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Financial Analysis of Eritrean Commercial Bank: CAMEL Model

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Abstract

Research on Eritrean banking system is scant. Hence, this study's aim is two-fold. To add literature to this scarce body of knowledge and to initiate the CAMEL model in the Eritrean context. The main purpose of this paper is to evaluate the performance of the Commercial Bank of Eritrea (CBER) using CAMEL approach. Data are gathered from consolidated financial statements of CBER. The analysis extends for 15 years starting from 2001 up to 2015 by employing two variables from each CAMEL parameter. Based on the selected CAMEL metrics the empirical analysis depicted a satisfactory result but with significant volatilities. Except for Capital Adequacy which is probably tied to its ownership structure Asset Quality, Management Efficiency, Earnings and Liquidity portrayed reasonable outcomes, nonetheless with frequent head and shoulder trends. These sheds light on the strengths and vulnerabilities of the bank, underlining the need to bolster the concerns of the decision makers to improve and increase its soundness.

Keywords: financial performance and soundness, commercial bank, CAMEL, Eritrea

1. Introduction

Since the industrial revolution, the financial sector has come an evolutionary journey to become the center and backbone of the modern economic system. Its significance and continuously increasing innovativeness is tugging banks from their traditional role of fund mobilization to advanced financial engineering, making them more competitive and facilitate to clients' altering needs (Dang, 2011). This enabled banks to be major and central agents of capital formation and intermediation for economic prosperity. Thus, the growth and development of banking sector becomes synonymous with the level of growth and progress of the economy extending up to the economy's and society's development image (Mishra & Aspal, 2013).

However, the financial system in general and the banking sector in particular are exposed to risks which makes them vulnerable towards shocks. Economic historians have documented the banking industry was at the center of most financial crisis and economic meltdowns with a painful and longer recovery time (Getahun, 2015). In the last four decades, Argentina in 1980, Chile in 1982, Sweden, Norway, and Finland in 1992, Mexico in 1994, Thailand, Indonesia, and Korea in 1997, Iceland in 2006 and ultimately the globe in 2008 experienced the culmination of a boom-bust scenario, albeit in different economic settings (Demyanyk & Hemert, 2011). The focal causes for these were deregulation, overleveraging, loose underwriting standards, deteriorated loan performance, and decreasing risk premiums.

The damage that can be created from financial crisis is so huge necessitating maintenance of sound and healthy banking environment. Thus, drawing closer attention to constantly evaluate their performance. Aswini, Harsha, Anand and Dhurva (2012) stated that maintaining soundness goes beyond keeping the economy stable, but a continuous and thorough soundness and performance evaluation needs to be done as the instability in the banking sector has a domino effect. Baral (2005) also indicated that maintaining health of the financial institutions in general gives a boost in financial markets confidence.

Among the classic ROE, ROA, and ROI and other complex mathematical bank performance measurement models CAMEL model is one of the popular and globally accepted. It was introduced in 1979 in the United States by regulatory bodies (Roman & Sargu, 2013). The CAMEL is an abbreviation that represents the main components of the framework: Capital Adequacy, Asset Quality, Management Efficiency, Earning Ability and Liquidity. It has expanded and developed over years integrating S in 1996, representing sensitivity to market risk and became CAMELS.

The purpose of this paper is to measure the performance of Commercial Bank of Eritrea (CBER) using CAMEL approach. Hence, we explain below a brief background of Eritrean banking, motive and significance of the study.

According to Mauri (1998), banking started in Eritrea in 1914 when Banca d'Italia opened branch offices in Asmara and Massawa. Under the Italian colonization, the banks grew to four until the British administration take over the control of Eritrea. Following the Federation of Eritrea with Ethiopia in 1952, first branch of State bank of Ethiopia was opened. In 1963

this bank split in to two to make up the National Bank of Ethiopia and Commercial Bank of Ethiopia ("CBER", 2010; Mauri, 1998). Until the 1974 coup that ousted Emperor Haileslassie by the Dergue, state owned and private banks were engaged in the economy. However, after 1974 all banks were nationalized, merged and were put under the National Bank of Ethiopia's authority (Teshome, 2018). After 30 years of war for independence, Eritrea gained its independence in 1991. The Economy was in ruins and the banking sector was very much weakened (Tewolde, 2002). That was because of the use of the banking system for colonial purpose with low penetration into private sector and unstable policies set for the banks by the insecure regime (Trevaskis, 1960). In 1991, among other countless economic challenges Eritrea had to confront this old-fashioned bank.

New Eritrea embarked on the construction of a new economy and considerable reform was undertaken. By the start of 1998, the country had achieved much in a short time. However, the ashes of the war that ended in 1991 have reignited in 1998 in a surprising and different way, and the fallout from the war endangered progress in development (Hansson, 2001). The 1998–2000 war was followed by many years of no peace-no war. The Eritrean government claims conspiracies and sanctions from the west due to self-reliant economic policies and independent political choices and standings of Eritrea, TPLF being the main thespian in all this threaten to undermine the continuity of the pre-war progress. Simultaneously, critics remark this excuses should not have deteriorated the economic progress this much. However, the Eritrean government confronted and overcome all these western challenges and recently removed TPLF from power (Seid, 2022).

