The impact of the selected macroeconomic indicators’ volatility on the performance of South African JSE-listed companies: A pre-and post-Covid-19 study

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ABSTRACT

The influence of macroeconomic variables on aspects of business and the country’s economy has been a subject of robust discussion. This study was conducted to identify the effect of macroeconomic variables, namely inflation rate, economic growth, exchange rate and share price, on listed companies in South Africa. The goal was to study the long run and short run effects of macroeconomic volatility on company performance because of the world’s recent pandemic experience. To achieve this objective, the study applied the panel Autoregressive Distributed Lag (ARDL) model on annual panel data from 2010 to 2020 to analyse the short run and long run effects of macroeconomic variables on a company’s performance. The study results suggested a positive impact of economic growth, exchange rate and share price on asset returns, whilst a company’s equity return is supported by economic growth and share price in the long run. The short run revealed that none of the independent variables has a sufficiently significant effect to influence a company’s performance changes in the short run. Based on the findings, it was recommended that policymakers and economic authorities should introduce and implement strategies that favour and enhance the country’s economic growth and stable exchange rate in order to improve company performance. Additionally, given that the company’s short-run performance may highly depend on internal factors such as corporate governance, internal policies and business strategies, these decisions should be taken with precaution and a high level of professionalism.

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Introduction

For companies to be healthy and sustainable, constant study and monitoring of both its micro and macroeconomic environment are very important as this has direct links to their performance, their survival and sustainability. Therefore, Pham et al. (2021) suggest that it is imperative to constantly study the economic environment to which these companies belong. This study concentrates on the macro-environment because it is beyond the control of the companies’ board of directors, which makes it more dangerous than the micro factors (Ganda, 2021). Chandra (2009) stated that changes above 30% of shareholders’ value are caused by the macroeconomic environment. Therefore, the stability of macroeconomic variables is highly germane to company survival and highly correlated with company performance (Pham, et al., 2021; Issah and Antwi, 2017; Setsheki and Masikari, 2019; Banda et., 2019). Apart from the above reasons, macroeconomic indicators dictate and determine investors’ perceptions and behaviours towards their portfolio investment decisions (Kisten, 2020). The stability of these variables over time attracts good investors from both local and international entrepreneurs, which later metamorphoses to economic growth and the development of the country through foreign direct investment (Okafor, 2012). It is also a strong determinant of company performance in terms of both short-term earnings (profitability) and long-term earnings through value creation, value maximisation and value sustainability performance. Apart from directing investors’ decisions, good and stable macroeconomic indicators help to boost management efficiency and company performance within the
micro-level with little stress and with good corporate governance mechanisms in place. Since a company’s yearly profitability is one of the yardsticks for companies to achieve long-term sustainability, it is also a success determinant through value generation and maximisation. Hence, it is expedient for companies to maintain a sustainable profit to maximise value for shareholders and other stakeholders.

However, recent events around the world which led to substantial macroeconomic depreciation and volatility that caused serious problems of liquidity, financial integration and economic instability between or amongst countries and multinational companies calls for a serious need to re-examine companies’ performance, especially after the shock of the Covid-19 pandemic and Omicron outbreaks. Many companies have reportedly had liquidity problems, some are struggling to survive, some are on the verge of bankruptcy and ceased operation, whilst some have completely failed due to this pandemic (Kisten, 2020). Although companies’ performance is directly related to both internal (micro) and external (macro) environments, the havoc caused by the macroeconomic environment for companies is enormous and the worse aspect of it is that macroeconomic factors are uncontrollable while micro-economic factors can easily be controlled and adjusted by good management and good governance from the company directors. Globally, no company can claim to be unaffected by what is going on in the global economic environment, especially regarding macroeconomic fluctuations and their negative impact on companies over the past few years (Aifuwa, 2020).

At a country level, South Africa is an emerging economy with upper-middle-income and is amongst the first ten largest economies, beaten by Nigeria’s economy to be the second-largest economy in Africa. Moreover, it is the most classified, diversified, technologically advanced and industrialised economy in Africa (World Bank, 2021). The economy is very important to the whole of Africa as any negative impact may negatively affect the entire African economy. Recently, the South African economy has been struggling, which forms part of the motivation to embark on this study. Its economic indicators have been decelerated with a GDP growth of 0.8% in 2018; 0.2% in 2019; -8.0% in 2020 and with 3.5% in the third quarter of 2021. Furthermore, the GDP in 2011 was almost triple its current peak at $416 billion in 2020, but it has declined to $317 presently (World Bank, 2021). The unemployment rate also stood at 34.9% as at the third quarter of the year and the inflation rate keeps increasing, at 3.3% in 2020 and 3.42% in 2021.

