Heuristics and the Performance of Financial Institutions in South Sudan

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Abstract

We study the relationship between heuristics and the performance of financial institutions in South Sudan using measures of institutional performance and heuristics. Using the ARDL model, we establish that heuristics indicators such as anchoring, availability, and halo effect negatively and significantly affect the performance of financial institutions while disaster neglect and overconfidence seem not to significantly exactly influence the performance of financial institutions in South Sudan. On the other hand, confirmation seems to significantly affect the performance of financial institutions in the country.

Keywords

Heuristics, Financial Institutions, Institutional Performance, South Sudan

1. Introduction

Performance is the driving force of every organization and organizations strive to achieve excellence in performance in all areas of operation while according to Yalcin et al. (2016), heuristics are the shortcuts and rule of thumb caused by data processing errors. Adesugba and Bambale (2016) argue that the objective of measuring performance does not only cover how a business is performing but also gives an insight on how business can perform better. Organizational performance is organization's capability to accomplish its goals effectively and efficiently using resources (Daft, 2000). Rezaei et al. (2018) regard organizational performance as the goals and achievement of a given organization. On the other hand, Richardo & Wade (2001) noted that achievement of organizational goals and objectives is considered organizational performance. Performance is a continuous and flexible process that involves managers and those whom they manage acting as partners within a framework that sets out how they can best work

together to achieve the required results (Armstrong, 2006; Rosta, 2008). Firm performance is attained in a sequence of events that follow some logical flow starting from acquisition and configuration of resources, developing capabilities, building competences and ultimately leading to superior performance. According to Hernant (2009) performance is a consequence of environmental factors and the extent to which the firm is patronized by consumers, which in turn is a consequence of how well firm attributes like: location, open hours, merchandise, firm layout, service, advertising, correspond to consumers' evaluative criteria for their firm choice behavior. Further, the firm's decision on firm attributes is influenced by underlying factors, such as local competition and local demand characteristics which enhance or diminish the overall performance of the firm.

Performance is the end result of activities and includes the actual outcomes of the organization operational process (Wheelen & Hunger, 2010). Organizational performance encompasses many specific areas of firm outcomes (Nwokah, 2008). Musah (2008) indicates that organizational performance should be measured through various indicators depending on the organizational structure. In agreement, Kent and Weese (2000) indicated that performance of the organizations is measured by the congruence between the goals of the organization and the observed outcome. Other authors (Richard et al., 2009; Thang et al., 2008; Morgan et al., 2003) argued that organization performance is related to customer satisfaction, employee satisfaction, increase of the productivity, and superior profit for the organization while Rezaei et al. (2018) suggest the use of multiple indicators in the measurement of organizational performance, which includes both financial and non-financial measures. At the same time with the emergence of the resource-based view (RBV) of the firm, the focus of performance shifted from industry to firm specific assets (Spanos & Lioukas, 2001). Saleem and Khurshid (2014) identified employee motivation in the organization as a measure of organizational performance.

In their study Savaneviciene and Stankeviciute (2010) indicated that whereas profit-oriented organizations tend to measure performance through financial turnover and profitability, non-profit oriented organizations cannot use such measure and thus focus on social benefits to measure performance. In an attempt to determine performance of the firm, empirical literature points that several indicators have been identified as measures of performance to include productivity, quality, innovation, profitability, creativity, commitment, loyalty, decision making, participation, effectiveness, efficiency and effort. In addition to these indicators, Rodwell and Teo (2004) pointed out that alongside customer loyalty, customer base is also a measure of firm performance.

Organizational performance has been measured using a three-item scale: return on assets, sales growth and increase in market share. Available literature shows the use of these indicators to measure changes in knowledge, competencies and learning of organizations. Shrader (2001) and Stuart (2000), among others, have adopted sales growth; Goerzen & Beamish (2005), return on assets

and Dussauge, Garrette and Mitchell (2004), increase in market share. Firm performance is measured in terms of sales level, profitability, productivity and customer base level.

