiction
Profitability Ratios			
Operating Margin (OM)	*The OM measures the operating income of a company as a percentage of sales. It is used to measure the company's operating efficiency*	*From period to period, a higher OM means high operating efficiency for the company.*	*Operating Income / Sales*
Net Profit Margin (NPM)	*The NPM measures the company's net income as a percentage of sales. It is used to measure the profitability of a company*	*From period to period, a higher NPM implies higher profitability.*	*Net income / Sales*
Operating Cash to Sales (OCS)	*The OCS measures the cash a company has generated from its operations in relation to its sales made*	*From period to period, a higher OCS suggests greater ability by the company to turn its sales into cash.*	*Operating Cash / Sales*
Return on Equity (RoE)	*The RoE measures the income / return that a company has earned from / on the equity capital in the business. It shows how much profit each 1 unit currency of common stock generates for stock holders.*	*From period to period, a higher RoE implies a higher return earned on the company's equity.*	*Operating Cash / Sales*
Liquidity ratios			
Current Ratio (CR)[29].	The CR measures a company's ability to satisfy its current liabilities with its current assets	A higher CR (greater than 1) means that a company is more capable of paying its short-term obligations (current liabilities) since it has more assets than liabilities	Current assets / Current liabilities
Quick Ratio (QR) – Acid Test	The QR is similar to the CR in that it measures a company's ability to satisfy its current liabilities with its current assets. The only difference is that it nets inventories from current assets since inventories are the least liquid form of current assets.	A higher QR means that a company is more capable of paying its short-term obligations (current liabilities) since it has more assets than liabilities	(Current assets – Inventories) / Current liabilities
Gearing ratios			
Debt-to-Equity Ratio (D/E ratio).	The D/E ratio measures a company's debt financing relative its equity financing	A high D/E ratio means that the company's growth has been financed chiefly by debt while a low D/E ratio means that the company's greatest financing has come from equity.	Total Long Term Debt / Total Shareholder Equity
Asset to Equity Ratio	The Asset to Equity Ratio indicates the relationship between total assets of the firm to the owner's equity.	There is no ideal asset/ equity ratio. However, the ratio can be used to compare similar businesses. A high asset to equity ratio could be an indication that the return on borrowed capital exceeds the cost of that capital.	Total Assets / Total Equity
Source	Author		

[29] A CR that ranges from 1 (1:1) to 2 (2:1) is considered fair. This is because a CR that is too high could mean that a company is not using its current assets efficiently (Onyuma *et al.*, 2012).

Appendix 6 List of Financial Ratios Used in the Study (continued)

Type of Financial Ratio	Definition of Financial Ratio	Implication of Financial Ratio Result	Formulaic Depiction
Investor Ratios			
Market Price of Share (MPS)	*This MPS measures the market price of the share*	*An increase in the market price of the share means an increase in the share price and therefore market capitalization (valuation) of the company.*	
Dividend Yield (DY)	*The DY measures the dividend declared as a percentage of the market price of a share.*	*From period to period, the higher the DY, the higher the return that an investor will receive on each unit currency they have invested.*	*Dividend per Share / Market Price*
Earnings per Share (EPS)	*The EPS reflects the earnings attributable to each share of common stock.*	*The higher the EPS, the more valuable are the common stocks of the firm.*	*Net income / Ordinary Shares Outstanding*
Price Earnings Ratio (PER)	*The PER relates share price to the EPS. It values the company by measuring its current share price relative to its EPS. It shows the number of times the earnings are covered by the share market price. It also indicates how much an investor would have to invest into the company in order to get one-unit currency of that company's earnings.*	*The higher the PER, the more times the company earnings are covered by the share market price.*	*Market price per share / earning per share*
Source	Author		

The role of non-bank financial intermediation in Lesotho: Challenges and possible remedies

Retšelisitsoe Simon Mabote

1 INTRODUCTION

FINANCIAL INTERMEDIATION is the process in which funds are channelled from the surplus savers to deficit spenders through market created mechanisms, such as, financial institutions. It is a result of deliberate policy actions that create and mobilise resources to meet every day needs and demands (Sinha, 2001). This is effected through financial intermediaries, which economic theory defines as, financial institution that consolidates deposits and uses the funds to transform them into loans (Siklos, Pierre, 2001). Financial intermediaries bring together the economic agents who want to lend their surplus funds (invest) to those with a shortage of funds to benefit business cycle and facilitate economic development.

It must, however, be underscored that for financial intermediation to be effective, information asymmetry and costliness have to be factored in. As a result, traditional theories of financial intermediation are based on transaction costs and asymmetric information. Franklin Allen (1996) claimed that they are designed to account for institutions which take deposits or issue insurance policies and channel funds to firms. Financial intermediation theory builds on the notion that intermediaries serve to reduce transaction costs and informational asymmetries.
The role of financial institutions in financial intermediation seems to be eroding with developments in information technology, deregulation, deepening of financial markets, etc., which have relegated it since information is now readily available. Traditionally, this role was played effectively and efficiently by the banking sector, whereas the non-bank financial institutions (NBFIs) became relevant in informal settings and rural areas.

The main objective of the study is to evaluate the role and impact of NBFIs in discharging their roles in financial intermediation in Lesotho. Specific objectives are;

- To determine the role and effectiveness of non-bank financial intermediation in Lesotho;
- To determine the challenges faced by the sector, growth and sustenance; and
- To identify and or suggest remedies.

The study is confined to the experience of Lesotho with a view to proffer advice on policy issues regarding the role of the sector in lubricating economic activity. The study investigates the NBFIs in their various formations, including the pension funds or contractual savings (assets of pension funds and life insurance companies) with respect to their impact on national savings or other financial development.

The rest of the paper is organised as follows: after this introduction, section two provides theoretical definition of the non-bank financial intermediaries, including coverage of their operations as well as, the legal provisions in Lesotho. Section three briefly discusses theoretical literature, borrowing from some empirical research. Section four chats diagnostic approach to be employed, while section five presents the results. Section six concludes the paper, while section seven offers some policy recommendations for consideration.

2 NON-BANKS FINANCIAL INTERMEDIARIES – THE DEFINITION

The previous section recognises the banking sector as traditional player in financial intermediation. However, that has since changed with the Non-bank financial intermediaries (NBFIs) claiming a bigger role of key players in economic development in both developing countries and emerging markets. Therefore, this section interrogates definition and categories of the NBFIs, with aid from the existing legislative provisions in order to establish a standard and or common understanding of the sector.

The Monetary and Financial Statistics Manual 2000 of the International Monetary Fund (IMF) defines the non-banks financial companies, or NBFCs, as the financial institutions that provide certain types of banking services, though they do not hold a banking license. These institutions are not allowed to take deposits from the public, which keeps them outside the scope of traditional oversight required under banking regulations. The NBFIs are broadly classified into five groups of institutions, namely:

- Development Financial Intermediaries - These are mutual investment schemes which pool the small savings of individual investors and enable a bigger investment fund. Therefore, small investors can benefit from being part of a larger investment trust.
- Saving Institutions – these are largely member based saving mobilising schemes whose aim is to share the collections on agreed periodicity.
- Employees Provident and Pension Funds – these are contributory schemes that distribute savings on retirement to smoothen members' spending and consumption after retirements.
- Insurance Companies – this category hedges against any unforeseen risks. Insurance companies spread the risk of default amongst members and over a longer time horizon.
- Other Financial Intermediaries – this comprises all other players not described above, such as, Credit unions, which are informal types of banks which provide facilities for lending and depositing within a particular community. Financial advisors provide information on all the intricacies of the financial markets and spending time looking for best investment.

These institutions play a vital role in facilitating saving access to the usually non-banked populace, as well as, extending credit. Their services range from leasing, factoring, and venture capital, to various types of contractual savings and institutional investors (pension funds, insurance companies, and mutual funds). The structure of the subsector differs depending on the level of financial development of a country.

Operations of the subsector in Lesotho are governed by the Financial Institutions Act 2012 and insurance Act 1976 as amended in 2014. These are mainly categorised into four groups:

- Collective Investment Schemes,
- Insurance Companies,
- Insurance Brokers
- Others

The fourth category includes Microfinance institutions, credit bureau and other cooperative societies whose operations are limited to members. The legal provisions governing this sector are:

- Financial Institution Act 2012 - Regulations of 2014.
- Credit Bureau under the Credit Reporting Act 2011 and Credit Reporting Regulations 2013.
- Financial Leasing Under the Financial Institutions (Financial Leasing) Regulations of 2013.
- Money Lenders Amendment Act of 1993.

3 LITERATURE REVIEW

3.1 Financial Intermediaries in Macroeconomic Management

Increased availability of financial instruments and institutions greatly reduces transaction and information costs in the economy which in turn influences savings rate, investment decisions and undertaking of technological innovations. The effectiveness of financial intermediation is registered in information asymmetry and reduction in transaction costs. This claim is further supported by Cetorelli et al (2012) who postulated that effectiveness of intermediation is when funding can be successfully matched with demand. This, therefore, places information asymmetry and transaction costs at the centre of financial intermediation for the surplus savings to benefit the deficit spenders.

Financial intermediaries eliminate transaction costs that arise from information asymmetry between borrowers and lenders. It facilitates efficient functioning of markets to ensure delivery of credit to lubricate macroeconomic activities. Therefore, financial intermediation transforms risk characteristics by efficiently allocating resources in the market.

Diamond and Dybvig (1983) recognised that without intermediation all investors would be locked into illiquid long-term investments that yield high payoffs only to those who consume at a later period. This means financial intermediation enhances risk sharing and facilitate welfare creation as it aids continuous consumption at different time intervals based on the need for liquid assets (Friedman, 1954). Financial intermediaries eliminate duplication through provision of information to potential market players at lower cost. They are able to hold long-term, high risk, large-denomination claims issued by borrowers and finance them by issuing short-term, low risk, small-denomination deposit claims.

This enables market players to evaluate prospective borrowers and investment projects to provide information accordingly. As a result, financial intermediaries are able to communicate information to investors about potential borrowers at a lower cost than can individual borrowers, Leland and Pyle (1977). Thus, both investors and savers are able to make informed decisions at a lower cost than would have been the case if intermediation was not available. This is one way through which markets, and hence, economy benefit directly through financial intermediation. Financial intermediaries reduce transaction costs by pooling diverse investment avenues to facilitate diversification of portfolios, and ensure positive returns to investors. Allen and Santomero (1998) opined that new markets for financial futures and options are mainly markets for intermediaries rather than individuals or firms. They purported an inverse relationship between intermediation vis-a-vis transaction costs and information asymmetry. They observed a rise in intermediation albeit falling transaction costs. This was further affirmed by Gary and Andrew (2002).

One of the glaring benefits of financial intermediation is the ability to ensure higher returns in order to induce firms to undertake projects with lower probabilities of success but higher payoffs when successfully implemented (Scholtens and Wensveen, 2003). As a result, it reduces the cost of channelling funds between relatively uninformed depositors to uses that are information-intensive and difficult to evaluate. It also facilitates collection of information, project evaluation, while monitoring borrowers' performance and risk sharing in order to moderate friction in the credit markets. As a consequence, a well-functioning and efficient financial system has beneficial impacts on economic growth.

Is the banking sector sufficiently equipped to provide financial intermediation for all economic sectors?

These arguments, therefore, warrant that financial intermediation facilitates economic growth and development. The challenge, however, is to establish whether the banking sector could provide all the financial services needed for growth. Carmichael and Pomerleano (2002) contend that no single financial intermediary can provide all financial services. They argued that such institutions would be extremely inefficient and would, in some areas, face conflicting incentives. The main limitation is that provision of payment services and liquidity constrains the ability of the banking sector to provide other services. They further claimed that the advanced risk-pooling services of insurance companies encounter the debt promises made by banks. This analogy, therefore, necessitates the role and influence of NBFIs to complement the banking services, and to some extent, offer some competition in order to benefit the end-users.

This argument calls for a closer look at the role of NBFIs in financial intermediation. The study looks at the variety of formations of NBFIs and their specific areas of interest in financial development.

3.2 The Roles of Non-Bank Financial Intermediation

The above discussions point to a growing importance of NBFI in deposit and loan penetration in the disadvantaged settings, such as the rural areas and the unbanked urbanites. The most important function of the non-bank financial intermediaries is to extend financial services to the disadvantaged through transfer of funds from the savers to the investors. For that reason, NBFIs have gained importance due to their ability to meet diverse financial requirements of business enterprises which the banking sector is restrained from servicing (Gupta et al., 2013). They provide medium and long term financing for projects that would otherwise not be covered in the mainstream financial sector due to accompanying higher credit or market risk. Gupta et al., 2013 established that NBFIs facilitate long term investment and financing, which the banking sector is not able to provide. They widen the range of products available for individuals

and institutions with resources to invest. They do not only provide demand side of funds, but alternative sector of financing besides bank financing, meeting the lowest denomination as per preferences of their respective clients. This is further confirmed by Vittas, (1999), adding that the NBFIs complement commercial banks activities and provide the necessary competition to be more efficient and responsive to customers' needs. The paper further argued that the NBFIs provide a stimulus to development of capital markets through generation of large amounts of long-term financial resources which also creates new sources of supply and demand for marketable securities. Furthermore, it is alleged that there is correlation between the size of contractual savings and the development of equity markets. Pension funds and other institutional investors that mobilise large long-term financial resources are mentioned as examples that act as countervailing forces to the dominant position of commercial banks.

The presumption is further affirmed by Snurazani (2013) who reported that saving mobilisation through compulsory pension funds scheme may have positive impact on economic growth through increasing national savings. Conceptually, high savings rates typically go hand in hand with high and persistent investment rates which is widely acknowledged as one of the key engines for driving sustained economic growth. The findings further implied that institutional investors (both at the aggregated and disaggregated levels) have significant causal impact on economic growth.

According to the Malaysian experience, the NBFIs contributed to improvement in the per capita real GDP through increased investment (Snurazani, 2013). The development of NBFIs promoted economic growth through providing long term financing to the productive investment activities where the financing activities of the conventional banking system were limited. They also promoted development of small and medium-sized industries which were previously disadvantaged to meet their financial needs from entering into the stock market and also from the commercial banking system.

On insurance industry, Vittas (1997) asserts that income and wealth, macrofinancial stability, and the regulatory framework are the main determinants of insurance business as they are of contractual savings. The study points out that the main line of insurance business is compulsory motor insurance, which is often subjected to regulation and low premiums. The study however,

confirms that development of life insurance is affected by existence of credible social security systems, and or the offer of well-funded company pensions based on defined benefit plans. The study also notes that weak and unreliable security of social pensions benefits life insurance business, as workers would seek alternative means for security to meet their old age needs.
It can therefore, be concluded that NBFIs play the following functions:

- Provision of funds to small businesses for which it is difficult to sell stocks and bonds because of high transaction costs;
- Benefits the small savers by pooling their funds and diversifying their investments;
- Reduction of risk through portfolio diversification;
- Employment of efficient and professional managers.

As a result, NBFIs play an important role in promoting savings in any economy. They provide stores of value for savings through a wide range of financial assets, and enable savings mobilisation through expert advice from the financial advisors.

3.3 The Importance of NBFIs in monetary policy operationsn

As stipulated by Baker (2016), activities of the NBFIs increase effectiveness of monetary policy. This is in contrast to the apparent stringent regulatory conditions and requirements in banks' operations, which do not make it easy for some segments of society to access financial services. As a result, the NBFIs have increased the transmission of monetary policy to the real economy. Ndele (1991) investigated the effects of NBFI's on the conduct of monetary policy in Kenya. The findings revealed that NBFIs offered healthy competition to the commercial banks in mobilising saving and also in provision of both medium-term and long-term credit. This revelation enhances predictability of anticipated responses to monetary policy actions, which enables Central Banks to effectively select and employ appropriate policy instruments.

Green *et al.,* (2012) observed that the effects of a rise in the official interest rates, lead to higher incomes in Kenya. They noted that interest rate liberalisation increases supply of bank deposits and reduce the demand for bank loans, thus reducing credit rationing. This is because higher

interest rates attract funds from other sectors of the economy, including the informal sector, and as a result, increases availability of credit, and thus, investable funds available for economic growth.

Do NBFIs respond to macroprudential regulation?

Moe (2014) asserts that reforming the non-bank financial sector has been high on the policy agenda for some time. This was on realisation of the mismatch between the long-term credit extension and short-term funding, following the 2001 financial crisis. The study observed that a sharp growth in shadow banking activities coupled with a shift from unsecured to secured credit created pressure on high quality liquid assets and central bank liquidity facilities. Accordingly, central banks broadened their liquidity support to non-deposit-taking institutions and intervene directly in a broad range of asset markets related to shadow banking activities.

