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

$$y_{it} = \alpha y_{i,t-1} + x_{it}\beta y + (\eta_i + v_{it})$$

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

RESEARCH BULLETIN

DECEMBER 2017

CENTRAL BANK OF LESOTHO

BANKA E KHOLO EA LESOTHO

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ABSTRACTS

1 The Financial Cost of Lesotho's Foreign and Domestic Public Debt

By Selloane Khoabane[1]

Abstract

THE FINANCIAL cost of external public debt could have increased due to the recent depreciation of the Loti against major currencies, which could strengthen the case for increasing domestic debt. Thus this paper carries out a comparative assessment of the financial costs of external and domestic debt. The theoretical advantages and disadvantages of these two types of debt as identified in the literature are also reviewed. The findings of the study reveal that foreign debt remained financially cheaper than domestic debt despite the recent depreciation of the Loti against the currencies in which the bulk of Lesotho's foreign public debt was held and serviced. This was attributed to the highly concessional nature of Lesotho's external public debt. Consequently, the major recommendation of the paper is that highly concessional foreign public debt should continue to be preferred more than domestic debt so as to maintain the burden of debt on government budgetary operations at sustainable levels. Nonetheless, domestic debt should be gradually increased when the fiscal space allows so as to develop the domestic capital market as an insurance against the disadvantages of foreign debt. A conducive environment should be created to minimize the possible costs and risks of foreign and domestic debt.

Keywords: Debt Financing, Domestic Debt, Foreign Debt
JEL classification: G12, H63, H68, H74

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ABSTRACTS

2 The Role of the Financial Cycle[1] in Macro-Prudential Policy Decision-Making: When to Accumulate or Reduce Counter-Cyclical Buffers

By Refiloe Tšephe[*]

Abstract

THE CREDIT-TO-GDP gap is used as a tool for macroprudential policy making. However, in Lesotho GDP data is only available on an annual basis. Therefore, the purpose of this study is to find an appropriate proxy for the credit-to-GDP gap. The study follows Karfakis (2013) and utilizes three methods to reach its aim, namely; cross-correlations, in-sample Granger causality, and the VAR model. The study uses annual bank credit to private sector, M2 and trade-deficit as a percentage of GDP data covering the period from 1973 to 2013. The study examines the relationship between the credit cycle and credit-to-GDP gap and discovers that the credit cycle is synchronous with the credit-to-GDP gap in Lesotho. In addition, the relationship between the M2 cycle and credit-to-GDP gap is explored and it is established that the M2 cycle leads the credit-to-GDP gap by one (1) year and can suitably be used as a proxy for the credit-to-GDP gap. In addition, there is a bi-directional causality between M2 cycle and credit-to-GDP gap. The study recommends the use of the credit cycle as a proxy for credit-to-GDP gap in line with empirical evidence found, and also recommends the use of M2 cycle on the basis of empirical evidence found in this study.

Keywords: Credit-to-GDP gap, Counter-cyclical buffer, Credit Growth
JEL classification: G18, G21, E32, E51

[1] The financial cycle in this paper refers to the expansion and contraction of credit and M2 over time.

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ABSTRACTS

3 The Scope of Government Revenue Mobilization in Lesotho

By Selloane Khoabane

Abstract

SACU REVENUE revenue has been the major source of government revenue averaging about 26.0 per cent of GDP between 2000 and 2015. However, it has been characterized by a lot of volatility though tilted more on a downward trajectory. The future trend in SACU revenue is expected to be downwards in line with global trends on customs revenue as a result of trade liberalization. Other sources of revenue, particularly tax revenue have also been sluggish. These have raised the need for alternative sources of revenue for the Government of Lesotho (GoL). Thus this paper identifies possible additional domestic revenue mobilization avenues for Lesotho. This is achieved by comparing Lesotho's tax rates and rates on non-tax revenue sources with those of other SACU member countries and other selected African countries. The areas identified include increasing tax rates on petrol and diesel, mobile telecommunication services. New taxes could also be introduced on alcohol and tobacco, sugar sweetened beverages and plastic bags. Contracts with diamond mining companies could be renegotiated to raise more revenue from the sector. Implementation of revenue raising measures that were proposed to GoL before also needs to be expedited. Other existing taxes such as the gaming levy, which have not been reviewed in a long time, should also be considered. While out of line with the scope of this paper, improvements in government spending efficiency, containing and streamlining public spending and implementation of policies and strategies for enhancing private sector growth could maximize the benefits of the proposed tax revisions.

Keywords: government revenue, customs revenue, taxation, government equity
JEL classification: E62, H20, H27

ABSTRACTS

4 Firm Size Distribution in Lesotho Manufacturing Sector: Implications for Job Creation[1]

By Rethabile Masenyetse, Mookameli Fuma and Malefu Manamathela[2]

Abstract

UNDERSTANDING FIRM firm size distribution is critical for informing policy intervention for sustainable job creation. The focus of the Government of Lesotho industrial policy has been to create jobs through growth of the manufacturing sector. To date, this has produced desirable results as witnessed by the surge in the production of textile and clothing resulting in manufacturing sector being the largest formal employer in the country. Using the unique dataset covering companies that are assisted by Lesotho National Development Corporation (LNDC) during the period 2004-2015, the paper evaluates the company survival patterns, investigate the evolution of firm size distribution in the manufacturing sector. The methodology employed takes into account the possible impact of the global financial crisis on the sector which presented a major shift in the global economic developments. The results show that the size distribution of the Lesotho manufacturing sector is dominated by the companies in the middle sized and large sized categories and they possess high survival rate. It is further found that majority of the companies in the sector remain in their size classes suggesting little growth by the sector. Smaller companies in the sector seem to be the ones registering faster growth. There is plethora of reasons underneath the differing survival patterns between the large and small firms and therefore different policy interventions should be explored for each category. The arising policy implications is that, for job creation effort should be put in place to increase the number of large companies and also support should be extended to the lower sized companies to increase their survival.

Keywords: Firm Growth, Size Distribution
JEL classification: L25, L6

[1] Acknowledgement: We would like to thank officials at Lesotho National Development Corporation (LNDC), Ministry of Small Business and Cooperatives for useful discussions.

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The Financial Cost of Lesotho's Foreign and Domestic Public Debt

Selloane Khoabane

1 INTRODUCTION

THE GOVERNMENT of Lesotho (GoL), like other governments around the world resorts to the debt market for financing of fiscal deficits. In Lesotho, public debt comprises both external and domestic debt with the latter accounting for the bulk of total debt. As depicted in Table 1 below, foreign debt accounted for 89.0 per cent of total debt on average from 2008 to 2015. Domestic debt is wholly denominated in the domestic currency, while foreign debt is denominated in various foreign currencies.

Table 1 Domestic and Foreign Debt (Percentage of Total Debt)

	2008	2009	2010	2011	2012	2013	2014	2015	2016
Domestic	6.47	8.16	12.93	14.33	14.33	11.66	10.58	8.76	2992
Foreign	93.53	91.84	87.07	85.67	85.67	88.34	89.42	91.24	-1539

Source Ministry of Finance and Central Bank of Lesotho

Foreign currency denominated public debt exposes government to high costs of servicing such debt during periods of high depreciation of the domestic currency against the foreign currencies in which the debt is held and repaid. Between 2000 and 2015, there were 3 episodes of the Loti depreciation against Lesotho's major external public debt currencies. It depreciated quite substantially in 2001 and 2002 after which it appreciated for 3 successive years and then depreciated marginally in the next two years. The Loti depreciated significantly again in 2008. The last episode of depreciation started in 2011 and persisted to 2015. The depreciation is expected to have resulted in an escalation in the costs of external debt to the GoL.

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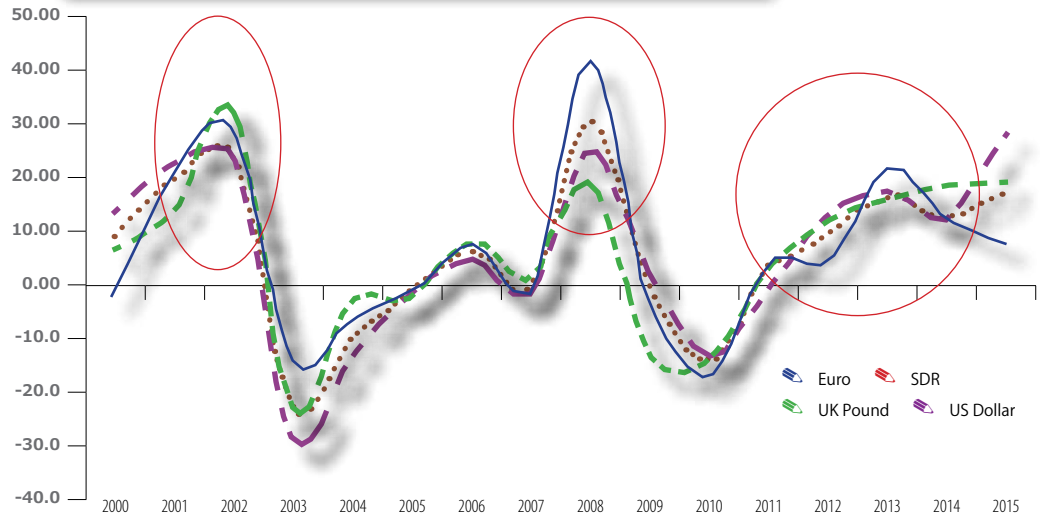
Figure 1 Exchange Rates of Major Foreign Debt Currencies



Source: Bloomberg

It is on the basis of the aforementioned that the objective of this paper is to evaluate the financial costs of foreign and domestic debt to the GoL. While the financial cost is important, it is not the only factor that should be looked at when choosing between foreign and domestic debt. The theoretical issues that underpin the choice between foreign and domestic debt, specifically their advantages and disadvantages are also reviewed with the objective of strengthening the conclusion and recommendations of the paper.

The rest of the paper is structured as follows: Section 2 discusses the trend and structure of Lesotho's public debt. Section 3 provides the literature review the covers the advantages and disadvantages of foreign and domestic debt. Section 4 elaborates the analytical framework and methodology for assessing the financial costs of foreign and domestic debt and the description of the data used in this study. Section 5 discussed the empirical results while Section 6 concludes the paper and provides recommendations.

2 AN OVERVIEW OF LESOTHO'S PUBLIC DEBT – THE TREND AND STRUCTURE

The stock of public debt as a share of GDP declined steadily from 115.5 per cent in 2001 to a trough of 36.8 per cent in 2010 after which it increased from year to year and reached 58.7 per cent in 2015. The decline was due to a lower increase in the stock of debt in Maloti terms compared with a higher rise in GDP. External debt, which accounted for an average of 89.1 per cent of total debt over the period 2008 to 2015 was the main contributor to the movements in the total stock of debt, while domestic debt increased sluggishly with minor fluctuations.

Domestic debt is comprised of Treasury bills (T-bills) of 4 tenors, 91, 182, 273, and 364 days, Treasury bonds (T-bonds) of 3, 5, 7 and 10 years tenors and the Central Bank of Lesotho's on-lending to GoL of funds obtained under the IMF's extended credit facility loan for balance of payments support[2]. The T-bills, which accounted for 26.0 per cent of domestic debt in 2015 are monetary policy instruments through which the Central Bank of Lesotho mops up excess liquidity and injects liquidity into the economy for purposes of maintenance of price stability. The size of the issuance of T-bills is determined on the basis of the liquidity conditions as estimated by the liquidity forecasting team of the CBL. The T-bonds were introduced in 2010 with the main objective of catalyzing the development of Lesotho's capital market. The issuances of T-bonds are intended to raise funds for public infrastructure development and to create alternative avenues for saving and investment in Lesotho. The Ministry of Finance determines the amount to be issued as part of the financing needs of the GoL each fiscal year, taking the GoL's capacity to repay the debt into account. The stock of T-bonds has increased from 19.4 per cent of total domestic debt in 2010 to 27.1 per cent in 2015. On average, GoL paid market rates of 8.0 to 10.0 per cent on domestic debt from 2008 to 2015.

[2] In 2010, Lesotho entered into an ECF arrangement with the IMF to restore balance of payments and fiscal sustainability, which were threatened by the slump in SACU revenue.

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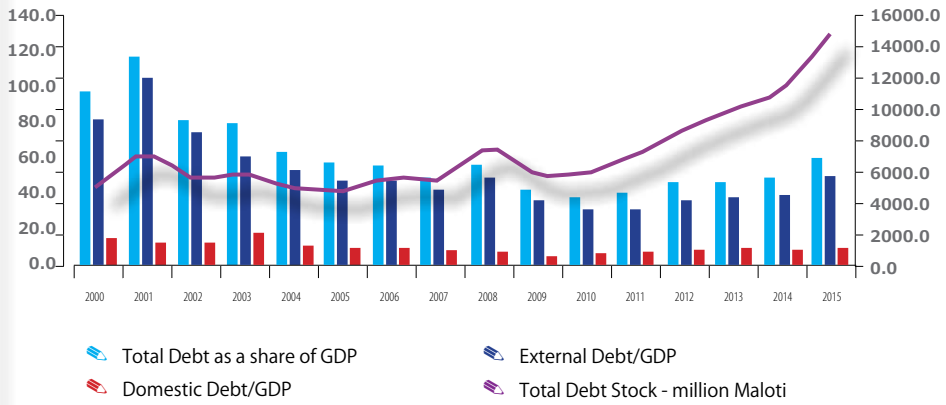
Figure 2 Public debt



Source: Ministry of Finance and the Central Bank of Lesotho

GoL's foreign debt comprises both concessional and non-concessional debt. The bulk of Lesotho's concessional foreign debt has an interest rate of 0.75 per cent (including service charges), a debt service period of 35 years or more years, a grace period of 10 years and a grant element. As shown in Table A8, in the Appendix, concessional debt accounted for the largest share of total external debt at 88.0 per cent on average over the 2008 to 2015 period. Concessional debt as a share of total external public debt of above 90.0 per cent was recorded year after year from 2008 to 2011 after which it consistently went on a downward trend to reach 78.6 per cent in 2015.

3 LITERATURE REVIEW – ADVANTAGES AND DISADVANTAGES OF FOREIGN AND DOMESTIC DEBT

Debt can either be foreign or domestic and each of these two types has its advantages and disadvantages. Woo and Gray (2000) indicate that one important benefit of external debt

financing of budget deficits is that it is less costly compared with domestic debt. Christensen (2004) points out that most Sub-Saharan African (SSA) countries have access to external debt at favourable conditions including very low interest rates (lower than market interest rates), very long maturity and a grant element. The other advantages of foreign debt are that it provides foreign exchange (Christensen, 2004) and it has lesser crowding-out effects on private investment (Mlachila *et al*, 2002). However, as pointed out by Mlachila *et al* (2002) external debt increases economies' exposure to external conditions. This leads to high debt service costs during a depreciation of the exchange rate (Woo and Gray: 2000) and during periods of higher interest rates in the case of debt contracted at a floating rate (Mlachila *et al*: 2002). Mlachila *et al* (2002) found that the cheapest way to finance budget deficits in developing countries is through highly concessional foreign borrowing, which usually remains attractive despite depreciation of the domestic currency.

Villar *et al* (2012) are of the view that emerging market economies have increased their domestic funding vis-à-vis foreign currency funding and this has contributed immensely in the development of their domestic bond markets and contributed to increased domestic savings. Domestic debt reduces the currency risk as it is usually denominated in domestic currency and its service does not require foreign exchange (Christensen, 2004). Mlachila *et al* (2002) also point out that it reduces inflationary pressures and the risk of external debt crises. Nonetheless, there are some concerns regarding accumulation of domestic debt. As outlined in Christensen *et al* (2007) these may include crowding-out private investment and increasing the fiscal debt burden because of the high domestic interest rates. However, Presbitero (2012) is of the view that the prerequisites of a well-functioning economy such as a stable macroeconomic environment, an efficient money market, a broader investor participation and the presence of a sound legal, regulatory and supervisory framework are essential for achieving the balance between the benefits and costs of domestic debt. Christensen *et al* (2007) contend that strong debt management practices and fiscal discipline could minimize the costs and risks of domestic debt.

4 THE FINANCIAL COSTS OF FOREIGN AND DOMESTIC DEBT

4.1 The Analytical Framework

The paper measures the cost of debt as the cost of servicing public debt. According to the IMF (2009) the cost of servicing debt comprises interest payments and capital gains/losses due to the effects of exchange rate movements on foreign currency denominated debt. Thus the IMF (2009) proposes an indicator of interest cost adjusted for capital gains/losses as

$$C_t = \left(\sum_{j=1}^{m} e_{jt} I_{jt}^{FX} + \sum_{j=1}^{m} (D_{t-1,j}^{FX} \Delta e_{t,j}) \right) + \sum_{j=1}^{n} I_{jt}^{DX} \qquad 1$$

Where C_t is the total nominal interest cost adjusted for capital gains/losses at time t , e_{jt} is the jth exchange rate between the domestic currency and foreign currency j , I_{jt}^{FX} represents interest payments denominated in foreign currency j , and I_t^{FX} is the local currency interest payments and

$$\sum_{j=1}^{m} D_{t-1,j}^{FX} \Delta e_{t,j}$$

is the capital gain/loss arising from exchange rate changes associated with outstanding foreign exchange debt at time t - 1.

Another indicator of the cost of debt is the interest payments per unit of debt, calculated as the nominal interest payment relative to the outstanding stock of debt (IMF: 2009). This measure gives the unweighted average interest rate;

$$\bar{i} = \frac{I_t^*}{D_t} = \frac{\sum_{j=1}^{m} e_j I_{j,t}^{FX} + I_t^{DX}}{D_t^{DX} + D_t^{FX}} \qquad 2$$

Where D_t^{DX} and $D_t^{FX} = \sum_{j=1}^{m} e_{t,j} D_{t,j}^{FX}$ are the outstanding domestic currency and foreign currency debt respectively.

4.2 The Analytical Methodology

This paper conducts a comparative analysis of the cost of foreign debt versus the cost of domestic debt. Adopting the analytical framework described above, the cost of foreign debt is measured as;

$$C_t^{FX} = \sum_{j=1}^{m} e_{jt} I_{jt}^{FX} + \sum_{j=1}^{m} (D_{t-1,j}^{FX} \Delta e_{t,j}) \qquad 3$$

The capital gains and/or losses are estimated as

$$\sum_{j=1}^{m} (D_{t-1,j}^{FX} \Delta e_{t,j}) = \sum_{j=1}^{m} P_{t,j}^{FX} \Delta e_{t,j} + \sum_{j=1}^{m} I_{jt}^{FX} \Delta e_{t,j} \qquad 4$$

Where, $\boldsymbol{P_{t,j}}$ is the principal repayment in foreign currency $\boldsymbol{j}$ at time $\boldsymbol{t}$, $\boldsymbol{\Delta et,j}$ is the change in the nominal exchange rate of currency $\boldsymbol{j}$ at time $\boldsymbol{t}$ and all the other variables are as previously defined. And the cost of domestic debt is measured as

$$C_t^{DX} = \sum_{t=1}^{n} I_t^{DX} \qquad 5$$

The unweighted average interest rate on the foreign debt, measured as the interest cost of foreign debt as a ratio of the total stock of foreign debt, is calculated as

$$\bar{i}^{FX} = \frac{\sum_{j=1}^{m} e_j I_{j,t}^{FX}}{D_t^{FX}} \qquad 6$$

The unweighted average exchange rate on foreign debt, measured as the ratio of the capital gains and/or loss due to exchange rate fluctuations as a ratio of the total stock of foreign debt is given by

$$\bar{e}^{FX} = \frac{\sum_{j=1}^{m} P_{t,j}^{FX} \Delta e_{t,j} + \sum_{j=1}^{m} I_{j,t}^{FX} \Delta e_{j,j}}{D_t^{FX}} \qquad 7$$

The total cost of foreign debt as a ratio of the total stock of foreign debt is given by

$$\overline{ie}^{FX} = \bar{i}^{FX} + \overline{e}^{FX} \qquad 8$$

The unweighted average interest rate on domestic debt is given by the total interest cost of domestic debt as a ratio of total stock of domestic debt

$$\bar{i}^{DX} = \frac{\sum_{j=1}^{n} I_{jt}^{DX}}{D_t^{DX}} \qquad 9$$

4.3 Data

The data on all external debt variables covering the period 1966 to 2015 was obtained from the Ministry of Finance while the data on domestic debt (Treasury bills and bonds) for the period 2008 to 2015 was obtained from the Central Bank of Lesotho. Exchange rate data going as far back as 1966 was sourced online from http://www.Fatop.com to supplement data from the Central Bank of Lesotho. The use of data on a loan by loan basis facilitated incorporation of the different terms of each loan in relation to grace period and maturity into the calculations. It also ensured application of appropriate foreign currency exchange rates for calculation of capital gains and/or losses due to exchange rate fluctuations.

Table 2	Debt Data Descriptions	
Variable	Description	Data Used
e_{jt}	is the ***jth*** exchange rate between the domestic currency and foreign currency **j**	Annual average nominal exchange rate[3] of the Loti against the foreign currency in which the interest payment or principal repayment was effected.
I_{jt}^{FX}	interest payments on foreign debt denominated in foreign currency **j**	Interest payments on foreign debt on a loan by loan basis denominated in the foreign currency in which the interest payment was made.
I_{t}^{DX}	interest payments on domestic loans	The cost of domestic loans to Government in the form of the discounted amount on 3, 5, 7 and 10 year Treasury bonds and on 92, 182, 273 and 364 day Treasury bills.
D_{tj}^{FX}	is the outstanding stock of foreign currency debt denominated in foreign currency **j**	Outstanding stock of foreign debt denominated in foreign currency in which the loan was contracted.
D_{t}^{DX}	is the outstanding stock of domestic debt	Outstanding stock of Treasury bills and bonds at time **t**.
$P_{t,j}^{FX}$	Principal repayments of foreign currency debt at time t denominated in foreign currency **j**	Principal repayments on foreign debt on a loan by loan basis, denominated in the foreign currency in which the repayment was made.

4.4 Empirical Results

The external and domestic public debts expose the Government to debt servicing costs. In the case of foreign debt, the financial costs arise from interest payments, and financial gains and losses resulting from exchange rate fluctuations as Lesotho's foreign debt is denominated in foreign currencies. With regard to domestic debt, the financial costs arise from interest payments only as it is denominated in domestic currency.

[3] The relevant exchange rate of the day of the transaction was the most ideal rate to use for increased accuracy of the estimates. However, the high number of transactions (31 000) on disbursements, interest payments and principal repayments and time constraints made it impossible if not impractical to compile the daily rates hence the use of annual average exchange rates.

Table 3	The Cost of Servicing External debt (Per cent of GDP)							
	2008	2009	2010	2011	2012	2013	2014	2015
Total Cost of Foreign Debt	**3.85**	**0.42**	**0.13**	**0.31**	**0.42**	**0.53**	**0.54**	**0.73**
Interest Payments	3.35	0.43	0.33	0.29	0.32	0.34	0.41	0.5
Exc* Rate Cost (Principal+)	0.5	-0.01	-0.2	0.02	0.1	0.19	0.13	0.23
Total Exc Rate Cost	**0.59**	**-0.01**	**-0.24**	**0.02**	**0.13**	**0.23**	**0.16**	**0.3**
Exc Rate Cost (Principal+)	0.5	-0.01	-0.2	0.02	0.1	0.19	0.13	0.23
Exc Rate Cost (Interest)	0.09	0.00	-0.04	0.00	0.03	0.04	0.03	0.07
Exc Rate Cost/ Total Cost	**15.32**	**-2.38**	**-184.62**	**6.45**	**30.95**	**43.40**	**29.63**	**41.10**

*Exchange

Looking at the period 2008 to 2015, the financial costs of Lesotho's foreign debt was marginal, despite increasing exponentially since 2011. It rose from 0.13 per cent of GDP in 2010 to 0.73 per cent of GDP in 2015. Interest payments accounted for the bulk of the costs. With regards to the exchange rate component of the financial costs the Government realized some savings in 2009 and 2010 followed by losses up to 2015. The financial losses increased during periods of higher depreciation and *vice versa.* On the one hand, the financial gains realized in 2009 and 2010 were due to the appreciation of the Loti against the Euro, Special Drawing Rights and the UK Pound in 2009 and 2010. This was complemented by the minimal depreciation of the Loti against the US Dollar in 2009 and its appreciation in 2010. On the other hand, the financial losses from 2011 to 2015 were a result of the depreciation of these currencies during that period. As depicted in Tables A3 and A4 in the Appendix, the bulk of the principal repayments and interest payments on foreign debt were effected in these currencies. As shown in Table A1 in the Appendix, the cumulative loss on account of the depreciation of the Loti against the foreign currencies in which GoL's foreign debt was denominated amounted to M196.2 million over the 2011 to 2015 period. As depicted in Table 4, this cumulative loss accounted for 41.1 per cent of the total cost of foreign debt. This was a lot of money given the level of Lesotho's economic development.