The efficient market hypothesis assumes that markets are rational (Yalcin et al., 2016). However, a stream of researchers exhibits many observed anomalies that are not explained by the arguments of the efficient market hypothesis Heuristics are quite functional to alleviate the cognitive efforts for making the decision process easier which may otherwise require too much time and mental resources. On the other hand, heuristics sometimes cause inevitable biases.

In making credit decisions, financial institutions' credit personnel are guided by objective (collateral) and subjective (know your customer) considerations. Human beings are referred to as making decisions on the basis of their experience and intuition, instead of gathering information, which would encourage them to make better decisions (Shah et al., 2018). Baker and Nofsinger (2010) observe that investment decision making process is affected by psychological biases, fundamental heuristics and cognitive errors. The study will investigate the effect of these biases on the relationship between heuristics and performance of financial institutions in South Sudan.

2. Literature

It is a given among economists that a healthy financial system is a key underpinning of a healthy economy (Pakravan, 2014). Banks are integral to economic development through the financial services they provide. Their intermediation role can be said to be a catalyst for economic growth. The efficient and effective performance of the banking industry over time is an index of financial stability in any nation. The extent to which a bank extends credit to the public for productive activities accelerates the pace of a nation's economic growth and its long-term sustainability (Kolapo, Ayeni, & Oke, 2012). Performance of financial institutions is represented mainly by quantifiable financial indicators. The literature on the determinants of bank performance has closely tied same with profitability measures such as ROA, and ROE (Bougatef, 2017; Chirwa, 2003; Majumder & Li, 2018). Profitability accounts for the impact of better financial soundness on bank risk bearing capacity and, on their ability, to perform liquidity transformation. According to Popa et al. (2009), popular measures of bank performances are return on assets (ROA), return on equity (ROE), net banking income and the efficiency ratio.

On the other front, different researchers assessed performance in terms of bank prices (as measured by interest rates) rather than bank profitability. The justification as explained by Chirwa (2003) is that the use of price-concentration relationship instead of profit concentration relationship measures the performance of banks and their market structure. They argued that the price-concentration relationship imply that high levels of concentration allow for non-competitive behavior that would result in lower interest rates given to depositors and/or higher

lending rates to borrowers. However, Chirwa (2003) also showed that price measures of performance create problems of cross subsidization of multiproduct firm.

The bank performance measure can be divided into traditional measures and market-based measures (Aktan & Bulut, 2008). The most common measure of bank performance is profitability. Profitability is measured using the following criteria: Return on Assets = a net profit/total asset shows the ability of management to acquire deposits at a reasonable cost and invest them in profitable investments (Ahmed, 2009). This ratio indicates how much net income is generated per £ of assets. The higher the ROA, the more the profitable the bank is. Return on Equity (ROE) = net profit/total equity. ROE is the most important indicator of a bank's profitability and growth potential. It is the rate of return to shareholders or the percentage return on each £ of equity invested in the bank. Liquidity indicates the ability of the bank to meet its financial obligations in a timely and effective manner. Financial liabilities are attracted through retail and wholesale distribution channels. Retail generated funding is considered less interest elastic and more reliable than deposits attracted from wholesale distribution channels (Thygerson, 1995). The following ratios are used to measure liquidity: Liquid Assets to Deposit-Borrowing Ratio (LADST) = liquid asset/customer deposit and short term borrowed funds. This ratio indicates the percentage of short-term obligations that could be met with the bank's liquid assets in the case of sudden withdrawals. Net Loans to Total Asset ratio (NLTA) = Net Loans/Total Assets NLTA measures the percentage of assets that is tied up in loans. The higher the ratio, the less liquid the bank is. Net Loans to Deposit and borrowing (NLDST) = Net loans/total deposits and short-term borrowings. This ratio indicates the percentage of the total deposits locked into non-liquid assets. A high figure denotes lower liquidity.

A moderator variable is one which systematically modifies either the form and/or strength of the relationship between a predictor and a criterion variable (Sharma et al., 1981). Moderating effects are also referred to as interaction and conditioning effects. A moderator variable may reduce or enhance the direction of the relationship between a predictor variable and a dependent variable, or it may even change the direction of the relationship between the two variables from positive to negative or vice versa (Lindley & Walker, 1993).