This also compliments supervision role as evidenced in Ghana (World Bank report, 2002). Some empirical evidence suggests presence of a positive relationship between minimum capital adequacy requirement and profitability. This revelation indicates that asking NBFIs to keep higher minimum capital adequacy ratio is likely to result in improving their profitability. This implies that capital regulation is an effective tool in enhancing the stability and profitability of the financial services sector. In addition, the paper found a positive relationship between regulatory pressure in terms of restrictions on deposits and NBFI profitability. This is because clients treat their deposits in NBFIs as part of their wealth.

However, Mayes (2014) advises that prudential regulation should be employed at all times for better alignment of incentives to ensure good governance and compliance. Otherwise, the consequences of failure to execute prudential regulations are a complete collapse of the sector, with dire consequences.

4 ANALYTICAL APPROACH

4.1 Market Performance)

This paper investigates the role of NBFIs in Lesotho, the scope and significance in the economy. It looks at the share of the NBFIs in financial intermediation, with emphasis on their reach and coverage. The study explores the relevant legislation supporting development and operations of the NBFIs.

The theory suggests that the Non-bank financial institutions play a vital role mobilising savings for the society that is often excluded from the banking stream. Some of the establishments are often owned and managed by the cooperative members, which makes information asymmetry and uncertainty irrelevant.

The NBFIs, both in the formal and informal category provide credit to lubricate economy, though the amounts are relatively less than that obtainable from the banking sector and often limited to members who have to borrow for growth and sustenance of the organisations. The default rate is almost eliminated for members realise returns through collectively participating in generating and managing the returns.

4.2 The Structure of the NBFIs in Lesotho

The NBFIs are largely categorised into two main groupings, namely: depository and contractual intermediaries as already indicated. They play a variety of role to lubricate the economy and respond to policy initiatives. For instance, the Contractual Intermediaries can influence the interest of the financial sector following pronouncement of policy rate by the Monetary Policy Committee. Depository Intermediaries can also moderate both the lending rates and deposits rate as they attempt to lure more members to join them.

These arguments are usually clarified by construction of the flow of funds accounts, which are used to analyse the "use and source of funds" in order to explicitly determine the significance

and importance of the NBFIs in the economy through funds mobilisation. The flow of funds accounts list the sources of all funds received and the uses to which they are put within the economy. All changes in assets are recorded as uses and all changes in liabilities are recorded as sources..

5 RESULTS PRESENTATON: MARKET PERFORMANCE

This part of analysis largely benefited from the report of the financial inclusion environment, "Making Access Possible (MAP) Lesotho initiative" that was conducted by FinMark Trus[1] in 2014. The report provided an in-depth analysis on the financial structure, financial products and market coverage.

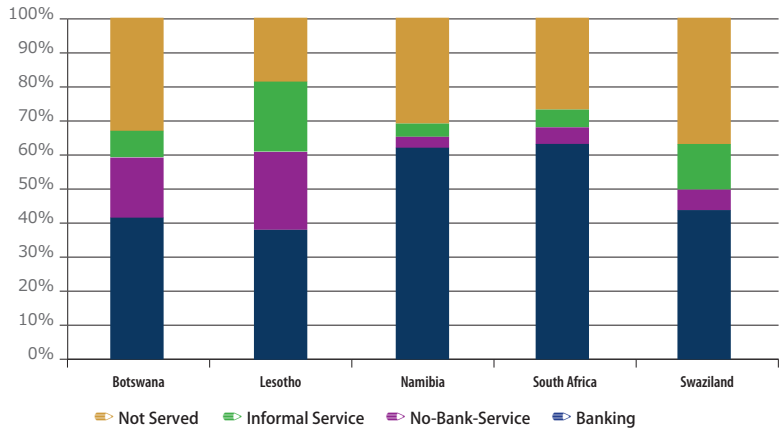
As described in the previous sections, NBFIs provide a variety of financial services to different segments of society. This is particularly true in Lesotho, with high financial inclusion, largely due to coverage and operation of the informal sector as depicted in figure 1. The FinMark report showed that 20 per cent of those receiving financial services largely benefited from the informal sector. The report further discovered that 62.4 per cent of the adult population used informal financial mechanisms, such as informal savings, insurance and credit extension.

According to the results of the 2011 FinScope survey, 81 per cent of Basotho adults were financially included. This means that Lesotho had the highest level of financial inclusion of any of the African countries where FinScope surveys were conducted. This high level of inclusion was driven by very high usage of insurance, primarily funeral insurance (formal as well as informal), which covered 62 per cent of adults, with a further 23 per cent having another form of formal financial service.

[1] FinMark Trust (www.finmark.org.za) is an independent non-profit trust whose purpose is 'Making financial markets work for the poor by promoting financial inclusion and regional financial integration'. The trust was established in March 2002 with funding from the UK's Department for International Development (DFID).

As a result, Lesotho had the lowest financial exclusion at 19.1 per cent of adult Basotho at the end of 2016. This figure compares with 27 per cent for South Africa, 31 per cent Namibia, and 33 per cent for Botswana. Other African countries registered exclusion figure of more than 75 per cent. However, the report shows that Lesotho ranks the lowest amongst SACU member state on access to the banking services at 38 per cent.

Figure 1 Percentage Distribution of Financial Service in SACU Member States



Source: FinScope 2011

According to figure 1 above, the NBFIs play important role to facilitate flow of funds to lubricate the economy in Lesotho. This is confirmed by more than 40 per cent of financial services that are sourced from the sector (Non-bank services plus informal service). The next section will analyse the products offered by the sector in order to determine the significance of the NBFIs relative to the banking sector.

Like many other developing countries, commercial banks mainly operate in urban areas. This means people in rural areas do not get full financial services enjoyed by their urban counterparts. Consequently, the NBFIs provide services that the commercial banks do not offer, especially the informal arrangements. This service is not exclusive to the rural areas, but includes those

marginalised, either due to their financial status or historical background and preferences. To aid analysis, the study presents results by product ranges as follows;

a) Savings

Saving is one segment of financial service that is mainly popular with the banking sector and available in urban areas to those with regular incomes. As a result, significant number of Basotho do not get this service, and those who do, are subjected to negative return due to the monopolistic nature of the sector. This is confirmed by the FinMark report which observed that the total informal deposit loan book stood at M400 millions in 2012/13. This constituted about 15 per cent of total household financial savings in banks.

MFIs and Collective Saving Schemes

The savings mobilised through the banking sector are complemented by those mobilised through the Microfinance institutions and collective saving schemes to financial needs. These institutions are authorised to receive deposits from their members. It must be noted that Lesotho has developed a culture of collective institutions such as burial societies and savings clubs, which comprise NGOs, Savings and Credit Cooperatives, Village Savings and Loan Associations, Rural Savings and Credit Groups. These institutions do not only provide financial services, but also social and emotional support to build resilience to day-to-day economic challenges to their members.

Pension and Provident Funds

Pension fund is relatively underdeveloped compared to what obtains in other countries in the region. The formal initiative was established in 2008 largely targeting public servants. This was estimated to cover about 35,000 members, and its assets were estimated at M2.5 billons in 2013. FinMark survey revealed that about 35 per cent of employees in the formal sector were covered in pension funds. This figure excludes those whose policies are held with South African based NBFIs, which has, to some extent, affected potential development of pension and provident funds market in Lesotho.

The NBFIs continue to be relevant for the general populace, as per the extend of service coverage compared with the banking sector, and the number of users of their services. Table 1 shows that operations of NBFIs reached roughly 400 thousand clients, with the informal groups serving more than 300 thousand of the total. The informal groups largely comprises collective savings schemes based in communities to mobilise collective savings.

Table 1 Holding of Savings by Provider

Types of Institution	Approximate no. of Customers
Banking Sector	368,000
Pension Fund	45,000
Savings and Credit Cooperatives*	41,000
Informal Groups	304,500
Others	3,234

* This represents one such establishment.

Source: CBL Various Reports and own calculations

Development of Stock Market

The introduction of the Lesotho Unit Trust[2] in 2001 was an attempt by Government to facilitate participation of Basotho in acquiring shares from Government parastatals during privatisation. African Alliance entered the foray in 2008, with the aim of providing access to the CMA wholesale money markets, regional listed equities and bond markets.

Lesotho has recently established Maseru Securities Market to mobilise capital necessary for development of the private sector. This is to curb the outflow of capital, and perhaps attract some from CMA in order to affect policy initiatives, and to grow the value of shares held with local assets management establishments.

b) Credit

Credit is the other segment of financial service that lubricates economy for development. This is one function that is widely provided by a variety of players, it being formal or informal. The banking sector has not fully provided this service to the productive sector of the economy. FimMark (2014) estimated that only 16.6 per cent of adults got credit from the formal sector, with a meagre 3.8 per cent served by the commercial banks in 2013. It has largely benefited consumption for clients with regular income in the form of monthly salaries that are used as

[2] This had assets in excess of M1.7 billion in 2013.

collateral. As a result, business aspirants have largely depended on own means of mobilising resources to meet their financial needs. This is seen in development of different types of financial groupings to facilitate resourcing the productive sector.

The trend is, however, improving perhaps supported by the on-going reforms such as the amended Land Act of 2010 which provides for land as collateral, as well as, married persons equality, which enables married women access to credit without spousal consent.

Credit Cooperatives

Government has supported formation of Savings and Credit Cooperatives, Rural Savings and Credit Groups to address the gap that was left by the formal financial institutions since liquidation of both Agricultural and Lesotho Development Banks. This is in addition to cooperatives that are initiated by private individuals. There are other forms of such, where members contribute agreed minimum deposit to finance one another rotationally[3].

Microfinance Institutions

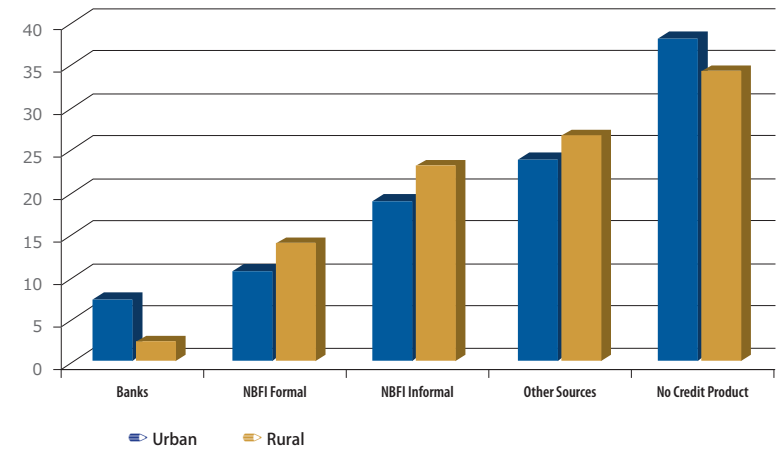
Credit extension in the non-banked and the informal sector largely benefits from Credit-only Microfinance Institutions. As at end of December 2015, CBL had registered seven (7) Credit-only and non-deposit taking MFIs, with total assets of M550.0 million. The sector primarily served people with regular income, offering personal loans of up to M250,000.00.

Money Lenders

As already indicated, there is significant number of Money Lenders in Lesotho. At the end of 2015, Central Bank renewed eighty six (86) licenses and issued forty one (41) new applications. This sector plays a very important role in financial inclusion, since they serve the unbanked individuals, as well as, the Small, Medium, and Micro Enterprises (SMMEs).

[3] This rotational collection and distribution of contribution is called "mochaellano" in local language.

Figure 2 Percentage Distribution of Credit by Source and Recipient



Source: FinScope 2011

c) *Money Transfer*

Money Transfer institutions provide a formal and critical conduit through which payments are made and remittances are transferred for households and business purposes in a safe manner. There are five players in the sector, categorised by:

- Two traditional over-the-counter companies;
- The Employment Bureau of Africa (TEBA); and
- The innovative approach operated by the mobile operators.

A TEBA service, whose membership has been decreasing in recent times, was mainly a channel for payment of deferred payments for migrant mineworkers. This used to form part of bank deposits with Lesotho Bank, and later Standard Lesotho Bank until government dissolved the arrangement.

As depicted in Table 2, mobile money continues to grow exponential, serving about half a million customers. This enables customers to pay for services and transfer funds. The service has further seen enhancement with introduction of cross border transfers in collaboration with some retail outlets both in Lesotho and South Africa.

Table 2 Money Transfer by Volumes

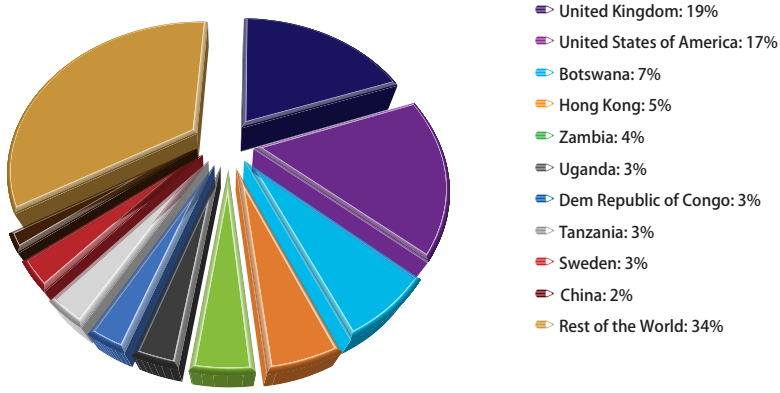
Types of Institution	Approximate no. of Customers
TEBA	22,000*
Mobile Money	500,000

* This continues to play important role for migrant mineworkers who receive their deferred pay funds through the facility.

Source: Central Bank of Lesotho Reports

Foreign money transfers in and out of the country continue to grow, signifying the importance of remittances channels in the country. Inflows by country of origin, excluding South Africa, were dominated by the United Kingdom with 19 per cent, United States of America with 17 per cent and Botswana with 7 per cent, while outflows were dominated by Asian and other African countries, as per figure 3 below as at December 2015.

Figure 3 Inflows by Country of Origin



Source: Central Bank of Lesotho

d) Finance

FinScope estimated that 62 per cent of the adult population had some form of insurance coverage as at end of 2011. Like the other segments of financial services, usage of insurance was recorded to be significantly higher in urban areas, where formal penetration was 48.1 per cent as compared to the 31.8 per cent in rural areas. Conversely, informal-only usage was much higher in the rural areas at 30 per cent compared with 11.4 per cent in urban areas. The seemingly, skewed preference of informal usage in rural areas was driven by funeral coverage (burial societies) also explained by the trend highlighted in the previous discussions where community mobilisation was geared towards emotional support in addition to attending to financial needs.

Analysis by product type also reveals that long-term (life) insurance dominated the segment in terms of premium payment. This comprised corporate and retail business, where corporate life business focused on employee benefits such as pension and provident funds, and funeral cover to the workforce. The retail business, which consists of fire accidents, health, property and transportation, were recorded at 50 per cent in 2011.

Table 3 below presents the market size from the supply side. As at end of December 2015, there were 42 service providers, six companies providing short-term insurance, six companies in the long-term, although dominated by one company with a market share of more than 70 per cent. This was served by 30 insurance brokers, in addition to financial advisors employed by some insurance companies.

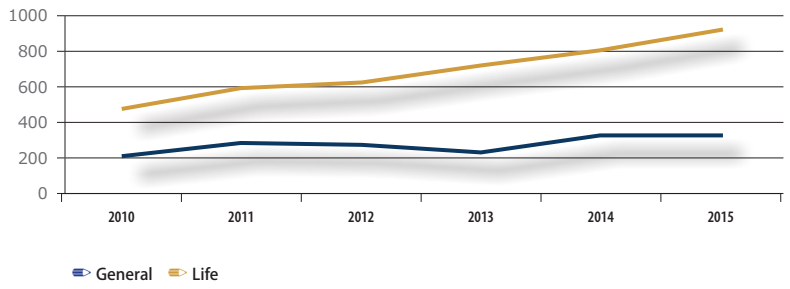
Table 3 Insurance Market in Lesotho

Insurer	Number
Short-term	6
Long-term	6
Insurance Brokers	30
Source	Central Bank of Lesotho

Figure 4 below presents growth of premium over a six year period from the year 2010. It can be observed that the long-term insurance has maintained an upward trajectory in line with the earlier claim that this is the profitable and lucrative insurance option. This compares with the short-

term insurance coverage, which rose by a lower margin over the same period. Generally, insurance business enjoyed positive growth as measured by the claim ratio ranging between 47 per cent and 60 per cent over a period 2009 to 2015, which is regarded as good client value by international standards. Short-term insurance penetration, as measured by ratio of gross premium to GDP stood at 1.5 per cent as at December 2016, compared with 4 per cent for the long-term.

Figure 4 Insurance Premium by Type



Source: CBL Reports

5.2 Financial Stability

Financial intermediation is often accompanied by some challenges, it being in the form of legal provisions or development in the sector, for all to realise the common purpose. This involves risks associated with financial transactions, predictability and uncertainty of the sector, and security of the investments. All these are catered for through a sound financial stability.