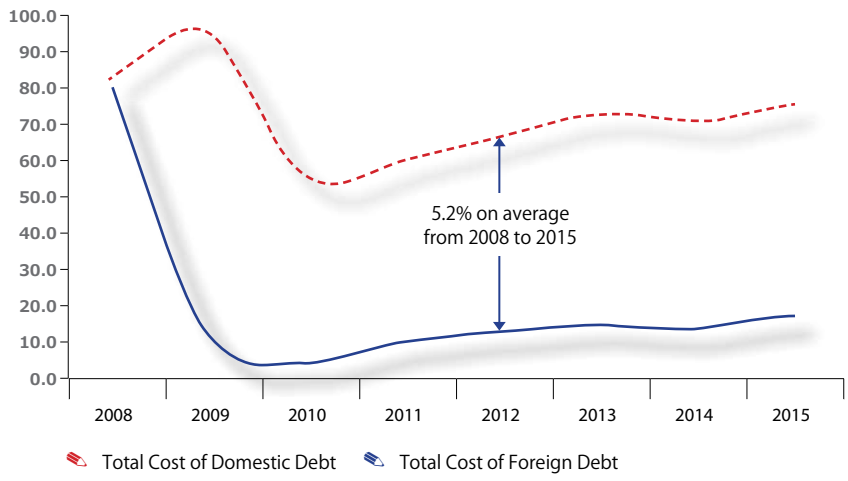
Table 4 Interest Payments on Domestic and Foreign Debt (Per cent of GDP)

	2008	2009	2010	2011	2012	2013	2014	2015
Domestic Debt	0.27	0.30	0.25	0.33	0.39	0.38	0.34	0.36
Foreign Debt	3.35	0.43	0.33	0.29	0.32	0.34	0.41	0.50

Source: Ministry of Finance and Central Bank of Lesotho

Interest payments on domestic debt have also been on an upward trend with minor fluctuations. The difference between interest payments on domestic and foreign debt was marginal. Worth noting is the fact that interest payments on domestic debt rose above interest payments on foreign debt for three successive years from 2011 to 2013. This is interesting given that domestic debt accounted for 10.9 per cent of total debt on average from 2008 to 2015.

Figure 2 The Cost of Domestic Debt Vis-a vis the Cost of External Debt



Source: Ministry of Finance and the Central Bank of Lesotho

The graphical representation of the unweighted average interest rate on domestic debt (total costs arising from domestic debt as a ratio of the outstanding stock of domestic debt) and the unweighted average interest rate on foreign debt (the total costs of foreign debt as a ratio of the outstanding stock of foreign debt) shows that domestic debt is more costly to the GoL than

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foreign debt. The costs of domestic debt exceeded that of foreign debt by an average of 5.2 per cent from 2008 to 2015. This is explained by the highly concessional nature of Lesotho's foreign debt as shown in Table A7 in the Appendix. As explained earlier, 88.0 per cent of public foreign debt was concessional in 2008 to 2015 and the interest rate on the bulk of this was 0.75 per cent, including service charges while the interest rate on domestic debt ranged between 8.0 and 10.0 per cent during the same period.

3 CONCLUSION AND RECOMMENDATIONS

The depreciation of the Loti against the currencies in which Lesotho's foreign debt was held and serviced has resulted in an increase in the financial costs of foreign debt to the GoL. It culminated in a cumulative loss of M196.2 million over the 2011 to 2015 period, which translates into 41.1 per cent of the total cost of foreign debt as a percentage of GDP. Nonetheless, domestic debt was financially more costly to the GoL than external debt despite the financial losses on foreign debt due to the depreciation of the Loti against the foreign currencies in which the bulk of Lesotho's public debt was held and serviced. These findings were in line with the findings of Mlachila *et al* (2002) who concluded that "financial costs of highly concessional loans are likely to be smaller over the long run, in spite of the risks inherent to foreign currency borrowing". This notwithstanding, both domestic and foreign debt have their advantages and disadvantages. It is on the basis of these two points that the following recommendations are made:

- Highly concessional foreign debt should continue to be the most preferred form of fiscal deficit financing over domestic debt to maintain the burden of debt on the fiscal operations at sustainable levels.

- A gradual increase in domestic debt should be pursued in times of fiscal surpluses with the objective of developing the domestic capital market. A developed domestic capital market will provide an avenue for supplementing where concessional foreign resources may not adequately meet the need for financial resources and also provide a cheaper alternative in the event that the Loti depreciates beyond the optimum level and raises the financial cost of foreign debt above that of domestic debt.

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APPENDIX

Appendix A1	Exchange Rates of Major Foreign Debt Currencies							
Currency	2008	2009	2010	2011	2012	2013	2014	2015
Loti per Unit of Foreign Currency (Annual Averages)								
Euro	12.07	11.69	9.71	10.10	10.55	12.83	14.39	15.51
Special Drawing Rights	13.02	12.96	11.17	11.45	12.58	14.62	16.48	19.41
UK Pound	15.11	13.10	11.32	11.63	13.02	15.10	17.88	21.27
US Dollar	8.27	8.42	7.32	7.26	8.21	9.65	10.88	13.99
Depreciation/ Appreciation Rates								
Euro	41.50	-3.14	-16.94	3.97	4.51	21.58	12.15	7.81
Special Drawing Rights	30.32	-0.45	-13.86	2.59	9.81	16.21	12.74	17.80
UK Pound	18.94	-13.27	-13.63	2.79	11.89	15.98	18.40	19.01
US Dollar	24.77	1.85	-13.06	-0.82	13.11	17.50	12.74	28.57
Source	Ministry of Finance and Central Bank of Lesotho							

Appendix A2	External Public Debt by Currency (Percentage Shares)				
Currency	2011	2012	2013	2014	2015
Canadian Dollars	0.12	0.10	0.09	0.08	0.07
Danish Kroner	0.24	0.21	0.21	0.18	0.15
Euro	10.32	9.20	8.78	7.22	6.31
European Currency Units	1.07	0.94	0.91	0.73	0.61
Kuwaiti Dinars	2.36	2.60	3.04	3.51	3.63
Maloti	1.51	1.29	0.98	0.85	1.17
Norwegian Krone	0.08	0.07	0.06	0.05	0.04
Pound Sterling	0.19	0.76	0.76	0.76	0.74
Rand	3.50	5.15	6.44	8.07	9.39
Saudi Riyals	0.34	0.90	1.18	2.39	2.69
Special Drawing Rights	48.17	48.32	48.54	45.94	44.84
Swedish Kronor	0.40	0.37	0.36	0.29	0.26
Swiss Francs	0.64	0.58	0.56	0.49	0.47
UAE Dirhams	0.00	0.00	0.00	1.02	1.67
US Dollars	19.33	17.91	17.68	18.96	18.77
Yen (000's)	7.43	6.32	4.96	4.40	4.22
Yuan Renminbi	4.32	5.27	5.45	5.06	4.95
Source	Ministry of Finance and Author's Calculations				

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Appendix A3	Principal Repayments by Foreign Currency (Percentage Shares)							
Loan Currency Amount	2008	2009	2010	2011	2012	2013	2014	2015
ADB Units of Account	0.10	0.06	0.14	0.25	0.65	0.88	1.11	1.11
Canadian Dollars	0.10	0.06	0.13	0.13	0.13	0.13	0.12	0.08
Danish Kroner	0.24	0.16	0.39	0.29	0.28	0.29	0.29	0.19
Deutsche Mark	0.05	0.03	0.06	0.05	0.05	0.06	0.05	0.04
Euro	20.51	17.11	18.59	19.80	20.32	22.07	14.38	11.72
European Currency Units	1.66	1.53	1.52	0.00	0.00	0.00	0.00	9.67
Kuwaiti Dinars	2.31	2.75	2.93	3.77	4.92	4.84	6.08	4.99
Netherland Guilders	0.01	0.00	0.01	0.01	0.01	0.01	0.01	0.01
Norwegian Krone	1.28	0.73	0.83	0.09	0.08	0.08	0.08	0.05
Pound Sterling	1.09	0.12	0.23	0.18	0.19	0.22	0.24	0.18
Rand	1.90	1.65	1.31	1.88	1.95	1.64	1.71	12.04
Saudi Riyals	0.00	0.00	0.00	0.00	0.00	1.25	4.65	1.50
Special Drawing Rights	26.97	40.26	46.78	46.54	41.26	32.96	29.97	22.16
Swedish Kronor	1.59	1.58	0.43	0.44	0.44	0.22	0.17	0.11
Swiss Francs	0.33	0.25	0.53	0.60	0.62	0.66	0.68	0.54
US Dollars	41.85	33.70	26.12	25.96	29.10	34.68	40.45	35.62
Yen (000's)	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00
TOTAL	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Source	Ministry of Finance and Author's Calculations							

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Appendix A4	Interest Payments by Foreign Currency (Percentage Shares)								
Currency	2008	2009	2010	2011	2012	2013	2014	2015	2015
Canadian Dollars	0.02	0.01	0.02	0.02	0.02	0.02	0.01	0.01	1.11
Chinese Yuan	0.55	5.10	7.23	3.74	3.49	0.00	0.00	0.94	0.08
Danish Kroner	0.24	0.13	0.20	0.17	0.14	0.13	0.11	0.08	0.19
Euro	16.71	13.41	14.31	14.06	9.07	6.86	5.27	4.14	0.04
European Currency Units	0.63	0.64	0.51	0.00	0.00	0.00	0.00	0.00	11.72
Kuwaiti Dinars	2.70	2.68	1.28	0.00	3.34	4.51	4.65	4.32	9.67
Norwegian Krone	0.73	0.23	0.15	0.05	0.05	0.04	0.03	0.02	0.18
Pound Sterling	0.44	0.08	0.46	0.34	0.49	0.47	0.38	0.57	12.04
Rand	0.00	0.00	1.00	3.88	7.36	5.76	3.91	3.51	1.50
Special Drawing Rights	54.25	26.50	22.94	27.54	27.49	32.08	41.68	45.16	22.16
Swedish Kronor	1.11	0.50	0.32	0.29	0.25	0.12	0.07	0.05	0.11
Swiss Francs	0.45	0.26	0.47	0.45	0.39	0.35	0.29	0.26	0.54
US Dollars	22.18	50.46	51.08	49.45	47.89	49.66	43.59	40.94	35.62
Yen (000's)	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Source	Ministry of Finance and Author's Calculations								

Appendix A5	Domestic and Foreign Debt (Percentage of Total Debt)							
	2008	2009	2010	2011	2012	2013	2014	2015
Domestic	6.47	8.16	12.93	14.33	14.33	11.66	10.58	8.76
Foreign	93.53	91.84	87.07	85.67	85.67	88.34	89.42	91.24
Source	Ministry of Finance and Central Bank of Lesotho							

Appendix A6	Concessional and Non-concessional Foreign Debt (Percentage of Total Foreign Debt)							
	2008	2009	2010	2011	2012	2013	2014	2015
Concessional	96.97	94.65	93.75	90.60	85.86	81.50	81.82	78.58
Non-concessional	3.03	5.35	6.25	9.40	14.14	18.50	18.18	21.42
Source	Ministry of Finance and Central Bank of Lesotho							

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Appendix A7	The Cost of Servicing External Debt (in Million Maloti)								
	2008	2009	2010	2011	2012	2013	2014	2015	2011-2015
Total Cost of Foreign Debt	**518.12**	**61.05**	**21.11**	**57.98**	**83.85**	**117.01**	**127.88**	**184.66**	**571.38**
Interest Payments	451.31	62.76	53.48	53.8	63.76	75.62	96.15	125.39	414.72
Exc* Rate Cost (Principal+)	66.81	-1.71	-32.37	4.18	20.09	41.39	31.73	59.27	156.66
Total Exc Rate Cost	**78.61**	**-1.73**	**-38.93**	**4.46**	**25.21**	**50.33**	**39.52**	**76.68**	**196.2**
Exc Rate Cost (Principal+)	66.81	-1.71	-32.37	4.18	20.09	41.39	31.73	59.27	156.66
Exc Rate Cost (Interest)	11.8	-0.02	-6.56	0.28	5.12	8.94	7.79	17.41	39.54
Exc Rate Cost/ Total Cost	**15.17**	**-2.83**	**-184.41**	**7.69**	**30.07**	**43.01**	**30.90**	**41.52**	**34.34**
	*Exchange, +Principal repayments								

Appendix A8	Interest Payments on Domestic and Foreign Debt (Million Maloti)							
	2008	2009	2010	2011	2012	2013	2014	2015
Domestic Debt	36.93	43.46	40.74	61.18	77.76	84.17	79.66	91.72
Foreign Debt	451.31	62.76	53.48	53.80	63.76	75.62	96.15	125.39
Source	Ministry of Finance and Central Bank of Lesotho							

Appendix A9	Cost of Domestic Debt Vis-à-vis the Cost of External Debt (Million Maloti except *)							
	2008	2009	2010	2011	2012	2013	2014	2015
	Domestic Debt							
Cost	36.93	43.46	40.74	61.18	77.76	84.17	79.66	91.72
Stock	446.84	456.85	735.48	1021.70	1171.34	1152.69	1133.63	1212.96
UIR*	8.26	9.51	5.54	5.99	6.64	7.30	7.03	7.56
	External Debt							
Cost	518.12	61.05	21.11	57.98	83.85	117.01	127.88	184.66
Stock	6457.10	5143.10	4951.40	6110.10	7001.50	8736.88	9583.24	12632.38
UIR*	8.02	1.19	0.43	0.95	1.20	1.34	1.33	1.46
	*Unweighted Interest Rate (Total Cost of Debt as a Percentage of the Stock of Debt)							

The Role of the Financial Cycle[1] in Macroprudential Policy Decision-Making: When to Accumulate or Reduce Counter-Cyclical Buffers

Refiloe Tšephe

1 INTRODUCTION

THE CENTRAL BANK OF LESOTHO (CBL) is mandated to promote the stability and soundness of the financial system in Lesotho. It attains this objective through delivering its core functions, notably: achieving and maintaining price stability; fostering liquidity, solvency and proper functioning of a stable market-based financial system; promoting safe and sound development of the financial system; and promoting efficient operations of the payments system. Different tools and approaches are used to this effect. Analysis of the financial soundness indicators (FSIs) and stress testing are some of the tools that are used in assessing the stability of the financial sector. In an effort to better understand the soundness of the financial sector, arrays of tools are explored to help assess the stability of the financial sector. Moreover, the 2007 – 2009 global financial crisis (GFC) has unveiled the need for better macroprudential policies and frameworks that will lead to effective macroprudential oversight. The Financial Stability Board (FSB), International Monetary Fund (IMF) and Bank of International Settlements (BIS) (2011), defined macro-prudential policy as a policy which focuses on system wide financial risk, detects and limits financial imbalances, risk concentrations and builds countercyclical buffers to smooth out the economic cycle.

[1] The financial cycle in this paper refers to the expansion and contraction of credit and M2 over time.

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A well designed macroprudential policy framework should have clearly defined objectives and instruments or tools that are used to achieve the objectives. Credit-to-GDP gap is one such tool developed as the reference point to address risk build-up in the economy and address the procyclical nature of banking institutions, whereby banks ride the economic cycle, thus exacerbating the booms and bursts episodes in the economy. Credit-to-GDP gap is derived as the difference between credit-to-GDP ratio and its long-term trend, and it is used as a guide for setting countercyclical capital buffers (CCB) to prevent procyclicality in credit extension. This measure acts as an early warning indicator. However, in Lesotho, the problem arises in attempting to deploy the credit-to-GDP gap tool in analyzing the systemic build-up of risk in the economy because GDP data is only available on an annual basis[2]. Therefore, the purpose of this study is to explore a high frequency variable that is highly correlated with credit-to-GDP gap that can be used as a credit-to-GDP gap proxy. Borgy *et al.*, (2009), FSB, IMF & BIS (2011) and Anusha (2015) among others have shown that there is a robust relationship between the real and financial sectors of the economy, with credit booms and bursts leading financial crises. Anusha (2015) further elucidates that it is vital to determine the cyclical properties of credit and its nexus with economic activity in order to establish early warning indicators for financial imbalances and macroeconomic policies. Moreover, Banerjee (2011) attributes the boom and burst phases of the business cycle to the procyclical nature of credit.

Following this introduction, the rest of the study is structured as follows; section two will be a brief description of the literature review and section three will detail the methodology adopted. Section four discusses the results while section five covers the recommendations of the study.

2 LITERATURE REVIEW

The credit-to-GDP gap sanctions broad credit to the household and private non-financial corporate sector, including non-banks and lending from abroad. Credit in each quarter is divided by rolling GDP sum of last four (4) quarters, commonly referred to as annualised credit-to-GDP ratio Basel committee on banking supervision (BCBS) (2010) and Bonfim and Monteiro (2013).

[2] The study did not use interpolation methods because as has been stated in the literature, interpolated data suffers from serial correlation (Chen, 2007). Moreover, interpolated high frequency data series does not correctly fit the old low frequency data (Pavia-Miralles, 2010).

BCBS has proposed that banks hold additional capital at times when the ratio of private sector credit-to-GDP grows more quickly than its long-run trend. The need for a countercyclical buffer arises due to the realization that in different phases of the business cycle, for instance in an economic upswing, the financial system tends to be overexposed to aggregate risk through ample credit availability, rapid increases in asset prices, leverage and maturity mismatches. Therefore, the financial system should build adequate buffers in these risky times so that when the cycle turns, the downside does not induce financial distress resulting from rationing of credit extension and significant deleveraging (FSB, IMF and BIS, 2011). In other words, the buffer is a stabiliser during both the expansion and contraction phases of the financial cycle.

There are three ways in which cycles can be determined; *classical or business cycles*, which are described as oscillations in the level of an economic variable; *deviation cycles*, the difference between the level and long run permanent component of an economic variable and growth rate cycles which are measured by the growth rates of level variables. However, deviation cycles are more favoured for empirical investigations (Egert and Sutherland, 2012). There are two different strands of theory on business cycle and the role of money in influencing real economic activity. *Monetary–business-cycle theory* argues that money has a fundamental role in determining real economic activity, with changes in the growth of money in circulation causing output growth. However, the *real-business-cycle theory* views money supply as a dormant factor as establishments in the real economy will influence the agents' financial decisions thus influencing the quantity of money demanded (Ahmed, 1993). Moreover, there are three main transmission channels through which credit feeds into economic activity. First, through the *borrower's balance sheet channel*, where negative financial shocks induce borrowers to reduce their demand for credit thus creating an environment of lower spending and lower economic activity. Second, there is the *bank balance sheet channel* which shows that monetary policy decisions affect the cost and availability of credit. Last, there is the liquidity channel, through which liquidity shortages can compel a fire-sale of assets by banks and create a solvency problem for banks (BCBS, 2011). The first two channels are referred to as the *financial accelerator channel* as they exacerbate the shocks from endogenous developments in credit markets to the real economy.

Banerjee (2011) used Granger causality test and cross coefficients methodology to establish the relationship between credit cycles and GDP cycles in India. Due to structural changes in the Indian economy, the data was broken into three episodes: first 1950-51 to 1979-80, a period

characterised by import substituting industrialization when credit was evidently observed to have significantly Granger-caused growth. Second, 1980-81 to 1990-91, there was no apparent causality as well as cross correlations between the two variables and last, 1991-92 to 2010-11 a period characterised by causality from output to credit cycles. In general, the direction of causality has changed overtime from credit leading output to output leading credit. In the liberalized phase, post 1992, there was more evidence of interconnectedness between financial institutions and the real economy in India.

In addition, Banerjee (2011) declares that procyclicality of credit is deemed as a vital factor influencing amplitudes of output cycles and intensifying the economic cycles. Moreover, analysis of the nexus between financial and real economy has established that credit booms precede financial crises (Anusha, 2015). Using a bivariate Markov switching model and a sample of 103 banking crises, Serwa (2008) could not find any lead-lag relationship between credit and output in both tranquil and crises periods, with the relationship being regime-dependent. The European Banking Federation (EBF) (2011) deploying cross correlations in 11 euro area countries and the US, with quarterly data covering a period from the first quarter of 1980 to the last quarter of 2010 established that credit cycles are vastly independent on business cycles with regard to both amplitude and synchronicity. The volatility of the credit cycle has been on average 2.5 times higher as compared to the business cycle. However, EBF further noticed that there has been a reduction in amplitude of the credit cycle in the late part of the 1990's, implying that there is more alignment between credit creation and the real economy. In terms of the lead-lag relationship, it was established that real GDP growth leads real credit growth. Furthermore, a feed-back relationship from credit to economic activity was observed though the observation is not the same across all countries.

Ricardo *et al* (2010) used standard deviation methods, state-of-the-art panel Granger causality tests and panel regressions for a sample of 144 countries over the period 1990 to 2007 to investigate the short-term relationship between credit changes and output changes. They established that Granger causality runs from GDP to credit in most of the countries, whereas the reverse holds true for a few countries in the sample under study. Moreover, their panel regressions reveal a more robust effect of GDP growth on credit growth than the opposite. Percic (2013) deployed quarterly data on real GDP and total credit to non-banking private sector from 10 European countries covering the period from the first quarter of 2000 to the

last quarter of 2012 and the results were mixed for the sampled countries. In 40 percent of the countries, it was discovered that economic activity led credit whereas 30 percent of the countries exhibited Granger-causality from credit expansion towards economic growth, with the remaining 30 percent showing no causal lead-lag relationship. In addition, credit cycle and real GDP have shown a synchronized relationship between the two cycles in about 40 percent of the countries, implying the affiliation of credit expansion to the real economy.

Investigating the cyclical relationship between credit and growth in India and US covering the period 1994 to 2013 in the frequency domain, Anusha (2015) discovered that credit cycles and output cycles are analogous in duration of almost 3 years. Moreover, Anusha found evidence of a lead-lag relationship between real credit and real output in both India and the US, with real credit leading output in the US and exhibiting robust synchronization while the reverse holds for the Indian economy. However, Zhu (2011) studied the nexus between the credit and business cycles using various methodologies and discovered that business cycle frequencies show a weak correlation between US credit variables and real activity and credit leads output by about 2 quarters. Moreover, Granger causality is indecisive about the direction of causality or whether it actually exists. In the euro area, bank credit was found to lag output by 2 quarters. Looking into the credit and business cycle nexus in Italy from 1861 to 2013, Bartoletto *et al* (2015) deployed a local turning-point dating algorithm and found evidence pointing to credit and business cycles being poorly synchronized in the medium term, and periods in which real contractions overlapped resulted in severe recessions. Moreover, there was insignificant evidence of credit leading output in both medium and short term fluctuations.

Gomez-Gonzalez *et al* (2015) used a sample of 33 developed and emerging market economies (EME) in the frequency domain and discovered that there is a high probability of cycle interdependence in medium and long-term frequencies. Moreover, they also established bi-directional Granger-causality between the two cycles with 88 percent of the countries showing greater correlation between credit and GDP. In addition, cross correlation between credit lags and contemporaneous output is positive with the relationship between the two cycles more robust with inclusion of lags. Last, they conclude that credit cycle peaks were found to precede booms in output, while peaks in output cycle precede troughs in the credit cycle. Classens, Kose and Terrones (2011) investigated the level of synchronization between business and financial cycles applying the concordance statistic on a database of over 200 business and 700 financial

cycles in 44 countries, covering the period from the first of quarter 1960 to the last quarter of 2007. They discovered that there is a robust level of synchronization between credit and output cycles, with both cycles in the same phase approximately 80 percent of the time. Moreover, developed economies show a higher degree of synchronicity relative to their EME counterparts, with financial downturns associated with slower economic activity while the reverse holds for financial upswings.