The new era is expected to resume the economic resurrection of Eritrea. Thus making an evaluation of the past can pave a way to the start of a new progress. Thus, this research among others attempt to fill this gap. The analysis is from 2001–2015 (2001—the immediate year after the war and 2015—due to data in availability).

Tsegai (as cited in Ghebregiorgis & Atewebrhan, 2016) stated the contemporary banking industry can be described as "small, state-owned, undeveloped and providing rudimentary banking and other financial services to the economy." In addition to this few studies have been conducted regarding banking sector in Eritrea and those relating to performance are rare and none of them used CAMEL model as far as our literature investigation. Based on profitability, risk and efficiency evaluations Ghebregiorgis and Atewebrhan (2016) indicated major commercial banks' advancement was not adequate from 1997 to 2007. Embaye, Chenyan and Abderaman (2017) evaluated the dependency of Eritrean commercial banks' financial performance on credit risk management. However, they reported paradox and unreliable results concerning the association and statistical significance of the variables. Hence, this research attempts to add literature to the scarce body of knowledge in the Eritrean banking sector and initiate evaluation of the CBER using the CAMEL approach.

This bank is the largest bank in Eritrea with seventeen branches distributed all over the country. Its main functions incorporate accepting deposits in foreign and local currency while providing loans and advances, dealing with cheques and foreign exchange. It also renders a service of safe custody boxes and money transfers in local and international level ("CBER",

2010).

2. Literature Review

Studies on bank performance commenced in the end of 1980s and start of 1990s, deploying Market Power (MP) or Efficiency Structure (ES) models (Mensi & Zouari, 2010). Several other models are also used to measure the performance of banks. We will initially review studies applying CAMEL followed by the classic ratios, European Central Bank models and finally a brief theoretical survey of MP & ES mathematical models.

2.1 CAMEL Model

Recently CAMELS framework is the most applied model for the banking performances and health checkup (Baral, 2005). The mounting evidence of empirical research based on CAMEL approach is in all developed, emerging and developing countries, but mostly crowding in India. Our literature primarily focuses on neighboring countries, Sub-Saharan Africa and emerging economies.

Capital Adequacy

Capitalization informs investors the level of risk associated with the firm (Gupta, 2014) and the capability of bank to withstand unfortunate events associated with risks taken (Roman & Sargu, 2013). Thus, serving as a cushion for banks' stakeholders (Ongore & Kusa, 2013) and boosting their confidence (Mathiraj & Ramya, 2014).

Two studies on Ethiopian commercial banks indicated that capital adequacy and ROA have insignificant negative relationship (Teshome, 2018; Getahun, 2013). However, the studies provided different results for the relationship between capital adequacy and ROE. Similar results were shown on 13 Chinese banks by Liu and Pariyaprasert (2012). Two studies on Kenyan commercial banks showed capital adequacy has a positive relationship with ROA indicating higher profitability (Olweny & Shipho, 2011**;** Ongore & Kusa, 2013). Ongore and Kusa (2013) also proved the negative relationship between ROE and capital adequacy. Jha & Hui (2012) studied 18 commercial banks in Nepal and found that capital adequacy have negative relationship with ROA due to heavy losses in the public commercial banks. In line with other studies, they also indicated that capital adequacy has insignificant negative relationship with ROE.

A common Capital Adequacy Ratio (CAR) is Debt to Equity (leverage ratio) which compares the amount of capital financed through debt and showing the leverage against creditors (Mathiraj & Ramya, 2014; Zafar, Maqbool, & Ali, 2014). In India Gupta (2014) found CAR was 13.04 which was higher than 4.45 in 10 Moroccan banks in a span of 10 years (Ferrouhi, 2014). The banks showed a decreasing CAR pattern implying higher capital proportion. Another CAR is Total Advances to Total Assets showing the ability of a bank to issue advances which in turn results in higher returns. It incorporates receivables while ignoring revaluation of assets. Mishra and Aspal (2013) documented a CAR of 62.5 on 6 Indian banks for a duration of 3 years. A study of 10 Pakistani banks showed CA as a statistically significant determinant of bank performance (ROE) (Ishaq, Karim, Ahmed, & Zaheer, 2016).

With the same methodology a Chinse study reported an opposite result (Liu & Pariyaparasert, 2012).

Asset Quality

Asset quality denotes an inquiry into the credit risk that arises in relation with the bank assets (Ishaq et al., 2016). A good asset is demarcated by the quality of loans as they are key indicators of total asset of banks (Roman & Sargu, 2013) and averting the possibility of insolvency (Gupta, 2014). Loan loss provision to Total loan can give an image of a bank's asset quality based on the amount that banks are required to put against bad loans (Getahun, 2015) implying the bank's ability to recover debts (Liu & Pariyaprasert, 2011). Lower ratio indicates low bad assets and less deduction from revenue that in turn increases profitability (European Central Bank (ECB), 2010).

Three studies concluded that significant number of Ethiopian commercial banks' profitability is negatively and significantly affected by their asset quality (Lelissa, 2014; Getahun, 2015; Teshome, 2018). Two studies comprising all Kenyan Commercial Banks also found similar results (Olweny & Shipho, 2011**;** Ongore & Kusa, 2013).