Thus, financial stability to ensure soundness is the necessary condition for intermediaries to function properly. This is a condition in which an economy's mechanisms for pricing, allocation, and managing financial risks (credit, liquidity, counterparty, market etc.) are functioning well to contribute to the performance of the economy (Schinasi, 2004). Financial stability is said to embrace the concept of a continuum since it encompasses a subset of all impediments that

may impede smooth functioning of the economy such as savings and investments, lending and borrowing, liquidity creation and distribution, asset pricing and wealth accumulation and growth. Therefore, financial stability can be summarised as ability of the financial system to mediate financing, through provision of payment mechanisms and redistribution of risks without giving in to disturbances in the economy.

This is one major challenge in overseeing operations of the NBFIs in Lesotho as there is dual regulation of the sector which is coupled with out-dated legal provisions that needs to be resolved as a matter of urgency if the country is to enjoy the full potential of intermediation. The current legislations do not provide for operation of the subsector in the current environment, and poses some systemic risk that may emanate from operation of one of the subsectors. Clarity on the roles of Central Bank and that of government Ministries make it difficult to apply the Financial Institutions Act as amended in 2012, despite having clear and appropriate regulatory provisions.

5.3 The Challenges

This section enumerates challenges which range from the market size, the landscape and proximity to the big economy with well-developed financial superstructures, as well as, financial literacy. Of course it is worth noting that Government has taken responsibility to level the play field for this to be attractive in order to ensure financial inclusion.

- Credit-only and no deposit-taking MFIs play a critical role in financing developments in Lesotho. This is reflected by their total assets, as well as the profits margin. However, it becomes difficult to capture their financial activity in the flow of funds accounts as they are mostly owner financed, with the funding sourced from within CMA due to the arrangement on capital mobility. As a result, this leaves a discrepancy which is not easy to interpret. Likewise, supervision and regulation is another challenge that makes it difficult. The law mandates the Department of Cooperatives to oversee operations of this subsector, leaving the financial regulator handicapped, despite their core business being financial. Disbursements of credit to beneficiaries are often

processed from companies' headquarters direct into beneficiaries' bank accounts. This distorts full representation in the Monetary and Financial Statistics coverage because it offers incomplete balance sheets due to the free capital movement within CMA. This was first observed when the deferred pay funds, that used to be centralised with the former Lesotho Bank through TEBA, were transferred into personal accounts.

- Even though the insurance subsector may seem to be challenge free, there are some challenges that either derails it from fully developing in order to operate at full potential. The short-term insurance is mainly dominated by motor vehicle and property (housing) insurance coverage, which are conditional to accessing finances, thereby operating below capacity. However, the subsector has made footprints on long-term insurance. This has largely benefited from funeral schemes that include savings plans, in addition to life insurance, which gained dominance in recent times, as per insurance supervision reports. Nonetheless, this continues to face stiff competition from the relatively well established industry in South Africa.

- Provident and pension funds remain underdeveloped in Lesotho. This is despite government initiatives to facilitate development of the sector, with enactment of supporting legislation. Laws governing secondary market have been in existence for some time now, but there is little or no market acceptance. This may be due to the relative low level of financial market development in the country. Investors hold on to their securities until maturity, thereby, hampering secondary market operations. Moreover, majority of companies operating in Lesotho are subsidiaries of regional companies headquartered in South Africa. So it is easy for them to mobilise funding through the parent companies across the border.

6 RESULTS PRESENTATON: MARKET PERFORMANCE

The analysis validates that the NBFIs play an important role in financial intermediation to benefit economic development. Indeed, the NBFIs play roles that are otherwise, excluded or not fully offered by the banking sector. These include:

- Broaden the spectrum of risks available to investors through, amongst others;
  - injecting liquidity
  - putting in place mechanisms for information dissemination, and
  - risk-pooling services.
- They encourage investment and savings, particularly for the unbanked rural communities and previously disadvantaged urbanites, and as a result, facilitate financial inclusion.

Therefore, NBFIs provide competition for banks in the provision of financial services, and further unbundle the services to provide components on a competitive basis for lower segments of the markets. They mobilise savings from the communities which were, otherwise not served by the banking sector and avail credit to the productive sector. As a result, they inject the necessary liquidity into the system. The credit-only institutions is the other segment that provides finances to the productive sector of the economy, thereby, lubricating economic activities, and in the process contribute to healthy financial fluidity. Consequently, they add to economic strength by enhancing resilience of the financial systems to economic shocks.

This is confirmed by Carmichael and Pomerleano (2002), who argue that a well-developed and properly regulated NBFI sector adds to a broad, balanced, efficient financial system that spreads risks and provides a sound base for economic growth and prosperity. By extension, this also opens up channels through which economic policy actions are transmitted. Their services are also tailor-made for specific sectoral needs, something that give them advantages arising from specialisation.

7 POLICY RECOMMENDATIONS

The study has reaffirmed the importance of the non-bank financial intermediaries in facilitating economic activities in Lesotho. This is despite operating under some legislative bottlenecks that suffocates their potential role for development of the local productive sector. It is, therefore, important to address those challenges through amendment of relevant legal provisions in order to level the play field.

The Financial Institutions Act of 2012, as the mother legal framework, should be amended to provide for financial innovations that are consistent with international developments. That will include, but not limited to:

- Transactions in mobile money, whether transfers to the third party or actual settlement of transactions, have grown exponentially since its introduction a few years back. This is one area that has to be addressed as a matter of urgency to improve on the current operational arrangement.

- The Real Estate Price Index is another initiative that could facilitate proper price and predictability of property pricing in Lesotho. This could benefit leasing and general access to financing by the deficit spenders, and thus fuel economic growth. It can also benefit the Land Administration Authority and Municipalities in terms of benchmarking.

- These advances should be supported with enactment and or amendment of the following legal provisions to fully hedge against any unforeseen risks, while also facilitating development of their respective markets, including secondary market which can spur operations of Maseru Securities Market:

    - Insurance Act of 1976 as amended
    - Money Lenders Act
    - Money Transfer Regulations
    - Construction of the real estate price index.

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Determinants of Poverty and Remedial Measures: Lessons for Lesotho

Selloane Khoabane

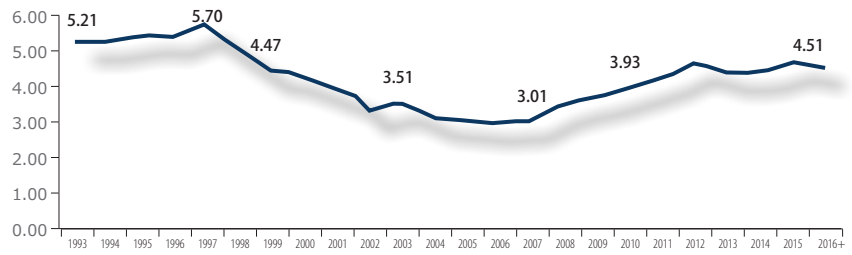
1 INTRODUCTION

THERE IS A wide realization and acceptance among policy makers and the nation at large in Lesotho that Lesotho needs economic transformation to enhance its capacity to address its major challenges of poverty, inequality and unemployment, amongst others. The need for economic transformation is expressed in a number of development planning documents including the Five Year Development Plans, Annual Plans and Budgets since 1970 and the Three Year Rolling Plans since 1997. In the year 2000 the National Vision 2020 was developed as the first document that describes the long term vision for Lesotho's economic, political and human development. The implementation strategies for the Vision 2020 were outlined in the Poverty Reduction Strategy 2004/05 – 2006/07 and the Interim National Development Frameworks. Currently, the National Strategic Development Plan 2012/13 – 2016/17 is the implementation strategy of the Vision. The development planning documents outline a number of key priorities and objectives and these have not changed much from one document to the next. These include accelerating economic growth by enhancing production in agriculture, manufacturing, tourism, mining and micro, small and medium enterprises (MSME s) so as to generate employment and minimize inequality. In addition, the necessary infrastructure, skills, technology and innovation, amongst other things, would be developed to support growth of the productive sectors.

This realization notwithstanding, Lesotho's economy has consistently been expanding since 1983, albeit with decelerations in some years. Economic growth averaged about 4.0 per cent over the 33-year period from 1983 to 2016. This reflected long periods of expansion in all the sectors except the agricultural sector, which has been highly volatile though dominated by contractions. The highest growth rates were observed in the mining and quarrying sector at 10-year moving averages of above 50.0 per cent from 2005 to 2012 after which they

moderated though still remaining high. The second highest growth rates were recorded by the manufacturing sector though it has been under pressure in recent years, experiencing its longest period of contraction from 2008 to 2014. The services sector, which is mainly dominated by public administration, education and health, which are services that are mainly provided by government, also persistently registered positive growth rates of 2.5 per cent to 5.0 per cent during the same period with highest growth rates observed in communication and information and financial and insurance services. The wholesale and retail trade sector also significantly supported growth at single digit 10-year moving average growth rate of 2.1 per cent in 2006 that rose over the years to 5.2 per cent in 2016.

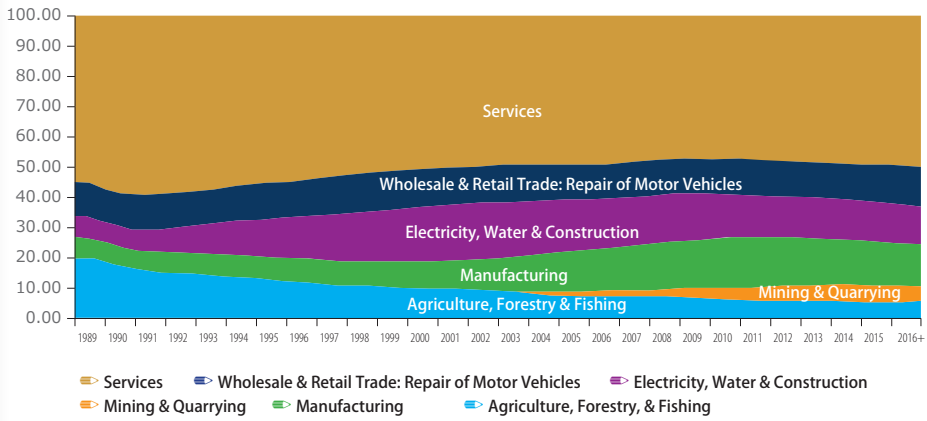
Figure 1 Lesotho's Real GDP Growth Rates (10 Year Moving Averages)



Source: Lesotho Bureau of Statistics and Author's calculations

The strong economic growth has been accompanied by some changes in the output structure and in the contributions of different sectors to Lesotho's GDP. The agricultural sector as a share of GDP has fallen from an average of 15.9 per cent in the first ten years of the 33 years covered by this review to an average of 6.0 per cent in the 10-year period to 2016. The electricity, water and construction sectors have also declined. The services sector remained the largest contributor to Lesotho's output despite declining from an average of 58.0 per cent as a share of GDP in the 10-year period from 1983 to 2002 to 49.0 per cent in the 10 years to 2016. The wholesale and retail trade sector has remained relatively stable. The manufacturing sector has increased from 6.0 to 13.0 per cent during the same period. The mining and quarrying sector remained the lowest contributor to GDP despite accelerating on account of high investment in the sector in recent years.

Figure 2 Lesotho's Real GDP - Sectoral Contributions



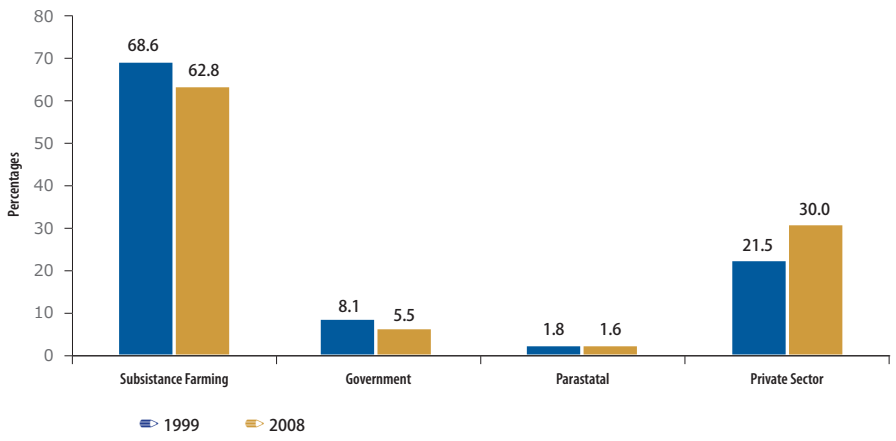
Source: BOS and Author's calculations

The strong economic growth and a seemingly positive shift in the output structure have not been accompanied by commensurate developments in employment and poverty reduction. According to the IMF (2016), Lesotho has achieved solid economic growth but unemployment has remained high, particularly among the youth and poverty has also remained high. The unemployment rate has deteriorated over the years and it is estimated at 25.3 per cent according to the Integrated Labour Force Survey of 2008. The most recent estimate by the Continuous Multi-Purpose Survey 1st Quarter 2014/2015 is 32.8 per cent and it also estimated the youth unemployment rate at 36.1 per cent. However, this Survey does not provide a sectoral breakdown of employment. The Labour Force Survey 2008 reveals the agricultural sector as the largest employer in Lesotho. It shows that the agricultural sector, which is mainly characterized by subsistence farming in Lesotho, is the largest employer of the Basotho nation at 62.8 per cent in 2008, a slight improvement from 68.6 per cent in 1999. Employment by the private sector, which covers sectors such as mining and quarrying, construction, services, wholesale and retail trade, *inter alia*, has increased moderately by 8.5 percentage points from 21.5 per cent in 1999 to 30.0 per cent in 2008.

Unavailability of high frequency statistics on employment precludes more elaborate discussion of Lesotho's employment developments. Nonetheless, it is worth noting that the sectors that have been growing fast and have consequently been behind Lesotho's solid economic growth over the past two decades as depicted in Table A1 in the Appendix are not highly labour intensive in nature. As such their contribution to employment has been very minimal. For example, the mining and quarrying sector has generated around 3,000 jobs despite growing by 10-year moving average growth rates of more than 50.0 per cent per year from 2005 to 2012.

Consequently, poverty remains high and unchanged from a decade ago (IMF, 2016). The poverty level in Lesotho as measured by the poverty head count ratio at US$1.90 per day in 2011 purchasing power parity (PPP) was 59.7 per cent in 2010. Measured at a higher poverty head count ratio of US$3.20 per day in 2011 PPP, Lesotho's poverty level was 78.0 per cent in 2010.

Figure 3 Sectoral Employment in Lesotho



Source: Integrated Labour Force Survey 2008

This state of affairs raises policy concerns. Thus this paper has two main objectives. The first one is to assess the determinants of poverty with the aim of understanding why poverty still remains a pressing challenge for Lesotho. The second objective is to identify policies that could enable Lesotho to address this challenge more effectively. The paper is structured as follows. Following this introduction is the literature review. Section 3 outlines the analytical methodology and Section 4 discusses the empirical results on the determinants of poverty. Section 5 reviews case studies that demonstrate how poverty reduction could be achieved. Section 6 concludes the study and provides policy lessons for Lesotho.

2 LITERATURE REVIEW

2.1 Theoretical Literature

There are different schools of thought on the theories of poverty. The classical theory is based on the premise that factors of production receive payments in the form of rent, wages and profits on their productivity. On the basis of the assumption that the market is efficient, it views poverty as a result of individual choices that affect productivity (Davis and Sanchez-Martinez, 2014). The role of government is to intervene when there is a need for supportive activities or threats, to correct for perverse economic incentives (Davis and Sanchez-Martinez, 2014). Second, the Keynesian or liberal theory attributes poverty to market distortions and broad underdevelopment. According to this school of thought, economic growth can promote economic development hence reduce poverty (Davis and Sanchez-Martinez, 2014).

Third, according to Marxist theories, poverty results from capitalism and related social and political factors. As articulated by Angelsen and Wunder (2006) the Marxist inspired theories are a result of uneven development and exploitation that cause skewed asset and income distribution. This is based on the notion that capitalists keep the cost of labour unnaturally lower than its value added by threatening to reduce employment. Furthermore, it is also contended that regulation of the labour market, for example through minimum wages, can alleviate poverty (Davis and Sanchez-Martinez, 2014).

Fourth, the monetarist and neoclassical mainstream theories do not explicitly include poverty reduction as part of their targets (Troyano and Martin, 2016). The policies of the Washington Consensus were focused more on economic growth as the key to poverty reduction. However, economic growth of the conventional economic reforms, inspired by the Washington Consensus, has not resulted in poverty reduction (Rodrik, 2005 and Troyano and Martin, 2016). This is culminating in a shift in policy thinking. Rodrik (2005) points out that the alternative policy direction that countries appear to be taking is to add more on to the policy agenda as existing policies yield less than expected results, which he terms the Augmented Washington Consensus[1].