Egert and Sutherland (2012) study the nature of financial and real business cycles in OECD countries deploying annual, quarterly and monthly economic indicators. The study used the concordance indices to determine the degree of the cycles overlapping once turning points were established. The study established that the amplitude of the real business cycle was narrowing during the great moderation with asset price cycle becoming more impulsive. Moreover, they identified that access to bank credit and capital markets exacerbate movements in the real economy and at the same time, there was feedback effect from the real economy to bank lending. Chang (2016) examines the linkage among cycles and their lead-lag relationship. The hypothesis of the study is that, theoretically, credit cycle is viewed as one of the reasons driving the business cycle. Chang used the concordance index to examine the degree of synchronization among cycles and discovered that credit cycles do indeed serve as one cause of business cycles. In addition, Chang (2016) used probit estimation and regressed 12 financial soundness indicators (FSI's) to determine the source of credit cycle. The main finding from the estimation was that short-term credit and changed level in loan to business and individuals have a higher concordance with real estate price index cycle and business cycle.

Karfakis (2013) studied the relationship between real output and real credit at business-cycle frequencies with 3 empirical methods; cross correlation, regression and simulation analysis in Greece between the first quarter of 2000 to the first quarter of 2011 and established that real credit Granger-causes movements in real output. The in-sample Granger causality tests portrayed that the "…real credit cycle has information content that helps predict movements in the real output cycle" (Karfakis, 2013: 26). This implies that an increase in the credit cycle or credit above long term trend is associated with a real output expansion. Moreover, Karfakis (2013) indicated that the history of business cycles in Greece does not Granger cause the

[3] http://data.worldbank.org/country/lesotho?view=chart.

cycles of real credit at a 5 percent significance level. Cross correlation results indicated that real credit cycle leads real output cycle by one quarter, with the relationship between the two cycles being strongly procyclical. On the other hand, real credit growth rate was established to have led real output growth rate by three quarters with the relationship between the two variables robustly procyclical.

3 METHODOLOGY

3.1 Data sources, type and sample

The study uses annual bank credit data to the household and private non-financial corporate sectors, including non-banks and lending from abroad, real gross domestic product (GDP), broad money (M2) and trade deficit to GDP ratio covering the period from 1973 to 2013. The data were extracted from the World Banks' world development indicators (WDI) database[3].

3.2 Description of Analytical tools

3.2.1 Descriptive Statistics

The study uses cross-correlations to determine the cyclical relationship between credit-to-GDP gap and credit as well as M2 cycles at various leads and lags established by looking at the Schwarz Bayesian Criterion (SBC)[4]. The credit and M2 cycles can lead the credit-to-GDP gap by $\boldsymbol{j}$ years, synchronous, or lag behind it by a similar period, corr($\boldsymbol{y_t}$, $\boldsymbol{x_{t-j}}$), corr($\boldsymbol{y_t}$, $\boldsymbol{x_t}$), corr($\boldsymbol{y_t}$, $\boldsymbol{x_{t+j}}$), respectively. $\boldsymbol{y_t}$ is the credit-to-GDP gap and $\boldsymbol{x_t}$ is the real credit cycle or M2 cycle. A statistically negative and positive significant value implies that real credit or M2 cycle is countercyclical and procyclical, respectively. Values close to zero (0) indicate that the two variables are uncorrelated while values close to one (1) show that the variables are synchronous.

[3] http://data.worldbank.org/country/lesotho?view=chart.

[4] Schwartz information Criterion provides more parsimonious models relative to the Akaike Information Criteria (Enders, 2010).

3.2.2 Econometric techniques

3.2.2.1 In-sample Granger causality (backward-looking aggregate demand specification)

The study uses the Augmented Dickey-Fuller (ADF)[5] test to examine the unit root properties of the data. On the basis of the outcome of the unit root test, the data is used to estimate the following model (aka Karfakis, 2013):

$$y_t = \alpha + \beta y_{t-1} + \vartheta x_{t-1} + \pi z_{t-1} + \mu_t \qquad (1)$$

Where $\boldsymbol{y_t}$ is the credit-to-GDP gap, $\boldsymbol{x_t}$ can either be the real credit cycle or M2 cycle, $\boldsymbol{z_t}$ trade deficit to GDP ratio, and $\boldsymbol{\mu_t}$ is the error term. The trade deficit ratio is incorporated to capture the effects of external factors on aggregate demand. Focus is on the causal effect of the credit cycle and M2 cycle as the predictor variable(s) in equation 1. The causal effect is determined by deploying an in-sample Granger causality F-test[6] for testing the null hypothesis that $\vartheta_t = 0$, using heterosckedasticity and autocorrelation (HAC) consistent standard errors. Temporal stability in equation 1 is tested using the sup-wald statistic.

3.2.2.2 Credit-output relationship in terms of vector autocorrelation regression (VAR)

In order to check for robustness of the results obtained from Granger-causality, the study also deploys the following VAR model:

$$Y_t = A + B(L)y_t + \theta z_{t-1} + w_t \qquad (2)$$

Where $\boldsymbol{Y_t} = (\boldsymbol{y_t}, \boldsymbol{x_t})$ is a 2*1 vector of endogenous variables, $\boldsymbol{A}$ is a 2*1 vector of constant terms, $\boldsymbol{B(L)}$ is a 2*2 matrix polynomial in the lag operator $\boldsymbol{L}$, $\boldsymbol{\theta}$ is a 2*1 vector of parameters,

[5] "… [Dickey-Fuller] DF, [Augmented Dickey-Fuller] ADF and [Phillips-Peron] (PP) tests have comparable accuracy when it comes to detecting stationarity. Also, the unit root test seems to give slightly better results than the KPSS test when larger samples are used, whereas the opposite occurs for smaller samples." (Vlad-Metes, 2005; 22).

[6] Alternatively, $\vartheta_t = 0$ can be estimated using out-of-sample Granger causality test. The predictive ability of Equation 1 is compared to its restricted version, which will exclude real credit. If the mean squared prediction error (MSPE) in Eq. (1) is smaller than the MSPE of the restricted version, then this will imply that real credit Granger causes real output.

z_t exogenous variable and w_t is a 2*1 vector of white noise error terms with covariance matrix $\sum w$.

After establishing whether credit can be a lead indicator for GDP, credit can be used to compute the countercyclical capital buffer (CCB) as follows: The credit-to-GDP ratio is used as a reference point and is intended to help the authorities analyse whether or not to activate or increase the required counter-cyclical capital buffer. The long term trend is calculated using the Hodrick-Prescott (HP) filter, using a smoothing parameter of λ = 400 000, with the low and upper bounds being 2 and 10, respectively. When the one-sided HP gap is less than two percentage points, the buffer add-on is set to zero. If the gap exceeds 10 percentage points, the add-on is set at its maximum of 2.5 percent. The buffer add-on is calculated as (gap - 2) * (0.3125) percent between extremes {2 < gap < 10}. For trend estimation, it is essential to use sufficiently long-time series (at least 30 years for annual data) to arrive at meaningful estimates.

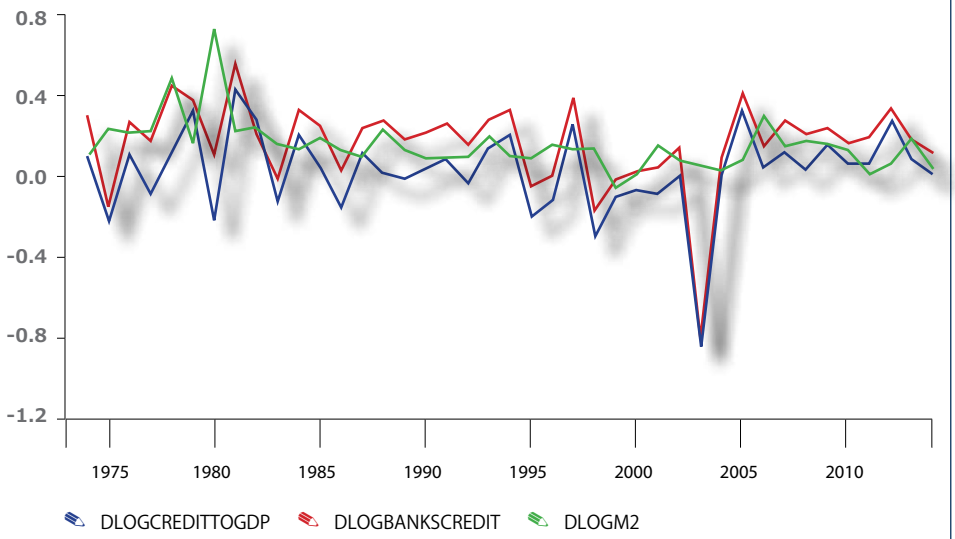
4 DATA ANALYSIS

4.1 Relationship between credit-to-GDP Growth, credit growth and M2 Growth

It is evident from Figure 1 that M2 growth moves first while credit-to-GDP[7] growth follows, inferring that M2 growth leads credit-to-GDP growth. On the other hand, credit growth mimics credit-to-GDP gap moving synchronously.

[7] Growth rates defined as differences in logs in M2 and credit to GDP ratio.

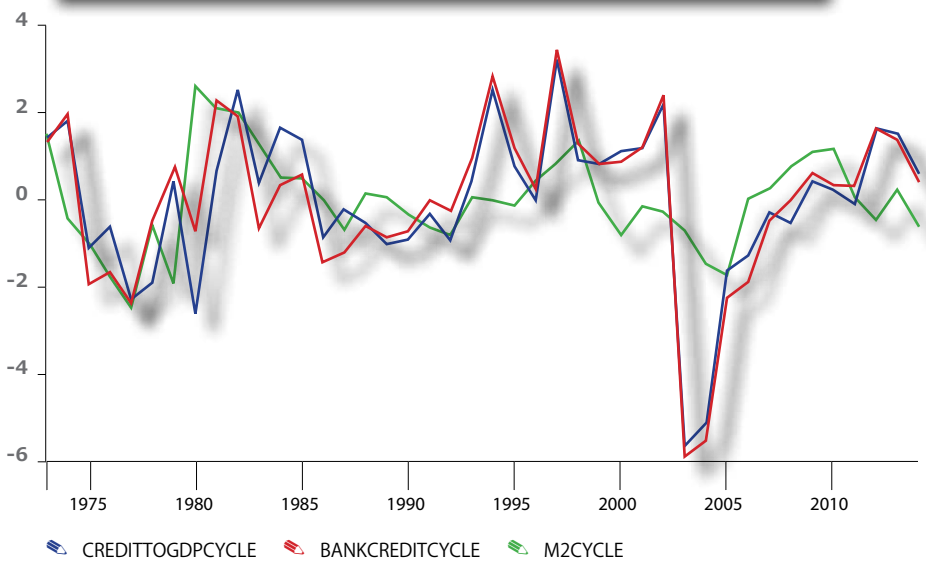
Figure 1 Credit-to-GDP gap, credit and M2 growth



Source: Word Development Indicators, 2016

Figure 2 shows the graphical relationship of credit-to-GDP gap, credit and M2 cycles in Lesotho. M2 cycle also moves first and then credit-to-GDP gap follows. The Credit cycle moves very closely to the credit-to-GDP gap showing a greater association between the two variables.

Figure 2 Credit-to-GDP gap, credit and M2 cycles



Source: Word Development Indicators, 2016

4.2 Analysis of M2 and credit cycles as lead indicators for credit-to-GDP gap[8]

4.2.1 Unit root test results

The study uses the ADF test with intercept, with only trade deficit ratio and credit-to-GDP gap tested using ADF with trend and intercept[9] to establish their stationarity. Table 1 show that M2 cycle, output cycle, credit cycle and credit-to-GDP gap are all stationary at a 5 percent significance level, while M2 growth, credit growth and output growth are all stationary at a 1 percent significance level. The trade deficit to GDP ratio is first difference stationary at a 1 percent significance level.

[8] Results on credit cycle are deferred to Appendix 2 because there is no lead-lag relationship found.

[9] Credit cycle and Credit-to-GDP gap graph in Figure 2 show a sharp decline in 2003, however, upon conducting the Chow-break point test, the there is no evidence found supporting structural breaks as shown in appendix 1. TDR shows a rising trend. Furthermore, impulse response functions in Appendix 2 show no evidence of structural breaks in the data used.

Table 1	ADF test statistic	
Variables[10]	T-statistic	Decision
M2 cycle	-3.65 (0.01)**	Stationary
Output cycle	-3.34 (0.02)**	Stationary
Credit cycle	-3.83 (0.01)	Stationary
M2 growth	-4.90 (0.00)*	Stationary
Output growth	-5.38 (0.00)*	Stationary
Credit growth	-6.06 (0.00)*	Stationary
TDR#	-0.64 (0.85)	Non-stationary
d(TDR)	-6.15 (0.00)*	Stationary
Credit-to-GDP gap#	-4.12 (0.01)**	Stationary

Critical values -3.60, -2.94 and -2.61. (*), (**) and (***) denote 1%, 5% and 10% level of statistical significance with p – values in parenthesis (). ADF with intercept and trend (#), critical values -4.21,-3.53 and -3.19 (*), (**) and (***) denote 1%, 5% and 10% level of statistical significance. (#) denotes ADF with intercept and Trend.

4.2.2 Lead-lag relationship between credit-to-GDP gap, M2 and credit cycles

The co-movement of credit-to-GDP gap and M2 cycle using correlation analysis is displayed in Table 2a. The study establishes a lead-lag relationship between credit-to-GDP gap and M2 cycle with M2 cycle leading credit-to-GDP gap by one (1) year and M2 growth also leading credit-to-GDP growth by one (1) year, displaying a procyclical relationship between the variables. Table 2b shows no lead-lag relationship between credit-to-GDP gap and credit cycle, with the two variables strongly associated in current periods. Credit growth is also established to be strongly synchronous with credit-to-GDP gap.

[10] Variables are in nominal terms.

Table 2A Cross correlations (Credit-to-GDP gap and M2 cycle)

Credit-to-GDP gap	x_{t-3}	x_{t-2}	x_{t-1}	x_t	x_{t-1}	x_{t-2}	x_{t-3}
$\bar{y}_t, \dot{x}_t$	0.27	0.28	**0.50**	0.35	0.34	-0.01	-0.35
	(0.10)	(0.09)	**(0.00)**	(0.02)	(0.03)	(0.94)	(0.03)
$\dot{\bar{y}}_t, \dot{\bar{x}}_t$	0.18	0.04	**0.38**	0.01	0.35	0.07	-0.21
	(0.28)	(0.80)	**(0.02)**	(0.96)	(0.03)	(0.69)	(0.21)

Where $\bar{y}_t, \dot{x}_t$ is the cross correlation between credit-to-GDP gap and M2 cycle. Whereas the notation $\dot{\bar{y}}_t, \dot{\bar{x}}_t$ refers to the growth rates of the credit-to-GDP gap and M2, respectively. Probability values are in parenthesis and largest absolute significant correlations are bold.

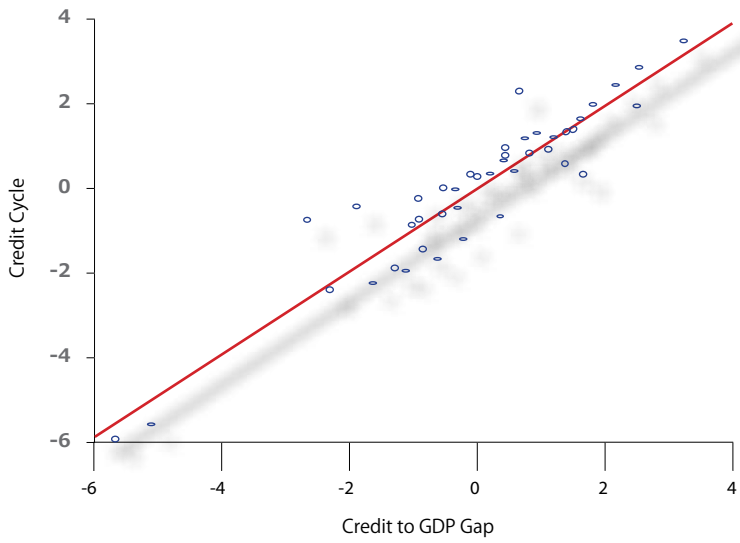
Table 2B Cross correlations (Credit-to-GDP gap and credit cycle)

Credit-to-GDP gap	x_{t-3}	x_{t-2}	x_{t-1}	x_t	x_{t-1}	x_{t-2}	x_{t-3}
$\tilde{y}_t, \tilde{x}_t$	0.21	0.16	0.45	**0.94**	0.34	0.02	0.004
	(0.19)	(0.32)	(0.00)	**(0.00)**	(0.03)	(0.89)	(0.98)
$\dot{\tilde{y}}_t, \dot{\tilde{x}}_t$	0.31	-0.09	-0.01	**0.94**	-0.07	-0.05	0.27
	(0.06)	(0.60)	(0.96)	**(0.00)**	(0.65)	(0.75)	(0.11)

Where $\tilde{y}_t, \tilde{x}_t$ is the cross correlation between credit-to-GDP cycle and credit cycle. Whereas the notation $\dot{\tilde{y}}_t, \dot{\tilde{x}}_t$, refers to the growth rates of the credit-to-GDP and credit, respectively. Probability values are in parenthesis and largest absolute significant correlations are bold.

Figure 3 shows how much credit-to-GDP gap is explained by credit cycle and about 87 percent of variation in credit-to-GDP gap is explained by credit cycle (R^2 = 0.87). This figure implies a high association between credit-to-GDP gap and the credit cycle in Lesotho also as indicated in Figure 3.

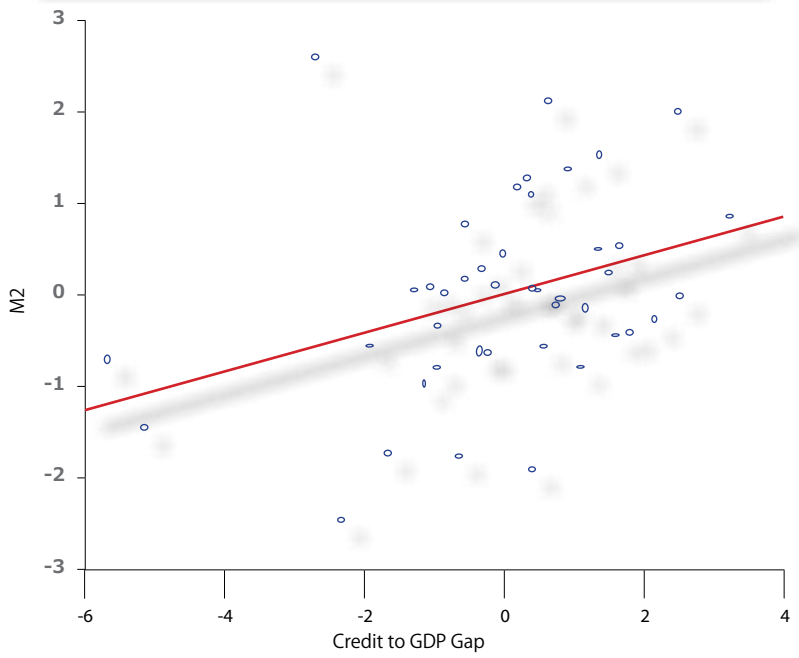
Figure 3 Credit-to-GDP gap and credit cycle



Source: Word Development Indicators, 2016

Figure 4 shows low degree of association between credit-to-GDP gap and M2 cycle. In other words, 12 percent of movements in the credit-to-GDP gap can be explained by the M2 cycle.

Figure 4 Credit-to-GDP gap and M2 cycle



Source: Word Development Indicators, 2016

4.2.3 The VAR relationship between credit-to-GDP gap and M2cycle

Table 3a shows that M2 cycle explains about 66 percent of the variations in credit-to-GDP gap. Moreover, 49 percent of the variation in M2 cycle is explained by lagged M2 cycle, with the relationship between the two variables positive and statistically significant. The information criteria variables all indicated two (2) lags; therefore Table 3b shows the VAR relationship with two (2) lags. However, credit-to-GDP gap is significant up to lag one (1) only, with other variables insignificant in explaining variations in credit-to-GDP gap. Also, only the first lag of M2 cycle is significant in explaining the movements in M2 cycle.

Table 3A	(Credit-to-GDP gap-M2 Cycle; 1 lag)		
Regressors	Credit-to-GDP gap	M2 cycle	Trade deficit ratio
$\bar{y}_{t-1}$	0.25 (1.73)	0.11 (1.32)	0.36 (0.45)
$\dot{x}_{t-1}$	0.66 (2.69)	0.49 (3.37)	-3.78 (-2.87)
dz_{t-1}	0.04 (1.52)	-0.01 (-0.89)	0.002 (0.01)

AIC, FPE, SIC and HQ select two (2) lags, diagnostics of the system: Serial correlation LM test: χ^2 (9) = 7.04 [0.63], Heteroskedasticity Test (whites' test with cross terms): χ^2 (2162) = 173.60 [0.17]. Moreover, all the inverse unit roots fall inside the unit circle, implying that the VAR is stationary.

Table 3B	(Credit-to-GDP gap-M2 Cycle; 2 lags)		
Regressors	Credit-to-GDP gap	M2 cycle	Trade deficit ratio
$\bar{y}_{t-1}$	0.25 (1.73)	0.11 (1.32)	0.36 (0.45)
y_{t-2}	0.66 (2.69)	0.49 (3.37)	-3.78 (-2.87)
$\dot{x}_{t-1}$	0.66 (2.69)	0.49 (3.37)	-3.78 (-2.87)
$\dot{x}_{t-1}$	0.66 (2.69)	0.49 (3.37)	-3.78 (-2.87)
dz_{t-1}	0.66 (2.69)	0.49 (3.37)	-3.78 (-2.87)
dz_{t-2}	0.04 (1.52)	-0.01 (-0.89)	0.002 (0.01)

AIC, FPE, SIC and HQ select two (2) lags, diagnostics of the system: Serial correlation LM test: χ^2 (9) = 22.09 [0.01], Heteroskedasticity Test (whites' test with cross terms): χ^2 (54) = 63.82 [0.17]. Moreover, all the inverse unit roots fall inside the unit circle, implying that the VAR is stationary.

4.2.4 Granger causal relationship between credit-to-GDP gap and M2 cycle

4.2.4.1 Simple Granger causality

Table 4 shows the estimated output equation with credit-to-GDP and M2 cycles obtained using the HP filter with a smoothing parameter of 100. There is a statistically significant positive relationship between lagged M2 cycle and credit-to-GDP gap, with lagged M2 cycle explaining about 66 percent of variations in the credit-to-GDP gap. In addition, Table 4 shows simple in-sample Granger-causality test and demonstrates that there is bi-directional Granger-causality between M2 cycle and credit-to-GDP gap. On the other hand, there is uni-directional Granger causality between M2 growth and credit-to-GDP growth.

Table 4	Credit-to-GDP gap-M2 cycle				
Regressors	*Coefficient*	*St. Error*	*T-statistic*	*In-sample test of Granger Causality*	
y_{t-1}				*Null*	*F-test (Prob)*
$\bar{y}_{t-1}$	0.26	0.14	1.79 (0.08)	$\dot{x} \neq> \dot{y}$	4.23 (0.02)
$\dot{x}_{t-1}$	0.66	0.24	2.72 (0.01)	$\dot{y} \neq> \dot{x}$	3.38 (0.05)
dz_{t-1}	0.04	0.03	1.54 (0.13)	$\ddot{x} \neq> \ddot{y}$	4.08 (0.03)
				$\ddot{y} \neq> \ddot{x}$	1.05 (0.36)

Adj. R^2 = 0.27; SEE = 0.15; Heteroskedasticity, white's test = F(9,30) = 1.02 (0.45), Breusch-Godfrey Serial Correlation LM Test: F(2,34) = 1.66 (0.21), Jarque-Bera test: 87.30(0.00), Ramsey-reset test: F(2,34) = 0.38 (0.69).