The efficient market hypothesis assumes that markets are rational (Yalcin et al., 2016). However, a stream of researchers exhibits many observed market movements so called anomalies that are not explained by the arguments of the efficient market hypothesis. Gigerenzer and Gaissmaier (2011) define heuristic as a strategy that ignores part of the information, with the goal of making decisions more quickly, frugally, and/or accurately than more complex methods. According to Yalcin et al. (2016), heuristics are the shortcuts and rule of thumb caused by data processing errors. They are quite functional to alleviate the cognitive efforts for making the decision process easier which may otherwise require

too much time and mental resources. On the other hand, heuristics sometimes cause inevitable biases. In making credit decisions, financial institutions' credit personnel are guided by objective (collateral) and subjective (know your customer) considerations. Human beings are referred to as making decisions on the basis of their experience and intuition, instead of gathering information, which would encourage them to make better decisions (Shah et al., 2018). Kahneman, Lovallo and Sibony (2011) pointed out that the most common heuristics and cognitive biases in decision making included confirmation bias, availability bias, anchoring, halo effect, overconfidence, disaster neglect and loss aversion. Baker and Nofsinger (2010) observe that investment decision making process is affected by psychological biases, fundamental heuristics and cognitive errors. The study will investigate the effect of these biases on the relationship between credit risk and performance of financial institutions in South Sudan.

Heuristics has been ably documented as affecting decisions (Gitau et al., 2018) and Kahneman & Tversky (1979) ably brought out the common heuristic and cognitive biases in managerial decision making which ends up lowering the quality of decisions made. McKinsey (2010) studied one thousand major business investments and concluded that when business spend time in trying to remove biases in their decision-making process, their return increased by seven points. Palmaer and Linden (2015) using a case study of private advisors' decision-making behaviour in a Swedish Bank concluded that it was evident that heuristics and intuition played important parts in the advisors' decision-making process, and that the reliance on technology varied between the advisors.

3. Methodology

We used the the ARDL model and consider other data properties using various tests outlined in the subsections.

3.1. The ARDL Model

We adopt the ARDL model in studying the relationship between heuristics and performance of financial institutions in South Sudan. This model is an interventional method for time series models that do not clearly feature the elements of simple and standard OLS as well as Error Correction models (ECM). The method also works with series that are of varying integral order $I(0)$ or $I(1)$, but not $I(2)$ and it carries more preferential weight among econometric researchers because different variables assume different lags as they are fitted into the model Pesaran and Shin (1999) and Pesaran et al. The traditional ARDL model can be expressed in the following form:

$$\Delta Yt = \alpha 0 + \sum \Phi i \Delta y_{t-i} + \sum \beta j \Delta x_{t-j} + \sum \delta k \Delta z_{t-i} \\ + \theta_1 y_{t-1} + \theta_2 x_{t-1} + \theta_3 z_{t-1} + ut \tag{1}$$

where Φi, β and δi are the short-run coefficients while θ_1, θ_2 and θ_3 represent the ARDL long-run coefficients and the error-correction term, z_{t-1} is replaced by the y_{t-1}, x_{t-1}, and z_{t-1} terms. Lagged residuals series therefore be-

come $z_{t-1} = (y_{t-1} - a_0 - a_1 x_{1t-1} - a_2 x_{2t-1})$.

3.2. Stationarity of the Model

We used the AR roots model to investigate the stationarity of the model and as shown below, the roots of the characterisitic polymonial lay within the unit circle (**Figure 1**).

3.3. Selection of Optimal Lag Structure

We determine the optimum lag length(k) by using the Akaike Information Criterion (AIC), Schwarz Bayesian Criterion (SBC) or Hannan-Quinn Criterion (HQC) in order to obtain Gaussian error terms that are free from serial correlation and heteroscedasticity. These criteria are based on a high log-likelihood value, with a "penalty" for including more lags to achieve this. As shown below, all the methods have chosen lag 1 to be the optimal lag to use (**Table 1**).