2.2 Empirical Literature

Angelsen and Wunder (2006) contend that the debate on poverty has culminated in a consensus that in most cases, macroeconomic growth increases the income of the poor and reduces the number of people below the poverty line. Seleteng and Motelle (2016) found out that, SADC countries that experienced higher average economic growth rates over the 2002 to 2012 period also registered lower unemployment levels and consequently inferred that economic growth reduces poverty. Most Asian countries such as Hong Kong, Indonesia, Malaysia, Singapore, South Korea, Taiwan, and Thailand have experienced the poverty reducing impact of economic growth. However, there are quite a significant number of cases where little or no poverty reduction was achieved through growth, particularly in Africa. This is attributable to skewed initial asset distribution and/or 'bad quality' economic growth that is characterized by low labour intensity and taking place in sectors that do not have a direct and significant link to the poor (Angelsen and Wunder, 2006).

Lavopa and Szirmai (2012) identify three channels through which economic growth affects employment and poverty. First is the direct impact, which results from the creation of new jobs

[1] Washington Consensus included the following policies; secure property rights, deregulation, fiscal discipline, tax reform, privatization, reorientation of public expenditures, financial liberalization, trade liberalization, openness to FDI, unified and competitive exchange rates. The augmented Washington Consensus added ten more policies to the Washington Consensus list. These are anti-corruption, corporate governance, independent central bank and inflation targeting, financial codes and standards, flexible labour markets, World Trade agreements, capital account liberalization, non-intermediate exchange rate regimes, social safety nets and targeted poverty reduction.

or the reallocation of workers from lower to higher productivity sectors, when wages reflect productivity levels. Second is the indirect impact, which arises from strong linkages between the growing sector and the rest of the economy. Lastly is the induced impact, which refers to the multiplying effects as growth in the rest of the economic activities further creates employment, productivity, and income growth.

In addition to growth of income, poverty risk and social exclusion are affected by other factors related to the quality of governance in an economy. The ILO (2005) explains that HIV/AIDS causes impoverishment through a number of channels. Household income is lost when working-age adults who earn income can no longer work due to illness and as household expenditures increase due to medical care costs. Sometimes households expend savings and loose assets to purchase medical care for sick members. Productivity in agriculture, particularly at subsistence level and among smallholder farmers becomes severely curtailed by lack of able bodied workers. In addition, the HIV/AIDS related labour force losses cripple economic growth thus undermining efforts to reduce poverty at the national level.

On the one hand, democracy is generally expected to result in the betterment of the lives of the nations. However, Holmberg and Rothstein (2010) found a positive but weak relationship between democracy and absolute poverty and inequality. This reflects that democracy may not produce the public goods needed to alleviate poverty. Furthermore, bad governance that is characterized by corruption, patronage, favoritism and abuse of power restricts the positive impact of democracy on poverty (Diamond, 2007). On the other hand, Varshney (1999) found out that authoritarian countries exhibited mixed signals on poverty reduction with countries such as Singapore, South Korea and Taiwan attaining spectacular success, some lying somewhere in between and others, particularly in Sub-Saharan Africa and Latin America failing miserably. He further points out that while countries that have had long tenures of democracy may not be enormous failures, none of them has attained success levels of Singapore, South Korea and Taiwan.

Government effectiveness, which reflects the degree to which citizens of a country view the public sector as fulfilling its obligations with a minimum waste of resources, is also important for poverty reduction. Bosco and Poggi (2016) found out that in countries with high government

effectiveness, the individual probability of being poor is lower. This is because government effectiveness is highly correlated with GDP per capita and it is more relevant for low-income countries (Jha and Zhuang, 2014). While all other different elements of governance are important for poverty reduction, the most important for low-income countries include government effectiveness, better regulatory quality and rule of law, and tighter control on corruption (Jha and Zhuang, 2014).

3 METHODOLOGY

To address the first objective of the paper, cross sectional data methodology is used to assess the extent to which factors identified by the literature affect poverty in developing countries. The analysis covers 102 developing countries that have data on the multidimensional poverty index as shown in the Human Development Report 2016, including Lesotho. The list of variables, their abbreviations and a-priori expected signs are provided in Table 1. The description and other details about the variables included in the model are provided in Table A1 in the Appendix. A more direct analysis on Lesotho would be ideal. However, it was not possible because of data constraints. Data on most of the variables used in this analysis were only introduced recently, for example, the dependent variable was introduced in 2010. In addition, data on most of the variables is compiled periodically through surveys conducted with lags of 5 or more years. This results in a small number of observations per variable per country.

Cross-sectional data regression was used to estimate the following model:

$$\log(MDPI_{it}) = \beta_0 + \beta_1 DEMOC_{it} + \beta_2 GEFF_{it} + \beta_3 \log(HIV_{it}) + \beta_4 \log(UNEMPR_{it}) + \beta_5 \log(GDP_{it}) + \beta_6 \log(MODERN_{it}) + \mu_{it}$$

Table 1 List of Variables and A-priori Expected Signs

Variable Name	Abbreviation	A-priori Expected Sign
Multidimensional Poverty Index	MDPI	N/A
Democracy	DEMOC	-
Government Effectiveness	GEFF	-
GDP per Capita	GDP	-
The Rate of HIV Prevalence	HIV	+
The Unemployment Rate	UNEMPR	+
Modernization	MODERN	-

Different approaches are used in different studies to model the determinants of poverty. The choice of a specific analytical approach is often determined by availability of data and the objectives of the study. Individual country studies based on household income and expenditure survey data pertaining to one period (year) are common (Adeyemi *et al*., 2009, Biyase and Zwane 2017 and Pindiriri, 2015). Many of these types of studies mainly employ ordinary least squares to study the determinants of poverty (Sakuhuni *et al*., 2011; Manjengwa *et al*., 2012; Benson et al., 2005; Okwi *et al*., 2007; and Datt and Jolliffe, 1999). A few studies that model the macroeconomic determinants of poverty over a cross section of countries, such as Adeyemi *et al* (2009) and Ulriksen (2012) use cross country data for one period (one year) and simple linear regression analysis. This could be attributable to the frequency of the available data for the poverty indicator or index that is used as the dependent variable. Along the lines of Adeyemi *et al* (2009).

While the quality or spuriousness of regression results in time series data is affected by stationarity issues, in cross-section data it is determined by cross-sectional dependence and heterogeneity. Cross-sectional dependence refers to a situation whereby the shocks in one cross section unit e.g. a country, impact on another unit when both belong in the cross sectional data set. According to Baltagi (2005), cross-sectional dependence and serial correlation are a problem in macro panel data with long time series but not in panels with few years and a large number of cases. As such the analysis in this study is based on the assumptions of cross-section independence and no serial correlation.

Heterogeneity refers to the dissimilarity or diversity in the cross-sectional observations, that is, a situation whereby the observations are widely scattered. Heteroskedasticity is a type of heterogeneity characterized by unequal variances of the disturbance terms in the regression function. In cross-section data analysis, one can improve over OLS in the presence of heteroskedasticity of unknown form by applying generalized method of moments (GMM) or two-stage least squares (2SLS). However, in large samples, OLS is unbiased and consistent, whereas GMM is guaranteed only to be consistent. With regards to the two-stage least squares, application in cross section analysis is not common. This is because two-stage least squares generally has only a minor impact on estimates of coefficients and statistical significance in the presence of heteroskedasticity. Thus the empirical analysis has taken care of heteroskedasticity.

The case study approach is used in pursuance of the second objective of this paper. The cases of two developing countries, Mauritius and Thailand, which have already reached or are on track to reach middle-income status, are reviewed. Mauritius is an African country that has attained commendable economic success. It has transformed itself from a poor sugar economy into one of the most successful economies in Africa in recent decades. In tandem with its economic transformation, Mauritius has achieved significant improvements in poverty reduction and other key human development indicators. Thailand is a developing country in Southeast Asia. It has attained structural economic transformation that has helped it to achieve impressive results on employment creation and poverty reduction.

4 EMPIRICAL RESULTS – DETERMINANTS OF POVERTY

This section presents the results of the pooled regression results on the determinants of poverty in developing countries. Three models have been estimated. The first model includes all the selected explanatory variables except modernization. The objective behind it is to determine the importance of economic growth in poverty reduction in the absence of economic transformation. The second model leaves out economic growth and includes modernization. It is intended to assess whether poverty can be addressed with economic modernization in the

absence of economic growth. The third model includes both variables and it is meant to assess the complementary effect of these two variables on poverty.

Table 2 Empirical Results

Variables	Model 1	Model 2	Model 3
Democ	0.014	0.036	0.02
	[0.37]	[0.92]	[0.53]
Geff	-0.652	-1.278	-0.691
	[1.85]*	[-4.50]***	[-1.98]**
Log(hiv)	0.265	0.338	0.254
	[3.04]***	[3.87]***	[3.00]***
Log(unempr)	-0.108	0.004	
	[-0.82]	[0.03]	
Log(GDP)	-1.001		-0.764
	[-5.17]***		[-3.16]***
Log(modern)		-1.438	-0.67
		[4.18]***	[-1.73]*
Constant	5.5201	2.151	5.941
	[3.08]***	[1.54]	[3.34]***
Number of Observations	79	80	79
Adjusted R-squared	0.64	0.60	0.65
F-statistics	25.63***	22.49***	26.90***

NOTE: *Dependent variable is the Multi – Dimensional Poverty Index. ***, ** and * denote 1%, 5% and 10% level of significance, respectively. Values in square brackets are t-statistics.*

The results confirm the importance of economic growth for poverty reduction. Models 1 and 3 show that an increase in GDP per capita leads to a decline in the poverty index. Structural transformation, as proxied by economic modernization, which results in the reallocation of workers from lower to higher productivity sectors, is also important for poverty reduction as demonstrated by models 1 and 2. This is in line with the findings of Lavopa and Szirmai (2012). When both GDP per capita and economic modernization are included in the model (Model 3), they both maintain their importance for poverty reduction, with GDP per capita displaying a little bit higher impact than modernization. The inclusion of both variables in the model also improves the explanatory power of the model. The results indicate that economic growth that

is supported by structural transformation is likely to have a more effective poverty reducing impact. This is because growth of the manufacturing and services sectors is usually accompanied by creation of formal and reasonably salaried employment opportunities.

There is a weak and statistically insignificant relationship between democracy and poverty. This is in line with the findings of Holmberg and Rothstein (2010) who contend that democracy does not always facilitate production of public goods that are necessary for poverty alleviation. This is particularly the case where governance that is plagued by corruption, patronage, favoritism and abuse of power hinders effective implementation of development orientated policies that are necessary for creation of quality employment and poverty reduction, regardless of whether it is democratic or authoritarian.

An improvement in government effectiveness results in a significant reduction in poverty. This is because government effectiveness reduces the probability of being poor, especially for low-income countries (Bosco and Poggi, 2016). This notion is further substantiated by Jha and Zhuang (2014) who highlighted that the importance of government effectiveness for poverty reduction emanates from its high correlation with GDP per capita.

The results depict that HIV prevalence retards poverty reduction. It intensifies poverty by reaping-off households of income when some household members can no longer engage in productive activities due to ill-health and by increasing household expenditures as a result of medical care costs. This is in line with the findings of Adeyemi *et al* (2009) on Sub-Saharan Africa. He concluded that the high prevalence of HIV/AIDS has affected the level of economic activities and well-being of the people in the sub-region and recommends that policies aimed at arresting the spread of HIV will go a long way in reducing poverty in Sub-Saharan Africa.

The estimated models were tested for heteroskedasticity using the Breusch-Pagan-Godfrey test. The results of this test, presented in Table2, show that the null hypothesis of homoscedasticity could not be rejected. In addition, the results of the heteroskedasticity robust pooled OLS regression presented in Table A2 in the Appendix are similar to those presented in Table 1 above, thus leading to the same conclusions. This confirms robustness of the empirical results of this exercise.

Table 3	Heteroskedasticity Test: Breusch - Pagan - Godfrey
Model 1	2.004
Model 2	3.500
Model 3	2.792
1% = 15.086 Critical Values for 5 df	1% = 15.086
	5% = 11.071
	10% = 9.236

5 POLICIES/STRATEGIES FOR ADDRESSING POVERTY: CASE STUDIES

Economic modernization stands out as a very important factor for poverty reduction amongst the explanatory variables explored in this study. It is therefore important to probe this variable further with the objective of deriving policy lessons for poverty stricken developing countries like Lesotho. Thus case studies have been included in this paper to demonstrate how economic modernization/ transformation impacts poverty. These case studies also provide some insight on the factors that could facilitate successful economic transformation that could effectively achieve the desired poverty reduction results.

5.1 Mauritius

Mauritius has successfully transformed its economy from sole dependence on sugar at independence in 1968 to tourism, textiles, financial services and Information and Communication Technology (ICT) in recent years (AFDB (2014), Sobhee (2009), Ulriksen (2012), Zafar (2016)). Mauritius has defied the predictions of Meade et al (1961) of dismal developmental prospects, which were based on Mauritius's high economic dependence on one crop (sugar), low income due to lack of job opportunities outside the sugar sector, rapid population growth and its long distance from the world markets than the average African country. According to the World Bank's World Development Indicators, Mauritius has transitioned from a Low Income to Upper Middle Income Country in 2012. Its GDP per capita in constant 2010 US Dollar terms has grown to US$9812.55 in 2016 (World Bank, WDI). It has made commendable progress on poverty reduction, with the poverty headcount ratio at US$1.90 a day of 0.1 per cent of the

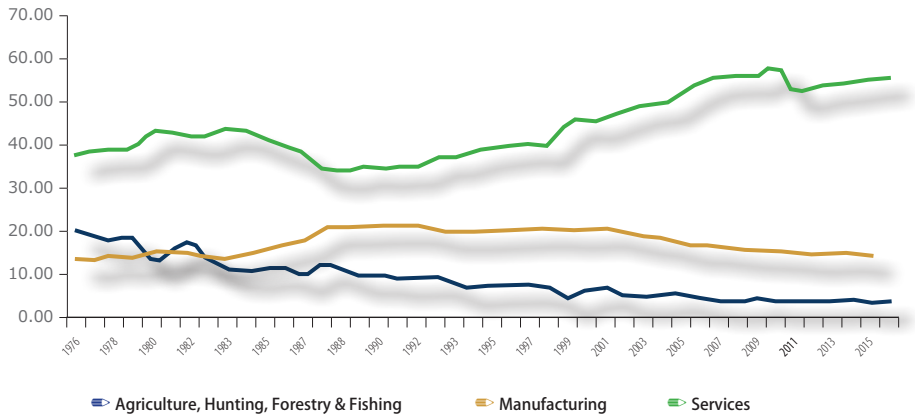
total population while it boasts one of the lowest unemployment rates in Africa at 7.8 per cent in 2016 (World Bank, WDI).

Agricultural activities have declined as the economy of Mauritius diversified (Bank of Mauritius, 2017). The agricultural sector has fallen from above 20.0 per cent of GDP in the 1970s to below 4.0 per cent of GDP since the beginning of the 21st century. This is largely explained by the decline in sugar cane production from around 16.0 per cent of GDP in the 1970s to less than 2.0 per cent since 2010. Nonetheless, sugar remains an important source of export earnings at 10.5 per cent of total exports value in 2016.

The manufacturing sector became the largest contributor to GDP from 1982, outperforming the agricultural sector and has, to date retained this position. It grew from 14.6 per cent of GDP in the period from 1976 to 1987 and stabilized at 20.0 per cent of GDP from 1987 to 2001. After that it started to fall year after year and it reached 13.9 per cent of GDP in 2016. Textiles and wearing apparel is the main contributor to the performance of the manufacturing sector and it has been declining as a result of the erosion of preferential trade agreements and increased international competition, amongst other factors.

The services sector is comprised of a number of services activities such as accommodation and food service activities, financial and insurance activities and information and communication technology. According to Bank of Mauritius (2017), accommodation and food service activities are the fourth pillar of Mauritius' economic growth and are mainly supported by tourism related activities. Gross value added of this sector as a share of GDP has increased from 1.6 per cent in 1976 to 6.8 per cent in 2016. Tourism earnings have increased from Rs503.00 million in 1983 to Rs55, 867.00 million in 2016.