Dang (2011) rated Vietnamese banks. The non-performing loan (NPL) to total loans was in downward trend from 1.80% to 0.70%. A study of 15 Romanian banks over a period of 8 years found that the average NPL to total loans was 6.851 (Roman & Sargu, 2013). A study of 5 banks for 5 years by Mathiraj and Ramya (2014) in India found this to be 2.217. Two studies of 35 Nepalese banks covering a decade found the average NPL ratio was 7.02 (Jha & Hui, 2012; Baral, 2005). This was lower than the average 15.9 in two studies covering 75 Kenyan banks over 17 years (Olweny & Shipho, 2011; Ongore & Kusa, 2013) and a study that showed an average 11 for 10 Pakistani banks in the range of 7 years (Ishaq et al., 2016).

Management Efficiency

Management efficiency denotes expertise & capability of a bank's board of directors and management team to run the firm efficiently (Mishra & Aspal, 2013) following several rules and proclamation and containing risks as they arise (Getahun, 2015). Most researchers agree this CAMEL component is more significant than the others (Grier, 2007) as the bank's continuity and advancement depends on it (Mathiraj & Ramya, 2014). However, it is the most volatile and difficult to gauge (Roman & Sargu, 2013). Common ratios applied include operating expense to total assets, deposit interest expense to total deposits, non-interest expense to net interest income plus non-interest income, personnel expenses to average assets, cost to income, average asset, loan or earnings growth rates (Dang, 2011; Zafar et al., 2012; Mishra & Aspal, 2013; Roman & Sargu, 2013)

Four studies including all Ethiopian commercial banks over the range of 26 years found that management efficiency has a positive and statistically significant relationship with the banks' financial performance (Kapur & Gualu, 2011; Lelissa, 2014; Getahun, 2015; Teshome, 2018). Olweny and Shipho (2011) and Ongore and Kusa (2013) found that management efficiency positively affects all Kenyan banks with a statistical significance. However, a study of banks in Morocco revealed a head and shoulder relationship between management efficiency &

profitability (Ferrouhi, 2014).

A study on efficiency of Sub- Saharan African banks documented the banks are efficient 98.35% of the time (Ngu & Mesfin, 2010). Banking industry of developing countries in general and the state-owned banks in particular are highly affected by political system and its institutions. A study by Ashraf (2018) focusing on 185 state owned banks from 51 developing countries in the range of 14 years depicted a significant political pressure on the state-owned banks. The banks' management was less efficient during election periods, as banks were required to give more loan & earn less.

Most CAMEL researches focus on Indian banks. Four studies which comprised 33 Indian banks and ranging in 11 years measured management efficiency using total advance to total deposit. their results depict almost all the banks had a growing ratio (Zafar et al., 2012; Kumar, Harsha, Anand, & Dhruva, 2012; Mishra & Aspal, 2013; Mathiraj & Ramya, 2014). A fifth study (Gupta, 2014) comprising 25 banks increased the number of banks to 58 & the year of study to 13 years. All the studies found that Indian banks have the worst return on equity.

Earning Quality

The sustainability of a bank depends on its capability to earn sufficient returns through its assets. Earning ability prospers bank's reserves, increase its capital, sustain its competitiveness (Liu & Pariyaprasert, 2018) and is the milestone of banks as it affects in funding their dividends and offering investment opportunities (Kumar et al., 2012). Analyzing earnings and profitability of banks follow indicators such as Return on Equity and Cost to Income Ratio (Getahun, 2015).

A study in Ethiopia specifies a direct and statistically significant relationship of earnings with both ROE and ROA (Getahun, 2015). However, another study in the same country identifies earning quality is negatively related with ROA (Teshome, 2018). Moroccan study detects volatility of earning over ten years of study (Ferrouhi, 2014).

Four studies in India measured earning quality using the ratio operating profit to total assets. The results displayed almost an increasing trend over the years of study (Zafar et al., 2014; Mishra & Aspal, 2013; Mathiraj & Ramya, 2014; Gupta, 2014). A fifth study by Kumar et al. (2012) found that private banks are rising at a faster rate than public sector banks in their overall performances leading toward a quicker convergence.

Liquidity

Liquidity is the core to banks' financial wellbeing, specifying banks' capability to pay short term debts and withstand significant depositor withdrawals (Roman & Sargu, 2013). Its mismanagement has a principal influence on financial distress and credit commitment which affect banks' financial performance by significantly increasing cost of fund and high vulnerability to unrated asset category (Kumar et al., 2012). Hence, banks should maintain adequate funds by increasing liabilities or changing their financial instruments to cash rapidly at a fair cost (Gupta, 2014).

Ethiopian banks revealed liquidity to have statistically significant and positive relationship with both ROA and ROE (Getahun, 2015; Teshome, 2018). However, in Kenya it is statistically insignificant (Ongore & Kusa, 2013). Olweny and Shipho (2011) also echoed the same results for large Kenyan banks. A study of 6 Moroccan banks over 11 years found unstable liquidity performances of the institutions (Ferrouhi, 2014).

Five studies in India measured liquidity by liquid assets to total assets (Kumar et al., 2012; Zafar et al., 2012; Mishra & Aspal, 2013; Mathiraj & Ramya, 2014; Gupta, 2014). These results point out most banks scored a volatile range over the years of study. Four of the studies found there is no statistically significant difference between the banks in their average liquid assets to total assets. However, the study by Gupta (2014) found the exact opposite, there is significant difference in performance of public sector banks.