3.4. Model Diagnostics: Serial Correlation

After estimating our appropriate model equation using the appropriate lag, we carry out model diagnostics by checking for autocorrelation using the Breusch-Godfrey Serial Correlation LM Test method under the null hypothesis that there is autocorrelation against of the alternative that errors are either AR(m) or MA(m), form = 1, 2, 3, ···, etc. (**Table 2**). This is a key element in the assumptions of the ARDL/Bounds Testing methodology of Pesaran et al. (2001). As presented, the P-value associated with the Chi-square statistic is way above 5% hence we cannot reject the null hypothesis that errors are serially independent.
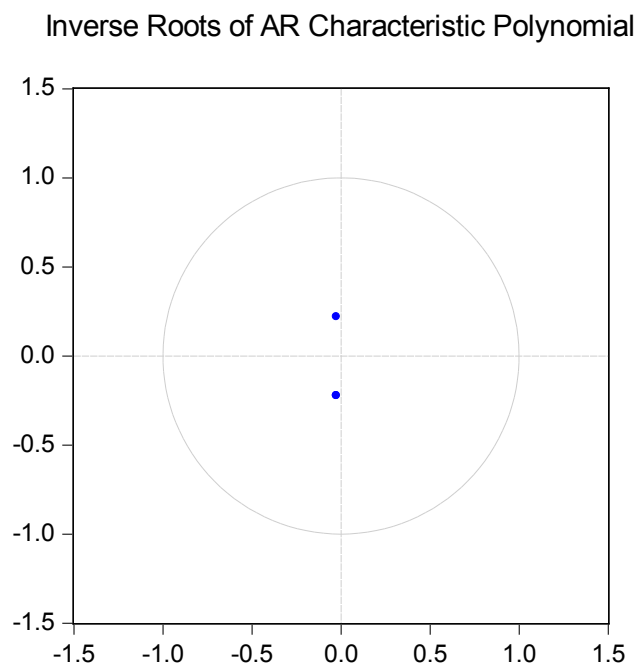

Figure 1. Inverse roots of the characteristic polynomial. Source: Author's illustrations.

Table 1. Lag structure.

Lag	LogL	LR	FPE	AIC	SC	HQ
0	−16.18600	NA	0.120662*	0.721970*	0.985217*	0.826138*
1	−16.11865	0.116613	0.124129	0.749810	1.045963	0.866999
2	−16.04660	0.122592	0.127694	0.777510	1.106569	0.907720
3	−14.82451	2.042895	0.126946	0.770881	1.132845	0.914111
4	−14.68115	0.235366	0.130352	0.796452	1.191322	0.952703
5	−12.23731	3.939315*	0.124987	0.753353	1.181129	0.922625
6	−12.22430	0.020595	0.128887	0.782815	1.243497	0.965108
7	−10.73194	2.316498	0.127194	0.768117	1.261705	0.963431

Source: Author's calculations. *indicates lag order selected by the criterion; LR: sequential modified LR test statistic (each test at 5% level); FPE: Final prediction error; AIC: Akaike information criterion; SC: Schwarz information criterion; HQ: Hannan-Quinn information criterion.

Table 2. Breusch-godfrey serial correlation LM test.

F-statistic	1.486520	Prob. F (2,41)	0.2381
Obs*R-squared	4.732735	Prob. Chi-Square (2)	0.0938

Source: Author's calculations.

3.5. Model Diagnostics: Dynamic Stability

We employ the Recursive OLS Estimates-CUSUM Test to determine model stability. The CUSUM (cumulative sum) statistics are defined according to:

$$\text{CUSUM}_t = \sum_{i=k}^{t} W_{i+1,i}$$

for $t = k, k+1, \cdots, T-1$, where $k = 2p + s + 1$ is the minimum sample size for which we can fit the model. Under the null hypothesis, the CUSUM_t statistic is drawn from a $\text{CUSUM}_{(t-k)}$ distribution. The $\text{CUSUM}_{(t-k)}$ distribution is a symmetric distribution centered at 0. Its dispersion increases as $t - k$ increases. We reject the null hypothesis at the 5% significance level if CUSUM_t is below the 2.5-percentile or above the 97.5-percentile of the $\text{CUSUM}_{(t-k)}$ distribution.