Figure 4 Mauritius' Real GDP Sectoral Contributions

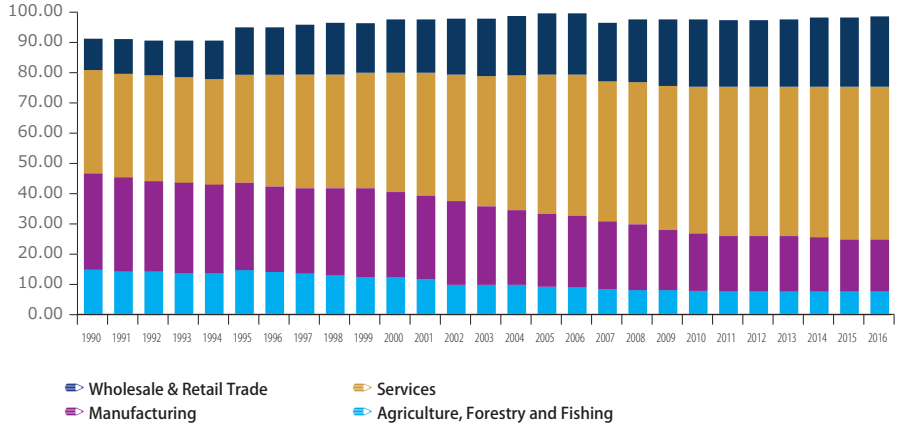


Source: Statistics Mauritius

The unemployment rate declined from 19.7 per cent in 1983 to a single digit figure of 6.0 per cent in 1987 and Mauritius has maintained the unemployment rate at single digit levels ever since. In 2016 it was recorded at 7.3 per cent. The manufacturing sector played an important role in this shift. According to Bank of Mauritius (1987) the manufacturing sector added 13 945, 20 390 and 16 808 new jobs as at end of March in 1985, 1986 and 1987, respectively. Most of these jobs were in the export processing zones and in clothing and apparel, in particular. Employment in the manufacturing sector rose to a peak of 142 400 in 1999 after which it fell steadily from year to year to 98 700 in 2016. This is in line with the decline in the contribution of this sector to Mauritius' GDP as discussed above. Employment in the agricultural sector has also been on the decline in line with this sector's importance in the economy. It fell from 63 200 in 1990 to 41 300 in 2016. Both the sugar cane and non-sugar agricultural activities have been shedding labour. The declines in employment in both the manufacturing and agricultural sector notwithstanding, they remain important contributors to employment in Mauritius.

The improvement in the unemployment rate has over the years been sustained by increasing employment in the services and wholesale and retail trade sectors. Employment in the services sector as a share of total employment has risen from 34.7 per cent in 1995 to 50.6 per cent in 2016. This represents an increase in the number of jobs from 159 900 in 1995 to 287 300 in 2016. Significant increases were recorded in the hotels and restaurants and transport and communications services categories. Employment by the hotels and restaurants rose from 16 800 in 1995 to 40 800 in 2016 while that of the transport and communications increased from 30 000 to 56 000 during the same period.

Figure 5 Mauritius's Sectoral Employment as a Share of Total Employment



Source: Statistics Mauritius

Ulriksen (2012) explains that Mauritius undertook measures to transform from "a mono-crop" economy and create employment through Import Substitution Industrialization (ISI) for catering for the domestic market and establishing export processing zones (EPZ) to produce for foreign markets. Trade preferences also played a significant role in Mauritius' economic transformation. They included the high quota on sugar exports to the European Union (EU) at a guaranteed price that remained above the market price for a considerably long period and the preferential access on exports of textiles and clothing under the Multi-Fiber Agreement (MFA). Zafar (2016)

adds incentives such as low corporate tax rate of 15.0 per cent, double taxation avoidance agreements and liberalized capital account, global competitiveness, and a conducive business climate to the list pointing out that the World Bank's Doing Business 2010 ranks Mauritius as the most attractive country for doing business in Africa. World Bank's Doing Business Report 2018 ranked Mauritius at 25 out of 190 countries covered by the report. Macroeconomic stability, anchored on fiscal prudence, played a significant role in surviving external shocks and crises periods (Zafar, 2016). A relatively well developed financial sector also helped to provide the necessary capital and credit to the private sector (AFDB, 2014). The efficient telecommunication facilities and infrastructural networks have also minimized trading costs for Mauritius (Sobhee, 2009).

Many of these factors have existed and continue to exist in many other developing countries. Nonetheless, those countries have not attained the same high level of success as Mauritius. According to Subramanian and Roy (2001) the "conventional determinants of growth do not fully capture Mauritius's economic performance" between 1960 and 1990. They contend that "strong domestic institutions" have contributed substantially to Mauritius's successful economic transformation. Subramanian and Roy (2001) contend that the "institutions have ensured free and fair elections, the rule of law, a vibrant and independent press, and respect for property rights, all of which have made Mauritius an attractive investment destination". The institutions also ensured consistent pursuit of policies that supported macroeconomic adjustment by "different governments of apparently divergent ideological persuasions" (Subramanian, 2009). According to Frankel (2010), Subramanian and Roy (2001), Subramanian (2009), Svirydzenka and Petri (2014) institutions, in the context of Mauritius's economic success are defined by the following attributes:

- The political majority, mainly Indian community did not nationalize or heavily tax the sugar sector, owned predominantly by the minority French community but instead they guaranteed the property rights of the sugar owners. This contributed to the success of the sugar sector, which facilitated increased domestic investment and establishment of a generous social protection system, particularly with regard to pensions.

- The separation of economic and political power. The economic power was in the

hands of the minority French community and other non-Indian community while the political power lay in the hands of the majority Indian community.

- A parliamentary system that ensures representation by all minority groups whereby members of Parliament elected during regular general elections by the first past the post system are supplemented with eight members who are referred to as 'the best losers' who are appointed by the Electoral Supervisory Commission to ensure that religious and ethnic minorities are equally represented.

- Not having a standing army has created more fiscal space for spending on public services and investment and also freed Mauritius from military coups that have plagued and crippled development in many African countries.

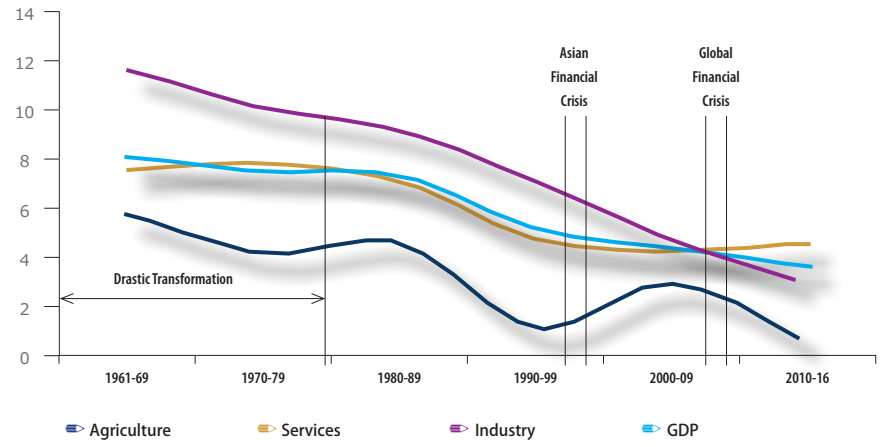
Mauritius suffered a number of external shocks that it survived without major effects. As an oil-importing developing country it was hit by the 1974-80 oil price crisis that led to the rapid increase in its import bill and large current account deficits. To strengthen the economy to deal with such shocks, successful adjustment through devaluation and trade reforms were implemented over three successive governments, displaying the benefits of a stable political system. Mauritius also lost trade preferences including the sugar preferences and the MFA. In response, Mauritius refocused its development agenda more towards the services sector. To this end, measures were undertaken to improve the business climate including introducing the Business Facilitation Act 2006 to eradicate impediments to investment and hiring, granting desired immigrants citizenship and introducing a simplified tax system. It was also hit by the recent global recession.

5.2 Thailand

The economy of Thailand has evolved quite interestingly over the years. It has grown and developed tremendously. From 1960 to 1979, Thailand's economy grew by an annual average of 7.6 per cent. At this time, value added by the agricultural sector increased by 5.0 per cent, the industrial sector by 11.0 per cent and the services sector by 7.6 per cent. From 1987 to 1996

the economy grew by an annual average of above 9.0 per cent with the agriculture sector's growth rate declining to 2.7 per cent while those of the industry and services sectors increased to 12.7 per cent and 8.6 per cent, respectively. Following this period, Thailand's economy was hit by the Asian Financial crisis in 1997 to 1998. From 1999 to 2007, the period before the global financial crisis, Thailand's economy expanded by 5.2 per cent with the agriculture sector recovering slightly to 3.5 per cent while the industry and services deteriorated to 5.9 per cent and 4.9 per cent, respectively.

Figure 6 Thailand's Real GDP Growth by Sectors

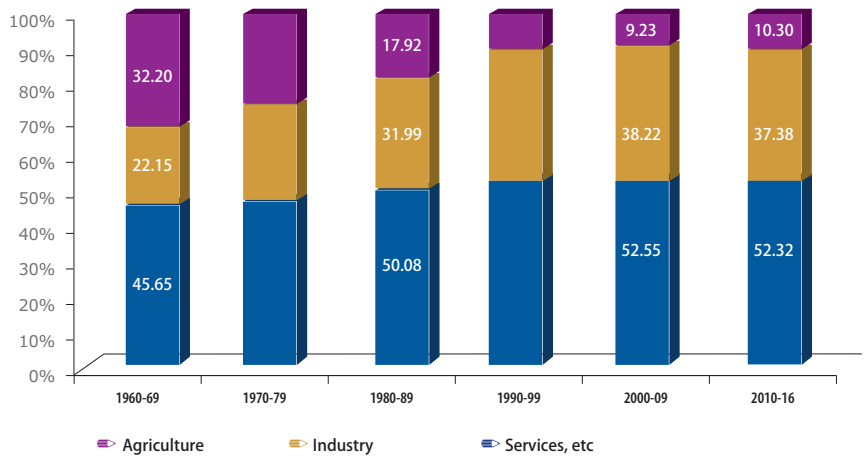


Source: World Development Indicators

The importance of agriculture has declined over the years as the industrial and services sectors grew. In the early 1960 to early 1980s, the agricultural sector was the main driver of the economy, employing around 70.0 per cent of the active working population of Thailand. From the early 1980s to date the agricultural sector has been growing, albeit at a slower pace supported by mechanization and availability of formal credit. Nonetheless, the dependence of Thailand's economy on agriculture, measured by the sector's value added as a percentage of GDP, declined from above 20.0 per cent in 1980 to 10.0 per cent in 2014 and its employment from 60.0 per cent in the beginning of the 1990s to 35.0 per cent in 2014. The industrial

sector, consisting of manufacturing, mining, electricity, water and gas industries has grown from 30.0 per cent of GDP in the early 1980s to above 40.0 per cent of GDP in recent years and its employment from 15.0 per cent in the early 1990s to 22.0 per cent of the labour force in 2014. The industrial sector and the manufacturing sub-sector in particular, has transitioned from dominance of food processing to include more sophisticated products such as petrochemicals, electronics, computers, automobiles, amongst others. The services sector has fallen from above 50.0 per cent of GDP in the early 1980s to around 45.0 per cent of GDP in recent years. However, its employment increased from 25.0 per cent at the beginning of the 1990s to 42.0 per cent in 2014.

Figure 7 Thailand's GDP - Sectoral Contributions

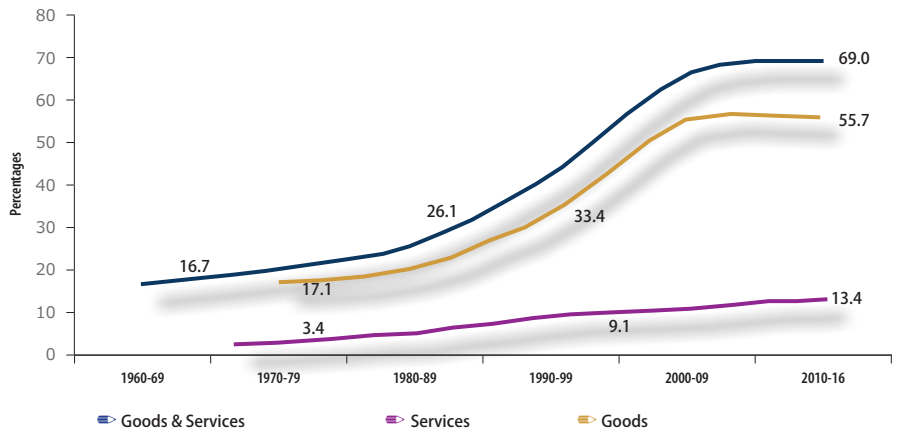


Source: World Development Indicators

The structural transformation has turned Thailand into an export driven economy with its exports of goods and services having risen from just above 20.0 per cent of GDP in the early 1980s to above 60.0 per cent of GDP from 2005. Exports of goods were behind the observed trend in the exports of goods and services. They increased from an annual average of 17.1 per cent of GDP in the period from 1975 to 1979 to 55.7 per cent of GDP from 2010 to 2016. Agro-processing and other unsophisticated consumer goods were the main

drivers of manufacturing exports in the early years of the transformation. They declined over the years as the process of transformation progressed and exports of much higher value-added products, including automobiles, office machines and electronic products increased. Exports of services rose from an annual average of 3.4 per cent from 1975 to 1979 to 13.4 per cent from 2010 to 2016.

Figure 8 Thailand's Exports as a Percentage of GDP



Source: World Development Indicators

Breisinger and Diao (2008) provide an account of Thailand's economic transformation and structural change. The development of the Thai economy is attributable to policies that promoted agricultural growth, ISI and growth of exports of agriculture and manufactured goods. The agricultural sector played a leading role in the crucial two decades of the growth of the Thai economy in the 1960s and 1970s. The development of the agricultural sector had a strong positive impetus on the industrialization process by facilitating agro-processing. The growth of agricultural production was supported by massive public investments in the construction of highways and rural road networks and in irrigation infrastructure. Investment in irrigation absorbed 60.0 per cent of the budget of the ministry responsible for agriculture up to the early 1980s (Breisinger and Diao, 2008) thus leading to a significant increase in irrigated area. In addition, measures were undertaken to improve access to credit by the agricultural sector. These

included provision of credit guarantees for agricultural exports, encouraging commercial banks to increase credit to the agricultural sector to specified benchmarks and capacitating institutions such as the Bank for Agriculture to expand credit to rural producers.

According to Breisinger and Diao (2008) the ISI started in the 1960s supported with policies such as tax concessions, low tariffs on imported intermediate and capital goods and high tariffs on imported competing products. The initial focus was on less sophisticated, more labor-intensive manufacturing dominated by processed food and textiles. The important roles that government played in this initiative included to refrain from direct public investment in manufacturing, providing the necessary infrastructure, particularly in transport and power generation and undertaking reforms to improve ease of doing business. Export promotion was formally commenced in 1963 and pursued concurrently with the ISI strategy. Policies implemented towards its success included exemption from taxes on imported machinery, raw materials and other intermediate products, and a discount on interest rates on loans to exporters. The comparatively stable political and policy environment in Thailand over the 1960 to 1990 period also encouraged growth of private businesses, and created long-term confidence in the country. The conservative monetary and fiscal policies further helped maintain economic stability. Khan (2012) contends that "key macro-economic agencies of the state", particularly the central bank, the National Economic and Social Development Board (NESDB) and the Finance Ministry were relatively insulated from politics, hence were able to shield monetary and exchange rate policy from adverse political influences, initially at least.

The structural transformation has helped Thailand to attain impressive results on employment creation and poverty reduction. The poverty gap at $1.90 a day has declined from 5.0 per cent in 1981 to 1.8 per cent in 1990 and further to zero from 2008 to date. A commendable improvement is observed even at a higher measure of poverty. The share of the population living below the $3.20 a day poverty line fell from 15.5 per cent in 1981 to less than 1.0 per cent from 2007 to date. Thailand's official unemployment rate has been around 1.0 per cent, on average over the past decade, categorizing it among the lowest in the world. The unemployment rate fell perpetually from 2.7 per cent in 1991 to less than 1.0 per cent from 2010 to date. In addition, Thailand reached upper-middle income status in 2011 and is currently the 22nd largest economy in the world (Asian Development Bank, 2015).

This impressive performance has been attained despite a number of challenges encountered along the way. Thailand has seen a number of eras of political instability characterized by military coups and numerous nullifications of existing constitutions followed by promulgation of new ones. The Asian crisis of 1997 and the recent global economic and financial crisis did not leave the Thai economy unscathed. Nonetheless, Thailand was able to weather these storms better than many countries. The prudent macroeconomic management, supported by reputable policy-making institutions, has maintained macroeconomic stability during uncertain political times (IMF, 2017). In addition, Thailand continued to improve its regulatory environment and protection of property rights thus improving its ease of doing business ranking to 26 among 190 economies in 2017 from 46 in 2016.

5.3 Summary of Policy Lessons

- Economic transformation that facilitates attainment of high economic growth rates of above 5.0 per cent are more likely to have a meaningful dent on unemployment and poverty.

- Identification of sectors that have the potential to transform the economy is important.

- Implementation of policies that have a direct impact on and support growth of identified sectors e.g supportive infrastructure, relevantly skilled workforce, tax policies, access to finance, a conducive business and investment environment, amongst others increase chances of success.

- Learning from experience and reviewing the strategy helps to sustain development and the gains made from it. When manufacturing started experiencing challenges policy focus shifted to services in Mauritius.

- Strong and effective domestic institutions are more important because they protect the development process from political disruptions thus ensuring sustained implementation of development policies.

6 CONCLUSION – LESSONS FOR LESOTHO

1. The empirical results of this paper confirm that economic growth should be supplemented with structural economic transformation or economic modernization. The case studies of Thailand and Mauritius also confirm the importance of job creating economic transformation for poverty reduction. These case studies further demonstrate the importance of agriculture in employment generation and in spearheading growth of the manufacturing sector, which has the potential to create a sizeable number of productive jobs. The case studies also demonstrate the significance of the services sector in complementing manufacturing e.g. in provision of credit and in making a direct contribution to growth e.g. through tourism.