Where $\bar{y}_t$ is credit-to-GDP gap, $\bar{\bar{y}}_t$ is credit-to-GDP growth, $\dot{x}$ is M2 cycle, x is M2 growth and z is trade deficit ratio (% of GDP), probability in parenthesis. $\dot{x} \neq> \bar{y}_t$; Means M2cycle does not Granger-cause credit-to-GDP gap, $\ddot{x} \neq> \bar{\bar{y}}_t$; means M2 growth does not Granger cause credit-to-GDP growth.

4.2.4.2 VAR Granger causality

For robustness checks, the study uses VAR Granger causality tests. The results are displayed in Table 5. VAR Granger causality test confirms the results from the simple Granger causality tests that there is bi-directional Granger-causality between M2 cycle and credit-to-GDP gap. On the other hand, there is no Granger causality between M2 growth and credit-to-GDP growth..

Table 5	In-sample Granger causality	
Null	F-statistic	Prob.
$\dot{x} \neq> y_t$	4.23	0.02
$\bar{y} \neq> x$	3.38	0.05
$\ddot{x} \neq> y$	4.08	0.03
$\bar{\bar{y}} \neq> x$	1.04	0.36

Where $\bar{y}$ is credit-to-GDP gap, $\bar{\bar{y}}$ is credit-to-GDP growth, $\dot{x}$ is M2 cycle, x is M2 growth.

5 CONCLUSION AND RECOMMENDATIONS

5.1 Key findings

The study investigates the lead-lag relationship between M2 cycle and credit-to-GDP gap and discovered that M2 cycle leads credit-to-GDP gap by one (1) year with the relationship procyclical. Moreover, simple OLS Granger-causality test indicates a bi-directional causality between M2 cycle and credit-to-GDP gap. Conversely, there is uni-directional evidence of Granger causality from M2 growth to credit-to-GDP growth. VAR Granger-causality test also corroborates the simple OLS results. The relationship between the credit cycle and credit-to-GDP gap was examined and the results show a strongly synchronous association between the two variables. On the other hand, the study investigated the relationship between real credit and real output cycles[11] and had anticipated that real credit cycle will mimic real output cycle, as availability of money will lead to increased investment and thus increase economic activity. However, the results of the study portray a different picture from our *a priori expectations*. First, the cross correlation between real output cycle and real credit cycle shows no significant lead-lag relationship between the two variables, there is cross correlation between real credit cycle and real output cycle only in the current period of the credit cycle. Similar results were established using the growth rates for both the real output and real credit. Second, using the simple OLS regression, the relationship between real credit cycle and real output cycle is negative and insignificant. The only significant relationship is found between real output cycle and its lagged value. Last, using the VAR regression for robustness checks, there is no relationship between real output cycle and real credit cycle. In addition, Granger causality tests were conducted on both the OLS and VAR regression models, the results confirm that neither real credit cycle nor real output cycle Granger-causes each other. Real output growth and real credit growth also displayed no Granger-causality between them. The results could imply several issues, for instance, it could mean changes in output are as a result of other variables except the availability of credit to the private sector or it could be as a result of mis-specification in the models used in the study.

[11] Refer to Box 1.

Additionally, the study also used the broad money supply (M2) as an alternative to credit to private sector as M2 has been used in the literature as a proxy for financial development like in Chang and Caudill (2005), Handa and Khan (2008), Akomolafe (2014) and Marbua (2013). M2 cycle was computed using the HP filter using a smoothing parameter of 100. The study investigated the relationship between M2 cycle and output cycle in order to establish whether M2 cycle can be used as a lead indicator for the output cycle[12]. The study discovered that M2 cycle leads the output cycle in Lesotho by 3 years, with the relationship countercyclical. Therefore, broad money can be used as a lead indicator for the output cycle in Lesotho. On the other hand, it was established that there is no lead-lag relationship between M2 growth and output growth[13]. Using simple OLS granger-causality, it was discovered that there is uni-directional causality from M2 cycle to output cycle while there is no Granger-causality between M2 growth and output growth.

5.2 Recommendations

The study proposes the following recommendations based on both the theoretical and empirical evidence discovered in the study, as a proposed way forward to develop the counter-cyclical buffers in Lesotho.

- Credit extension to the household and private non-financial corporate sector, including non-banks and lending from abroad is limited in influencing real output in Lesotho. According to the CBL (2012) economic review, dimness in private sector credit extension can be attributed, amongst others; to commercial banks' risk aversion[14] coupled with low credit demand by the private sector. Consequently, because of the empirical evidence found in this study, credit cycle can be used as a proxy for credit-to-GDP gap in Lesotho.

- M2 cycle can also be used as an instrument for the macroprudential policy framework on the basis of empirical evidence that suggests its' suitability as a leading indicator for the credit-to-GDP gap.

[12] Refer to Box 1.
[13] Calculated as first difference in logs.
[14] CShown by a high risk premium in Lesotho relative to other common monetary area (CMA) countries - CBL, Financial stability watch, March 2015.

- Credit-to-GDP gap is computed by taking credit in each quarter and dividing it by a rolling GDP sum of last four (4) quarters, commonly referred to as annualised credit-to-GDP ratio. Therefore, the last quarter value coincides with annual GDP value which can be used to perform a reality check on the validity of the proxies.

- The study recommends that for stress testing, shocks to the NFA should be conducted to determine how they affect the macro-financial stability and financial deepening factors as it represents a big part of broad money in Lesotho.

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BOX 1

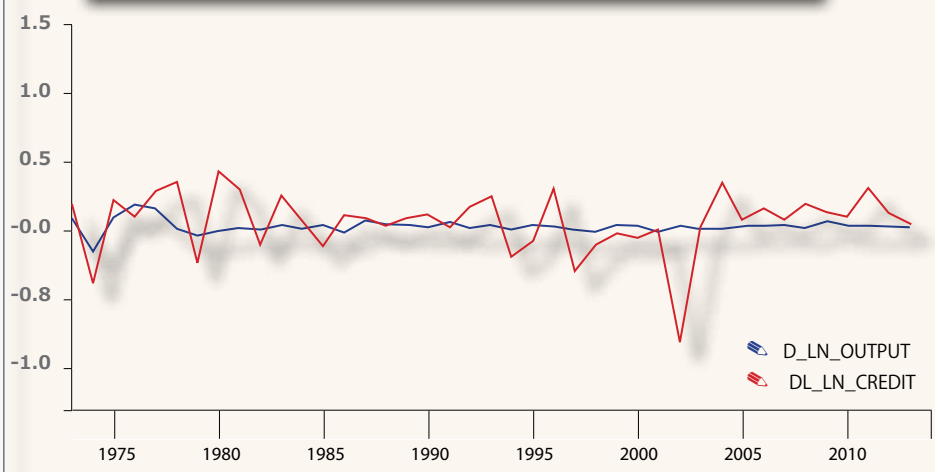
Box 1 Application of credit and M2 to output

1. Relationship between real GDP growth and real credit growth

Figure 1 shows the growth rates of real GDP and real credit, calculated as difference in logs in real GDP and real credit in Lesotho. Through visual inspection, real GDP growth rate appears to be more stable across the sample period while real credit growth tends to deviate from its mean in some periods. Commercials banks performance in Lesotho was weak and characterised by inadequate management, extension of credit disregarding prudent lending practices and excessive political intervention for one of the state owned banks', which was eventually closed in 1998 (Motelle and Masenyetse, 2012; Borotho, 1998). Two of the state owned banks were experiencing limited lending capacity in late 1990s as a result of insolvency and being illiquid and resulted in low investment environment, which transpired in recessionary conditions in 1998 (Borotho, 2000) and subsequently led to the privatisation of Lesotho bank (Motelle and Masenyetse, 2012). This period was coincidentally aligned to the Asian banking crises, which for some countries extended to the early 2000s'. In 2001, the AGOA initiative was signed into law and resulted in Asian businesses locating to Lesotho to enjoy this duty free environment for exports to the US market. In an attempt to boost the export market, the Central Bank of Lesotho (CBL) in 2002 signed a memorandum of understanding (MOU) with commercial banks to advance credit to eligible exporters. In 2004, two additional players were introduced in the banking sphere and this resulted in banks aggressively competing for loans and thus relaxing their credit standards (CBL, 2004). The 2007 global financial crisis had an impact on the global market and Lesotho was no exception. The land administration act (LAA) was introduced in 2010, where households could use land as collateral to access credit from banks (CBL, 2012). These developments explain the rather sporadic movement in real credit growth. Since credit exerts a small influence in creating more output in Lesotho due to limited extension to the private sector, the developments which transpired in the credit environment have shown not to have impacted the real output growth as it is shown to be smooth in the period under review.

Box 1 Application of credit and M2 to output (continued)

Figure 1 Real GDP growth and real credit growth



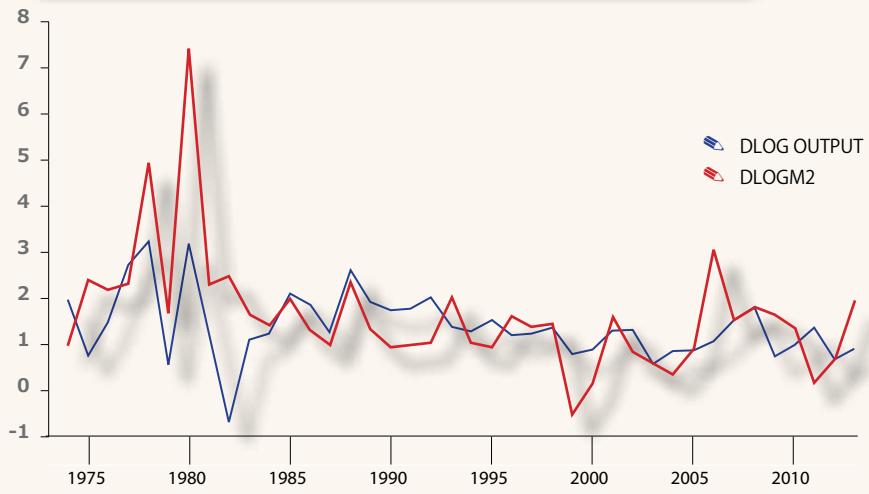
Source: World Development Indicators, 2016

2. Relationship between GDP growth and M2 growth

Alternatively, the study investigated the relationship between the growth rates of GDP and M2 as showed in Figure 2, calculated as difference in logs in GDP and M2 in Lesotho. Through visual inspection, there seems to be correlation between GDP growth rate and M2 growth in the period under review as the two growth rates look to be moving closely to each other with M2 growth looking to move first then output growth following.

Box 1 Application of credit and M2 to output (continued)

Figure 2 Output growth and M2 growth

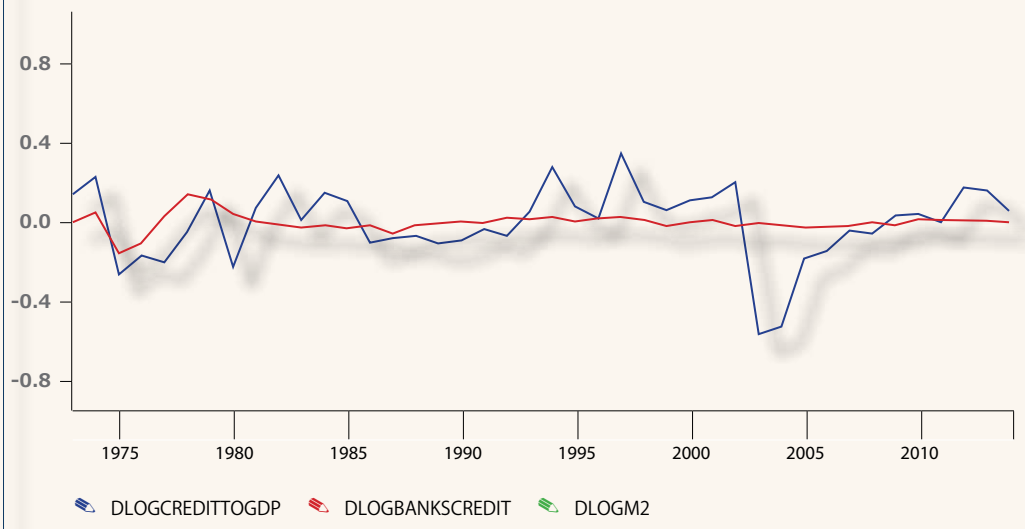


Source: World Development Indicators, 2016

Figure 3 plots the real output and real credit cyclical components (in logarithms). The cycles were derived using the Hodrick-Prescott (HP) filter with an annual smoothing parameter of 100. Notably, there seems to be a structural break in 2003 for the real credit cycle. The Chow break-point test was conducted to formally test whether the observed structural break is statistically significant. The test confirms that there is a structural break in 2003. The findings on the test are reported in Appendix 1.

Box 1 Application of credit and M2 to output (continued)

Figure 3 GDP and credit cycles

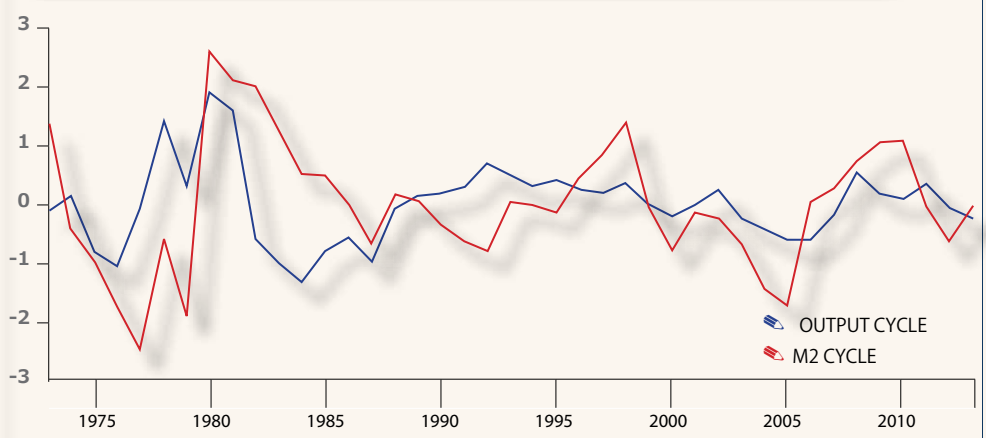


Source: World Development Indicators, 2016

Figure 4 plots the output and M2 cyclical components (in logarithms). The cycles were derived using the HP filter with an annual smoothing parameter of 100. From the visual inspection of the Figure 4, it is evident that the M2 cycle graph leads the output cycle graph, as peaks and troughs of M2 cycle are followed by peaks and troughs of the output cycle graph.

Box 1 Application of credit and M2 to output (continued)

Figure 4 Output and M2 cycles



Source: World Development Indicators, 2016

3. Credit cycle and M2 cycle as lead indicators for the output cycle

3.1. Unit root test results

The apparent structural break in 2003 for real credit cycle prompted the stationarity test to be conducted on the variable employing an ADF test with an intercept and trend. Also, trade deficit to GDP ratio exhibits a rising trend and ADF test with an intercept and trend was used to determine the stationarity of the variable. However, for the remaining variables, the ADF test with intercept was used. Table 1 shows that real credit cycle and real output cycle are stationary at a 5 percent significance level, while real credit growth and real output growth are stationary at a 1 percent significance level. The trade deficit to GDP ratio is stationary at a 10 percent significance level. Table 1 shows that M2 cycle and output cycle are stationary at a 5 percent significance level, while M2 growth and output growth are both stationary at a 1 percent significance level. The trade deficit to GDP ratio is first difference stationary at a 1 percent significance level

Box 1 Application of credit and M2 to output (continued)

Table 1: ADF Test

Variables	T-static	Decision	Variables	T-statistic	Decision
Real credit cycle#	-4.15 (0.01)**	Stationary	M2 cycle	-3.65 (0.01)**	Stationary
Real output cycle	-3.86 (0.01)**	Stationary	Output cycle	-3.34 (0.02)**	Stationary
Real credit growth	-6.70 (0.00)*	Stationary	M2 growth	-4.90 (0.00)*	Stationary
Real output growth	-5.93 (0.00)*	Stationary	Output growth	-5.38 (0.00)*	Stationary
TDR#	-3.36 (0.07)***	Stationary	TDR#	-0.64 (0.85)	Non-stationary
			d(TDR)	-6.15 (0.00)*	Stationary

Critical values -3.60, -2.94 and -2.61. (*), (**) and (***) denote 1%, 5% and 10% level of statistical significance with p – values in parenthesis. () ADF with intercept and trend (#), critical values -4.21, -3.53 and -3.19 (*), (**) and (***) denote 1%, 5% and 10% level of statistical significance.

3.2 Lead-lag relationship between GDP, credit and M2 cycles

The results reported in Table 2a show that there is no lead-lag relationship between real output cycle and real credit cycle, as the largest significant value in absolute terms is at the current observation of real credit cycle. Although insignificant, there is evidence suggesting that the real credit cycle is pro-cyclical to real output cycle in the lead periods, and it is counter-cyclical in the lagging periods. In other words, the results imply that real output cycle is explained by the current level of real credit cycle. When examining the real growth rates, it is evident that real output growth is also explained at the current rate of real credit growth. In contrast, there is evidence suggesting that real credit growth is counter-cyclical to real output growth in the lead periods, and pro-cyclical in the lag periods with an exception noted in year x_{t-3}. This was a period where growth in credit was fuelled by the reduction in borrowing costs due to low domestic and global interest rates.

The co-movement of output cycle and M2 cycle using correlation analysis is also displayed in Table 2b. The study establishes that M2 cycle is countercyclical with the output cycle, and M2 cycle leads output cycle by 3 years. Moreover, the relationship between M2 cycle and output cycle changes in the lead periods and turns procyclical. Moreover, Table 2b displays that the relationship between M2 cycle and output cycle turns procyclical in the lead periods with the correlations statistically significant.

Box 1 Application of credit and M2 to output (continued)

Table 2 A: Cross Correlations (Output cycle and credit cycle)

$\tilde{y}_t, \tilde{x}_t$	x_{t-3}	x_{t-2}	x_{t-1}	x_t	x_{t+1}	x_{t+2}	x_{t+3}
	-0.24	-0.27	-0.01	**0.30**	0.23	0.15	0.11
	(0.15)	(0.10)	(0.95)	**(0.06)**	(0.14)	(0.35)	(0.50)
$\grave{y}_t, \grave{x}_t$	-0.07	0.04	0.06	**0.34**	-0.03	-0.16	-0.10
	(0.70)	(0.80)	(0.71)	**(0.03)**	(0.87)	(0.33)	(0.65)

Where $\tilde{y}_t, \tilde{x}_t$ is the cross correlation between real output cycle and real credit cycle. Whereas the notation $\grave{y}_t, \grave{x}_t$ refers to the growth rates of both the real output and real credit. Probability values are in parenthesis. The highest significant correlations are in bold.

Table 2 B: Cross Correlations (Output cycle and M2 cycle)

y_t, x_t	x_{t-3}	x_{t-2}	x_{t-1}	x_t	x_{t+1}	x_{t+2}	x_{t+3}
	-0.60	-0.52	-0.15	0.31	0.31	0.43	0.30
	(0.00)	(0.00)	(0.35)	(0.05)	(0.05)	(0.01)	(0.06)
$\ddot{y}_t, \ddot{x}_t$	0.03	-0.07	0.03	**0.51**	0.05	0.35	0.15
	(0.88)	(0.67)	(0.85)	**(0.00)**	(0.78)	(0.03)	(0.38)

Where y_t, x_t is the cross correlation between output cycle and M2 cycle. Whereas the notation $\ddot{y}_t, \ddot{x}_t$ refers to the growth rates of both the output and M2. Probability values are in parenthesis. The highest significant correlations are in bold.

3.3 The VAR relationship between GDP, credit and M2 cycles

Table 3a displays GDP-credit cycles VAR estimation output with endogenous variables lagged once. The results indicate that in all three systems of equations, the left hand side variables are only explained by their own lagged variables and the rest of the variables are statistically insignificant. Looking at the output regression, about 50 percent of the variance in real GDP cycle is caused by lagged real GDP value, while the lagged credit cycle explains about 34 percent of the current credit cycle movements and lastly, only 2 percent of the current movement in trade deficit to GDP ratio is explained by its lagged value. However, Looking at Table 3b, about 67 percent of the variance in output cycle is caused by lagged output cycle value, while the lagged M2 cycle explains about 24 percent of the variation in output cycle and bearing a countercyclical effect.

Box 1 Application of credit and M2 to output (continued)

Table 3 A: Estimating VARs (Output-credit cycles; 1 lag)

Regressors	Output cycle	Credit cycle	Trade deficit ratio
$\tilde{y}_{t-1}$	0.50 (3.26)	0.54 (0.83)	0.99 (0.64)
$\tilde{x}_{t-1}$	-0.04 (-1.07)	0.34 (2.12)	-0.33 (-0.87)
z_{t-1}	-0.002 (-0.55)	-0.003 (-0.22)	0.02 (26.96)

AIC, FPE and HQ select three (3) lags, while SIC select one (1) lag, diagnostics of the system: Serial correlation LM test: χ^2(9) = 8.09 [0.53], Heteroskedasticity Test (whites' test with cross terms): χ^2(36) = 54.69 [0.02]. Moreover, all the inverse unit roots fall inside the unit circle, implying that the VAR is stationary.

Table 3 B: Estimating VARs (Output-M2 cycles; 1 lag)

Regressors	Output cycle	M2 cycle	Trade deficit ratio
$\dot{y}_{t-1}$	0.67 (4.63)	0.36 (1.46)	-0.17 (-0.38)
$\dot{x}_{t-1}$	-0.24 (-2.78)	0.47 (3.27)	-0.65 (-2.40)
dz_{t-1}	-0.003 (-0.07)	-0.12(-1.37)	0.04 (0.25)

AIC, FPE and HQ select three (3) lags, while SIC select one (1) lag, diagnostics of the system: Serial correlation LM test: $\chi^2(9)$ = 8.09 [0.53], Heteroskedasticity Test (whites' test with cross terms): $\chi^2(36)$ = 54.69 [0.02]. Moreover, all the inverse unit roots fall inside the unit circle, implying that the VAR is stationary.

Moreover, the AIC, FPE and HQ information criterion variables indicate three (3) lags in the GDP-credit cycle VAR regression model and two (2) lags for output cycle and M2 cycle in Table 4a and 4b. Table 4a shows real output cycle lags are significant up to two lags, with the second lag being negative. Moreover, when looking at the real credit cycle regression, lagged real output cycle explains about 2 percent of movements in real credit cycle. Lagged real credit explains about 39 percent of movements in real credit cycle up to lag one (1). Trade deficit to GDP ratio explains about 20 percent of movements in real credit cycle lagging real credit cycle by three (3) years. Lagged trade deficit to GDP ratio explains about 76 percent of movements in the current trade deficit to GDP ratio. Table 4b displays GDP-M2 cycle VAR estimation output with 2 lags, 64 percent of variation in output cycle is explained in the first lag of the output cycle while 23 percent is explained by the second lag of the M2 cycle with a countercyclical effect. When looking at the M2 cycle regression, lagged M2 cycle explains about 62 percent of movements in the current M2 cycle while 20 percent of the variation is explain in lag 2 of the trade deficit ratio. Lag one of M2 cycle explains about 81 percent of the variation in Trade deficit to GDP ratio with a countercyclical effect.