Contrarily, Nepalese banks depict high liquidity problem affecting their financial soundness negatively by worsening their profitability (Baral, 2005). Other study in China found liquidity to be inversely related with performance of banks (Liu & Pariyaprasert, 2011).

2.2 Other Bank Performance Measurement Models

Now, we turn our face to the common ratios, ECB models and other models used to gauge bank performance.

In the aftermath of the 2008 financial crisis, demand for more sophisticated measurement of bank performance arose. In addition to the classical measurements ROE, ROA and ROI the ECB (2010) developed four models to rigorously assess bank performance, namely business model, economic capital model with stress test, and governance which comprises value creation compensation and market discipline with disclosure. The former examines the ability of the model to uphold higher returns while standing strong during shocks. ROE portrays gross profitability, but risks are often covert in the details and breakdown of the profit. Thus in the business model, revenue decomposition discloses permanent revenue and the temporary which often distort reports. Furthermore, this model embraces earnings, funds and business composition considering the products offered, market structure and risk exposure of the bank. The basis theory for the second model defines the share of each portfolio's capital to the risk exposure of the bank that affect the decisions on performance. Its goal is laying out measurement for banks' risk profile, risk appetite and total instability exposure in regard with their earnings and capital adequacy appraisal. This is accompanied by stress-test in discovering the model to withstand external shocks (ECB, 2010).

The last model is governance which is categorized by ECB into two. The first focuses on clear authority distinction among top management and compensation incentives, which affect risk taking behavior for instant returns while overlooking long term values created to the institution. The second stresses on market discipline as branding a firm good or bad have a huge impact in market segment of the firm and transparency in financial reporting which is valuable during tough periods.

Other bank performance mathematical measurement theories beyond those focusing on profitability are based on Market Power (MP) and Efficiency Structure (ES). MP explains the

performance of a bank based on a bank's market power as it indicates the variation in profitability. According to Bikker and Bos (2008), the market power theory can be explained in seven models: Structure-Conduct-Performance, Cournot model, Stigler approach, Relative-market power hypothesis, Iwata model, Bresnahan and Lau model, and Panzar-Rose model.

The Structure-Conduct-Performance approaches a bank performance subjecting to market structure, determining bank behavior and tending to act connivingly in concentrated markets expecting higher return. Jeon and Miller (2005) found out that in the US, there is a positive relationship between bank concentration and average return on equity on state level. In comparison with this, the Cournot model can precisely explain imperfect market structures, varying cost arrangement and improper conduct. Comparatively the former focus on single banks market segment while the latter is engaged in analyzing the influence of market build up. In relation to the Cournot model, Stigler positions deceitful behavior is more likely to occur if the market segment increases.

On the other hand, the Relative-market power assumption posits only large banks with a financial product distinctly associated with maximizing profits be exploiting price. The Iwata model evaluates the variance of values for banks offering similar products in an oligopolistic market. Opposing to Iwata, Bresnahan and Lau inquire the degree of market power on collective short run analysis assuming all banks are equal and identical. Contradicting to this, the Panzar-Rose model evaluates the level of competition based on cross-section data by putting "the comparative static properties of reduced-form revenue equations" in the center. The model presumes that banks need to be running in long run equilibrium with homogenous cost structure and greater than unity price of demand.

The ES defines profitability of banks through X-efficiency and Scale-efficiency approaches. X-efficiency associates the profitability of banks with efficient administration and governance which regulate outlays while Scale-efficiency states that banks with "scale of economies" lower their expenditure which upsurge profit and progress (Jeon & Miller, 2005).

Olweny (2011) concisely defined these two theories. Market power being associated with exogenous determinants in banking environment while efficiency structure allied with endogenous features within a bank's structure. Another method of performance evaluation developed in 1990s is the Balanced Scorecard (BSC) analysis. It assesses performance relying on long run behavior considering the intertwined influence of financial and non-financial aspects of the model. Based on Kaplan and Norton (1996), the BSC analysis base on four perspectives; financial, internal processes, customer with learning curve and growth.

3. Methodology

The CAMEL model is often used to evaluate and rank several banks running in a similar environment. However, it was initially developed by Federal Financial Institutions Examination Committee (FFIEC) as an instrument to evaluate a bank's financial performance and soundness. Eritrea has one big commercial bank with 17 branches across the country.

Thus, we challenge the norm of CAMEL application to evaluate the consolidated performance of the bank.

Secondary data used in our research are obtained from the consolidated financial statements of the bank. The primary data regarding annotations on the performance outcomes is gathered from structured interviews with the bank management of CBER and bank supervision division of the central bank. The study comprises 15 years bank operations (2001–2015).

Each CAMEL parameter has several ratios to measure the desired performance objective. However, most researches use two or three of a specific parameter at a time. Hence, to evaluate the performance of CBER, "selected variables" has been used. Table 1 depicts the ratios selected and applied in this research and the way they are calculated. Two ratios from each CAMEL parameter are employed. Sensitivity to market ratios are not applied due to data in availability.