2. Effective economic transformation is a result of conscious policy decisions that include:

   a. Identification of economic sectors that have the potential to rapidly and successfully transform the economy.

   b. Identification and implementation of policies that support growth of the identified sectors, such as, supportive infrastructure, relevantly skilled workforce, tax policies, access to finance, a conducive business and investment environment, amongst others.

   c. Protecting/ insulating the formulation and implementation of development policies and the entire macro economy from adverse political influences and disruptions.

3. Recommendation of specific economic policies may prove a futile exercise in the absence of an effective institutional structure to support their implementation.

4. Every country is unique. Countries face different sets of opportunities and challenges. As such it is important to identify country specific gaps and challenges, identify what is most likely to work for a particular country, ensure proper and effective implementation, learn from it and change, improve and refocus the development strategy and its implementation strategy as necessary.

In as far as Lesotho is concerned, the identification of economic sectors is always very much well carried out and documented or has at least improved over the years. The NSDP 2012/13 – 2016/17 identifies the agriculture, manufacturing, tourism and mining sectors as the main sectors for transforming Lesotho's economy. The agricultural sector is the main source of employment in Lesotho, particularly in the rural areas. The manufacturing sector has ample potential to create jobs through export-led growth in labour intensive manufacturing activities. The tourism sector remains highly unexploited despite its high potential. The mining sector is attracting private sector investments and its capacity to boost economic growth is increasing.

Policies that could support growth of the identified sectors have also been outlined. According to the NSDP 2012/13 -2016/17, the potential of the identified sectors would be unleashed through developing the necessary infrastructure, developing relevant skills, improving health, promoting peace and democratic governance and building effective institutions. The importance of these factors for economic transformation and poverty reduction is supported by the literature, empirical results and case studies included in this paper.

However, action in the direction of laying these foundations down has been lacking. According to the Report on the Review of the NSDP (2017), this is seen in a number of areas. First is the deterioration in infrastructure including road networks, energy generation and water due to backlog of maintenance, amongst other factors. The government budget speech 2018/19 also points out that the maintenance backlog is a result of lack of a clear infrastructure maintenance plan. Infrastructure development is also hampered by low absorptive capacity of the public capital budget as pointed out in a number of government budget speeches. Nothing new has been done in as far as strengthening institutions, if things have not worsened due to the fragmentation of some government ministries, which have been sub-divided into more ministries, which has possibly weakened policy coordination hence effectiveness of government. HIV and AIDS remain a serious problem and the public health sector is plagued by numerous challenges including lack of medicines so that patients are sometimes issued medical prescriptions to buy from private pharmacies, a serious challenge for the poor.

The authorities in Lesotho are aware that economic transformation is the answer for attaining rapid economic growth that has the ability to create poverty reducing employment. They are

aware of the sectors that can drive Lesotho in that direction as well as the policies that could support growth of those sectors. The question that remains to be answered is "what inhibits implementation?". Some ascribe sluggish implementation to factors such as lack of coordination between the work of different government agencies and ministries and the need for them to catalyze investment and employment generation, lack of or low political will, not taking lessons from past successes and failures, lack of an effective implementation plan, lack of monitoring and evaluation, lack of clear assignment of roles, political instability and frequent changes in government e.t.c. These may be remedied through two actions. Firstly, is the development of effective institutions. Secondly is the insulation of the development policies and their implementation as well as the whole economy from adverse political influences. Without these two, formulation of any microeconomic and/or macroeconomic policies might prove to be a futile exercise as we have learned from past experience.

Developing effective institutions and insulating the development process from adverse political influences: What could it mean and how could it be achieved in the context of Lesotho?

- The national law should provide for approval of the national development strategies and their implementation plans by Parliament and for implementing Government Ministries and agencies to account to Parliament on progress on implementation of development strategies.

- There should be a requirement in the national law for every incoming Government to align its policies to the prevailing national development strategy and to officially publicly communicate their policies towards attainment of the national development strategy and their implementation plans and to periodically, officially report to the public and Parliament on progress.

- Empowering and strengthening strategic institutions such as the Judiciary to ensure protection of property rights, the public service to ensure effective provision of public goods, the national executive to honestly and earnestly play their role in the execution of the national development agenda, the Parliament to hold the executive, government ministries and agencies accountable and the nation to hold government accountable.

- Affording all strategic institutions/bodies a reasonably high level of independence to shield them from short-term political influences in pursuing their mandate. All human resources positions in such institutions should be filled with individuals selected on merit through a transparent selection process.

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APPENDIX

Table A 1 Lesotho's Sectoral Growth Rates (10-Year Moving Averages)

	2010	2011	2012	2013	2014	2015	2016+
Agriculture, forestry and fishing	-0.46	0.52	-0.97	3.57	2.77	2.20	1.99
Mining and quarrying	59.62	58.06	56.83	52.83	33.54	28.35	9.69
Manufacturing	9.91	7.65	4.24	0.74	-1.26	0.06	1.77
of which Textiles, clothing, footwear and leather	11.54	8.77	4.41	0.19	-2.53	-0.74	1.27
Electricity and water	1.18	0.87	0.69	0.51	1.08	1.05	0.18
Construction	2.18	-0.43	3.80	4.80	4.91	7.08	7.06
Wholesale and retail trade; motor vehicles repairs	3.82	4.85	5.72	6.48	6.02	7.06	6.82
Transportation and storage	3.93	4.25	4.66	4.88	4.50	5.00	4.60
Accommodation and food service activities	3.03	2.46	3.39	3.86	3.13	1.19	1.51
Information and communication	13.39	14.20	13.10	12.87	14.75	14.83	14.50
Financial and insurance activities	10.88	9.64	10.66	12.43	12.39	10.90	10.85
Real estate activities	1.25	1.26	1.39	1.31	1.30	1.31	1.28
Public administration and defense	5.97	5.98	5.99	4.64	4.16	4.53	4.67
Education	3.07	2.47	2.19	2.07	2.41	2.56	2.55
Human health and social work activities	1.43	5.24	7.43	8.12	9.71	10.71	11.67
GDP at market prices	**3.94**	**4.18**	**4.36**	**4.42**	**4.16**	**4.51**	**4.50**

Source Author's Calculations

Table A 2 Data Description

Variable	Description	Year	Source
Multi-Dimensional Poverty Index (MDPI)	The Multidimensional Poverty Index (MPI) identifies multiple deprivations at the household level in education, health and standard of living. It uses micro data from household surveys to measure the proportion of people below a threshold level in these basic dimensions of human development.	2005 - 2015	Human Development Report 2016
Democracy (DEMOC)	A democracy is a political system with institutions that allow citizens to express their political preferences about alternative policies and leaders, has constraints on the power of the executive, and a guarantee of civil liberties. The Democracy indicator is an additive eleven-point scale (0-10).	2015	Polity IV (2016)
Government Effectiveness (GEFF)	Government effectiveness captures perceptions of the quality of public services, the quality of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government's commitment to such policies.	2015	World Governance Indicators 2017
HIV Prevalence (HIV)	Prevalence of HIV refers to the percentage of people aged 15-49 who are infected with HIV.	2015	World Development Indicators 2017
Unemployment Rate (UNEMPR)	It is the number of unemployed persons expressed as a percentage of the total number of persons in the labour force.	2015	ILOSTAT May 2017
GDP per Capita (GDP)	GDP per capita, PPP (constant 2011 international $) GDP per capita based on purchasing power parity (PPP). It is converted to international dollars using purchasing power parity rates. An international dollar has the same purchasing power over GDP as the U.S. dollar has in the United States.	2015	World Development Indicators 2017
Modernization (MODERN)	Percentage of employed workforce working in other sectors other than the agricultural sector.	2015	ILOSTAT May 2017

Table A 3 Heteroskedasticity Robust Empirical Results

Variables	Model 1	Model 2	Model 3
Democ	0.02	0.04	0.02
	[0.54]	[1.12]	[0.70]
Geff	-0.68	-1.312	-0.693
	[-1.75]*	[-4.59]***	[-1.82]*
Log(hiv)	0.26	0.332	0.253
	[3.11]***	[4.17]***	[2.97]***
Log(unempr)	-0.09	0.02	-0.019
	[-0.64]	[0.10]	[-0.12]
Log(GDP)	-0.99		-0.765
	[-4.55]***		[3.59]***
Log(modern)		-1.42	-0.659
		[-3.45]***	[-1.71]*
Constant	5.38	1.98	5.907
	[2.86]***	[1.32]	[3.00]***
Number of Observations	78	79	78
Adjusted R-squared	0.63	0.60	0.64
F-statistics	34.15***	27.50***	27.60***

NOTE: *Dependent variable is the Multi – Dimensional Poverty Index. ***, ** and * denote 1%, 5% and 10% level of significance, respectively. Values in square brackets are t-statistics.*

Estimating and evaluating measures of core inflation in Lesotho

Realeboha Khamali

1 INTRODUCTION

ONE OF THE most important economic variables is the inflation rate, which is the rate at which general prices in the economy change. The inflation rate affects the overall economy through several channels (du Plessis, du Rant and Kotze, 2015). For example, high and unstable inflation rates create uncertainty about the course of future inflation, clouding consumers' saving and businesses' investment decisions. The second, but not the last, channel through which inflation affects the economy is the redistribution of wealth such as capital gains/losses between creditors and borrowers (Pedersen and Wagener, 2000). Therefore, in order to curb the negative impact of inflation rate, most governments around the globe have mandated their central banks to achieve and maintain price stability.

Given the costs of inflation on the economy, the need for the proper measure of inflationary pressures in the economy is key for policymakers in order for them to achieve price stability. In this endeavour, most central banks monitor and analyse developments in the Consumer Price Index (CPI), even though there are other measures such as the GDP deflator and Personal Consumer Expenditure (PCE), which is mostly used in the United States (US). This is because CPI is easily understandable by the public and mostly produced on a higher frequency relative to other measures of general prices.

Nonetheless, while there are advantages in using the CPI as a measure upon which monetary policy can be based, it contains information that is too noisy for policy and forecasting purposes, thus making it a doubtful policy target, especially for monetary policy. This is because CPI contains information on transient developments in prices such as a shock of bad weather conditions, which may raise prices of items like maize meal. The price of maize meal may be short-lived and if monetary policy is used to react to such developments, it can be distortionary on the overall economy (du Plessis *et.al,* 2015).

For CPI to be used as policy target that captures the medium to long term changes in prices, economists and policymakers have tried to separate the transitory movements from CPI, to get the underlying trends and this has led to the concept of core inflation. According to Nessen and Soderstrom (2001), core inflation captures the price changes mostly relevant for monetary policy. This is because changes to policy have long lasting effects and policy effects come out but with a lag. In this regard, several measures of core inflation are developed that are used to gauge the underlying trend in inflation.

This note outlines the concept of core inflation as widely used in the inflation dynamics literature. It provides literature review on the measures of core inflation. The third section presents the CPI data set for Lesotho's measure of inflation and some descriptive statistics, while estimation results for core inflation measures are presented in the fourth section. The fifth section evaluates the measures of core inflation using the criteria often applied in literature and the last section is the conclusion and recommendations.

2 LITERATURE REVIEW

Despite the prevalent uses of core inflation measures for monetary policy and inflation forecasting purposes, the concept of core inflation in itself is not clearly defined according to Bryan and Cecchetti (1994). Roger (1998) argues that this is because core inflation is better explained or defined by the method used to derive it but he contends that the general concept revolves around measuring the persistent or underlying trends in inflation. Figueiredo (2001) points out that these trends are generally related to the demand pressures in the economy and some long lasting shocks over the economy's productive capacity, which leave out the transient shocks that may self-correct without policy intervention in the short-run and some supply-side shocks.

According to Bryan and Cecchetti (1994) some earlier attempts to define core inflation dates as far back as the early 1970s and 1980s, when oil prices rose substantially. Gordon (1975) excluded food and energy in his estimation of the core price equation while assessing the

importance of the demand and supply factors of the US inflation. At the beginning of the decade that followed Gordon's work, Otto Eckstein (1981) defined core inflation in terms of the "trend rate of increases of the prices of the aggregate supply" in his seminal work on the development of core inflation. The concept further received other definitions such as "that inflation rate which has no medium to long term effect on real output" by Quah and Vahey (1995). Other authors such as and Lafleche and Armour (2006) defined core inflation as the "underlying trend or movement" in the general price level, using CPI as the measure of the price level. In all of these definitions, the concept of core inflation is that which captures the underlying trends of the general prices in the economy.

Like the concept itself, the measures for calculating core inflation also vary depending on the purposes for which they are constructed and the distribution of the price level on which they are based. All measures of deriving core inflation broadly revolve around the statistical and model-based approaches (Mallick and Sethi, 2014). While the statistical or reduced-form techniques exploit the statistical properties of prices such as using means, median, standard deviations, among others and the disaggregated price data, the model-based method is grounded in economic theory (Gupta and Saxegaard, 2009). In the case of the model-based approach, an econometric model is formulated in which core inflation is linked to its fundamental economic determinants such as the current level of output. The most popularly known technique under the model-based approach is the Vector Autoregressive (VAR) technique popularised by Bryan and Cecchetti (1994).

The statistical approach to measuring core inflation consists of techniques that are broadly defined into three main groups, namely, the exclusion-based methods, the limited influence estimators (LIE) as well as weighted variance and persistence-weighted methods (Chamberlin, 2009). The approach strips the overall headline inflation of those items deemed most volatile and mostly driven by supply-side disturbances such as some food and energy items, which normally exhibit large price changes. The second set of items that are usually excluded from the headline inflation to obtain core are those price series[1], which are not shaped by market mechanism but are controlled by some regulatory authority such as water and electricity in

[1] These price series are referred to as the administered prices.

the case of Lesotho. According Alvarez and Matea (1999) the following formula is used in calculating core inflation indicator:

$$CCIP = \frac{\sum_{i=1} w_i * p_i - \sum_{j \neq i} w_j^{excl} * p_j^{excl}}{\sum_{i=1}^{n} w_i - \sum_{j \neq i}^{m} w_j^{excl}} \qquad (1)$$

The first part in the numerator is the sum of the weighted price indices of items in the overall CPI basket, while the second one in the numerator is that of the excluded items. In the denominator, the sum of the weights of the excluded items is subtracted from the sum of the weights of all items in the overall CPI. $\boldsymbol{i}$ and $\boldsymbol{j}$ are the goods and services included and excluded from the overall CPI basket, where $\boldsymbol{n}$ and $\boldsymbol{m}$ are the number of goods and services included and excluded from the overall CPI basket, respectively.

Some drawbacks of the exclusion-based methods include: 1) excluding a set of pre-determined price series whose volatility may change over time thus leading to erroneous calculation of core inflation, 2); removing food or energy items, for example, whose weights take a lion's share in the representative consumption basket of a particular country. For example, food items take over a third of the total CPI basket in Lesotho while in other countries it takes over 50.0 per cent. Removing such items that have bigger weights may lead to a useless indicator.

To overcome the weaknesses of the exclusion-based methods as explained above, some authors introduced the LIE. This approach strips the headline inflation of the outlying portions of the price change distribution of the measure of inflation (Gupta and Saxegaard, 2009). That is, it trims the lowest and highest price changes in the distribution on basis that they convey little information on the underlying trend of inflation relative to the centre of the distribution (Bryan and Cecchetti, 1993). Every time when the measures are calculated, the new set of items are removed which may have not been removed in the past. This feature overcomes the fixed criteria used for exclusion-based methods. The LIE includes the weighted median CPI and trimmed means.

According to Mankikar and Paisley (2004) and Silver (2007), the trimmed mean is derived by cutting off a specified upper and lower tails of the price distribution. This is based on a

determined percentage cut off when prices are ordered in either ascending or descending order as well as the cumulative weights. For example, a 30.0 per cent trimmed mean estimate excludes the 15.0 per cent of weight at the top of the distribution and another at the bottom, if the price distribution is normal. However, in the case of non-normal distribution the percentage cut-offs both at the upper and lower ends are not similar. This may be caused by high skewness or kurtosis. In this case, the asymmetric trimmed mean is calculated, where say, 25.0 per cent of the cumulative weight is cut at the top and 10.0 per cent at the bottom. Then rest of the remaining weights are then normalized so that they add up to 1.

According to Vega and Wynne (2001), the trimmed mean is calculated by sorting the data on price change in a descending or ascending order with their respective weights. Then, the cumulative weight is defined from 1 to i as W_i. Formally, it is defined as shown below (Berkmen, 2002):

$$W_i = \sum_{j=1}^{i} W_j$$

The set of observations to be averaged to calculate the trimmed mean is determined as

$\frac{\alpha}{100} < W_i < \frac{1-\alpha}{100}$ and called as I_α.