Her sectoral contributions to the real GDP of the country are as follows: the natural resources extraction industry contributes $13.5 billion and the financial sector contributes $41.4 billion with an asset base of $1.41 trillion (World Bank, 2021). The choice of this country was because of recent depreciation in the macroeconomic indicators, most especially during this turbulent time that the country has been experiencing over the last few years brought about by a high debt burden, alleged corruption, Covid-19 and the Omicron variant of Covid. Setschedi and Masikari (2019) linked this to accusations of corruption, a high debt burden, pandemic and recent social unrest within the country. Hence, there is a need to re-examine companies within the country as the performance of companies is a function of its macro-environment. In addition, sustainable business performance and a sustainable macroeconomic environment cannot be separated. Healthy economies help companies to survive and to be sustainable, which in turn improves the economy through the movement of its indicators (Pham, et al., 2021). For companies to survive and to be sustainable, Kisten (2020) avers that they need a good and healthy economic environment, and they must devise strategies to reduce their negative impact on their environment through their policies (Aifuwa, 2020; Ganda and Ngwakwe, 2013). Corporate sector is a major contributor to any healthy economy, both locally and internationally (Matar and Eneizan, 2018). Furthermore, both private and public sectors dictate the quality of macroeconomic indicators, as they drive the economy of any nation through job creation and poverty reduction policies; help in regulating the inflation rate; help in price stability; improve the stock market; reduce insecurity and crime rates; and facilitate exchange rate stability, which later transforms into economic growth and development. Government, on the other hand, regulates, puts policies in place and monitors to ensure the compliance of all activities of every sector for all-round stability. Government, therefore, needs to provide a good and conducive economic environment for company survival since companies in different sectors contribute to nations’ development. For instance, the government must provide a stable power supply, food security, local and international markets for their products, raw materials, good road networks, good security, good governance, etc for easy distribution of products and strong value and supply chain.

Globally, studies in this area have mainly related macroeconomic variables to stock/capital markets, stock prices and stock returns. However, there have been limited studies that actually related macroeconomic variables to company performance. Even those few studies on macroeconomic variables and company performance have conflicting results, which can be associated with country-specific problems, different economic environments and company-related factors. These studies revealed that macroeconomic variables such as GDP, inflation, exchange rates, unemployment rates, interest rates, etc have significant impacts on company performance. Kargbo (2007); Issah and Antwi (2017); Setschedi and Masikari (2019); and Banda, Hall and Pradhan (2019) have proven that company performance is dependent on macroeconomic performance. Consequently, there have been conflicting results from some of their findings. For instance, Chen et al. (2005) revealed that inflation cannot predict stock returns as a measure of performance. Additionally, Tripathi and Kumar (2014) found contradictory results amongst BRICS countries, whereby the relationship between inflation and company performance (stock returns) in China and in India are positively and significantly related, while in Russia it revealed a negative but significant result. Related studies in this area in South Africa dwell mainly on the Financial and Agricultural sectors. Based on the extent of research findings, there have not been any studies that covered all sectors in this area of study in Africa. Thus far, studies have been based on only one or more sectors (Kargbo, 2007; Ifeacho and Ngalawa, 2014; Setschedi and Masikari, 2019; Kisten, 2020). However, this study ensures that companies from all sectors are fully represented according to Johannesburg Stock Exchange classifications. In addition to the above problems, the level of fluctuations in South
Africa’s macroeconomic indicators over the last two years are worrisome and need urgent attention because it has been a source of threat to the national cost of living, price stability, survival of citizens, economic sustainability and performance of companies. The above reasons have been the sources of motivation for this study. These and many more are the gaps that this study covered and the goal was to study the long run and short run effect of macroeconomic volatility on company performance because of the world’s recent pandemic experience. The study, therefore, addressed the above problem by examining the impact of macroeconomic volatility on the performance of South African JSE-listed companies. Other parts of this work are arranged as follows: a concept definition; a review of theoretical foundations and literature review; Data source and methodology; analysis and interpretations; summary and a conclusion.

**Literature Review**

**Theoretical and Conceptual Background**

The concept ‘macroeconomics’ is that branch of economics that deals with how the overall economy operates and its performance in an aggregate form for decision-making by stakeholders. It is the general behaviour of the entire economy in an aggregate form, measured through indicators called macroeconomic variables. The relationship between macroeconomic variables and corporate performance cannot be undermined as several prior studies have proven that those macroeconomic variables impact companies’ performance. For instance, Kargbo (2007) revealed that both macroeconomic variables and share price are positively and significantly related. Moreover, Setschedi and Masikari (2019) state that agricultural productivity improves GDP in South Africa. Banda, Hall and Pradhan (2019) found a positive relationship between macroeconomic variables and inflation. A stable economy is characterised by accelerating economic indicators, attracting foreign investors, good local demand, a high and competitive supply of goods and services which bring about price stability and is bound to be attracting more investors (Okafor, 2012). This will generate a positive ripple effect on companies’ performance. This leads to the review of the theoretical foundation of this study.