Table 1. CAMEL measurements and their evaluation method

CAMEL variable	Ratios	Computation methods
Capital Adequacy	Leverage ratio	Debt to Equity
	Aggressiveness in Lending	Total Advances to Total Assets (%)
Asset quality	Loan loss provision ratio	Loan loss provision to Total loan (%)
	Increase in net NPA	Last year Net NPAs -Current Net NPAs to last year Net NPAs (%)
Management	Interest expense ratio	Deposit interest expense to Deposits (%)
Efficiency	Operating expense ratio	Operating expense to Total asset (%)
Earnings	Non-interest income ratio	Non-interest income to Interest income (%)
	Return to equity	Net profit to Total equity (%)
Liquidity	Deposit ratio	Deposit to Total asset (%)
	Liquid asset ratio	Liquid asset to demand deposit (%)

The increase or decrease of the above ratios depicts the strength or vulnerability of the bank. Their favorability or un favorability is discussed in the results section below.

4. Results and Discussions

In this section the financial performance of the CBER will be analyzed based on the CAMELS framework. The results are analyzed with two ratios employed from each CAMEL parameter followed with the discussion of the identified outcomes of the evaluation.

Capital Adequacy

Table 2 shows the Debt to Equity ratio as an indicator of capital adequacy. Generally, it shows an increasing trend with an average of 27.8. It has increased from 2001 up to 2004 followed by a decrease in the next four years. It then picked up the momentum. The years 2007–2008 and 2011–2012 depicted a relatively constant change from year to year. The start

and end of the study period are the years in which the two-range extremum were observed.

Table 2. Capital adequacy

a. Debt to Equity

b. Total Advances to Total Assets (%)

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
a	17.1	32.3	31.3	34.6	21.1	19.7	18.3	18.4	25.1	32.5	25.6	25.0	36.2	35.0	44.4
b	15.7	12.8	1.3	12.1	11.4	10.6	8.7	7.7	5.4	3.4	3.1	3.3	3.4	3.7	2.0

Source: Authors calculations based on Bank data.

The table also uses another indicator of capital adequacy, Total advances to Total Assets. The upper and lower ends of the range are seen in the years 2001 and 2015, having a downward movement. In the early years of study, the ratio was constantly above 10%, except in 2003 where it shows a sharp decline to 1.3%. While in the later years the ratio is fluctuating around 3.5 followed by lower ratio of 2% in 2015. The average total advance to total assets of CBER was around 5.8% in the fifteen years of study.

The Debt to Equity ratio of CBER is very high implying lower capital adequacy. This result indicates CBER capital structure is mainly composed of debt. The ratio is concerning as it displays increasing trend denoting lower leverage to creditors. It is contrary to Gupta (2014) and Ferrouhi (2014) found in Indian and Moroccan banks that showed declining trend, interpreted as a movement toward adequate capital. The higher ratio of CBER can be attributed to the banking environment. The bank is state owned, implying the government will bail out if any financial distress arises. As such, there has been no bank run or bank failure. This assurance can also explain the low Total advance to Total assets ratio which imply that CBER does not have much loans and advances. This decreasing ratio indicate that the bank has decreased the amount of advance it issued above seven times (2001–2015). Subsequently it is expected this will lower the amount of returns.

Asset Quality

To analyze asset quality of CBER, Loan loss provision to Total loan is applied (Table 3). In 2002 and 2003, the highest ratios were scored with 3.2% and 2.81% respectively. The lowest ratio was 0.02% in 2006 followed by a notable sharp increase to 2.18% in 2007. The general movement of the bank in terms of the ratio can be said as downward while spiking in 2002, 2003, 2007, and manifesting steeper decline starting 2008 to 2015 except two insignificant increases in 2013 and 2015.

Table 3. Asset quality

a. Loan loss provision to Total loan (%)

b. Last year Net NPAs -Current Net NPAs to last year Net NPAs (%)

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
a	1.11	3.2	2.81	2.29	0.66	0.02	2.18	1.67	0.93	0.87	0.70	0.13	0.25	0.08	0.37
b	6.6	21.9	16.1	-1.6	-13	2.2	-0.4	20.8	0.0	64.9	16.6	11.6	23.4	28.9	51.5

Source: Authors calculations based on Bank data.

Table 3 also analyze asset quality by the difference of Last and Current year non-performing assets as percentage of last year non-performing assets. The analysis shows a volatile trend with negative results in 2004, 2005 and 2007. The bank has highest ratio in 2010 and 2015 surpassing 50% and no change in 2009.

Asset quality of CBER can be categorized as satisfactory based on the result of Loan loss provision to Total loan ratio. The ratio has decreased implying the bank has managed to lower its bad loans. This is from the reducing amount reserved to cover bad loans. This indicates that the amount cut from earnings to cover the reserve is also low implying more earnings that is unbound for other uses. In comparison to Moroccan banks which showed a 0.7% (Ferrouhi, 2014) it may seem higher with an average of 1.15%. However, it indicates a better position with good asset quality as it is lower than Ethiopian banks average of 2.77% (Getahun, 2015) and much healthier than Nepalese banks which scored 4.095 (Baral, 2005). The ratio of percentage change in Net NPA generally also shows improvement although it is volatile. In 2004, 2005 and 2007 the ratio is observed to be negative implying a reduction in the asset quality. 2009 was a year in which there was neither improvement nor decline in asset quality. CBER's asset quality enhanced in the last 5 years with positive results and reaching above 50% improvement in 2010 and 2015.