The trimmed mean is calculated as below according to Bryan, Cecchetti and Wiggins (1997),

$$\bar{X}_\alpha = \frac{1}{1-2\frac{\alpha}{100}} \sum_{i=1}^{I_\alpha} w_i x_i \qquad (2)$$

Where $\bar{X}\alpha$ is the sample mean (The trimmed mean estimator), w_i and x_i are vector of weights and price changes, respectively. The percentage to be trimmed in the case of symmetric trimmed mean approach is α at both the lower and upped ends. For asymmetric trimmed mean, $\alpha = [\alpha_1, \alpha_2]$.

Nonetheless, the most pressing issue with this method is to decide the level of cut-off since statistical and economic theory does not provide any guidance on the optimal level of the

percentage to be trimmed. If the distribution of prices is not normal, or they are skewed, then the mean may not be the best indicator and sometimes, the weighted median approach is used in such cases (Aghajanyan, 2005).

The weighted median is an extreme case of the trimmed mean. It represents the growth rate of the price of the component that is situated in the middle of the increasingly ordered distribution. For the weighted median, half of the weighted monthly increases are above the weighted median and half are below. Then, the median is calculated according to the previous procedure, except that it is the first price change whose cumulative weight is greater or equal to 50 per cent. Alternatively, Taillon (1999) and ALEEM (2004) suggests using the following formula to calculate the weighted mean estimator;

Let WMI represent the weighted median inflation, then

$$WMI = \frac{\pi_1(50\% - cw_1) + \pi_2(cw_2 - 50\%)}{cw_2 - cw_1}, \tag{3}$$

where cw_1 is the cumulative weight of the first value in the median and cw_2 is for the second value. Likewise, π_1 is the percentage change in the price of the first item in the median value whereas π_2 is for the second one.

All of the above methods of calculating core inflation exclude items that are selected according to a certain criterion, mostly the large price changes or those with high volatility. Chamberlin (2009) argues that this feature can be refined by including all of the price changes but down-weighting those items that are highly volatile[2] or less persistent. In the case of most volatile items, the weight of an item is calculated as the ratio of the inverse of the respective volatility over the sum of the inverses of all the items. The weight of item i is formally defined as below.

Let w_1 be defined as the weight of item i, then according to Dow (1994)

[2] Volatility an item is measured by the standard deviation of that item over the entire period or in the past 5 years.

$$w_i^{DW} = \frac{1/\sigma_i}{\sum_{i=1}^{n} 1/\sigma_i}$$

where n is the number of items under consideration, σ_i represents the standard deviation (volatility) of item i. Thus the measure of core inflation, π_1^{core}, is then calculated according to the following estimator:

$$\pi_t^{core} = \sum_{i=1}^{n} w_{i,t}^{DW} x_{i,t} \tag{4}$$

where $x_{i,t}$ is a vector of price changes (inflation rates) of the components of the overall CPI.

Another method, which downplays the importance of each item in the calculation of the core inflation, is the persistence-weighting approach (Chamberlin, 2009). This method derives its existence from Blinder's definition of what core inflation is. Blinder (1997) defines core inflation as that part of actual inflation, which only includes the permanent or persistent price movements that are likely to carry information for future inflation, when the transitory price changes have been removed or reversed (Cutler, 2001). The persistence-weighted approach as suggested by Cutler (2001) re-weights the price movements in monthly inflation rate by using the coefficients from the following first order autoregressive, AR (1) model:

$$\pi_{it} = \alpha_i + \beta_i \pi_{i,t-1} + \varepsilon_{it} \tag{5}$$

where π_{it} is the price change for item i at a particular time t, and β_i is the coefficient of the measure of persistence in item i's past annual inflation rate. The estimate of persistence is then used as a weight of the respective item in the aggregate inflation rate to calculate the underlying trend. The weight of an item in the aggregate inflation is derived formally as follows:

Let w_i represent the weight of component i in the aggregate inflation, that is defined as:

$$w_i = \frac{\beta_i}{\sum_{i=1}^{n} \beta_i}$$

Where $i \in [1, n]$ for n items that make up the aggregate inflation when the less persistent items are removed. If β_i is negative, it means that the respective component's past price changes are quickly reversed, hence not persistent and it is therefore assigned a zero weight. In the case of positive persistence coefficient, the weight of an item is equal to the size of the coefficient estimated, with the sum of all positive coefficients normalized to 1.

Finally, yet not least and last, is the measure of core inflation that uses structural modelling techniques. As mentioned earlier, the model-based approaches to measuring core inflation are based on economic theory. In this case, core inflation is defined as that part of aggregate inflation that does not have an impact on medium-to long-run real output (Quay and Vahey, 1995). The core inflation under this approach is derived using its fundamental economic determinants, for example, output by the use of the structural vector autoregressive (SVAR) model. Where monthly output measures such as GDP are not available, output proxies such as industrial production or manufacturing output are used.

In order to estimate the SVAR model, core inflation is assumed to be influenced by two types of shocks (Goyal and Pujari, 2005), namely the demand (core) and supply (non-core) shocks that are uncorrelated. They argue that one type has only transitory impact on real output while the other one has unrestricted impact on headline inflation and output but does not affect the underlying inflation. Then the underlying inflation that corresponds to the second type of disturbance is calculated.

However, Quah and Vahey (1995) point out that there may be more than two types of disturbances that may affect inflation and output. Nonetheless, the concept of core inflation that is being considered makes an assumption of only two types of uncorrelated disturbances as part of restriction in the SVAR approach.

3 DATA

In this paper, price indices that are used to construct core inflation measures are expressed in terms of the Consumer Price Index (CPI). The primary source of the CPI data is Bureau of Statistics, Lesotho. The CPI data is used at the most disaggregated level of 182 items over a period from March 2010 to December 2017 (105 months) and the inflation rate is calculated as the year-on-year change in CPI, consequently termed 12-month inflation rate or (annual inflation rate). The year-on-year change in CPI is used because it smooths seasonal fluctuations in data relative to month-on-month changes in prices' indices. The annual inflation rate for a given month is calculated as follows:

$$\pi_t = 100 * \frac{CPI_t}{CPI_{t-k}} - 100 \qquad (6)$$

Where CPI is the measure of consumer price index and t is the current time period while k stands for the time interval between the current period and the previous one. For example, the month-on-month change in CPI (monthly inflation rate) corresponds to $k = 1$ while for the 12-month inflation rate, k becomes 12. While most measures of the underlying inflation rate are calculated using the most disaggregated CPI data, some measures such as the persistence-weighted core inflation can also be constructed much more easily if the series is aggregated at a lesser level. This is because estimating the AR (1) model may involve many equations, which may be tedious to work with. All the exclusion-based measures and the LIEs are constructed based on disaggregated CPI.

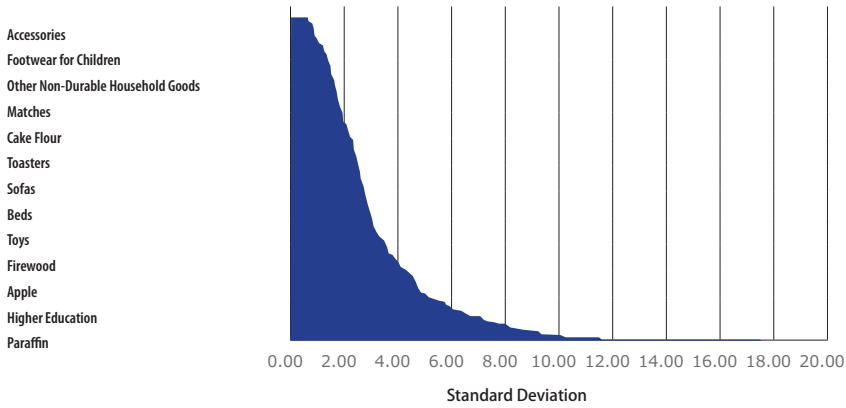
4 ESTIMATION RESULTS

This section presents the estimation results of the core measures of inflation as discussed in the literature above, except for the volatility-weighting, persistence-weighting, median CPI inflation and SVAR model. For SVAR, the analysis is limited because it requires a measure of output on a much higher frequency (monthly) and currently there is no such measure.

4.1 The Exclusion-based Approach

As discussed above, the first measure of core inflation that is estimated is the exclusion of the most volatile components from the overall CPI. The volatility of an item is measured by its historical standard deviation over the whole sample period. The cut-off value of the standard deviation is set at four, in which case any item whose corresponding standard deviation exceeds the cut-off point is eliminated in deriving the core estimate of inflation. The cut-off point of four has been chosen after examining the nature of the distribution of the CPI items' standard deviations as show in figure 1 below.

Figure 1 Distribution of CPI items by their volatility

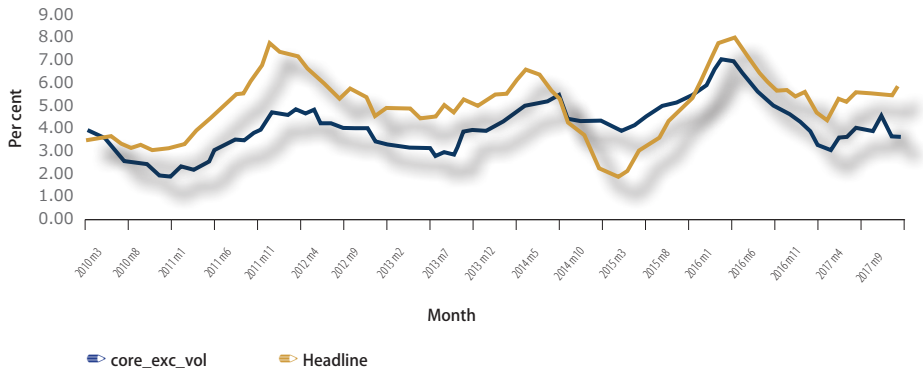


Source: Authors calculations and BOS

Figure1 above exhibits the standard deviations of the 182 CPI items from March 2010 to December 2017. Any item for which standard deviation is above four is taken as highly volatile and it is a candidate for exclusion in calculating core inflation. The results show that about 24.0 per cent of the respective items have standard deviation values of greater than four each, and hence they are candidates for exclusion. Each of these items is at least three times as volatile as the overall inflation rate. The standard deviation value of the headline

inflation rate is 1.4 per cent. Most food and energy items have high standard deviations and are thus excluded to derive the core inflation indicator as shown in figure 2 below.

Figure 2 Time path of headline inflation versus core-excluding volatile items



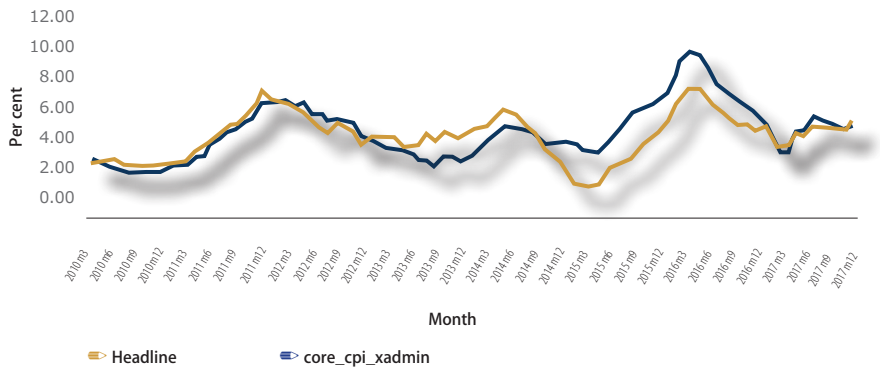
Source: Authors calculations and BOS

Core inflation excluding the most volatile items was calculated and the results are shown in figure 2 above. While the average headline inflation rate was 5.0 per cent during the review period, the core estimate was 4.0 per cent, but the volatility of the former was almost twice the latter. The standard deviation of the headline inflation during the sample period was 1.4 per cent while that of the core inflation rate was 0.74 per cent. The core inflation rate has been below the headline for a large part of the sample period except for the period between October 2014 and January 2016. The five quarters from October 2015, marked the period of declining food and fuel prices, especially oil prices at the international, and hence Lesotho's domestic front.

Figure 3 below shows the estimated core inflation, which excludes the administered prices plotted against the headline inflation rate. The administered group of prices are not determined by markets forces but are controlled by the government or designated authority, and they vary from country to country. In Lesotho, the items in this category

include energy and water prices, education and health, public and personal transport, telecommunications and social protection, among others. Some regulatory organs in the country include Lesotho Energy and Water Authority for water and electricity, and Lesotho Communications Authority for the telecommunications sector.

Figure 3 Headline inflation versus Core-excluding administered prices



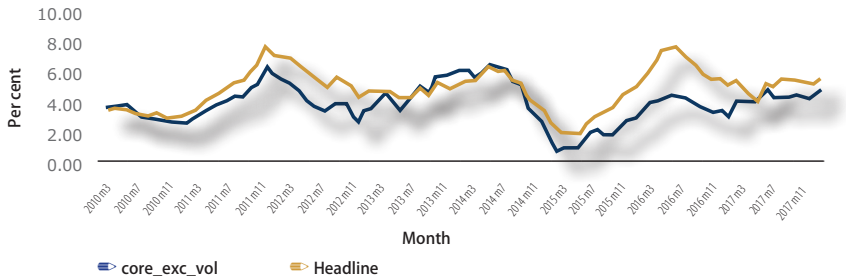
Source: Authors calculations and BOS

The figure above shows that from March 2010 until the second half of 2013, the core inflation rate excluding the administered component moved very closely with the headline inflation rate. Nonetheless, the subsequent months until the end of the sample period saw the gap between the two rates widening though at a smaller pace. Just like the exclusion of the most volatile items, the core excluding the administered prices is less volatile than the headline inflation with the standard deviations of 1.07 per cent for the former and 1.40 per cent for the latter. While the headline inflation rate was at a trough of 2.0 per cent in March 2015, the corresponding core inflation rate was twice as much. In March 2016, the latter peaked at 10.0 per cent, 2.0 percentage points higher than the headline inflation rate.

Figure 4 displays the time paths of the headline inflation rate against the core measure estimated by excluding food component only. Clark (2001) argues that food prices are excluded when estimating the core indicator because they are commonly regarded as being prone to changes that often fail to persist. Food prices are also subject to supply

disruptions such as drought. In the overall CPI basket, food component takes 36.1 per cent. According to figure 4 below the two series display similar trends with the core inflation rate below the headline series over the entire sample period, but the gap widens between June 2016 and March 2017. During the sample period, the headline inflation rate averaged 5.0 per cent while the corresponding core measure averaged 4.0 per cent. The standard deviation of the headline inflation rate was 1.4 per cent while the respective core indicator was 1.1 per cent, indicating that the former is more volatile than the latter.

Figure 4 Headline versus core-excluding food

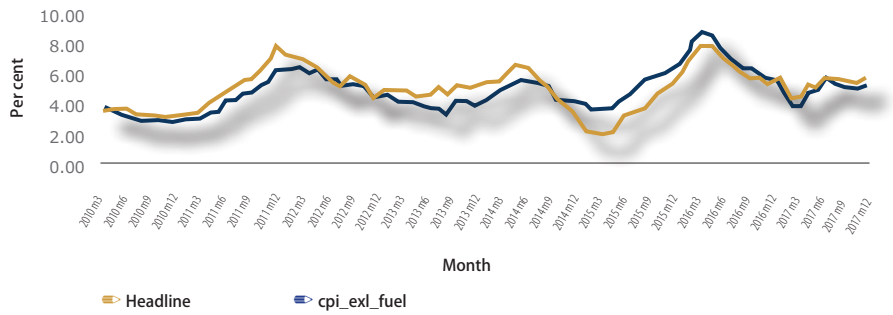


Source: Authors calculations and BOS

The food component commands a larger share of the CPI basket in Lesotho like in many other countries such Bangladesh and Swaziland, among others. Therefore, excluding the whole of this category has some drawbacks. One of the disadvantages of excluding the whole of the food component is that this may lead to ignoring the price signal that may be very important for the underlying measure of inflation in the economy.

Figure 5 below plots the historical path of the headline inflation against that of the core inflation, which excludes energy prices. Energy prices in Lesotho include electricity, gas, water, fuels (solid and liquid), among others and constitute a share of 7.9 per cent in the overall CPI. The chart shows the close movement of headline and core inflation. On average, the headline and core inflation rates recorded averages of 5.0 per cent and 4.9 per cent during the entire sample period while their respective volatilities are 1.40 per cent and 1.35 per cent.