Signalling Theory considers macroeconomic indicators as mirror investors’ watch or that attracts investors as this directs and dictates their decision making relating to their combination of portfolios’ determination (Akerlof, 1970; Wolf et al., 2001). Next is the Theory of International Stock Valuation Model, in which company performance is determined by discounting the present value of the company’s future cash flows, which guides management to make the right decisions that enhance future performance for profitability and for value creation, maximisation and sustainability in the long run. Lastly, International Capital Flow Theory in relation to this study states that when there is long-term macroeconomic variables depreciation, such a country experiences capital outflow (Abdalla and Murinde, 1997). By implication, people prefer to hold hard currencies instead of their local currency in a country where there is severe currency depreciation and hyperinflation. Therefore, a combination of these three theories forms the basis of the theoretical foundation of this study. This leads to a review of extant studies to determine the recent impact of macroeconomic volatility on the performance of South African companies.

**Empirical Studies**

Past research studies were reviewed to discover the extent of previous works and gaps in the literature. The work of Kargbo (2007) on the effect of macroeconomic variables on the South African Agricultural sector revealed a strong and significant impact between the selected macroeconomic variables and agricultural outputs, with share price and stock returns as the dependent variables. Setschedi and Masikari (2019) also studied macroeconomic factors and the performance of Agricultural companies in South Africa, with three groups of nine variables under study, findings revealed a long run relationship between the selected variables and company performance. The results also showed that GDP and capital formation boost Agricultural productivity in South Africa. Other researchers in this line of study that have related macroeconomic factors with the agriculture sector within a South African context and other parts of the world are Letsoalo and Kirsten (2003); Abba, Barro and Mosca (2015) and Oyetade, Applanaidu and Abdul-Razak (2015). Other research work related to macroeconomic variables with other sectors, other than the Agricultural sector, are reviewed as followed: Banda, Hall and Pradhan (2019) studied macroeconomic variables in the Industrial sector, with a mixed result. Whilst the result from inflation revealed a positive and significant result, interest rate revealed a negative relationship with stock price and no relationship with GDP. In addition, Oseni and Nwosa (2011) examined the stock market and macroeconomic volatility in Nigeria. Their results revealed that a bi-causal relationship does exist between the stock market and GDP, while inflation revealed no causal relationship between both. Kanwal and Nadeem (2012) investigated the impact of macroeconomic variables on banks’ profitability in Pakistan. A mixed result was revealed amongst the variables and the proxy of profitability. While inflation revealed a negative relationship, interest rate showed a strong, positive and significant relationship and GDP revealed an insignificant but positive relationship. Moreover, Ifeacho and Ngalawa (2014) also carried out their investigation on the impact of bank-specific variables and macroeconomic indicators in South Africa, finding a mixed result with different measures of performance. Kisten (2020) evaluated the impact of uncertainty on macroeconomic variables and the results revealed that the shock of uncertainty has declined over time in South Africa. Furthermore, Ali, Nzotta, Akujaobi and NWaimo (2020) investigated the impact of macroeconomic variables on stock market returns in Ghana, Nigeria and South Africa, revealing that macroeconomic variables do not impact stock market returns volatility in all three countries. Okafor (2012) determined whether macroeconomic factors influence Foreign Direct Investment (FDI) in Nigeria and the results revealed that macroeconomic variables are key determinants of FDI in Nigeria. In addition, Ndoblu and Alagidede (2018) examined the impact of industry structure and macroeconomic indicators on ROE.
within the financial sector and revealed mixed results. In their results, while GDP and interest rate revealed a positive impact, inflation, unemployment and exchange rate showed a negative effect on ROE.

Gikombo and Mbuyu (2018) determined the effect of macroeconomic variables on the performance of banks in Kenya, with results revealing that all macroeconomic indicators contribute significantly to both profitability and company performance with both positive and negative influences. Agade (2014) studied macroeconomic indicators and operational efficiency in the Kenyan Banking sector and found a negative but significant relationship between inflation and operational efficiency, while exchange rate, lending rate and GDP revealed a positive and significant result with operational efficiency. Additionally, Bayar and Ceylan (2017) analysed the impact of macroeconomic uncertainty on firm profitability and revealed that volatility of interest, exchange rate, growth and inflation had a negative effect on both measures of performance. Worlu and Omodero (2017) carried out a comparative analysis amongst selected macroeconomic variables to find their impact on stock market performance in four major African countries, with mixed results from those countries. Verma and Bansal (2021) investigated the effect of macroeconomic indicators on stock markets and found mixed results. Moreover, Ajayi and Olanjayan (2016) studied the dynamic relations of macroeconomic variables and stock prices between the UK and South Africa, finding a positive and a long run effect on stock prices in the UK, but only a positive and no long-run effect with SA. Kpanie and Esumanza (2014) explored the relationship between macroeconomic variables and stock market performance and found a long-run relationship between them and a highly significant result. Bilson, Brailsford and Hooper (2001) addressed whether macroeconomic variables explain stock returns in emerging markets and found that support commonality explains stock returns over emerging markets. Meanwhile, the investigation by Ullah, Islam, Alam and Khan (2017) between macroeconomic variables and stock market performance in SAARC countries, revealing that economic variables such as exchange rate, interest rate and foreign currency reserves are statistically significant, while inflation and money supply is not. Oxelheim (2003) presents the impact of volatile macroeconomic variables on corporate performance, showing that information presented by IAS 1 is comprehensive enough to draw conclusions about the extent of the influence of macroeconomic variables on company performance. Issah and Antwi (2017) also investigated the role of macroeconomic variable conditions to predict company performance, found that the performance of a company is a function of the prior year’s performance and that micro-economic variables’ conditions also dictate future performance. Akanni, Nwanna and Mbachu (2016) examined the effect of macroeconomic variables on banks’ performance in Nigeria and concluded that there is a positive and significant relationship between macroeconomic variables and the performance of banks in Nigeria. In another study, Muchir (2012) examined the impact of macroeconomic variables on Nairobi’s stock market performance, where results revealed that selected variables influence stock market performance. Irungu and Muturi (2015) determined the relationship between macroeconomic variables and financial performance in Nairobi and revealed that the selected factors indeed have a strong influence on firm performance of the Energy and Petroleum sector.