Box 1 Application of credit and M2 to output (continued)

Table 4 A: Estimating VARS with multiple lags (GDP-credit cycles; 3 lags)

Regressors	Real output cycle	Real credit cycle	Trade deficit ratio
$\tilde{y}_{t-1}$	0.81 (5.71)	2.02 (2.06)	2.06 (1.15)
$\tilde{y}_{t-2}$	-0.37 (-2.79)	0.45 (0.50)	-0.79 (-0.47)
$\tilde{y}_{t-3}$	-0.08 (-0.75)	0.11 (0.15)	-4.22 (-3.08)
$\tilde{x}_{t-1}$	-0.04 (-0.00)	0.39 (2.38)	-0.03 (-0.11)
$\tilde{x}_{t-2}$	-0.02 (-0.64)	-0.12 (-0.69)	0.39 (1.21)
$\tilde{x}_{t-3}$	0.01 (0.39)	0.22 (1.28)	0.08 (0.25)
z_{t-1}	-0.01 (-1.09)	-0.11 (-1.30)	0.76 (4.90)
z_{t-2}	0.00 (0.15)	-0.09 (-0.83)	0.34 (1.81)
z_{t-3}	0.01 (0.68)	0.20 (2.46)	-0.13 (-0.91)

Akaike information criterion (AIC), Final prediction error (FPE) and Hannan-Quinn information criterion (HQ) select three (3) lags, while Schwarz information criterion (SC) selects one (1) lag, diagnostics of the system: Serial correlation LM test: $\chi^2(9) = 5.83$ [0.7560], Heteroskedasticity Test (whites' test with cross terms): $\chi^2(108) = 115.93$ (0.28). Moreover, all the inverse unit roots fall inside the unit circle, implying that the VAR is stationary..

Table 4 B: Estimating VARS with multiple lags (GDP-M2 cycles; 2 lags)

Regressors	Output cycle	M2 cycle	Trade deficit ratio
$\dot{y}_{t-1}$	0.67 (4.63)	0.36 (1.46)	-0.17 (-0.38)
$\dot{y}_{t-2}$	-0.24 (-2.78)	0.47 (3.27)	-0.65 (-2.40)
$\dot{x}_{t-1}$	0.67 (4.63)	0.36 (1.46)	-0.17 (-0.38)
$\dot{x}_{t-2}$	-0.24 (-2.78)	0.47 (3.27)	-0.65 (-2.40)
dz_{t-1}	-0.24 (-2.78)	0.47 (3.27)	-0.65 (-2.40)
dz_{t-2}	-0.003 (-0.07)	-0.12(-1.37)	0.04 (0.25)

AIC, FPE and HQ select two (2) lags and SIC select one (1) lag, diagnostics of the system: Serial correlation LM test: $\chi^2(9) = 20.18$ [0.0.02], Heteroskedasticity Test (whites' test with cross terms): $\chi^2(162) = 174.09$ [0.24]. Moreover, all the inverse unit roots fall inside the unit circle, implying that the VAR is stationary.

Box 1 Application of credit and M2 to output (continued)

3.4 Granger causal relationship between GDP, credit cycle and M2 cycle

3.4.1 Simple Granger causality

Looking at the in-sample Granger-causality test, we fail to reject the null hypothesis that real credit cycle does not Granger-cause real output cycle. Moreover, the null hypothesis that real output cycle does not Granger-cause real credit cycle is accepted. While examining the growth rates, real output growth does not Granger-cause real credit growth, with real credit growth also not Granger causing real output growth. On the other hand, Table 5b shows the estimated GDP-M2 cycle output equation with the cycles obtained using the HP filter. The in-sample Granger-causality test shows that we reject the null hypothesis that M2 cycle does not Granger-cause output cycle. Moreover, we fail to reject the null hypothesis that output cycle does not Granger causes M2 cycle. Moreover, there is no Granger-causality between output growth and M2 growth.

Box 1 Application of credit and M2 to output (continued)

Table 5 A: Estimated real output equation (GDP-credit cycle)

Regressors	*Real output cycle*	*Real credit cycle*	*Trade deficit ratio*	*In-sample test Granger Casuality*	
				Null	*F-test (Prob)*
$\tilde{y}_{t-1}$	0.50	0.15	3.26 (0.00)	$\tilde{x} \neq> \tilde{y}$	1.10 (0.30)
$\tilde{x}_{t-1}$	-0.04	0.04	-1.07 (0.29)	$\tilde{y} \neq> \tilde{x}$	0.70 (0.41)
z_{t-1}	-0.002	0.004	-0.51 (0.61)	$\grave{x} \neq> \grave{y}$	0.09 (0.91)
				$\grave{y} \neq> \grave{x}$	0.53 (0.59)

Adj. R^2 = 0.17; SEE = 0.04; Heteroskedasticity, Breusch-Godfrey test = F(3,36) = 1.72 (0.18), Breusch-Godfrey Serial Correlation LM Test: F(2,34) = 1.96 (0.16), Jarque-Bera test: 98.55 (0.00), Ramsey-reset test: F(2,34) = 1.89 (0.17).

Where $\tilde{y}$ is real output cycle, $\grave{y}$ is real output growth, $\tilde{x}$ is real credit cycle, $\grave{x}$ is real credit growth and is trade deficit ratio (% of GDP), probability in parenthesis. $\tilde{x} \neq> \tilde{y}$; Means real credit cycle does not Granger-cause real output cycle, $\grave{x} \neq> \grave{y}$; means real credit growth does not granger cause real output growth.

Table 5 B: Estimated real output equation (GDP-M2 cycle)

Regressors	*Real output cycle*	*Real credit cycle*	*Trade deficit ratio*	*In-sample test Granger Casuality*	
				Null	*F-test (Prob)*
$\dot{y}_{t-1}$	0.67	0.15	4.63 (0.00)	$\dot{x} \neq> \dot{y}$	6.32 (0.00)
$\dot{x}_{t-1}$	-0.23	0.09	-2.78 (0.01)	$\dot{y} \neq> \dot{x}$	2.35 (0.11)
dz_{t-1}	-0.003	0.05	-0.07 (0.95)	$\ddot{x} \neq> \ddot{y}$	0.38 (0.69)
				$\ddot{y} \neq> \ddot{x}$	2.03 (0.15)

Adj. R^2 = 0.38; SEE = 0.05; Heteroskedasticity, Breusch-Pagan-Godfrey test = F(9,29) = 4.89 (0.00), Breusch-Godfrey Serial Correlation LM Test: F(2,33) = 1.33 (0.28), Jarque-Bera test: 2.67 (0.99), Ramsey-reset test: F(2,33) = 0.72 (0.49).

Where $\dot{y}$ is output cycle, $\ddot{y}$ is output growth, is $\dot{x}$ M2 cycle, $\ddot{x}$ is M2 growth and z is trade deficit ratio (% of GDP), probability in parenthesis. $\dot{x} \neq> \dot{y}$; Means M2 cycle does not Granger-cause output cycle, $\ddot{x} \neq> \ddot{y}$; means M2 growth does not granger cause output growth.

3.4.2 VAR Granger causality

For robustness checks, the study uses VAR Granger causality tests in Table 6[1]. Looking at the in-sample Granger-causality test, we fail to reject the null hypothesis that real credit cycle does not Granger-cause real output cycle. In addition, real output cycle does not Granger cause real credit cycle. While examining the growth rates, real output growth does not Granger-cause real credit growth and real credit growth does not Granger cause real output growth either as evidenced in Table 6a and 6c.

Moreover, the study uses VAR Granger causality tests in Table 6b for GDP-M2 relationship. VAR Granger-causality confirms results that M2 cycle does Granger-cause output cycle. In addition, output cycle does not Granger-cause M2 cycle. Moreover, there is no Granger-causality between M2 growth and output growth.

Box 1 Application of credit and M2 to output (continued)

Table 6 A: In-sample Granger causality (GDP-credit cycles; 1 lag)

Null	*F-statistic*	*Prob.*
$\tilde{x} \neq> \tilde{y}$	1.10	0.30
$\tilde{y} \neq> \tilde{x}$	0.70	0.41
$\grave{x} \neq> \grave{y}$	0.10	0.76
$\grave{y} \neq> \grave{x}$	0.32	0.57

Table 6 B: In-sample Granger causality (GDP-M2 cycles: 2 lags)

Null	*F-statistic*	*Prob.*
$\dot{x} \neq> \dot{y}$	7.05	0.01
$\dot{y} \neq> \dot{x}$	1.33	0.26
$\ddot{x} \neq> \ddot{y}$	0.14	0.87
$\ddot{y} \neq> \ddot{x}$	0.74	0.49

Table 6 C: In-sample Granger causality (GDP-credit cycles; 3 lags)

Null	*F-statistic*	*Prob.*
$\tilde{y} \neq> \tilde{x}$	7.05	0.01
$\tilde{y} \neq> \tilde{x}$	1.33	0.26
$\grave{y} \neq> \grave{x}$	0.14	0.87
$\grave{y} \neq> \grave{x}$	0.74	0.49

Where $\tilde{y}$ is real output cycle, $\grave{y}$ is real output growth, $\tilde{x}$ is real credit cycle, $\grave{x}$ is real credit growth. Where $\dot{y}$ is output cycle, $\ddot{y}$ is output growth, $\ddot{x}$ is M2 cycle, is M2 growth. $\bar{y}$ is credit-to-GDP gap, $\bar{\bar{y}}$ is credit-to-GDP growth.

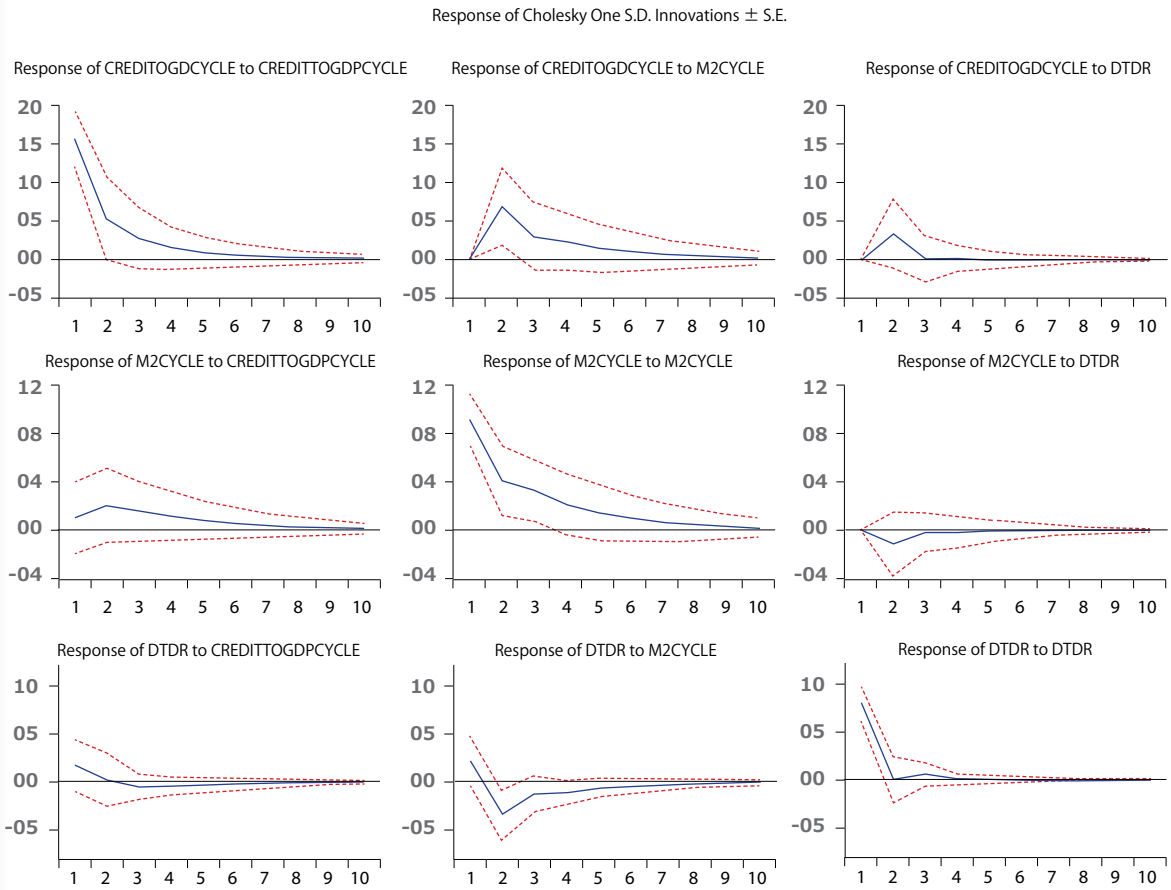
APPENDIX 1

Table 1 Chow breakpoint test

	Value of the test Statistic	Probability value
F-Statistic	1.00*	Prob. F(4,31) = 0.42
Log likelihood ratio	4.72**	Prob. Chi-square(4) = 0.32
Wald Statistics	3.99**	Prob. Chi-square(4) = 0.41

Ho: No breaks at specified breakpoints, (*) F-statistic, (**) Chi-square Statistic.

Figure 4 Impulse response function



Source: Word Development Indicators, 2016

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The Scope for Government Revenue Mobilization in Lesotho

Selloane Khoabane[1]

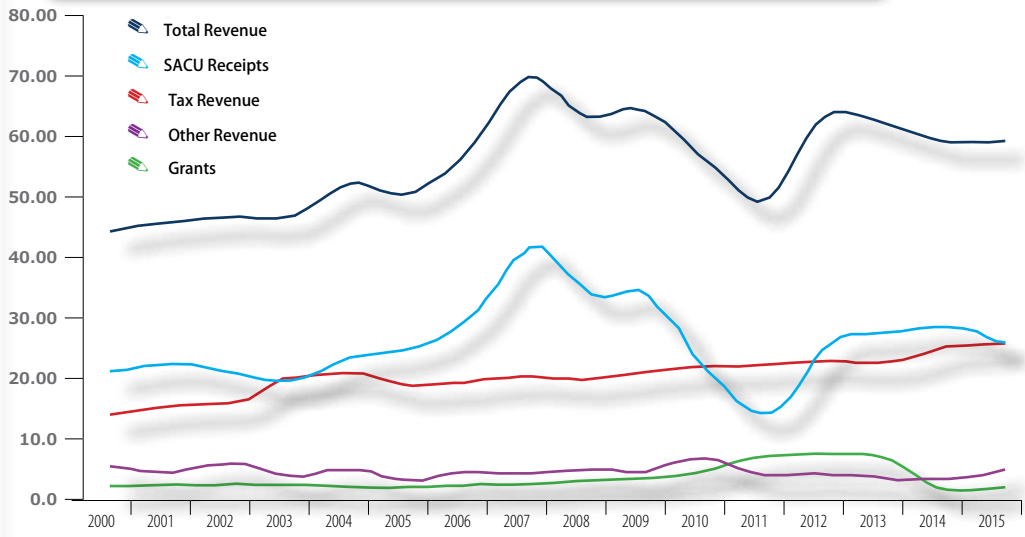
1 INTRODUCTION

LESOTHO IS A MEMBER of the Southern African Customs Union (SACU) with Botswana, Namibia, South Africa (SA) and Swaziland. As a customs union, SACU has the following characteristics: first, there is a common external tariff on all goods imported into the union from the rest of the world. Second, the SACU Agreement allows for free movement of SACU manufactured goods within SACU countries under duty and quota free terms. Third is the sharing of revenue collected from the common customs revenue pool through an agreed revenue sharing formula.

The importance of SACU revenue to the Government of Lesotho (GoL) cannot be overemphasized. For a long time, SACU revenue has been the largest source of GOL's revenue accounting for more than half of total revenue and grants. As shown in the Appendix, SACU revenue accounted for 50.9 per cent of total annual revenue, on average from 2005 to 2010. It fell to an annual average of 40.2 per cent as a share of total revenue from 2010 to 2015. As depicted in Figure 1, SACU revenue has been the major source of government revenue averaging about 26.0 per cent of GDP between 2000 and 2015. However, a lot of volatility in SACU revenue was observed during the course of this period. 2000 to 2005 was a period of relative stability with SACU revenue recording an average of 22.2 per cent of GDP with a trough of 19.6 per cent of GDP in 2003 and a peak of 25.3 per cent of GDP in 2005. This was followed by increases up to a peak of 42.3 per cent of GDP in 2007. Thereafter it went on a downward trend to a historical low of 14.0 per cent of GDP in 2011, averaging 23.8 per cent of GDP in 2010 to 2015. In line with global trends on customs revenues, the expected future trajectory of SACU revenue is highly likely downwards as a result of trade liberalization. Over

the years, SACU has been engaging in free trade agreements with a number of countries and regions. For instance, the Free Trade Agreement (FTA) with the European Free Trade Association entered into force in 2008 and the Preferential Trade Agreement with the Southern Common Market, *Mercado Comun del Sur* (MERCOSUR) became operational in the first half of 2016, just to mention a few.

Figure 1 Lesotho Government Revenue and its Components (Per cent of GDP)



Source: Ministry of Finance and Central Bank of Lesotho

The second largest component of government revenue, tax revenue, has been stable albeit increasing sluggishly in recent years following the establishment of the Lesotho Revenue Authority (LRA) in 2003. Tax revenue increased from an average of 19.8 per cent of GDP between 2005 and 2009, to an average of 23.4 per cent of GDP between 2010 and 2015. The largest component of tax revenue, taxes on income and taxes on profits and capital gains, accounted for an average of 54.7 per cent of tax revenue between 2000 and 2015. The components of this category, personal income tax, company tax, withholding tax and fringe benefit tax, accounted for 33.2, 13.7, 7.5 and 0.3 per cent of tax revenue, respectively, on average from 2000 to 2015. Revenue from taxes on goods and services accounted for an average of 40.1 per cent of tax revenue from 2000 to 2015. The major component in this category

with a contribution of 34.7 per cent of tax revenue was general sales tax (GST) revenue until 2003 and value added tax (VAT) thereafter. This was followed by excise taxes at an average share of 3.8 per cent. Excise taxes included motor vehicle assurance, oil levy, petroleum levy, road maintenance levy, gaming levy, motor vehicle licenses and other licenses. Under taxes on property was Rand compensation that the South African government pays the GoL for loss of seigniorage as a result of free circulation of the SA Rand in Lesotho as provided for under the Common Monetary Area (CMA) Agreement. The revenue accruing from stamp duty payments was negligible. The main contributor to other revenue was water royalties followed by dividends, which accounted for 4.2 per cent and 2.4 per cent of GDP, respectively, on average from 2000 to 2015. The other components of other revenue made individual contributions of less than 1.0 per cent to total revenue, on average, during the same period.

In light of the volatility in SACU revenue while other sources of revenue, particularly tax revenue exhibited sluggishness, the objective of this paper is to identify possible additional domestic revenue mobilization avenues for Lesotho. The potential room for Lesotho to raise more revenue is assessed by comparing Lesotho tax rates and rates on non-tax revenue sources with those of other SACU member countries and other selected African countries. The selection of comparator countries is largely based on data availability though with a preference for SACU member countries as they share similar characteristics with Lesotho.

The rest of the paper is organized as follows: Section 2 covers the literature review on different avenues for public revenue mobilization. Section 3 identifies potential revenue mobilization avenues for Lesotho and estimates the amount of potential revenue gains where data availability allowed and Section 4 concludes the paper and provides recommendations.

2 LITERATURE REVIEW

The importance of public revenue notwithstanding, it falls short of expenditure needs in many countries, especially developing countries. This calls for strategies to increase domestic revenue mobilization in such countries. According to Lagarde (2016) there is a pressing need to generate higher and more reliable revenue in many countries, although not necessarily for the same reason. Many developing countries are facing a dire need to raise more revenue from

their own tax bases to, amongst other things, achieve the Millennium Development Goals, meet infrastructure needs and address climate challenges (IMF, 2011). There is evidence that trade taxes have declined in Africa due to trade liberalization, hence a need to replace them (Mubiru, 2010). According to Ebeke and Ehrhart (2010), Sub-Saharan Africa (SSA) is characterized by high tax revenue instability due to higher dependency on trade taxes and lower reliance on domestic indirect taxes. They also found some evidence that high volatility of tax revenue depresses public investment. Even though the evidence is scanty on the effects of trade taxes and tax volatility on growth, the findings of Wacziarg and Welch (2008) that trade liberalization fosters growth imply that lower reliance on trade taxes positively impacts growth. In addition, over reliance on one type of tax exposes a country to shocks to that source of revenue and if it is volatile, revenues are uncertain and volatile, stability of which could be achieved through a balanced mix of taxes (Mubiru, 2010).

A country's economic structure, history and tax structures of its neighboring countries are some of the factors that determine its taxes (Bird and Zolt, 2003). Other factors that are taken into consideration when choosing between different types of taxes are the characteristics of a good tax system such as fairness, the economic effects of different taxes in as far as they discourage economic activity and the administrative costs of tax revenue collection (Bird and Zolt, 2003). Gupta (2007) contends that the sectoral composition of output is an important determinant of revenue performance because some sectors of the economy are easier to tax than others. For example the findings of Tanzi (1981) reveal that mining and non-mineral export share have a positive effect on the tax ratio while Ghura (1998) concludes that tax revenue declines with the share of agriculture in output in SSA. It is on the basis of these that the literature identifies a number of taxation avenues that developing countries could exploit to increase sources of tax revenue and reduce volatility of tax revenue.

2.1 Petroleum Products

In many countries motorists are charged taxes on fuel as a means of generating public revenues and also to reduce the consumption of fossil fuels and greenhouse gas emissions to minimize their contribution to climate change and global warming. Hossain (2003) identifies taxes that can be charged on petroleum products as road user charges to address road damage externality, a tax

to address environmental externality, a tax/ subsidy to reduce variability in price, a tax/ subsidy for distributional considerations and a tax for revenue purposes. According to Usui (2011) and UNDP (undated) taxation of gasoline has a number of advantages. First, it is relatively easy to administer with a minimum risk of avoidance or evasion. Second, it is admissible on a large tax base. Third, it is progressive because the richer households spend more on gasoline. Fourth the tax may reduce the negative externalities of gasoline consumption including traffic congestion, accidents and pollution. One of the shortcomings of this type of tax as identified by UNDP (undated) is that the revenues from it may decline as the price elasticity of fuel may increase in the longer term, very high tax rates can reduce consumption.

2.2 The Extractive Sector

The extractive sector in resource rich SSA could provide such countries with the opportunity to raise domestic funds to finance public goods and achieve their development goals (Stürmer and Bochholz, 2009). The resources and minerals rights are owned by governments, on behalf of their nations and they should be compensated for their extraction and the opportunity cost associated with their consumption (Manungo, 2013). Hence the resource rent principle that efficient output from minerals includes a producer surplus that should accrue to the owner of the asset, leaving an adequate rate of return to the producer to encourage investment (Commonwealth Secretariat and International Council on Mining and Metals, 2009).

Governments derive the resource rents through taxation. The revenue accruing to governments from taxing the extractive sector is a key component of its contribution to development (Commonwealth Secretariat and International Council on Mining and Metals, 2009). Furthermore, the design of minerals taxation policy requires trading off government objectives such as attracting investment, maximizing public revenues and enhancing the developmental impact of the mining sector. Stürmer and Bochholz (2009) contend that the minerals taxation system has to be distinct due to the special features of the extractive sector, including the size and timescale of investments and the instability of world market prices. Manungo (2013) is of the view that an effective tax regime for the extractive sector should yield maximum revenue to the state while also balancing the risk to the investor and offering the prospect of stability of contract terms.

Stürmer and Bochholz (2009), and Manungo (2013) identify the features of minerals taxation regimes in most countries. They include royalties, which are calculated on the basis of either the volume or value of production or exports. Their advantages are that they are relatively easy to apply and provide a stable source of revenue to government since production and sales normally vary less than profits. Nonetheless, they may be costly to producers, especially when world prices and profits are low, hence they may deter investments if very high. There is also windfall profit tax that is applied on above normal profits on the basis of a certain threshold such as a specific world market price level. The corporate income tax is payable on profits. It is not an easy tax to impose as profits have to be assessed and it is highly volatile. However, it protects investors from paying even when they are barely making profits or running losses. Sometimes governments hold equity shares in the mining industry with the objective of protecting national interests and maximizing state revenues. Critics of public ownership of equity in mining companies point out that it may expose government to costs relating to reinvestments and expansions of projects and give rise to conflict of interest as government is also expected to regulate the sector on environmental and social impacts. Other resource rents may include surface rent, licensing and registration fees.