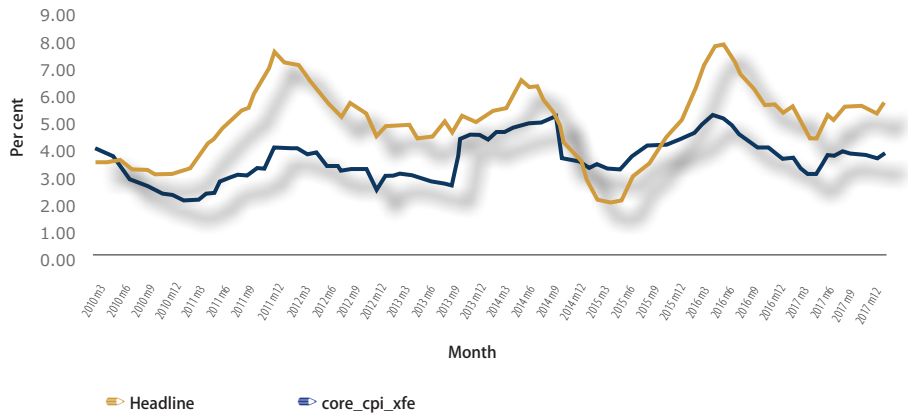
Figure 5 Headline inflation versus Core-excluding administered prices



Source: Authors calculations and BOS

Graph 6 below presents the historical path of the headline inflation rate against the measure of core inflation, which excludes the energy and food components in its calculation. The total weight for excluded food and energy items constitutes 42.8 per cent. During the sample period, the headline inflation rate was higher than the core indicator by 1.35 percentage points, and its volatility was almost twice that of the core indicator. The core measure has trended below the headline inflation rate during the sample period but they exhibited almost similar trends.

Figure 6 The headline inflation rate and CPI-excluding energy and food prices

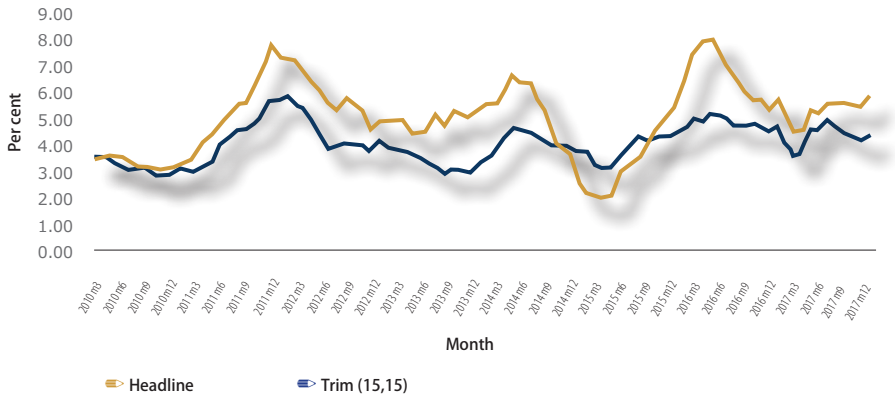


Source: Authors calculations and BOS

4.2 Limited Influence Estimator

The results for the estimated symmetric trimmed mean as a measure of core inflation are shown in figure 7 below. The trimmed mean measure as calculated in this paper constitutes removing 30 per cent of the distribution of price changes symmetrically. This means that 15.0 per cent is cut from the bottom of price changes distribution and the other 15.0 per cent at the top of the distribution.

Figure 7 Headline versus symmetric trimmed mean inflation



Source: Author's calculation using data from BOS

In figure 7 above, the core inflation rate (the 30 % -trimmed mean) is plotted against the headline rate. As with other measures of core inflation, the trimmed mean has been below the headline over the entire sample period with the latter averaging 5.0 per cent relative to 4.0 per cent for the former, except for the period starting from December 2014 to September 2015. The trimmed mean indicator has been less volatile than the headline inflation rate during the sample period but they showed similar trends.

5 EVALUATION OF MEASURES OF CORE INFLATION

This section evaluates the relative performance of various measures of core inflation calculated in the preceding section against a given set of criteria. Clark (2001) points out that there are many criteria used in evaluating measures of core inflation. Among others, Lafleche & Armour (2006) and Silver (2007) use timelines and credibility, ability to track trend inflation and ability of core inflation to predict future headline inflation. Nonetheless, Bicchal, Sharma & Kamauah (2010) argue that just like the definition of core inflation and

frameworks in calculating core inflation, there is no consensus regarding the best evaluation criterion. Clark (2001) argues that the commonly used criteria are the ability to track trend inflation and the ability of a given core indicator to predict future overall inflation.

5.1 Ability to Track Trend[4] Inflation

According to this criterion, a good core inflation indicator should neither overstate nor understate the long run growth of the overall CPI (Rich & Steindel, 2007). This means that in the long run, the means of the two series should be equal. Another way of assessing whether core inflation tracks the trend inflation is by examining the volatility of the deviation between the two series or by minimising it. If the former tracks the latter accurately, either the standard deviation of their respective deviation will be relatively smaller or root mean squared error (RMSE) will be (Clark, 2001) and Rich & Steindel (2007). This means that any change (rise or fall) in trend inflation should be matched by a commensurate change in core inflation indicators.

Table 1 Summary statistics for Headline inflation rate and core measures

Inflation measure	Average rate	Volatility	Volatility around trend	Coefficient of Variation
Overall CPI	5.01	1.40	1.18	0.28
CPI excluding food	4.02	1.31	1.26	0.33
CPI excluding energy	4.86	1.35	1.16	0.28
CPI excluding food & energy	3.66	0.80	0.85	0.22
CPI excluding administered prices	5.29	1.70	1.48	0.31
CPI excluding most volatile	4.06	1.08	1.02	0.26
CPI excluding administered prices	5.29	1.70	1.48	0.31

Notes: The coefficient of variation is the standard deviation divided by the mean.
All figures in table 1 are expressed in percentages.

Source: Author's calculations and BOS

[3] Trend inflation in this case is measured by the use of Hodrick-Prescott filter using the lambda value of 14,440 for monthly data.

Table 1 above depicts the averages and volatilities of the headline inflation rate and a series of core inflation indicators for the entire sample period. According to the table, the following core inflation indicators have long run means lower than the headline inflation and the difference between the respective indicators and headline inflation means are all statistically significant[4] at all levels (1%, 5% and 10%); CPI excluding the most volatile items, food and energy, food only and the 30%-Trimmed mean. This means that there is a downward bias for all the four core inflation indicators. The CPI excluding only energy also has a downward bias in its mean relative to the overall inflation and but the difference between the two series is not statistically significant at any level less than 8.9 per cent.

Finally, yet importantly, the difference between means of the CPI excluding the administered prices only and the headline inflation is statistically significant at 5% and 10% levels only but not at 1% level. For this core inflation indicator there is, however, an upward bias. Under this criterion of equal means, no core inflation indicators exactly match the headline inflation rate's mean. This means that all candidates are biased estimators of the overall CPI inflation. Nonetheless, CPI excluding fuel tracks the underlying inflation with no bias but only at 1% and 5% significance levels, while CPI excluding administered prices becomes an unbiased estimate only at 1% significance level.

According to (Clark, 2001), the accuracy with which core inflation tracks trend inflation is measured by the volatility around the trend (standard deviation of the difference between the respective series) or the RMSE of the difference between core indicator and trend inflation (Rich and Steindel, 2007:25). The respective RMSE is calculated as follows:

$$RMSE(\pi^{trend} - \pi^{core}) = \sqrt{\frac{1}{T}\sum_{t=1}^{T}(\pi^{trend} - \pi^{core})^2} \quad for\ t = 1....T \tag{7}$$

Where π^{trend} is the trend inflation at time t and π^{core} is core indicator of inflation at time t.

[4] This is done by using t-tests of equal means, with the Null Hypothesis $\mu^{headline} = \mu^{core}$, assuming equal variance.

By this criterion, trimmed mean performs better than the rest of the five measures. Its volatility around the trend and the respective RMSE (Table 2 below) are the smallest among the rest of the core inflation measures. The CPI excluding food and energy follows in the second top most of the list and the CPI excluding the most volatile items is the third top most performer. This means that they efficiently capture the persistent movements in the headline inflation relative to alternative measures.

Table 2 The Root Mean Squared Errors (per cent)

Core	Root Mean Squared Error (RMSE)
CPI excluding most volatile	1.390
CPI excluding energy	1.163
CPI excluding food and energy	1.592
CPI excluding food	1.597
CPI excluding administered prices	1.504
30%-Trimmed mean	1.157

Source: Author's calculations and BOS

5.2 Predictive Ability

The good performance of the core inflation indicator can also be assessed by its ability to predict future headline inflation. In evaluating the predictive ability of core indicator, the following benchmark model has been used in the literature by Johnson (1999) and Clark (2001), among others.

$$\pi_{t+k} - \pi_t = \alpha + \beta(\pi_t^{core} - \pi_t) + \varepsilon_t \qquad (8)$$

Where π_t represents the headline CPI inflation and π_t^{core} is the measure of the core inflation at time. The parameter k measures the number of periods in the future for the overall CPI inflation, for example, k = 1, 3, 6 and 12 months ahead. The equation generally measures how much of the current gap between core and headline inflation is able to predict the change of inflation over the next period, for example, over the next month or three months.

The benchmark model should satisfy the following restrictions, $\alpha = 0$ and $\beta = 1$ if core inflation is to an unbiased predicator of future headline inflation. If the first restriction fails to hold, then there is a systematic bias in the core inflation indicator. The latter restriction captures the extent to which the core indicator understates or overstates the transitory movement in headline inflation. If $\beta < 1$, then core inflation understates the future headline inflation and the specific shock that might have hit the headline inflation will be reversed in the future. In this case, headline inflation should therefore be expected to fall.

According to Lafleche and Armour (2006), the ability of the deviation of headline inflation from core inflation to predict the future headline inflation is measured by the relative size of the R^2. After estimating equation (8) above for all core indicators, the estimated R^2 for every measure of core inflation is compared to those of others and the regression that portrays relatively high R^2 means that the relevant core indicator performs better than its counterparts and has relatively good predictive content. The size of β in the above equation is positively related to the measure of predictive ability such that the more positive and closer to one the β is, the higher the R^2.

Table 3	The gap[5] model for the ability of core inflation to predict future inflation			
Core	R^2	β (s.e)	*P - value* $H0: \beta = 1$	*t - statistic*
1-month ahead (k=1)				
core_exc_vol	0.009	0.056(0.059)	0.348	0.94
cpi_exl_fuel	0.010	0.078(0.079)	0.329	0.98
core_cpi_xfe	0.014	0.067(0.059)	0.255	1.15
core_cpi_xfood	0.000	0.002(0.068)	0.979	0.03
core_cpi_xadmin	0.008	0.049(0.060)	0.413	0.82
Trim(15,15)	0.060	0.185(0.077)	0.018	2.40**
3-months ahead (k=3)				
core_exc_vol	0.141	0.644(0.170)	0.000	3.79***
cpi_exl_fuel	0.052	0.460(0.209)	0.031	2.20**
core_cpi_xfe	0.188	0.711(0.158)	0.000	4.51***
core_cpi_xfood	0.026	0.314(0.207)	0.133	1.52
core_cpi_xadmin	0.018	0.214(0.170)	0.212	1.26
Trim(15,15)	0.213	0.752(0.154)	0.000	4.88***
*Notes: Standard errors (s.e) are corrected for first-order serial correlation. * p<0.05, ** p<0.01, *** p<0.001.*				
Source	Author's calculations and BOS			

Table 3 above presents results from the gap model above for both the 1-month and 3-months forecasting horizons. The results for 6-months and 12-months horizons are in Appendix 1. The first panel of table 3 shows the results of the gap equation for 1-month ahead horizon. Among the six measures considered in this case, only the coefficient related to the 30%-trimmed is statistically significant at both 5% and 10% levels but not at 1% level. This means that for the shortest horizon possible, 30% trimmed mean indicator is the only candidate, which provides the significant predictive power as shown by its relatively highest $R^2 = 0.062$, among the respective candidates.

[5] This model actually tests whether the current gap between the headline and core inflation is statistically significantly in relation to the gap between the current and future headline inflation. It actually enables assessment of the convergence of headline inflation towards measure of core inflation, after a temporary shock.

Nonetheless, as the horizon increases to 3 months, the number of indicators which show a significant explanatory power for predicting future headline inflation increases to four. The coefficients for the models related to 30%-trimmed mean, CPI-excluding food and energy and the CPI-excluding the most volatile items are all statistically significant at 1%, 5% and 10%. The coefficient for CPI-excluding only energy is significant at any level above 3.1%. In this case, the indicator that has the relatively highest R^2 is the 30%-trimmed mean followed by the CPI-excluding food and energy, then CPI-excluding the most volatile items and finally the CPI excluding energy.

It is worth noting that as the forecasting horizon increases to six and twelve months, the predictive power of most core inflation indicators increase too. For example, the number of candidates which have a significant predictive power for the future headline inflation increase from four to five as the forecasting horizons increase to six and twelve months. In all these four horizons used in this paper, the CPI-excluding food does not have any predictive content for the future headline inflation, which is evidenced by its relatively lowest R^2 among the core inflation candidates.

6 CONCLUSION AND POLICY RECOMMENDATIONS

In conclusion, the foregoing attempt to measure core inflation and their evaluation helped in identifying what best measures can be used in the case of Lesotho. Using CPI data for the sample period from March 2009 to December 2017, the paper estimated six measures of core inflation, which generally involved measures that are based on exclusion of some items in the aggregate inflation rate. The evaluation of these measures against the set of criteria mentioned above has revealed important points about the behaviour of underlying inflation rate in Lesotho.

All of the calculated measures of core inflation have the desirable features of being easily calculated, timely and understandable by the public. This means that they can be produced almost at the same time as the overall CPI inflation. They can also be verifiable by the

parties external to the CBL and this means they are credible. Nonetheless, some measures are superior in performance relative to others when evaluated against certain criteria. All of the calculated core inflation indicators exhibited the mean and the volatility (measured by standard deviation) lower than the headline inflation except for the CPI-excluding administered prices. The measures with lowest volatility include the 30%-Trimmed mean, CPI-excluding food and energy and the CPI-excluding the most volatile items with volatility of 0.74 per cent, 0.79 per cent and 1.04 per cent, respectively.

In terms of tracking trend inflation, the 30%-Trimmed mean, CPI-excluding food and energy outperformed other measures with the lowest volatility around the trend. The root mean squared errors (RMSE) were also calculated for the measures, from which 30%-trimmed mean, CPI-excluding fuel and CPI-excluding the most volatile items outperformed others with lowest RMSEs. This means that these measures are able to track the trend inflation relatively well.

The last criterion used is the predictive ability of core measures in relation to the future headline inflation. In this case, assessment was made to determine which measures are able to predict future inflation using the p-values of the coefficients of the deviation of headline inflation from the core indicators as shown in the gap model in the preceding section over the horizons of one, three, six and twelve months ahead. According to the results, the 30%-trimmed mean outperformed all other core indicators in all the forecasting horizons. In the one-month ahead forecast, it is the only candidate that passes the test of predictive power. As the forecasting horizon increases to three and six months ahead, the 30%-trimmed mean and CPI-excluding food and energy outperforms other candidates. However, for the twelve-month ahead forecasts, the 30%-trimmed mean followed by the CPI-excluding the most volatile items and then the CPI-excluding food and energy outperform others in terms predictive ability.

As the above analysis shows, it is apparent that the 30%-Trimmed mean outperforms all of the five measures calculated. The fact that other measures do not consistently follow the 30%-trimmed mean in terms of their performance ranking in predicting future headline inflation, makes it the only candidate that is recommended for Lesotho's case relative to

the other five. It is in this regard that Central Bank of Lesotho has adopted the use of the 30%-trimmed mean as its core inflation measure. Others measures that are discussed above are complex in calculation such as the SVAR and persistence weighting, for example and they may not be easily understood by the public but they will be calculated in future in order to use them for internal consistency and robustness checks with the 30%-trimmed mean.

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APPENDIX

Appendix 1	The gap model for the ability of core inflation to predict future inflation			
Core	R^2	β (s.e)	P - value $H^0 : \beta = 1$	t - statistic
K=6				
core_exc_vol	0.233	0.956(0.188)	0.000	5.08***
cpi_exl_fuel	0.124	0.835(0.241)	0.001	3.46***
core_cpi_xfe	0.240	0.918(0.177)	0.000	5.18***
core_cpi_xfood	0.007	0.206(0.265)	0.439	0.78
core_cpi_xadmin	0.056	0.463(0.207)	0.027	2.24***
Trim(15,15)	0.295	1.008(0.169)	0.000	5.96***
K=12				
core_exc_vol	0.282	1.329(0.239)	0.000	5.56***
cpi_exl_fuel	0.165	1.249(0.316)	0.000	3.94***
core_cpi_xfe	0.260	1.196(0.227)	0.000	5.27***
core_cpi_xfood	0.002	0.147(0.383)	0.702	0.38
core_cpi_xadmin	0.089	0.774(0.280)	0.007	2.77***
Trim(15,15)	0.542	1.719(0.178)	0.000	9.67***
Source	Author's calculations and BOS			

NOTES

NOTES

$$\dot{k} = f(k) - c - (n + g + \delta)\, k$$

$$U(c_t, c_{t+1}) = \mu(c_t) + \beta E_t [\mu(c_{t+1})])$$

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