Muhammad and Ahmed (2018) investigated the effect of macroeconomic variables on stock returns in the Jordanian stock market, and findings revealed that macroeconomic variables have a statistically significant impact on stock returns. In addition, Romus, Anita, Abdillah and Zakaria (2020) investigated the effect of Macroeconomic variables on firm performance and found a mixed result amongst the variables with firm performance, but all variables have positive effects on dividend policy. Soukhakian and Khodakarani (2019) examined the impact of working capital management and macroeconomic variables on firm performance, whereby findings revealed that macroeconomic variables are positive and significant, but the variables do not influence working capital management and firm performance. Hussain and Nyguens (2021) explored the interaction effect of macroeconomic indicators and working capital flows on firm performance and a mixed result was found. Pacini, Mayer Attar and Azam (2017) studied the impact of macroeconomic variables on firm performance in the UK, finding a positive impact on the performance of companies. Ghareh and Mohammadi (2016) examined the effect of macroeconomic variables and firm characteristics on the quality of financial reporting, where no effect on the quality of financial reporting was found but a great significant effect was found with macroeconomic variables. Furthermore, Haider, Anjum, Sufyan and Khans (2018) examined the impact of macroeconomic variables on financial performance and revealed mixed results amongst the selected economic variables with company performance. Naka, Mukherjee and Tufle (1998) analysed the relationship that exists amongst macroeconomic variables and the stock market in India and found a long run relationship amongst the selected variables. Further findings revealed that inflation is the most influential factor amongst the variables. Shafana (2014) examined the effect of macroeconomic variables on share price indices in Sri Lanka and, found that exchange rates, treasury bills and inflation are the variables that affect the variability of share prices.

Atanda, Asaolu and Adewale (2015) studied macroeconomic variables and value creation in the Nigerian manufacturing sector and found that the selected economic variables were important factors that improve economic value in Nigeria. Pacini et al. (2018) examined the impact of macroeconomic dynamism on company performance in the UK and mixed results were found amongst the selected variables. Gatsi and Gadzo (2013) examined the effect of macroeconomic variables and firm-level variables on insurance companies’ performance and found that all firm-level variables and inflation are the main determinants of company performance, while other variables are insignificant to the performance of Ghanaian insurance companies. Hurjira, Chani, Irfan and Javed (2014) analysed macroeconomic factors affecting company performance in Pakistan, finding a significant impact of all macroeconomic variables on company performance with both positive and negative relationships. Kitatia, Zablonb and Maithyac (2015) investigated the effect of macroeconomic variables on share price and found mixed results amongst the variables, with share price as a measure of performance. Assagaf, Murwansingari, Gunawan and Mayangrsari (2019) analysed the effect of macroeconomic variables on companies’ returns and found a significant effect between the selected variables and stock market returns. Hasan, Islam and Wahid (2018) examined the impact of macroeconomic variables on the performance of insurance companies. Their findings revealed that...
the selected economic variables significantly impacted the performance of insurance companies. In addition, Ismail, Ishak, Manaf and Husin (2018) examined the impact of macroeconomic factors on the performance of Malaysian insurance companies and found that selected variables have both positive and negative effects on insurance companies. Huy (2020) examined risk management and the impact of macro and micro-economic factors on stock price and the findings revealed a significant result between macroeconomic factors and stock price. Furthermore, Hunjra, Chani, Irfan, Ijaz and Farouq (2014) determined the impact of macroeconomic Variables on stock price but found no relationship between stock price and the selected variables in the short run, but they exist in the long run. Jacob (2019) investigated the impact of macroeconomic forces on corporate governance performance in India and revealed that the selected variables have a significant influence on corporate governance. Ali (2011) studied both micro-and macroeconomic variables on the Dhaka stock exchange market, finding mixed results amongst the variables and the stock market price. Kholish and Dwarti (2020) identified macro and company variables in predicting financial distress, revealing no significant relationship between macroeconomic variables and financial distress. Sasidharan, Ranjith and Prabhuram (2020) analysed both firm-specific and macroeconomic factors affecting financial performance, finding mixed results amongst economic variables and financial performance. Willy (2012) determined the effect of the macro-environment on financial performance and found a significant result on the performance of companies. In addition, Yakub, Hishamuddin, Ali, Achu and Folake (2020) examined the effect of micro-and macroeconomic variables adoption on the real estate sector price prediction model and found that macroeconomic variables play a significant role in price determination. Rolle, Javed and Herani (2020) examined the impact of micro-and macroeconomic variables on bank performance, whereby findings revealed a significant impact between the selected variables and the performance of banks in Pakistan. Rahman (2019) studied the relationship between macroeconomic indicators and stock price, but the study revealed no relationship between the selected variables and stock price and cannot be used to predict stock price. Reddy and Negendra (2019) analysed the impact of macroeconomic variables that are positively correlated with share prices.