2.3 Mobile Telecommunications Sector

The telecommunication sector, particularly the mobile phone sector has grown substantially in many countries and this represents a viable revenue raising mechanism due to the high frequency nature of its transactions (World Health Organization, 2010). For instance, the mobile industry contributed more than US$160.0 million to the budget of the government of the Democratic Republic of the Congo (DRC) and over 37.0 per cent of the revenue collected by the national tax collection agency in 2008 (Deloitte, 2015a).

The World Health Organization (WHO) advocates a consumption tax in the form of a levy on both voice and data use of mobile phones. However, taxing of mobile phone use is criticized on the grounds that it inhibits adoption of mobile technology, hence it is counter-productive. Therefore, an alternative is to tax companies that provide mobile services as in the case of Gabon, which implemented a levy on mobile phone companies. Initially this resulted in an increase in prices as the companies passed the tax to consumers. However, within a short

time the companies absorbed the impact on their margins as competition between the major services providers pressured them to lower prices.

As evidenced by Jensen (2007), excise taxes on telecommunications could raise substantial revenues without discouraging use. For instance, according to Deloitte (2015a) the DRC applies a number of taxes on users of mobile phone services. These include VAT at 16.0 per cent on devices and SIM cards as well as VAT at the same rate and excise duty at 10.0 per cent on calls, SMSs and mobile broadband. In Ghana, Deloitte (2015b) identifies a number of taxes that mobile phone users are subject to. These include, VAT at 15.0 per cent, communications service tax at 6.0 per cent and the national insurance levy at 2.5 per cent, all of which are levied on calls, SMSs, data and airtime vouchers. Nonetheless, mobile phone use in both countries is on the rise. According to the International Telecommunications Union (ITU), in the DRC, the number of active mobile phone subscribers rose from 11.82 million in 2010 to 37.1 million in 2014. In Ghana, it rose from 17.4 million in 2010 to 30.4 million in 2014.

2.4 Alcohol and Tobacco

An increase in excise tax on alcohol and tobacco is justifiable on the grounds that it is a partial solution to public financial resources needs as well as health and social ills associated with their consumption (Moshoeshoe, 2012). This is further concurred with by the WHO (2010) in pointing out that there is ample room for increasing the levels of excise taxation on alcohol and tobacco in low income countries because demand for these products is price inelastic. It is estimated that an increase in the excise tax to 40.0 per cent of the retail price would reduce consumption by 18 per cent, which would still result in substantial excise revenues despite the resultant lower consumption. In Lesotho, there is also evidence that the demand for alcohol and tobacco are income inelastic with the income elasticity of alcohol estimated at 0.6553 and of tobacco at 0.3561 (Moshoeshoe, 2012). In the same token, in SA and in many other low income countries, there is also evidence that price elasticity of demand for cigarettes is around 0.6 per cent indicating that people reduce their consumption in response to a price increase despite the addictiveness of tobacco (Van Walbeek, 2012).

2.5 Small/Informal Businesses

African economies are characterized by large numbers of small and micro businesses. However, according to IMF (2011), despite their high number, these businesses have very limited revenue potential. Efforts towards tax collection from these businesses have proved to be highly financially costly with poor revenue collection results (IMF, 2011). For instance, in Kenya, despite the large informal sector, estimated at 33.7 per cent of GDP, the presumptive tax of 3.0 per cent on gross turnover that targets small businesses has yielded very low revenue at an average of 0.1 per cent of total tax revenue (Maina, 2016). At this level, the yield is found to be far lower than the tax potential of the sector, which is estimated at 4.0 per cent of GDP. In Zimbabwe, it is estimated that informal sector presumptive taxes amounted to 0.45 per cent of total revenue in 2011 (Dube, 2014), which is also very low. The IMF contents that leaving the small businesses out of the tax net could undermine compliance of larger businesses and suggests that the small businesses could be subjected to a simple tax similar to a license fee.

2.6 Sugar Sweetened Beverages

Concerns over obesity and the high rates of chronic and non-communicable diseases including high blood pressure, heart diseases, type 2 diabetes and some forms of cancers have resulted in calls to tax sugar sweetened beverages (SSBs) which are high calorie and low-nutrient (Cawley and Frisvold (2015), Claro et al (2012) and National Treasury Department of South Africa (2016)). Cawley and Frisvold (2015) list the following countries that have recently levied taxes on SSBs (years in brackets); Mexico (2014), France (2012), Finland (2011), Hungary (2011), Nauru (2007), Fiji (2006) and Australia (2000). National Treasury Department of South Africa (2016) adds Denmark, Ireland, Mauritius and Norway to the list and points out that the United Kingdom and Thailand have announced their intention to introduce such taxes soon. In the SACU region, SA has announced in the February 2016 Budget its decision to introduce a tax on SSBs with effect from 1st April 2017. Cawley and Frisvold (2015) indicate that other countries impose taxes on drinks for purposes of revenue generation. For instance, in the United States (US), a number of states have imposed the same tax on both caloric soft drinks and the diet versions.

3 REVENUE MOBILIZATION AVENUES

3.1 Petroleum Products

Governments around the world subject petroleum products to taxation. Lesotho is not an exception; in addition to the VAT and excise taxes[1] other taxes on petrol and diesel include the oil levy, the petroleum fund levy, the motor vehicle assurance levy and the road maintenance levy. However, these taxes make a negligible contribution to public revenue. The combined revenue from these levies accounted for 1.4 and 1.7 per cent of total revenue in 2014 and 2015, respectively.

Table 1 Taxes on Petroleum Products in SACU (in SA cents)

	Botswana+	Lesotho	Namibia	South Africa	Swaziland	SACU Average
Fuel tax, Oil levy, Fuel levy	10.62*	60.00	11.00*	278.00*	220.00	186.00
Petroleum Fund Levy	15.09	11.00	90.00*	0.00	20.00	11.52
Road Accident Fund	5.59	10.00	49.00	154.00	35.00	50.72
Customs and Excise Duty	3.26	4.00	4.00	4.00	4.00	3.85
Road Fund Levy	89.44	30.00	114.00	0.00	0.00	46.69
Total	**124.01**	**115.00**	**268.00**	**436.00**	**279.00**	**244.40**

*Source: Lesotho Petroleum Fund * Average for petrol and diesel where the two were different. Tax rates in Botswana Pula converted to Maloti using the annual average exchange rate for 2016 of R1.30.*

In the SACU region, Lesotho's tax on petroleum products is the lowest and it is below the SACU average. At an aggregate of 115.00 cents per litre of petrol and diesel, Lesotho is followed by Botswana at 124.00 cents, Namibia at 268.00 cents, Swaziland at 279.00 cents and SA is the highest at 436.00 cents.

[1] Excise taxes are the same across all SACU member countries.

Table 2 Tax Level Proposals and Potential Revenue

	Tax Level (SA Cents)	% Increase in Tax Level	Revenue (Million Maloti)	Revenue Gains from the Higher Tax Level (Million Maloti)
Lesotho's Current Tax Level	115.00	-	313.92*	-
Botswana	124.00	7.83	338.49	24.57
Namibia	268.00	133.04	731.57	417.65
South Africa	436.00	279.13	1190.17	876.25
Swaziland	279.00	142.61	761.60	447.68
SACU Average+	**244.00**	**112.17**	**666.06**	**352.14**

**Preliminary estimate based on three quarters of available data for 2016. + Excluding Lesotho.*

An assessment of the revenue implications of an increase in Lesotho's tax to other SACU countries' tax levels is undertaken and the findings are as follows. The increase to Botswana's tax level of 124.00 cents would result in a negligible increase of M24.57 million in Lesotho's tax revenue from petroleum products. The next higher tax level is the average of all the SACU countries excluding Lesotho at 244.00 cents. Increasing Lesotho's tax to the SACU average is likely to result in a more than double-fold increase in revenue from petroleum products. The increase to Namibia and Swaziland's rates is likely to result in gains in revenue to the tune of M417.65 million and M447.65 million, respectively. SA's tax rate is the highest in the region and raising Lesotho's to it would yield substantial revenue gains. However, the paper recommends a somewhat gradual increase in Lesotho's tax level to minimize the possible distortionary effects of the response by economic agents to a more drastic and abrupt increase. As a first step, the tax level could be raised to the SACU average. It could thereafter be adjusted periodically to protect its value from erosion by inflation.

While empirical evidence on the price elasticity of demand for petrol and diesel in Lesotho could not be found during this research the expectation is that it is inelastic in line with the empirical findings on other African countries, implying that the upward revision of the tax may result in an increase in public revenue. Boshoff (2012) found long-run price elasticities of -0.44 and -0.21 for petrol and diesel, respectively for SA. In the case of Namibia, De Vita *et all* (2005) estimated a long run price elasticity of -0.34 for aggregate energy comprising of petrol, diesel and electricity while Dahl (1994) found price elasticity of demand for energy of -0.94 for Botswana.

3.2 The Diamond Mining Sector

Mineral exploration and mining often fail to make a meaningful economic impact in resource rich economies and in some economies, large discoveries of minerals become a resource curse. For instance, in Ghana, the economic and developmental impact of the sector remains meager despite the massive inflows of foreign direct investment (FDI) into Ghana's mineral mining and the resultant upsurge in exports, (Awudi, 2002). This is attributable to low employment creation capacity of the sector due to its capital intensive nature and export of the minerals in crude form, without any beneficiation or value addition. Nonetheless, there are exceptions such as Botswana which has demonstrated that sustainable resource-led growth is attainable. According to De Beers Group of Companies (undated) the strategy of developing and managing its diamond resources with long term development goals in mind has helped Botswana to avoid the worst effects of the resource curse. Jeffers (2013) explains that Botswana's diamond mining sector is the largest contributor to GDP, exports and government revenues at 25.0 per cent, 86.0 per cent and 41.0 per cent, respectively from 2003 to 2013. As depicted in Table 3, the sources of revenue for the Government of Botswana from the diamond mining sector are Government's equity investments through joint ventures and taxes in the form of royalties, corporate tax and withholding tax on dividends.

Table 3 Diamond Sector Tax and Equity Rates by Country

	Botswana	Namibia	Lesotho
Royalty Rate	**10% of gross market value**	**10% of Gross Turnover**	**10% of Gross Market Value (6% - 8%)**
Corporate Tax/ Variable Rate Income Tax	22 - 55 %*	55%	25%
Withholding Tax	7.50%	10%	15%
Taxation on Downstream Processing	15%	-	-
Government Equity Interest	- 50% in Debswana -15% in De Beers - 50% Diamond Trading Company Botswana - 80% indirect beneficiary shareholding in Morupule Colliery	- 50% in Namdeb - De Beers Marine Namibia owned 30% by Namdeb and 70% De Beers	-25% Liqhobong Mine - 30% Letšeng Mine - 20% Lemphane Mine - 25% Kao Mine - 20% Kolo Mine - 25% Mothae Mine

Source: Botswana – Mines and Minerals Act 1999, Ministry of Minerals Water and Energy Resources on www.gov.bw/Global/MMWER, MBendi Information Services on www.mbendi.com. Namibia – Minerals (Prospecting and Mining) Act 1992, KPMG (2014), Namibia Country Mining Guide and Ministry of Finance Income Tax Tables. Lesotho – Mines and Minerals Act 2005, Income Tax Act 1993, FIAS, IFC and World Bank (2006), Ministry of Mining and Websites of mining companies or major shareholders.

**Other mining companies except diamonds for which the tax regime is negotiated.*

Regarding Government of Botswana's equity stake in diamond mining, the Botswana Mines and Minerals Act 1999 Section 40 (1) provides for the Government to acquire up to 15.0 per cent working interest participation in the mines. However, being regarded a strategic mineral to the economy of Botswana the diamond sector is treated differently in this regard (MMWER, 2008). The Botswana Mines and Minerals Act 1999 Section 51 (1) stipulates that "the issue, renewal, transfer or amendment of a license to mine diamonds shall initiate a negotiating process, in good faith, between government and the applicant covering all technical, financial and commercial aspects of the proposed project including government participation". This has enabled the Government to acquire a substantial 50.0 per cent stake in the main diamond mining company in Botswana (Debswana) through a joint venture with De Beers and 50.0 per cent or more in other companies. In addition, the Government of Botswana has 15.0 per cent shares in De Beers. According to Jefferis (2013) this was facilitated by engagement of high level technical expertise by the Government to strengthen its negotiating position and using its "leverage points" such as renewal of agreements.

In the case of Namibia, participation of Government in diamond mining is defined by the Minerals (Prospecting and Mining) Act 1992 Section 49. It provides for the Minister of Mines and Energy to enter into an agreement that may include the terms and conditions relating to the participation of Government. This covers the acquisition of equity share capital by the State in production sharing or other joint ventures before a mineral license is issued. According to KPMG (2014) the Government of Namibia has 50 per cent shareholding in Namdeb, which it owns with De Beers. Namdeb is the largest producer of diamonds in Namibia at 95.0 per cent of domestic diamond output and it is the largest tax payer in Namibia (KPMG (2014), FIAS, IFC and World Bank (2006)).

In Lesotho, the Mines and Minerals Act 2005 section 44 (1) provides for the GoL, through the Mining Board, to engage in negotiations with an applicant of the issue, renewal, transfer or amendment of a mineral concession for diamonds. The negotiations cover technical, financial and commercial aspects of the project applied for, including government participation. GoL's shareholding in diamond mining companies ranges from 20.0 per cent to 30.0 per cent.

Regarding the tax regime, the tax on profits differs in the three countries. In Botswana there is a variable rate income tax for mining other than diamond mining. The diamond mining sector is taxed in terms of an agreement with Government. However, the rate cannot be less than 22.0 per cent and increases with profitability of the mine. FIAS, IFC and World Bank (2006) point out that the corporate tax rate for the diamond mines in Botswana ranges from 25.0 per cent to 55.0 per cent. In Namibia, the corporate tax for diamond mining companies is 55.0 per cent and is higher than the standard corporate tax of 33.0 per cent. In Lesotho the standard corporate tax of 25.0 per cent applies to diamond mining companies.

The statutory royalty rate for diamonds is 10.0 per cent in the three countries. The royalty rate for Botswana is stipulated in the Mines and Minerals Act 1999 and Jefferis (2013) confirms that the rate is non-negotiable in Botswana. However, in the case of Lesotho, even though the 10.0 per cent royalty rate is stipulated in the Mines and Minerals Act 2005, the mining companies negotiate lower rates. Consequently, the royalty rates in most of the existing diamond mining contracts in Lesotho range between 7.0 and 8.0 per cent (FIAS, IFC and World Bank, 2006) though the most recent information is that the lowest rate is currently 6.0 per cent. The withholding tax is higher in Lesotho than in comparator countries but does not compensate for

the low rates on other taxes, especially because companies do not pay out dividends every year. SA and Swaziland are not included in this analysis because of the following reasons. In SA, the mineral deposits are vast and hence required a lot of huge investments. Consequently, the diamond mining sector tax regime was designed with a bias towards encouraging investments into the mining industry and the mining of marginal ores (Deloitte, undated). As such, the diamond mining industry operates under the general tax system. For instance it is subject to the general income tax rate of 28.0 per cent. In addition, the royalty rate is very low. It is calculated on the basis of profits, with the maximum rates of 5.0 per cent and 7.0 per cent for refined and unrefined mineral resources, respectively and the minimum of 0.5 per cent that applies to both (The Davis Tax Committee, 2014). In the case of Swaziland, the diamond mining industry is barely operational (Mobbs, 2015). As such there is barely anything to learn from it.

Table 4 Revenue from Royalties (Million Maloti)

	Royalties Revenue	Assuming 7.0%	Revenue Gains
2014	11.25	16.07	4.82
2015	121.61	173.73	52.12
2016	203.13	290.19	87.06

***Source**: Ministry of Finance and Author's Calculations*

As discussed earlier, the diamond mining companies in Lesotho are subject to different royalty rates. The royalty rates which apply to existing diamond mining companies range between 6.0 and 8.0 per cent. Attempts to access information on the contractual royalty rates for specific mines proved futile, understandably so because it is confidential contractual information. Consequently, in carrying out an assessment of the potential revenue gains from applying the statutory royalty rate of 10.0 per cent across all diamond mining companies, an average royalty rate of 7.0 per cent, which is the average of 6.0 to 8.0 per cent, was assumed to apply to all diamond mining companies. On the basis of this assumption and the realized royalties revenue, all other factors remaining the same, an increase in the rate to 10.0 per cent would yield a 42.9 per cent increase in revenue from diamond mining royalties.

Table 5	Corporate Income Tax Revenue (Million Maloti)		
	Revenue @ 25.0% Tax Rate	Revenue Gains from 35.0% Tax Rate	Revenue Gains from 50.0% Tax Rate
2014	120.76	169.04	241.52
2015	328.78	459.2	657.56
***Source**: Lesotho Revenue Authority and Author's calculations*			

The corporate income tax revenue from the mining industry amounted to M120.76 million and M328.78 million in 2014 and 2015, respectively. An increase in the income tax rate from the current 25.0 per cent to Botswana and Namibia's levels of 50.0 per cent would result in a doubling of corporate income tax revenue from the diamond mining industry.

Table 6	Dividends Paid to GoL (Million Maloti)	
	Dividends Paid to GoL	Revenue Gains from an Increase in GoL's Equity to 50.0%
2014	1.60	1.07
2015	175.00	291.67
***Source**: Lesotho Revenue Authority and Author's calculations*		

Currently GoL's equity interest in diamond mining companies ranges from 20.0 to 30.0 per cent. Calculations based on withholding tax revenue from the diamond mining sector indicate that government revenue from dividends amounted to M1.6 million and M175.00 million in 2014 and 2015, respectively. On the basis of an assumption that GoL has equity interest of 30.0 per cent in the diamond mining sector , it is estimated that the increase in GoL's equity to 50.0 per cent will result in a 66.7 per cent rise in government revenue from dividends.

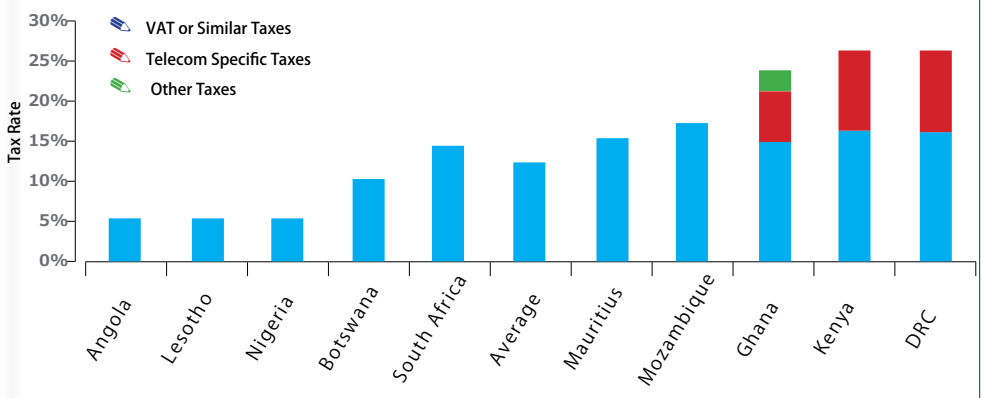
3.3 The Mobile Communications Sector

The key taxes on the mobile communications sector usually comprise of taxes on devices, taxes on services including calls, SMS, and mobile broadband as well as corporate taxes. Mobile services are high frequency transactions and hence represent a viable fiscal resources raising mechanism. VAT is the most common type of tax levied on mobile services. Some countries levy telecom specific taxes on mobile services. For example, the DRC and Kenya charge an excise duty at the rate of 10.0 per cent while in Ghana there is a communications service tax at the rate of 6.0 per cent. Ghana also collects the national health insurance levy from mobile services at the rate of 2.5 per cent.

[2] This is a reasonable assumption because only Letšeng mine paid dividends to GoL in 2015 and 2016.

In Lesotho, VAT is the only tax to which consumers of mobile services are subjected. While the standard VAT rate in Lesotho is 14.0 per cent, the VAT rate on communication services including mobile communications services is 5.0 per cent as stipulated in the Value Added Tax Regulations 2003, Section 6 (b). Consequently, Lesotho's tax rate on mobile phone services is one of the lowest in Africa (Deloitte 2015a) and among selected African countries as demonstrated in Figure 2. At the rate of 5.0 per cent Lesotho's tax is lower than that of its close neighbors, Botswana and SA.

Figure 2 Taxation on Mobile Services by Country

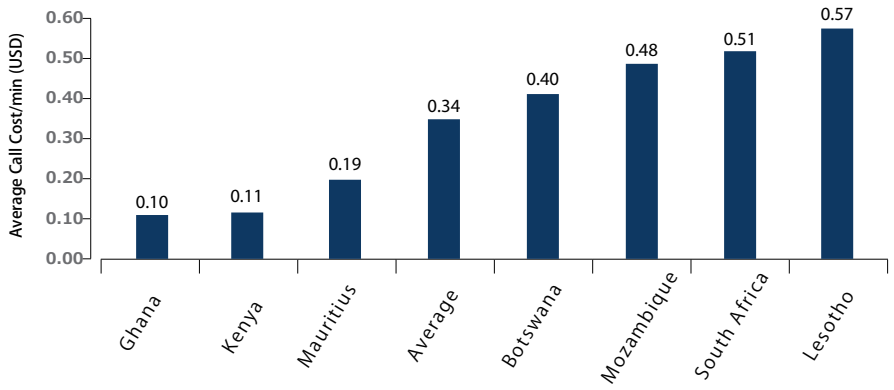


Source: Deloitte (2015b), Digital Inclusion and Mobile Sector Taxation in Ghana.

Lesotho's low tax rate notwithstanding, its tariff rate on mobile services is higher than that of a number of African countries that charge higher taxes than Lesotho. Lesotho's tariff rate is 82.4 and 80.7 per cent higher than Ghana and Kenya's tariff rates, respectively. Mobile tax rates on these two countries are some of the highest in Africa. Lesotho's tariff rate is higher than Botswana and SA's by 29.8 and 10.5 per cent, respectively. This could be an indication that the low tax rate environment has provided room for mobile phone services providers to charge higher tariffs and gain more revenue.

In Lesotho, mobile connections and internet use have grown significantly in recent years. The number of mobile connections in Lesotho grew from 1.75 million in 2013/2014 to 2.29 million in 2014/2015 and the number of internet users on mobile devices rose from 0.55 million to 0.71 million during the same period (Lesotho Communications Authority, 2014/2015). The numbers are growing despite the high tariff rates. Thus Government should consider raising the VAT rate on communications services and mobile services to the standard rate of 14.0 per cent.

Figure 3 Mobile Tariffs by Country



Source: Independent Communications Authority of South Africa (2013), 2014 – 2018 Cost to Communicate Programme, Presentation to Stakeholders.

The GoL's value added tax revenue from the communications sector amounted to M62.35 million and M63.21 million in 2014 and 2015, respectively. Keeping all other factors constant, an increase in the value added tax rate for the communications sector from the current 5.0 per cent to the standard rate of 14.0 per cent could result in revenue gains of more than M110.00 million a year. This is an increase of 180.0 per cent in the VAT revenue from the communications sector.

Table 7	VAT Revenue from the Communications Industry (Million Maloti)		
Period	Revenue @ 5.0% VAT	Estimated Revenue @14.0% VAT	Revenue Gains from the Higher Tax Rate
2014	62.32	174.50	112.18
2015	63.21	176.99	113.78

***Source**: Lesotho Revenue Authority and Author's calculations.*

3.4 Alcohol and Tobacco

Within the SACU region, the common taxes on alcohol and tobacco products include VAT and excise taxes. The SACU agreement integrates SA's customs and excise tax rates across all five SACU member states and allows members to levy country-specific levies on goods and services including alcohol and tobacco (Tam and van Walbeek, 2013). Botswana was the first country in the SACU region to subject alcohol and tobacco to a levy. The Government of Botswana introduced the alcohol levy at the rate of 30.0 per cent in 2008 and raised it to 55.0 per cent in 2015 (Sinkamba, 2015). The revenue raised through the alcohol levy amounted to P298.73 million for the 2014/15 fiscal year while the tobacco levy raised P44.67 million during the same period (Botswana Unified Revenue Services, 2015).