Management efficiency

Management efficiency is calculated by two ratios as depicted in Table 4. The first is Deposit expense to Deposits. CBER showed a higher ratio in 2001 with 2.73% and the lowest in 2015 with 1.08%. The ratio shows a smooth decline from 2001 to 2015. From 2001 up to 2009, the bank maintained a ratio of above 2%, declining with an average of 1.3% in the last six years.

Table 4. Management efficiency

a. Deposit interest expense to Deposits (%)

b. Operating expense to Total asset (%)

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
a	2.73	2.54	2.27	2.48	2.04	2.08	2.00	2.01	2.03	1.86	1.20	1.24	1.18	1.25	1.08
b	0.97	0.92	1.21	1.85	1.27	0.77	1.53	1.34	1.09	1.02	0.16	0.41	0.54	0.43	0.52

Source: Authors calculations based on Bank data.

The second ratio in Table 4 as an indicator of management efficiency is Operating expense to Total asset. Between 2003 and 2010 the bank demonstrated a greater than 1% ratio, with the exception of 2006 where the ratio was 0.77%. The average result is 0.94%. There is no outlier observation from the average result excluding 2004 and 2011.

Based on Deposit interest expense to Deposits ratio as an indicator of management efficiency, CBER has maintained a declining lower ratio. This signifies the bank's management efficiency enhanced as it was able to lower its expense on deposits especially from 2010 up to 2015.This implies CBER is managerially efficient when compared to 15 Romanian banking with average of 6.25% (Roman & Sargu, 2013) in terms of Deposit interest expense to Deposits ratio. This also holds for the other ratio Operating expense to Total assets as average of the Romanian banks was a little higher than 5%. The Operating expense to Total asset ratio shows generally the bank did not have significant changes in management efficiency even though the ratio remains low. From 2003 to 2010, with the exception of 2006, the ratio is above 1% indicating that CBER was managerially less efficient in those years comparing with 2011 to 2015. Both ratios demonstrated that the bank has become managerially more efficient in the last 5 years compared to the prior 10 years.

Earnings

To analyze earnings, the ratio of Non-interest income to Interest income and Net profit to Total equity has been used (Table 5). Based on non-interest income to interest income ratio CBER maintained an average result of 8.27% over the study period. Exceptional returns were obtained in 2005, 2009 and 2014 in relation with other years. Especially 2005 was notably different with 28.8% which is almost more than fourfold to many years.

Another ratio implemented to assess earnings is Net profit to Total equity. The ratio showed high volatility where the range is between 55.8% in 2005 and 4.14% in 2014. The average of the ratios found to be 10.48 % with no clear pattern of increase or decrease. In 2004, 2005 and 2006 the bank attained an above 45% ratio with the rest being lower. The bank experienced loss in four years with the highest in 2002.

Table 5. Earnings

a. Non-interest income to Interest income (%)

b.Net profit to Total equity (%)

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
a	9.0	5.3	5.3	7.4	28.8	5.3	7.2	5.2	16.5	5.9	5.3	4.8	5.6	16.1	4.7
b	13.5	-55.9	25	48.5	55.8	51.2	10.4	12.5	-25.9	-12.5	11.7	14.4	8.72	4.14	-4.36

Source: Authors calculations based on Bank data.

Non-interest income to Interest income ratio show that the earnings of CBER has been volatile indicating the bank has not secured other operations where earnings flow steadily. In 2005, 2009 and 2014 CBER managed to show higher earnings other than the normal course of bank businesses. Another ratio used in evaluating earnings is Net profit to Total equity ratio. CBER has managed to keep the ratio positive in most of the years except in 2002, 2009, 2010 and 2015. Although it shows high volatility it succeeded in keeping an average ratio of 10.48 % higher than Romanian banks i.e., 6.24% (Roman & Sargu, 2013). However, it is much lower than the average 17% of Indian state group banks (Mishra & Aspal, 2013), Ethiopian banks 23.46 % (Teshome, 2018), and Nepalese banks 25.24% (Baral, 2005).

Liquidity

Table 6 shows liquidity analyzed through Deposit to Total Asset ratio. The ratio is observed to have a constant pattern around the average, 35.9%. The lowest result calculated was 34.6% in 2006 and highest 37.1% in 2013.

Table 6. Liquidity

a. Deposit to Total asset (%)

b. Liquid asset to demand deposit (%)

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
a	35.4	36.2	N/A	36.2	35.2	34.6	35.2	35.2	36.2	36.9	36.1	36.8	37.1	36.8	34.9
b	19.4	16.7	N/A	15.6	14.9	16.7	16.9	19.2	17.8	20.9	20.3	21.6	24.0	29.4	41.0

Source: Authors calculations based on Bank data.

In terms of Liquid Asset to Demand Deposit, CBER has an average percentage of 21%. The ratio started with less than 20% in the first 8 years, then tended to increase reaching highest extremum in 2015 with 41%. The highest jump of 11.6 % was recorded between 2014 and 2015.

The liquidity of CBER analyzed by the Deposit to Total asset ratio show a relatively constant level. CBER managed to uphold the ratio above 30% which denotes high liquidity. Simultaneously, it maintained the level when total assets have increased over the years. In terms of Liquid asset to Demand deposit, CBER showed a relatively constant level in the first 10 years followed by an increasing trend in the remaining years. Especially in 2015, the ratio reached 41% indicating that the bank is liquid and has the ability to meet demand from creditors. Based on both ratios, CBER can be considered as a liquid bank. In comparison to Indian public banks, it is so much higher as they have an average of 11.9% (Mishra & Aspal, 2013).