Gap discussion from the literature review

From the review so far, it was discovered that macroeconomic volatility is a constant issue, but the degree of it can either be managed or depreciated beyond control. Apart from firm-level variables such as good corporate governance, optimal capital structure, companies’ asset age, firm size, etc. that affect firm performance, it was discovered that the extent of the macroeconomic impact on companies cannot be underestimated. Generally, it was also discovered that a majority of the past studies were mainly on sectoral-based research and some based their work on the Financial sector (Kanwal and Nadeem, 2012), some on the Agricultural sector (Letsoalo and Kirsten, 2003; Kargbo, 2007; Setshedhi and Masikari, 2019), while majority based their studies on broad stock market performance (Oseni and Nwosa, 2011; Banda, Hall and Pradhan, 2019; Ali, Nzotta, Akujuobi and Nwaimo, 2020). Studies that based their works on firm performance are very few and the results of those few studies are mixed and conflicting. Hence, the gap that this study covers. Watkins (2007) studied micro-and macroeconomic crises and the performance of companies generally and found that both variables are highly correlated because companies are usually vulnerable during these crises. Pacini, Berg, Tischer and Johnson (2017) found a positive impact between macroeconomic variables and firm performance. Moreover, the macroeconomic indicator movements and variabilities of South Africa for the past three years are worrisome. The downward and negative trend of macroeconomic indicators in South Africa recently calls for serious attention (Kisten, 2020). These are gaps covered by this study and add to the world literature. The next stage leads to data analysis and sources of data.

Research and Methodology

This section presents the data source, design and model specification.

Data source

The data used for this study is based on 20 companies, representing all sectors from South African JSE-listed companies for the years 2010-2020. Data were retrieved from the annual reports of all the sampled companies and processed to become needed information with relevant and applicable formulae. The dependent variables, which included returns on assets (ROA) and returns on equity (ROE), are all utilised as indicators of company performance. The explanatory variables included macroeconomic variables such as consumer price index as a measure of inflation (INF); gross domestic product as a proxy for economic growth (GDP); Share price (SP); Exchange rate (EGR); unemployment rate (UNEPLR); and Interest rate (INTR). The choice of this country was because of the decelerating, depreciating and fluctuating nature of macroeconomic indicators in recent years, and the sampling of companies employed was based on the availability of their data online.

Research design

To assess the implication of explanatory variables on dependent variables, this study followed an ex post facto research design. The ex post facto design refers to an investigation that analyses the existing data (relating to the past) or situation to deduce their effects on the current situation and forecast for the future (Kerlinger and Rint, 1986). The ex post facto design is adequate for the current study as the latter aims to determine the effects of independent variables on dependent variables and causality amongst variables, according to Owolabi (2017).
Econometric Model specification

This is a quantitative research study built on annual time series from 2010 to 2020. The study is conducted on 20 companies selected from listed companies on the Johannesburg Stock Exchange (JSE). A combination of these time-series and cross-sectional analyses resulted in balanced panel data. Companies were selected based on their industrial classifications, role in the South African economy and the availability of their data. Some other important companies are not considered by the study owing to the lack of data. To assess the effect of macroeconomic variables on selected companies' performance, returns on assets (ROA) and returns on equity (ROE) are used as dependent variables, while independent variables (macroeconomic variables) are represented by the consumer price index as a measure of inflation or consumer price index (CPI); gross domestic product as a proxy for economic growth (GDP); Share price (SP); the Exchange rate (EXR); and unemployment rate (UNR). Data for the dependent variables (ROA & ROE) was retrieved from the annual reports of selected companies and data for the independent variables was acquired from the South African Reserve Bank (SARB). To analyse the relationship between the dependent and independent variables, the authors employed the Autoregressive Distributed Lag (ARDL) model.

As mentioned in the above paragraph, the study used both ROE and ROA as measures of companies’ performance. Therefore, a relationship between company performance and macroeconomic variables can be mathematically expressed and modelled as follows:

\[ ROA_{it} = f \text{ (macroeconomic variables)} \]
\[ ROE_{it} = f \text{ (macroeconomic variables)} \]

Explicitly the models are expressed as follows:

\[ ROA_{it} = \alpha + GDP_{it} + SP_{it} + EXR_{it} + INTR_{it} + UNR_{it} + \mu \]
\[ ROE_{it} = \alpha + GDP_{it} + SP_{it} + EXR_{it} + INTR_{it} + UNR_{it} + \mu \]

Where \( ROA_{it} \) represents a proportion of net income to total assets of the company \( (i) \) for a period \( (t) \), \( ROE_{it} \) represents a proportion of net income to total equity of the company \( (i) \) for a period \( (t) \), GDP is economic growth, SP is share price, EXR is the exchange rate, INTR denotes interest rate and UNR denotes unemployment rate.