Table 8	Alcohol and Tobacco Levy by Country	
	Alcohol	Tobacco
Botswana	55.0	30.0
Lesotho*	4.0	4.0
Swaziland*	10.0 (5.0)+	10.0 (5.0)+

***Source**: Botswana – Sinkamba (2015), Alcohol Abuse and Interventions Strategies in Botswana and China: A Preliminary Study, PULA: Botswana Journal of African Studies, Vol. 29, No. 1. Namibia Economist (2014), Botswana: Tobacco Levy Introduced in Botswana Cause for Concern, Windhoek. Lesotho – Budget Speech to Parliament for the 2015/2016 Fiscal Year. Swaziland – The Alcohol and Tobacco Levy Bill, 2016, Bill No.16 of 2016. ()+ for locally manufactured alcohol and tobacco products. *Proposals that are yet to be implemented.*

In Swaziland, the Government has developed the Alcohol and Tobacco Levy Bill, 2016 as part of the legal framework towards introduction of a levy on imports of alcohol and tobacco goods and those manufactured in Swaziland other than for export. The Bill proposes levy rates of 10.0 per cent on imported and 5.0 per cent on locally manufactured alcohol and tobacco products. In Lesotho, the 2014/2015 Budget Speech had proposed a levy of 4.0 per cent on alcohol and tobacco products. The requisite laws for implementation of this proposal including the Alcohol and Tobacco Bill are in the process of being developed. The proposed rate of 4.0 per cent is low

compared with Botswana and Swaziland's rates. Introduction of the levy at this rate is neither likely to result in any substantial reduction in the consumption of alcohol and tobacco nor in any meaningful increase in government revenue. WHO (2010) estimated that a 40.0 per cent tax on these products would reduce consumption by 18.0 per cent and result in substantial revenue gains despite the reduction in consumption. As in the case of Botswana, the levy should be introduced at a higher rate of 30.0 per cent for it to have the expected impact. An attempt to estimate the revenue implications of the proposed levy of 30.0 per cent was unsuccessful due to unavailability of data on alcohol and tobacco tax revenue.

3.5 Small Scale / Informal Businesses

There are 88 338 small scale/ informal businesses that are unregistered, privately owned and operated, characterized by a small number of employees (less than 5) in Lesotho (Household Budget Survey, 2010/2011). The majority of these businesses, estimated at 51.4 per cent are in wholesale and retail trade followed by 35.8 per cent in agriculture, hunting and forestry. 3.4 per cent are in manufacturing and 1.7 per cent in construction. However, due to lack of information about the turnover and profitability of these businesses it is challenging to make concrete and meaningful conclusions and recommendations regarding revenue mobilization from this sector. Nonetleless, along the lines of thinking of IMF (2011), small businesses in Lesotho could be subjected to a simple tax, akin to a license fee, of a blanket M100.00 per year to include them in the tax net and also as a way of motivating compliance by larger businesses. This could yield revenue of M8.83 million a year, with the assumption that all the 88 338 businesses remain operational and comply.

As highlighted in the Literature Review, in line with the experiences of other African countries, tax turnover from this sector will be below potential despite the high likelihood that collecting it will result in substantial financial costs. In addition, pursuing this sector might divert attention from more important sectors that have high revenue potential.

3.6 Other Possible Sources of Revenue

A number of revenue mobilization areas have been proposed before but have not yet been implemented. First, in Lesotho, the fees for public services and fines charged to perpetrators of the law have not been reviewed in a long time and hence remain very low. That is why a proposal to revise them was made in the 2015/2016 Government Budget Speech. It is vital that this revision is accelerated. In the years following this revision, the fees and fines should be adjusted for inflation to maintain their value in real terms and avoid another major revision. Second, are some innovative revenue enhancing measures such as the introduction of personalized car registration number plates, which would be offered at higher fees than the normal number plates. Implementation in these regards also needs to be expedited.

There are a number of other options that the GoL could pursue that have the potential to raise revenue while also addressing certain specific externalities. These include, but are not limited to taxation of SSBs and plastic bags. Taxation of SSBs is justifiable on health and revenue raising grounds in the case of Lesotho. Non-Communicable Diseases (NCDs) related deaths are estimated to account for 27.0 per cent of Lesotho's total deaths and in Lesotho, 14.6 per cent of adults are obese (WHO, 2014). In addition, as already indicated the GoL needs to come up with additional sources of revenue to close the gap arising from volatile SACU revenues and the sluggishness observed in the other sources of revenue. Another option is the taxation of plastic bags, which could, in addition to raising revenue, also have a positive externality of promoting environmental cleanliness.

4 CONCLUSIONS AND RECOMMENDATIONS

SACU revenue has been an important source of Lesotho's fiscal revenue. However it has been volatile and more tilted towards a declining trend. This calls for additional avenues for domestic revenue mobilization. Thus this paper has identified a number of areas with the potential of addressing this need and makes the following recommendations:

- Lesotho's tax on petrol and diesel should be raised to the SACU average at which level it will be lower than Namibia, SA and Swaziland's tax levels. This could have raised an

additional M352.14 million in revenue in 2016. In the years following the increase, the rate should be adjusted periodically to shield its value from erosion by inflation.

- Contract negotiation capacity needs to be strengthened and contracts with diamond mining companies renegotiated with the objective of implementing the statutory royalty rate as it is and increasing the corporate tax rate and government equity interest in Lesotho's diamond mines along the lines of Botswana and Namibia. This has the potential of increasing royalties revenue by 42.9 per cent, doubling the corporate income tax revenue and raising 66.7 more revenue from dividends.

- Lesotho charges the lowest tax rate on mobile communications services among African peers despite the recent rapid growth of the sector. Mobile Network Operators (MNOs) are taking advantage of this by charging a tariff rate that is higher than the rates of some African countries that charge higher tax rates than Lesotho. The Government should consider raising the VAT on mobile services to the standard rate of 14.0 per cent from the current 5.0 per cent. This could result in GoL's revenue from this source rising by 180.0 per cent.

- Lesotho does not currently levy any tax on alcohol and tobacco other than VAT and excise tax. The recently proposed 4.0 per cent levy on alcohol and tobacco is way lower than Botswana's rates and Swaziland's proposed rates. Lesotho has room to introduce the levy at a higher rate of 10 to 50 per cent to reduce consumption of alcohol and tobacco and the health and social ills related to their consumption while also raising the necessary fiscal revenue.

- An introduction of a tax, similar to a licence fee of M100.00 per year for small/ informal businesses could raise a meagre M8.83 million per year. This is too little for this sector to be pursued, especially because experience of other African countries shows that collections are highly likely to fall below this potential despite the high financial costs that are likely to be incurred in its implementation.

- Implementation of revenue raising measures that have been proposed before, including, amongst others, the revision of stamp duty, fees and fines and introduction of personalised car registration number plates should be expedited. Other existing taxes such as the gaming levy, which have not been reviewed in a long time, should also be considered.

- Taxation of SSBs and plastic bags should also be considered both for raising revenue and addressing negative externalities associated with their use.

Although it is outside the scope of this paper is it worthy to note that improvements in government spending efficiency, for example, by reducing wasteful spending and corruption would make the proposed tax revisions more acceptable and encourage compliance. Containing public recurrent spending, while increasing and streamlining capital spending towards more growth enhancing development projects, would maximize the benefits of higher tax rates. In addition, implementation of policies and strategies for promoting and enhancing private sector growth should be expedited. This is important for reducing the high dependence of Lesotho's economy on Government for employment, hence the burden on the fiscus and for increasing the tax base.

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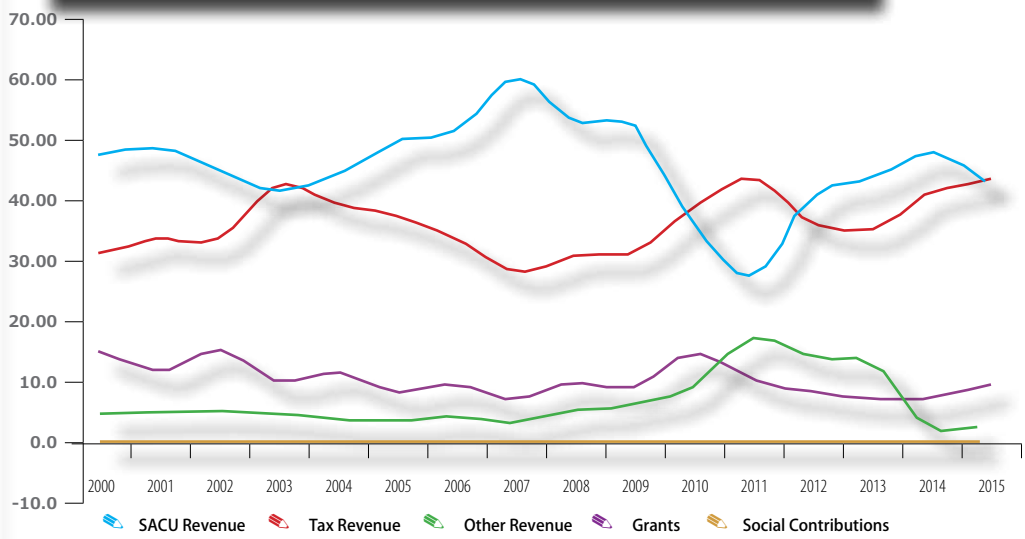
[i] Attempts to obtain data on Namibia and Swaziland were not successful that is why they are not included in the analysis.
[ii] Namibia and SA are not included in the analysis because they do not subject alcohol and tobacco to any levy or additional tax over and above the VAT and excise taxes.

Appendix Components of Lesotho Government Revenue (Per cent of Total Revenue)



Source: Ministry of Finance and Central Bank of Lesotho

Firm Size Distribution in Lesotho Manufacturing Sector: Implications for Job Creation

Rethabile Masenyetse, Mookameli Fuma and 'Malefu Manamathela

1 INTRODUCTION

ATTAINMENT OF HIGH inclusive economic growth and job creation remain the core macroeconomic priorities of the Government of Lesotho. This is rightly so because a fast growing economy that is capable of generating sustainable jobs is the foundation for addressing a prevalence of high levels of poverty and inequality. The National Strategic Development Plan 2012-2016 also targets at amongst others, to create high, shared and employment generating growth. The 2008 Labour Force Survey conducted by the Bureau of Statistics, estimates the unemployment rate in Lesotho to be at 25.3 per cent. At that level, it is indicative that unemployment is a major challenge for Lesotho. Although unemployment is not observed across all age categories, it is believed to be most prevalent amongst the youth. Historically, the South African mining industry has provided significant employment to Basotho, particularly in the gold and platinum mines. However, the continued decline in the price of gold coupled with the unstable labour market situations in South Africa and the changing global economic conditions resulted in the deterioration of the number of Basotho employed in this sector over time. The number fell from more than 127,385 in 1990 to less than 40,000 as at the end of 2015. Several studies have assessed the effects of the declining number of Basotho migrant workers in South Africa and the impact of remittances (Foulo, 1990, Crush et al, 2010). It is clear that the developments in the mining sector in South Africa have exacerbated unemployment conditions in Lesotho.

There have been other employment opportunities for Basotho in South Africa although not well documented in the literature. Some thousands of Basotho are employed in the South African agricultural sector every year as seasonal workers. In the post 1994 period there has also been a steep increase in Basotho employed in white collar jobs and domestic workers category. Going forward, the employment opportunities in South Africa may be difficult in light of the recent developments in South Africa relating to employment of foreign nationals. There are indications that in future conditions may be tighter. As such Lesotho may want to put more emphasis on creating more jobs through the domestic industrial sector. The industrial sector in Lesotho is estimated at 31.8 per cent of GDP in 2014 slightly above 30 per cent in 2000[1].

The issue of who creates most jobs has been well investigated in developed countries. However, despite its importance, little research has been done on the issue in developing countries, particularly in Sub-Saharan Africa. This is partly because of the scarcity of firm level data in developing countries. Company level data is normally obtained through industrial censuses which unfortunately are very scarce in developing countries due to the high cost of conducting frequent surveys. For instance, in Lesotho, the World Bank enterprise survey was first done in 2007 and the second wave in 2016. The Bureau of Statistics undertook the census of business enterprises in Lesotho. It is expected that going forward the census will be the valuable source of data for understanding business dynamics. This paper contributes towards filling that gap in the economic literature by assembling a panel of manufacturing companies in Lesotho and analyzing the size distribution. Because the paper uses the employment as the measure of firm size, then it directly addresses the questions on job creation by the sector.

Most studies on Lesotho manufacturing sector have adopted the macroeconomic approach to understanding the dynamics within the textile and clothing industry with exception of Staritz and Morris (2013) that analysed Lesotho textiles sector integration to the global value chains. This paper adopts a microeconomic approach, which can yield additional revelations about manufacturing sector and recommend appropriate policies with a view to ensuring creation and sustainability of jobs within the textile and clothing industry. The distribution of firms across different sizes and their survival patterns plays an important role in understanding the potential

[1] According to the World Bank Development Indicators, Industry corresponds to ISIC divisions 10-45 and includes manufacturing (ISIC divisions 15-37). It comprises value added in mining, manufacturing (also reported as a separate subgroup), construction, electricity, water, and gas.

for job creation, sustainability and innovation. The recent upgrading of the Department of Small Businesses to the level of a Ministry bears testimony to the growing importance of understanding firm dynamics.

The analysis of firm size distribution has been dominated by the use of the framework proposed by the Gibrat law. The law belongs to the stochastic growth models and can be traced to Gibrat thesis in 1931. They argue that the determinants of firm growth rates, including product demand, managerial talent, innovation and government policy, are complex and determined by a range of factors and behaviour that make treating growth as a random shock on initial firm size. That is the shape of the distribution is the result of extremely complex economic processes (Biggs and Oppenhelm, 1986). According to the Gibrat law the growth of the firm is independent of its initial size. The model implies that all firms grow at the same rate proportionate to their sizes. Therefore the probability distribution of growth rates was the same for all sizes of firms. That is the shape of the logarithm of size is log normal. Thus, over time, the size distribution will begin to be characterised by few large firms and many small ones. The distribution will be positive skewed, indicating increased concentration. While the Gibrat law has been the workhorse in industrial economics, it has been greatly criticized for its lack of theoretical underpinnings (Sutton, 1997, Coad, 2009). But because of its tractability it has been widely used in empirical work analysing the growth of companies and the changing size distribution of firms.

Testing the validity of the Gibrat's law has attracted a lot of attention in the empirical literature since the 1960s mostly in developed countries, for instance Mansfield (1962), Hart and Oulton (1996, 1999), Dunne and Hughes (1994), Evans (1987a, 1987b) and Hall (1987). Initial studies overwhelmingly supported the validity of the law but it has been continually rejected by recent evidence (Hart, 2000). For survey articles see Sutton (1997), Caves (1998) and Santarelli et al (2006). Empirical evidence from Sub-Saharan Africa has shown that small firms grow faster than the large ones (Page and Soderbom, 2012, Bigsten and Gebreeyesus, 2007). Interestingly there is evidence from Lesotho, McPherson (1996) tested of the law in five Southern African countries South Africa, Swaziland, Botswana and Zimbabwe including Lesotho using survey data. The study found that smaller firms grow faster than large ones. Furthermore, the evidence by Page and Soderbom (2012), Bigsten and Gebreeyesus (2007) and Gunning and Mangistae (2001) on Ethiopia, Sleuwaegen and Goedhuys (2002) on Cote d'ivoire, Teal (1998) on Ghana and Dunne and Masenyetse (2014) on South Africa also reject the validity of Gibrat's law. Overall, previous

empirical research on which firms creates most jobs provides mixed results. However, the prevailing narrative in developing countries and among donors is that small businesses create more jobs (Page and Soderbom, 2012). This has called for a more balanced policy intervention towards support for small and medium sized firms but not at the expense of large ones.

The objectives of the paper are threefold. Firstly, to compile firm level data for companies assisted by Lesotho National Development Corporation (LNDC) into a panel suitable for analysis of the industrial structure and analyse the evolution of the firm size distribution in Lesotho manufacturing sector in the pre and post global financial crisis periods. Secondly, to examine the patterns of company survival within the sector using transition matrices. Third, to investigate the relationship between firm size and growth using both the non-parametric and mean analysis methods. The findings of the paper are in line with the some stylized facts established in the empirical literature on firm dynamics but raise some interesting policy implications particularly on the crafting of industrial policy to ensure that small companies are able to create job. The results can be summarized by the following key points; first, the majority of the firms remain in their original size groups suggesting low dynamism in the sector. In essence, the sector has not been growing for some time suggesting deeper growth challenges. Second, the overall survival rate is high and is mainly observed amongst the large companies employing above 1000 employees. The lower size groups employing below 50 employees still face high death rate. Last, the overall participation in the sector is still dominated by large players mainly foreign owned. This has implications for innovation, indigenization and job creation.

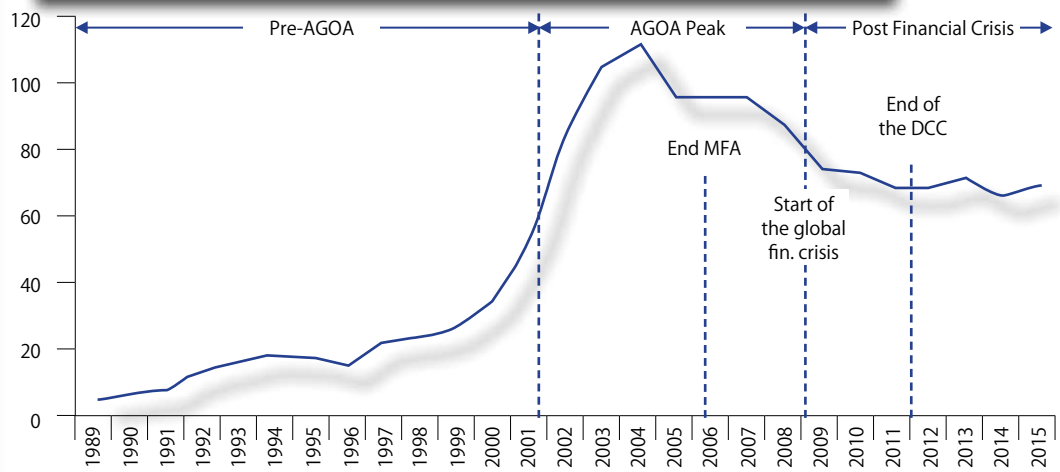
The remainder of the paper is structured as follows. The next section traces the evolution of the manufacturing sector in Lesotho and how it has impacted on macroeconomic performance and job creation. Section three discusses the data collection and panel construction and analyse the main characteristics emerging from the data. Section four presents the main results on the patterns of company survival, the changing size distribution and the relationship between firm size and growth. Section five discusses the constraint to doing business in Lesotho. The last section is the policy implications and conclusions.

2 EVOLUTION OF MANUFACTURING SECTOR IN LESOTHO

The evolution of manufacturing sector in Lesotho can be separated in three distinct periods, i) Pre AGOA Period, ii) AGOA Peak Period and iii)Post Global Financial Crisis Period. Figure 1 below presents Lesotho textiles and clothing exports to the US during the period 1989-2015. Lesotho's pursuit of export led industrialization strategy saw the surge in the manufacturing of textiles and clothing products driven by the increase in the number of Asian companies that relocated to Lesotho to take advantage of cheap labour and access to the United States (US) and other markets through Generalised System of Preferences (GSP) and the Multi-Fibre Agreements (MFA).

The coming into effect of African Growth Opportunities Act (AGOA) which allowed Lesotho exports duty free access to the US took the sector to the next level. The phenomenal growth led Lesotho to be considered among the leading exporters of garments through AGOA to the United States (US) in the early 2000. Understandably, the manufacturing sector is the largest formal employer in Lesotho. The manufacturing has not always been a major sector in Lesotho. In years prior to enactment of AGOA, it constituted mainly the food and beverages industry and quite a small clothing manufacturing industry. Subsequent to enactment of AGOA, the setting changed quite drastically. The manufacturing sector's contribution to the overall gross domestic product increased sharply, from less than 10.0 per cent to more than 20.0 per cent; and this was propelled by manufacturing of textiles and clothing. Between 2000 and 2003, exports of textiles and clothing increased by 202.0 per cent. The enactment of AGOA brought peculiar preferential incentives to producers in Sub-Saharan Africa. The producers from the East Asian countries took advantage of AGOA and set-up operations in Lesotho. That saw employment increasing to more than 50,000 employees as at 2004. Presently, the Lesotho textile and garment industry employs more than 40, 000 workers, mostly women and remains the second largest employer. As figure 1 below shows, the quantity of Lesotho's exports to the US averaged 30 million square metres in 2000. However, following the period post enactment of AGOA, export of textiles and clothing to the US increased exponentially.

Figure 1 Lesotho Textile and Clothing Exports to the US (Million Sq. Meters)



Source: OTEXA

Overtime, a number of events affected the performance of the textile and clothing sector. The first major blow was in 2005, when the MFA came to an end. The MFA was an agreement amongst the western countries to limit imports from other textile producers such as Asia, which could produce these products more cheaply. That expiry saw fierce competition from textile producers in Asia which could produce these products more cheaply that Lesotho. In 2005, exports to the US declined quite significantly following the expiry of the MFA. The industry further took a knock during the global financial crisis of 2008. The financial crisis let low import demand by the US buyers in response to weakened consumer demand. The coming to an end of the duty credit certificate facility in 2011 also made it difficult for local firms to compete with foreign firms. These developments have continued to threaten the sustainability of this sector unless there is a deeper understanding of the various challenges that confront this sector.

The observed pattern reflects the dynamism in the global value chains in recent years. Staritz and Morris (2013) shows Lesotho textiles sector operates in two distinct global value chains, the US based value chain operated by the Asian companies. The value chain was severely

affected by the financial crisis. The second value chain is the South African based value chain which is operated by the South African companies. The chain is driven by the high labour costs in South Africa and has been on the increase. This presents huge opportunities for the economy of Lesotho as most of the competitiveness issues inherent in the US value chain do not apply.

3 DATA

The study uses information collected from Lesotho National Development Corporation (LNDC) on its assisted companies during the period 2004 - 2015. Lesotho National Development Corporation is the government owned investment Promotion Company with the primary mandate to initiate, promote and facilitate the development of manufacturing and processing industries, mining and commerce in a manner calculated to raise the level of income and employment in Lesotho[2]. In pursuing this mandate, the corporation collects employment statistics on companies that they assist. The assistance is mainly through provision of factory shells and setting up. The database of LNDC assisted companies constitute the largest proportion of firms operating in Lesotho manufacturing sector. This feature makes the database suitable for undertaking this study. The other database is by the manufacturing survey undertaken by the BOS which is based on a sample. The manufacturing survey is only used for comparison and is not reported in the paper. It is worth noting that the data is at firm level so there is no need for aggregation.

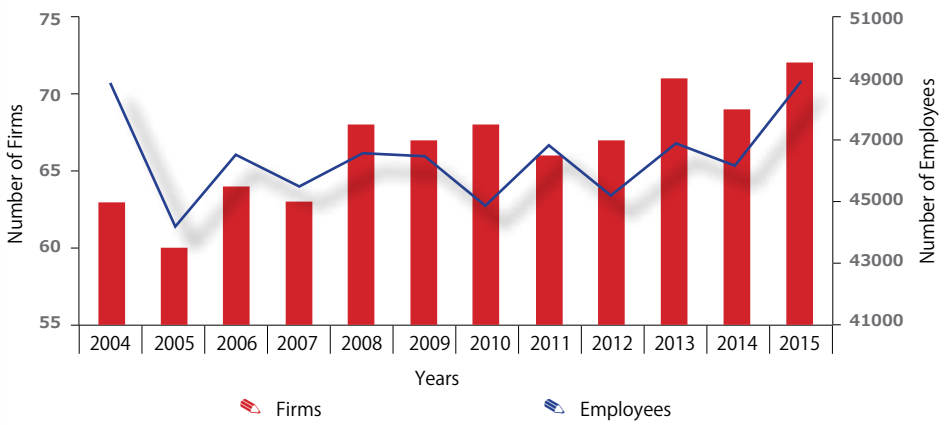
While LNDC collects the data on quarterly basis, the data is not organised into a panel. So data was collected going back from previous files in the Bank and at LNDC. Then, the data was merged into a single panel data. Significant effort was exerted in ensuring that the merging of the different files is consistent. This involved checking that the entrants and exits are placed in their correct periods. The database has both quarterly and annual dimensions. And this study uses the annual dimension. The resulting database has 125 companies over the entire period. The next section unpacks some of the characteristics of the dataset.