5. Conclusion

Eritrea's fast economic progress of the 90s was halted by war and politics. The recent political changes are expected to bounce back the economy to its former development. To support the new progress, past evaluation of the economy is necessary. The banking sector is a significant pillar of the economy. Thus, we evaluate the financial performance of Commercial bank of Eritrea (CBER) using CAMEL approach. It is the largest bank in Eritrea and a representative of the whole banking industry which signify its importance for evaluation. As per our extensive literature review this is the first study to investigate and evaluate the CBER by CAMEL model and comparison with other countries.

Capital adequacy assessed by debt to equity and total advance to total assets ratios showed that the CBER has lower capital adequacy. This can be attributed to the state ownership of the bank which makes it less aggressive in lending and an environment with no bank run or financial distress records.

CBER demonstrated a relatively good asset quality based on the loss provision to total loan ratio. Another ratio, the percentage change in net NPA, also supported this outcome. The bank has managed to improve its asset quality in later years of the study period, non-performing assets decreased and subsequently both the ratios declined.

The efficiency of the bank management is evaluated on by Deposit Interest Expense to Deposits and Operating Expense to Total Asset. The results of both the rates portrayed a declining trend implying an improved bank management as the years go by.

Over the 15 years of study CBER maintained a positive earnings ratio from its non-routine operations measured by Non-Interest Income to Interest Income. However, the average of the years is around 9 % with a dwindling rate. As the main commercial bank in Eritrea it could have fully employed its monopolistic power to generate more non-interest income by extending other financial services. The net profit to equity depict certain trends. Given it is the largest bank with only one rival, profit is expected to be higher taking its comparatively lower equity. However, except for few years' extraordinary profitable years and some loss

recording years, most years in the study period had a lower return.

In terms of liquidity, the bank is highly liquid which makes it less vulnerable to demand from creditors. Maintaining less advances level may be credited for the higher liquidity evaluated by deposit to total asset and liquid asset to demand deposit ratios.

The comparison of CBER results with neighboring and other countries can provide an insight of its general performance but cannot be used for generalization. This is due to the nature of banking industry. Although, many countries (banks) agree on the three Basel accords they all have country specific banking regulations. In addition, the ownership, structure, economic strength, financial development and business environment of the country they operate in is unique.

Finally, based on the "selected CAMEL parameters" applied we conclude that the financial soundness of CBER is satisfactory. However, the volatility of the results draws attention. This should shed light on the strengths and vulnerabilities of the bank, underlining the need to bolster the concerns of the decision makers to improve and increase its soundness. In addition, we recommend a further investigation on the reasons for this instability. This further investigation can add value for deeper understanding the past performance of CBER for sustainable future growth.

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Hosie conceived and designed the study. All the authors contributed equally in the research.

Reference

Al-Najjar, S., & Kalaf, K. (2012). Designing a Balanced Scorecard to Measure a Bank's Performance: A Case Study. *International Journal of Business Administration*, *3*(4), 44–53. https://doi.org/10.5430/ijba.v3n4p44

Aswini, M., Sri, G., Anand, S., & Rajesh, N. (2012). Analyzing Soundness in Indian Banking: A CAMEL Approach. *Research Journal of Management Sciences*, *1*(3), 9–14.

Baral, K. (2005). Health Check-up of Commercial Banks in the Framework of CAMEL: A Case Study of Joint Venture Banks in Nepal. *The Journal of Nepalese Business Studies*, *2*(1), 41–55. https://doi.org/10.3126/jnbs.v2i1.55

Bikker, J., & Bos, J. (2008). *Bank Performance: A Theoretical and Empirical Framework for the Analysis of Profitability, Competition, and Efficiency*. Oxford.

Commercial Bank of Eritrea: Brief background of Commercial Bank of Eritrea [Brochure]. [2010]. *Asmara, Eritrea: Commercial Bank of Eritrea*.

Dang, U. (2011). *The Camel Rating System in Banking Supervision*. A Case Study, Degree

thesis. Arcada University of Applied Sciences, International Business, Helsinki, Finland.

Demyanyk, Y., & Hemert, V. (2011). Understanding the Subprime Mortgage Crisis. *The Review of Financial Studies*, *24*(6), 1848–1880. https://doi.org/10.1093/rfs/hhp033

Embaye, S., & Chenya, A. T. (2017). The Impact of Credit Risk Management on Financial Performance of Commercial Banks—Evidence from Eritrea. *Research Journal of Finance and Accounting*, *8*(19), 70–76. Retrieved from http://www.iiste.org.

European Central Bank. (2010). *Beyond Roe – How to Measure*. Frankfurt: European Central Bank. Retrieved from http://www.ecb.europa.eu

Ferrouhi, M. (2014). Moroccan Banks Analysis Using CAMEL Model. *International Journal of Economics and Financial*, *4*(3), 622–627.

Getahun, M. (2015). *Analyzing Financial Performance of Commercial Banks in Ethiopia: CAMEL Approach*. Master's Thesis. Addis Abeba University, The Department of Accounting and Finance, Addis Abeba, Ethiopia.