The Panel ARDL model was selected as the study estimation approach. To ensure the correctness of the model selection and accuracy of findings, stationarity or panel unit root tests were performed before the short run and long run estimations. The main objective of unit root tests was to assess that none of the data is stationary at the second difference \( [1 (2)] \) as the latter do not fit with the ARDL model. Additionally, to ensure the model’s robustness, the Mean Group (MG), Pooled Mean Group (PMG) and Pooled Mean Group (PMG) approaches were performed and compared to ascertain the best panel ARDL that accounts for the consistency and efficiency of the estimators. The best two estimated panel ARDL models are expressed in Equations 3 and 4 below:

\[ \Delta LROA_{it} = \beta_1 LROA_{it-1} - \beta_j X_{it-j} + \sum_{j=1}^{q} \gamma_1^j \Delta (LROA_{it-j}) + \sum_{j=1}^{q} \gamma_2^j \Delta (X_{it-j}) + u_{it} + e_{it} \]
\[ \Delta LROE_{it} = \beta_1 LROE_{it-1} - \beta_j X_{it-j} + \sum_{j=1}^{q} \gamma_1^j \Delta (LROE_{it-j}) + \sum_{j=1}^{q} \gamma_2^j \Delta (X_{it-j}) + u_{it} + e_{it} \]

Where \( LROA \) and \( LROE \) are the natural log of the return on asset and return on equity respectively and are used to measure company performance from the selected companies. \( X \) represents each selected economic variable. Long run coefficients are denoted by, while both \( \gamma \) and \( \delta \) are the short run for both dependent and independent variables respectively. Cross-sectional and time-series are represented by \( \beta \) and \( \theta \) respectively, while the fixed effect and the error term is represented by \( u \) and \( e \) respectively. After the estimation of long run and short run relationships, the study performed residual tests through cross-dependency to confirm the model’s robustness and findings’ usefulness.

Results and Discussions

This part of the study illustrates all research findings and the discussion.

Panel Unit Root Tests

The results from the conducted panel unit root tests are displayed in Table 1. Considering both trends and intercepts, all test results indicate that five variables of the study, namely return on asset (ROA), return on equity (ROE), gross domestic product (GDP), inflation (CPI) and exchange rate (EXR), have a unit root at levels but become stationary at first difference. In contrast, the unit root result on share price suggests that this variable is stationary at level. Therefore, panel unit root results show that the variables of interest form a mixture of I (0) and I (1) stationarity. In other words, these results confirm the choice of panel ARDL as an estimation approach.
Table 1: Panel unit root tests outcomes

<table>
<thead>
<tr>
<th>Variable</th>
<th>ADF-Fisher</th>
<th>PP-Fisher</th>
<th>LLC</th>
<th>FM, Pesaran &amp; Shi</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>ROA</td>
<td>No trend</td>
<td>Trend</td>
<td>No trend</td>
<td>Trend</td>
<td>No trend</td>
</tr>
<tr>
<td>∆ROA</td>
<td>0.007**</td>
<td>0.011*</td>
<td>0.000**</td>
<td>0.000**</td>
<td>0.000**</td>
</tr>
<tr>
<td>ROE</td>
<td>0.332</td>
<td>0.313</td>
<td>0.246</td>
<td>0.081</td>
<td>0.010*</td>
</tr>
<tr>
<td>∆ROE</td>
<td>0.006**</td>
<td>0.111</td>
<td>0.000**</td>
<td>0.000**</td>
<td>0.000**</td>
</tr>
<tr>
<td>GDP</td>
<td>0.999</td>
<td>0.999</td>
<td>0.031*</td>
<td>0.007**</td>
<td>0.022*</td>
</tr>
<tr>
<td>∆GDP</td>
<td>0.000**</td>
<td>0.014*</td>
<td>0.000**</td>
<td>0.004**</td>
<td>0.000**</td>
</tr>
<tr>
<td>CPI</td>
<td>0.999</td>
<td>0.999</td>
<td>0.031*</td>
<td>0.007**</td>
<td>1.000</td>
</tr>
<tr>
<td>∆CPI</td>
<td>0.003**</td>
<td>0.000</td>
<td>0.000**</td>
<td>0.000**</td>
<td>0.014*</td>
</tr>
<tr>
<td>EXR</td>
<td>0.966</td>
<td>0.500</td>
<td>0.998</td>
<td>0.455</td>
<td>0.000**</td>
</tr>
<tr>
<td>∆EXR</td>
<td>0.000**</td>
<td>0.208</td>
<td>0.000**</td>
<td>0.000**</td>
<td>0.000**</td>
</tr>
<tr>
<td>SPR</td>
<td>0.006**</td>
<td>0.003</td>
<td>0.000**</td>
<td>0.000**</td>
<td>0.001**</td>
</tr>
<tr>
<td>∆SPR</td>
<td>0.175</td>
<td>0.134</td>
<td>0.000**</td>
<td>0.000**</td>
<td>0.012</td>
</tr>
</tbody>
</table>