[2] LNDC Order 1990 and Amended in 2000.

3.1 Basic Facts on the Data

To understand the relationship between the overall employment generated and the number of companies, Figure 2 shows the evolution of the number of companies and total employment. The left axis shows the total employment while the right axis is the number of firms. During the period, the number of companies in the database averaged about 66 companies reaching a peak of 72 in 2015 and a low of 60 in 2005. Total employment averaged 46 473. The high for total employment was reached in 2004 and 2015 while the low was 44 222 recorded in 2004. Looking at the two variables, they seem to be moving together albeit with a lag. This is because when a company is faced with difficulties it begins by laying off the casual employees and if they persist then it closes down. From the figure 2 the impacts of the external shocks to the sector such as the end of multi fibre agreement in 2005 and the global financial crisis in 2008-2009 can also be deduced.

Figure 2 Lesotho Textile and Clothing Exports to the US (Million Sq. Meters)



Source: Authors computations

Looking at the sectoral distributions, Lesotho manufacturing sector is built around the production of textiles and clothing. Table 1 below presents the sectoral distribution of companies in the data. As expected in line with that overall structure of Lesotho manufacturing sector, most of the companies in the dataset seem to be in the knit garments category. Over time there has been relative stability in terms of the shares, the knit garments comprised about 43.7 per cent of the total during the period 2010-2015. This is followed by woven garments with an average of 11.6 per cent and embroidery, screen printing and packaging with 10.6 per cent. The category of embroidery, screen printing and packaging is quite interesting since it has some presence of local companies and reflects the linkage with the local economy which is the major criticism of Lesotho industrial development (Staritz and Morris, 2013). Overall, the sectoral distribution indicates some progress towards diversification despite high concentration in textiles and clothing. This is reflected by the presence of automobile industries at 1.4 per cent and electronics at 5.6 per cent.

Table 1 Sector Distribution

Sector	Average 2004 - 2008	2012	2013	2014	2015	Average 2010 - 2015
Automotive	1.6	0.0	1.4	1.4	1.4	1.4
Construction	6.6	6.0	5.6	5.8	5.6	5.8
Electronics	3.8	6.0	5.6	4.3	4.2	5.1
Embroidery; Screen printing; Packaging	8.5	11.9	9.9	10.1	8.3	10.9
Fabrics	1.6	1.5	1.4	1.4	1.4	1.4
Food and Beverages	7.9	6.0	5.6	4.3	5.6	6.0
Footwear	5.3	4.5	4.2	4.3	4.2	4.3
Green Industries	0.0	1.5	1.4	1.4	1.4	1.4
Knit Garment	43.4	41.8	42.3	43.5	45.8	43.7
Other	4.1	7.5	9.9	10.1	9.7	8.0
Pharmaceutical Products	1.6	0.0	0.0	0.0	0.0	0.0
Tobacco products	0.0	1.5	1.4	1.4	1.4	1.4
Woven Garment	16.4	11.9	11.3	11.6	11.1	11.6
Total	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

Source: *Authors computations .*

An important variable in this study is the size of the firm. The number of employees is used as the appropriate measure of firm size in this paper because it focuses on job creation (Hart and Oulton, 1996). In defining the firm sizes, the National Policy on Small Medium Enterprises and empirical literature on African countries are used. The national policy defines a small firm as comprising 3-9 employees while medium is 10- 49 employees. This may be too narrow for the nature of manufacturing being followed in Lesotho. As a result, the paper departs from the national definition and disaggregates the date into the following six size categories as 1-9 employees, 10-49 employees, 200-499 employees, 500-999 employees, 1000-1999 employees and 2000 employees and above. This is informed by the empirical literature in the area.

Table 2 presents the size distribution for selected years. The middle size categories (50-199, 200-499 and 500-999) seem to have the highest number of companies. This is followed by the large sized companies (1000-1999, 2000+). Surprisingly, the small sized firms (1-9, 10-49) have the smallest share. This is rather worrying since healthy industrial structure should have many small companies and fewer large ones. While we are cautious on this observation as it may be the result of our database but it is indicative of the constraints faced by the small sized companies in manufacturing sector.

Table 2 Size Distribution

	Size of Firms							
Years	1-9	10 - 49	50 - 199	200 - 499	500 - 999	1000 - 1999	2000+	Total
2004	1	6	9	16	15	10	6	63
2008	4	8	9	18	17	6	6	68
2010	3	9	12	18	11	9	6	68
2015	1	11	14	16	15	9	6	72

***Source**: Authors computations.*

Another important aspect to consider when analysing the industrial structure is the age of the companies. Young firms are more productive and innovative (Van Biesebroeck, 2005). Age of the firm is calculated as the current year minus the year that the company was established. Table 3 shows the distribution of firms for the selected years. Age is categorised into three categories young firms which are less than five years old, middle aged which are between 5 years and 10 years and the last category is for mature companies which are above 10 years. It seems that the largest category is the mature companies accounting for 55 per cent in 2015. The middle

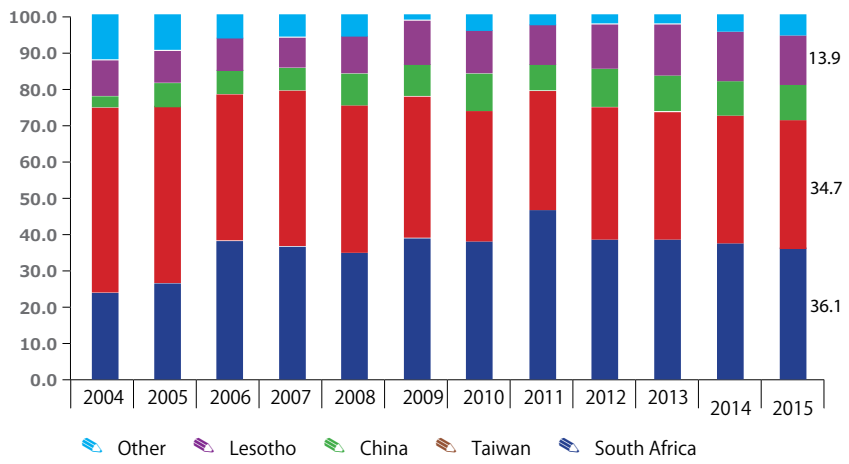
and young companies account for 12.5 per cent and 33 per cent respectively. The dominance of mature companies is in part explained by the over representation of large companies. A large company is likely to stay in the market for a longer period.

Table 3	Age Distribution			
	Age Categories			
Years	Young	Middle-Age	Mature	Total
2004	9	12	42	63
2008	5	17	46	68
2010	5	18	45	68
2015	23	9	40	72

Source: *Authors computations.*

The origin of the investment in the manufacturing sector is also important. As shown by Figure 3 below, most of the investment originated from South Eastern Asia entrepreneurs, mainly Taiwan. Taiwanese investors were among the first to relocate in Lesotho. However, it appears that the share of the Taiwanese investors has been declining over time to the current 34.7 per cent compared with 50.8 per cent in 2004. The share of firms from Taiwan took a huge knock during the global financial crisis and has not recovered to the pre-crisis levels. Nonetheless, South African companies have also been growing providing a much needed diversity of markets and products. In 2015, the share of investment from South Africa was the largest with 36.1 per cent compared to 23.8 per cent in 2004. Interestingly, there are some domestic investors in the sector representing 13.9 per cent in 2015.

Figure 3 LNDC Assisted Firms By Origin



Source: Authors computations

4 EMPIRICAL ANALYSIS

4.1 Survival Analysis

Before analyzing the size distribution, it is important to investigate the patterns of survival. In order to isolate the impact of the financial crisis on firm dynamics given that the financial crisis represented major shift in the evolution of the manufacturing sector in Lesotho. As such the analysis is divided into two periods, the pre-crisis period (2004-2008) and post crisis period (2010-2015). The choice of the actual point of the crisis varies from country to country and has been debated extensively in the literature. In the case of Lesotho, looking at the data the effects were felt in 2009.

Looking at the pre-crisis period, out of the 65 companies that were alive in 2004, 48 companies (73.8 per cent) survived to 2008. Disaggregating the survival rate by size groups shows that the highest survival rate is observed in higher size groups (2000+ employees). The size category

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of 2000+ recorded 100 per cent survival rate. As expected the smallest size category has the lowest survival rate of 50 per cent. In the post crisis period, the overall survival declined slightly to 72 per cent. But it still remained high indicating that the crisis had minor effect on the firm dynamics. In the disaggregated analysis, the similar pattern is observed in the post crisis period. The results suggest that survival rate tends to increase with the size of the firm indicating that smaller firms face more difficulties compared with the large ones. The reliance of the manufacturing sector during the global financial crisis was partly due to the dominance of large firms. While it is noted that the number of small firms in the database is small this result is not likely to be changed if the sample is increased.

Table 4	Company Survival by Size Category						
		Post Crisis			Pre Crisis		
	Employment Categories	Number of firms alive in 2010	Number of firms surviving to 2015	Survival rate	Number of firms alive in 2004	Number of firms surviving to 2008	Survival rate
0	1-9	3	1	33.3	2	1	50.0
1	10-49	9	6	66.7	7	6	85.7
2	50-199	12	9	75.0	9	6	66.7
3	200-499	18	8	44.4	16	13	81.3
4	500-999	11	11	100.0	15	10	66.7
5	1000-1999	9	8	88.9	10	6	60.0
6	+2000	6	6	100.0	6	6	100.0
		68	**49**	**72.0**	**65**	**48**	**73.8**

Source: *Authors computations .*

4.2 Transition Analysis

In this section, the changing size distribution of companies in the pre-crisis period 2004-2008 and post crisis period is analysed. This is done through the use of the transition matrices in the two periods. The matrix considers how firms moved (or didn't move) across size groups. Table 5 presents the pre-crisis scenario. About 30 companies of those that survived through 2004-2008 remained in their size groups. This is represented by the diagonal line of the transition matrix. A large portion of the surviving firms are not growing their employment. The second largest category is for those above the diagonal line which are the companies that moved up to the next size group. It is worth noting that fewer companies are moving beyond two groups.

The exception is a company in electronic that moved from the group 10-50 to group 1000-1999. A smaller number of companies moved to lower size groups. The notable downward movement was the companies that declined from the size groups 500-999 to the size group of 10-49. The pattern is similar for the post crisis period 2010-2015 as presented in Table 6. About 31 companies remained in their size categories between 2010 and 2015. Overall the results reveal that the sector has not been realizing robust growth with more firms remaining in their size groups and that has implication on the job creation.

Table 5 Transition Matrix Pre Crisis

Employment Size of Firms in 2004	Employment Size of Firms in 2008							
	1-9	10 - 49	50 - 199	200 - 499	500 - 999	1000 - 1999	2000+	Total
1 - 09	1	0	0	0	0	0	0	**1**
10 - 49	0	3	1	0	0	1	0	**5**
50 - 199	0	1	4	2	0	0	0	**7**
200 - 499	0	0	0	10	2	0	0	**12**
500 - 999	0	0	1	1	7	2	0	**11**
1000 - 1999	0	0	0	0	1	3	1	**5**
2000+	0	0	0	0	0	0	5	**5**
Total	**1**	**4**	**6**	**13**	**10**	**6**	**6**	**46**

Source: Authors computations.

Table 6 Transition Matrix Post Crisis

Employment Size of Firms in 2004	Employment Size of Firms in 2015							
	1-9	10 - 49	50 - 199	200 - 499	500 - 999	1000 - 1999	2000+	Total
1 - 09	1	1	0	0	0	0	0	**2**
10 - 49	0	4	1	1	0	0	0	**6**
50 - 199	0	1	8	0	0	0	0	**9**
200 - 499	0	0	0	5	2	2	0	**9**
500 - 999	0	0	0	2	6	1	0	**9**
1000 - 1999	0	0	0	0	3	4	1	**8**
2000+	0	0	0	0	0	1	5	**6**
Total	**1**	**6**	**9**	**8**	**11**	**8**	**6**	**49**

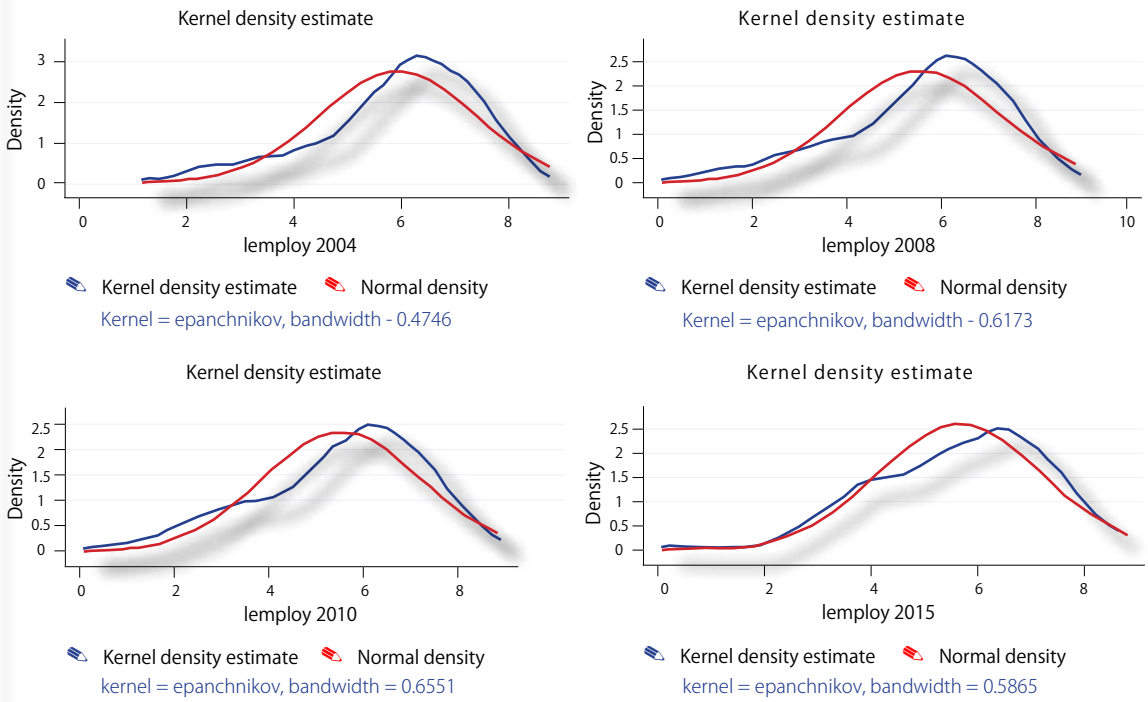
Source: Authors computations.

4.3 Non-Parametric Analysis of Firm Growth and Size

This section uses non-parametric methods to investigate whether growth of companies in the industry could be linked to their size categories. This is important since the policy intervention can be directed to the relevant size groups. Following Bigsten and Gebreeyesus (2005) we use non-parametric method to test whether the logarithm of employment is log normal as implied by the Gibrat law. If it deviates from normal then we reject Gibrat law that growth of firms is explained by stochastic factors. We analyse the distributions of the logarithms of employment in the selected years 2004, 2008, 2010 and 2015[3]. Figure 4 below shows the kernel density functions for logarithm of employment in the selected years overlaid by the normal distribution. In all periods, the distributions are not normal they are skewed to the right indicating the dominance of large firms. Clearly, even without testing normality of the functions the normality tests will be rejected suggesting that growth of the firms will not be random. This indicates that size groups are growing at different rates.

[3] Full distributions are available from the authors.

Figure 4 Kernel Density Functions



Source:

Then, we assume that the factors that explain firm growth are complex as posited by the stochastic models of growth and that there is no obvious systematic pattern across different sizes of firms then the probability distribution of growth rates is the same for all sizes. To check whether this holds, we follow Dunne and Hughes (1994) method and look at the distribution mean growth rates. They should be the same across size classes if the size distribution is log normal. Thus, there should not be any differences in the mean growth rates across the size classes. Table 7 below shows mean employment growth and standard errors tabulated across all the size classes in both pre and post crisis periods. In the pre - crisis period, the lowest size category registered a contraction indicating that companies in that category were more susceptible to

the financial crisis and a lot of jobs were lost in that category. The largest category of 2000 employees and above no growth was registered. During this period, growth was generated in the middle size group with exception of 1000-1999 category which registered a contraction. The picture seems to be clear in the post-crisis period where the smaller categories are growing faster than the larger ones. The two lowest size classes registered the highest growth during the period. The largest size class shows no growth at all while the following two categories are contracting. It can be observed that while the sector is dominated by relatively large companies they have not been growing in both periods. This indicates that small employment increases observed recently is mainly driven by companies employing less than 500 employees.

Table 7 Company Growth and Size

	Post-crisis growth (2010-2015)				Post-crisis growth (2010-2015)			
			95% Confidence Interval				95% Confidence Interval	
Size of Firms	Mean	Std. Error	Lower Limit	Upper Limit	Mean	Std. Error	Lower Limit	Upper Limit
01 - 09	-0.9				0.5	0.5	-6.1	**7.1**
10 - 49	1.1	0.5	-0.3	2.6	0.7	0.4	-0.4	**1.8**
50 - 199	0.1	0.1	-0.2	0.3	0.1	0.1	-0.1	**0.4**
200 - 499	0.1	0.1	-0.1	0.4	0.3	0.2	-0.1	**0.7**
500 - 999	0.0	0.2	-0.4	0.5	-0.1	0.2	-0.5	**0.3**
1000 - 1999	-0.1	0.2	-0.5	0.4	-0.1	0.1	-0.4	**0.3**
2000+	0.0	0.0	-0.1	0.1	0.0	0.2	-0.4	**0.5**

***Source**: Authors computations.*

5 CONSTRAINTS TO DOING BUSINESS

In order to give the results some policy perspective and highlight some of the factors that negatively affect firm growth, this section draws from the recent Africa Competitiveness Report 2017 and discusses the most problematic factors for doing business. Table 8 below shows the top ten constraints to doing business in Lesotho, Botswana, Namibia and South Africa. The other three countries are included for comparison. This is because these countries are members of the Southern African Customs Union (SACU) and they share common external

tariff[4]. Also there are discussions at the level of SACU for common industrial policy. Access to financing is rated first most problematic constraint facing businesses in Lesotho and Namibia and second in Botswana. However, access to finance is not in the top ten in South Africa which has a well-developed financial sector with an array of products for financing businesses. The lack of access to financing is most likely to be acute among the small and middle sized firms. This is likely to retard growth of these firms. The second factor is corruption. This is ranked among the top five in all the countries except for Botswana where it is ranked number eight. Inadequate supply of infrastructure is ranked third. Most developing countries are experiencing huge infrastructure deficit. This includes roads, electricity and information technology. Overall there is a menu of factors that affect firms differently across the size distribution.

Table 8 Ten Most Problematic Factors for Doing Business in SACU Countries*

Lesotho (120)	Namibia (84)	Botswana (64)	South Africa (47)
Access to financing	Access to financing	Poor work ethic in national labor force	**Inefficient government bureaucracy**
Corruption	Inadequate educated workforce	Access to financing	**Restrictive labor regulations**
Inadequate supply of infrastructure	Inefficient government bureaucracy	Inadequate educated workforce	**Inadequate educated workforce**
Insufficient capacity to innovate	Poor work ethic in national labor force	Inadequate supply of infrastructure	**Policy Instability**
Inefficient government bureaucracy	Corruption	Inefficient government bureaucracy	**Corruption**
Policy instability	Inflation	Restrictive labor regulations	**Crime and Theft**
Inadequate educated workforce	Insufficient capacity to innovate	Insufficient capacity to innovate	**Poor work ethic in national labor force**
Government instability/ Coups	Tax rates	Corruption	**Inadequate supply of infrastructure**
Poor work ethic in national labor force	Restrictive labor regulations	Crime and theft	**Tax rates**
Crime and theft	Inadequate supply of infrastructure	Policy instability	**Inflation**

***Source**: Authors computations.*

[4] The other SACU member Swaziland is not reported in the report.

6 CONCLUSION

The paper set out to investigate the firm size distribution in the manufacturing sector in Lesotho and evaluate its implications for job creation and sustainability. Using unique database of LNDC assisted companies; the paper examined the evolution of firm size distribution, survival patterns and the relationship between firm size and growth. The manufacturing sector remains an important sector in Lesotho given the size of employment it generates. However, the varying developments within that sector threaten the existence of that sector and sizable employment opportunities are at risk. While the challenges that affect the manufacturing sector are well understood at the macro level, there is still a dearth of knowledge in so far as the extent to which the firm size may determine its sustainability and its potential to grow and therefore generate more jobs. Therefore, this paper contributes towards understanding the role of firm level dynamics in ensuring sustainability of the firms and employment.

The results show that the overall survival rate in the sector is relatively high registering 73.8 per cent after the crisis. In the lowest size category survival ranges between 33 per cent and 50 per cent in five years comparable with rates reported in other countries. While the paper has covered a limited number of small companies but it is evident that the companies in the lowest category are facing more difficulties. This is a stylized fact in firm dynamics that small companies have low survival rate. This is mainly due to their inability to compete with bigger companies given their lower economies of scale. This contrasts with the observation made on large firms which depict long lifespan. One of key reasons for the high survival rates amongst the large firms is that in times of distress they are able to enjoy financial support from their parent companies. As a result there is urgent need to support small local companies for sustained impact on job creation. The support can be in various forms including financial support in times of distress and access to finance to meet their operational expenses. These issues are clear from the interviews conducted with local operators in the sector.

Using the transition matrices, the results indicate that there is no dynamism in the sector. Interestingly, the phenomenon exists even before the global financial crisis suggesting that the country probably long reached the capacity ceiling. Most surviving companies remain in their size classes and this is supported by data from the quarterly manufacturing surveys. Importantly,

the result says that the manufacturing sector is not creating new jobs. Also the results show that the modest growth observed, is limited to companies employing less than 500 employees. For creation of new jobs it is imperative that the industrial policy should employ new strategies. There are a number of policy lessons. First, there is need to fully understand the challenges that affect the large firms and address them. This will sustain employment in the current levels. Second, there is need to also critically analyse the nature of small operators in the sector and the challenges they face and come with appropriate remedies. While these results are very preliminary, it is clear that representation of small sized manufacturing firms in Lesotho is vital for job creation. Otherwise, the country needs to continually attract large investors. Overall the results collaborates the view that in order to unlock growth in developing countries, it is important that the constraints of doing business should be addressed urgently. For Lesotho, according to Africa Competitiveness Report 2017, the top three most problematic factors for business are access to finance, corruption and lack of infrastructure.

The study has a number of limitations that may be subject to further research. First, the paper did not evaluate the participation of Basotho at the strategic management level of the large foreign owned companies. This assessment will lend a hand in whether there are potential Basotho industrialists undergoing mentoring. This is important given the complexity of the industry. Consultations with local entrepreneurs in the sector articulate this complexity very well. Second, the paper has not assessed the type of innovation that is occurring in the sector. Small and middle sized firms are known to be good innovators which will give Lesotho some edge over its competitors. Our suspicion is that the level innovation in the sector is likely to be very low due to the dominance of large companies. Innovation can be important in ushering in the process of indigenization of the sector.

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

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

$$y_{it} = \alpha\, y_{i,t-1} + x_{it}\beta y + (\eta_i + v_{it})$$

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