Ghebregiorgis, F., & Atewebrhan, A. (2016). Measurement of bank profitability, risk and efficiency: The case of the Commercial Bank of Eritrea and Housing and Commerce Bank of Eritrea. *African Journal of Business Management*, *10*(22), 554–562. Retrieved from http://www.academicjournals.org/AJBM

Gupta, R. (2014). An Analysis of Indian Public Sector Banks Using Camel Approach. *IOSR Journal of Business and Management*, *16*(1), 94–102. https://doi.org/10.9790/487X-161494102

Hansson, G. (2001). *Building new states: Lessons from Eritrea*. WIDER Discussion Paper, No. 2001/66, The United Nations University World Institute for Development Economics Research (UNU-WIDER), Helsinki.

Ishaq, B., Karim, A., Ahmed, S., & Zaheer, A. (2016). Evaluating Performance of Commercial Banks in Pakistan: "An application of Camel Model". *Journal of Business & Financial Affairs*, *5*(1). https://doi.org/10.4172/2167-0234.1000169

Jeon, Y., & Miller, S. M. (2005). *Bank Performance: Market Power or Efficient Structure*? Economics Working Papers. 200523. Retrieved from https://opencommons.uconn.edu/econ_wpapers/200523.https://opencommons.uconn.edu/econ_wpapers/200523.

Jha, S., & Hui, X. F. (2012). A comparison of financial performance of commercial. *African Journal of Business Management*, *6*(25), 7601–7611. https://doi.org/10.5897/AJBM11.3073

Kaplan, R., & Norton, P. (1996). *Balanced Scorecard: Translating Strategy into Action*. Harvard Business School Press. https://doi.org/10.2307/41165876

Kapur, D., & Gualu, A. (2011). Financial performance and ownership structure of Ethiopian commercial banks. *Journal of Economics and International Finance*, *4*(1), 1–8. https://doi.org/10.5897/JEIF11.036

Kumar, M., Harsha, G., Anand, S., & Dhruva, N. (2012). Analyzing Soundness in Indian Banking: A CAMEL Approach. *Research Journal of Management Sciences*, *1*(3).

Lelissa, T. (2014). The Determinants of Ethiopian Commercial Banks Performance. *European Journal of Business and Management*, *6*(14).

Liu, J., & Pariyaprasert, W. (2011). *Determinants of Bank Performance: The Application of the CAMEL Model to Banks Listed in China's Stock Exchanges from 2008 to 2011*.

Mathiraj, S., & Ramya, V. (2014). Camel Model in Banking Sector. *Shanlax International Journal of Commerce*, *2*(1), 7–20.

Mauri, A. (1998). *The First Monetary and Banking Experiences in Eritrea*. African

Mensi, S., &, Zouari, A. (2010) Efficient Structure versus Market Power: Theories and Empirical Evidence. *International Journal of Economics and Finance*, *2*(4), 151–166. https://doi.org/10.5539/ijef.v2n4p151

Mishra, S. K. (2012), Analyzing Soundness in Indian Banking: A CAMEL Approach. *Research Journal of Management Sciences*, *1*(3), 9–14.

Mishra, S. K., & Aspal, P. K. (2013), A CAMEL Model Analysis of State Bank Group. *World Journal of Social Sciences*, *3*(4), 36–55.

Ngu, B., & Mesfin, T. (2010). *Measuring Commercial Bank Performance and Efficiency in Sub-Saharan Africa*. School of Technology and Society.

Nyende, M., & Okumu, L. (2014). *African economic outlook Eritrea*. AfDB, OECD, UNDP. Retrieved from https://www.africaneconomicoutlook.org

Olweny, T., & Shipho, M. T. (2011). Effects of Banking Sectoral Factors on the Profitability of Commercial Banks in Kenya. *Economics and Finance Review*, *1*(5), 01–30.

Ongore, V. O., & Kusa, G. B. (2013). Determinants of Financial Performance of Commercial Banks in Kenya. *International Journal of Economics and Financial Issues*, *3*(1), 237–252. Retrieved from http://www.econjournals.com

Roman, A., & Sargu, A. (2013). Analyzing the Financial Soundness of the Commercial Banks in Romania: An Approach Based on the Camels Framework. *Procedia Economics and Finance*, *6*, 703–712. https://doi.org/10.1016/S2212-5671(13)00192-5

Seid, A. [Hidmona]. (2022, December 1). *ስርሒት GAME OVER* [Video]. YouTube. Retrieved from https://www.youtube.com/watch?v=mU-ZdeZWBtk&t=2231s

Teshome, A. (2018). *Financial Performance analysis of Commercial Banks in Ethiopia: A CAMEL Approach*. Master's Thesis. University of Addis Ababa, Department of Accounting and Finance, Addis Ababa, Ethiopia.

Tewolde, M. (2002). *Market oriented policy changes and manufacturing performance: the case of Eritrea*. Ph.D. thesis. Tilburg University, Development research Institute (IVO),

Tilburg, The Netherlands

Trevaskis, G. K. N. (1960). *Eritrea: A Colony in Transition*. London: Oxford University Press.

Zafar, S., Maqbool, A., & Ali, N. (2012). A Study of Ten Indian Commercial Bank's Financial Performance using CAMELS Methodology. *IMS Manthan*, *7*(1). Retrieved from https://www.researchgate.net/publication/269401273

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