Long run Analysis Results

Based on the optimal number of lags selected using the Akaike Information Criterion (AIC), the best-estimated panel ARDL model was ARDL (1, 1, 1, 1). The coefficients of the long run relationship between selected macroeconomic variables and company performance are displayed in Table 2. As mentioned previously, given its efficiency and stability, the PMG was estimated using the Hausman test to assess whether the null hypothesis can be rejected or not. The Hausman test provided a Chi-square p-value of 0.326 for Model One and 0.417 for Model Two, which are greater than the critical value of 0.05. Consequently, the null hypothesis was rejected in favour of the alternative. This implies that the PMG has a more efficient estimator compared to those of MG and DFE. Nonetheless, it is important to highlight that the disparity amongst these estimators is not large, which endorses the robustness of the estimated results and gives the green right for an interpretation and discussion of the PMG long run results.

The regression result in Table 2 Section a represents the long run relationship between the selected macroeconomic variables and the return on an asset within the selected companies. This finding supported a long run relationship between macroeconomic variables and ROA. Moreover, the finding was consistent with other studies (Ajayi and Olanianyi, 2018; Ali, Nzotta, Akujuobi and Nwaimo, 2020). Besides, inflation (which is also not significant) changes in all selected macroeconomic variables have a significant and positive effect on companies' performance, specifically return on assets, as earlier revealed by various authors (Kanwal and Nadeem, 2013; Ifeacho and Ngalawa, 2014; Soukhakian and Khodakarami, 2019) revealed that macroeconomic variables and ROE are highly correlated.

On the other hand, the regression results in Table 2 Section b indicate that all selected macroeconomic variables have a significant impact on a company's return on equity. While an inverse relationship exists between a company's return on equity, inflation and exchange rate (Haider, Anjum, Sufyan, Khan and Ullah, 2018), other independent variables, namely GDP and share price, have a positive long run effect on the company's return on equity (Ndlovu Alagidede, 2018; Ifeacho and Ngala, 2014; Soukhakian and Khodakarami 2019). A one percent increase in inflation caused the ROE to decline by 0.635496 percent and a one percent increase in exchange rate leads to a -0.310010 percent decrease in return on equity. However, a one percent increase in the GDP level results in a 1.880294 percent increase in ROE, whilst a one percent increase in share price causes equity returns to increase by 0.907819. These results suggest that a high rate of inflation and exchange rate impede a company’s performance when the focus is made on ROE. Nonetheless, like the Model 1 results, in Model two (ROE), economic growth has a dominant and leading effect on ROE. Other findings in the literature support this study's findings. For instance, Ndlovu and Alagidede (2018); Ifeacho and Ngala (2014); Soukhakian and Khodakarami (2019) revealed that macroeconomic variables and ROE are highly correlated.
Table 2: Long run Results for Model 1 (ROA) and Model 2 (ROE)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Std. Error</th>
<th>t-Statistic</th>
<th>Prob.*</th>
</tr>
</thead>
<tbody>
<tr>
<td>LCPI</td>
<td>-0.222548</td>
<td>0.387201</td>
<td>-0.574760</td>
<td>0.5668</td>
</tr>
<tr>
<td>LEXR</td>
<td>0.801610</td>
<td>0.271029</td>
<td>2.957651</td>
<td>0.0039**</td>
</tr>
<tr>
<td>LGDP</td>
<td>2.578795</td>
<td>0.725722</td>
<td>3.553422</td>
<td>0.0006**</td>
</tr>
<tr>
<td>LSPR</td>
<td>0.444414</td>
<td>0.041690</td>
<td>10.66003</td>
<td>0.0000**</td>
</tr>
</tbody>
</table>

Hausman test: Chi-square p-value = 0.326

Model 2: ROE

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Std. Error</th>
<th>t-Statistic</th>
<th>Prob.*</th>
</tr>
</thead>
<tbody>
<tr>
<td>LCPI</td>
<td>-0.635496</td>
<td>0.250832</td>
<td>10.50700</td>
<td>0.0000**</td>
</tr>
<tr>
<td>LEXR</td>
<td>-0.310010</td>
<td>0.114992</td>
<td>-2.695926</td>
<td>0.0081**</td>
</tr>
<tr>
<td>LGDP</td>
<td>1.880294</td>
<td>0.524687</td>
<td>3.583651</td>
<td>0.0005**</td>
</tr>
<tr>
<td>LSPR</td>
<td>0.907819</td>
<td>0.109333</td>
<td>8.303257</td>
<td>0.0000**</td>
</tr>
</tbody>
</table>