In our study (Figure 2), model stability was carried using Recursive OLS Estimates-CUSUM Test and our results indicates that the trend line lies within the boundaries as shown above. As observed the trend line for the CUSUM test observes a positive bounds projection that is within the 5% level of significance.

4. Results

The table below presents the results obtained from the estimation of the model presented in 3.1.

From the results, we observe that anchoring, availability and halo effect negatively and significantly affect on the performance of finance insituttions in South Sudan. However, disaster neglect and overconfidence do not significantly influence the performance of financial insitutions. On the other hand, confirmation seems to significantly exact a positve impact. These results bear signifcant relev-

ance to the litaerature. These findings are the result of the pioneer work on the performance of financial instutions in South Sudan considering the issues of heuristics. They provide guiding ground for policy in the banking sector.

5. Conclusion

This study was conducted to analyze the relationship between heuristics and the performance of financial institutions in South Sudan. Measures of institutional performance, such as financial institution profitability, return on equity, return on assets, net interest margin, net income and efficiency ratio were adopted. On the other hand, heuristics was measured using anchoring, availability, confirmation, disaster neglect, halo effect and over confidence. An ARDL model was used to examine the relationship (**Table 3**). Our results show that anchoring, availability and halo effect negatively and significantly affect the performance of finance institutions while disaster neglect and overconfidence seem not to significantly exactly influence the performance of financial institutions in South Sudan. On the other hand, confirmation seems to significantly affect the performance of
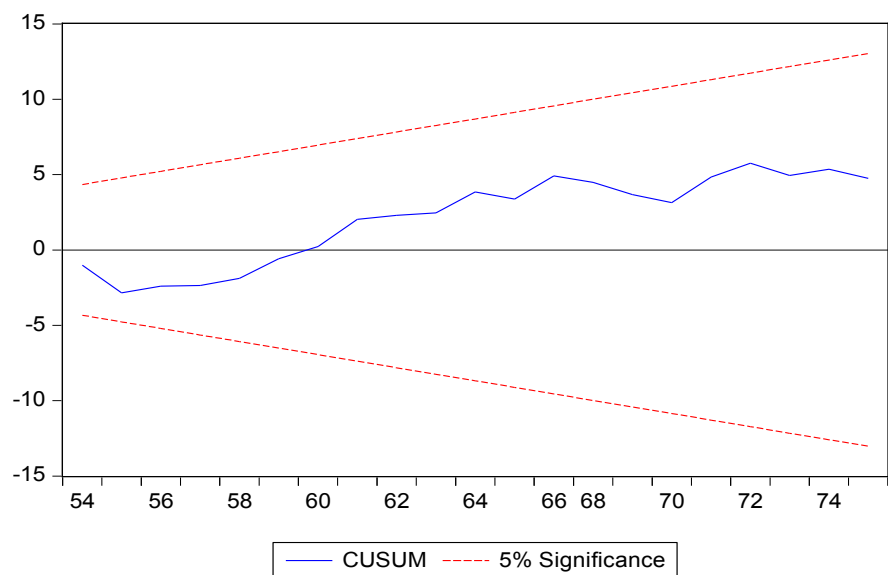

Figure 2. Bounds for the dynamic stability of the model. Source: Author's illustrations.

Table 3. ARDL estimation.

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
ANCHORING	−0.308957	0.139260	−2.218557	0.0318
AVAILABILITY	−0.306322	0.106053	−2.888390	0.0060
CONFIRMATION	0.324006	0.107544	3.012783	0.0043
DISASTER_NEGLECT	−0.014403	0.133660	−0.107756	0.9147
HALO_EFFECT (−2)	−0.594922	0.186932	−3.182558	0.0027
OVERCONFIDENCE (1)	−0.165093	0.184501	−0.894806	0.3759
C	0.911397	0.232311	3.923169	0.0003

Source: Author's calculations.

financial institutions in the country. This study was limited to only heurisitics without regard to other parameters that influence the performance of financial institutions and as such, further research may focus in the direction of credit risk in the same context of institutional performances.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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