Hausman test: Chi-square p-value = 0.417

Note: ** indicates the rejection of the null hypothesis at a 1 percent level

Analysis of short run dynamics outcomes

Having established a co-integration or long run relationship between a company’s performance and macroeconomic variables, the subsequent section focuses on the short run dynamics between the study variables. The short run regression results are displayed in Table 3 and separated into two sections. Section a consists of short run results for Model 1 and Section b exhibits short run results for Model 2. In Model 1, none of the economic variables is significant at the 0.05 percent level to impact changes in asset returns. Economic growth (GDP) is the only significant variable at a 0.10 percent level of significance, yet with a negative impact. Thus, a one percent increase in GDP causes the asset return to decline by 0.0836 percent. The error correction model for Model One meets the expected requirements. It has a negative error term (-0.34458) and is significant at a 0.05 percent level. This implies that, in the long run, the short-term model disturbance returns to its equilibrium level. It is therefore necessary to note that approximately 35 percent of model disturbances are fixed each year and it will take the model approximately three years \((1/0.34458) = 2.9\) to return to full equilibrium.

Considering the results in Table 3 Section b, none of the selected macroeconomic variables has a significant effect to influence changes in the company’s performance, or rather the return on equity in the short-term. This result agrees with Ijaz and Farouq (2014)’s result. However, the error correction term suggests that the model’s short-term shocks are annually re-established towards long run equilibrium. The model’s Error Correction Term (ECT) is \(-0.369902\) with the probability value of 0.0020. In other words, it is negative and significant as expected. Each year, 0.369902 of the model disequilibrium is adjusted towards long run equilibrium and the model requires about 2 years and seven months \((1/0.34458) = 2.7\) to reach its full equilibrium.

Table 3: Short run results

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Std. Error</th>
<th>t-Statistic</th>
<th>Prob.*</th>
</tr>
</thead>
<tbody>
<tr>
<td>COINTEQ01</td>
<td>-0.344580</td>
<td>0.145581</td>
<td>-2.366930</td>
<td>0.0199**</td>
</tr>
<tr>
<td>D(LCPI)</td>
<td>0.217328</td>
<td>0.249230</td>
<td>0.871997</td>
<td>0.3854</td>
</tr>
<tr>
<td>D(LEXR)</td>
<td>-0.282062</td>
<td>0.606274</td>
<td>-0.465239</td>
<td>0.6428</td>
</tr>
<tr>
<td>D(LGDP)</td>
<td>-0.727717</td>
<td>0.416171</td>
<td>-1.748601</td>
<td>0.0836*</td>
</tr>
<tr>
<td>D(LSPR)</td>
<td>0.056608</td>
<td>0.074276</td>
<td>0.762129</td>
<td>0.4479</td>
</tr>
<tr>
<td>C</td>
<td>-3.335303</td>
<td>1.426192</td>
<td>-2.338607</td>
<td>0.0214**</td>
</tr>
</tbody>
</table>

Model 2: Short Run Equation (ROE)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Std. Error</th>
<th>t-Statistic</th>
<th>Prob.*</th>
</tr>
</thead>
<tbody>
<tr>
<td>COINTEQ01</td>
<td>-0.369902</td>
<td>0.117452</td>
<td>-3.149397</td>
<td>0.0020***</td>
</tr>
<tr>
<td>D(LCPI)</td>
<td>0.018765</td>
<td>0.755521</td>
<td>0.024837</td>
<td>0.9802</td>
</tr>
<tr>
<td>D(LEXR)</td>
<td>-1.023233</td>
<td>1.535961</td>
<td>-0.666185</td>
<td>0.5066</td>
</tr>
<tr>
<td>D(LGDP)</td>
<td>-0.875493</td>
<td>0.707519</td>
<td>-1.237413</td>
<td>0.2185</td>
</tr>
<tr>
<td>D(LSPR)</td>
<td>0.101345</td>
<td>0.075746</td>
<td>1.337961</td>
<td>0.1828</td>
</tr>
<tr>
<td>C</td>
<td>-3.410463</td>
<td>2.494419</td>
<td>-1.367238</td>
<td>0.1742</td>
</tr>
</tbody>
</table>

Note: *, **, *** indicates significance at 10%, 5% and 1% respectively

To ensure the accuracy of the used models and the validity of their outcome, the authors performed a check, the cross-section dependency tests. Additionally, the Breusch-Pagan Chi-Square, Pearson LM normal and the Pearson CD tests were performed to ensure that the spurious results are not produced and reported. The result of all diagnostic tests is shown in Table 4. Considering the probability value of each test, it can be concluded that the employed models were stable, normally distributed and free of serial correlation. Therefore, the study findings are valid and robust.
Study Implication

It is highly important for countries to constantly check the volatility rate of its macroeconomic indicators. One of the main reasons is policy implementation to control these variables at any given time. Suitable policies such as a reduction in interest and exchange rates are needed because this can help companies to have access to loan facilities to reduce liquidity problems faced, according to the result from the study that macroeconomic variables are critical to company performance. Another reason for the constant monitoring of macroeconomic indicators is that a healthy economy helps its companies to survive and to be sustainable. Moreover, it has been proven that companies perform well in countries where their macroeconomic variables are relatively stable over time. Therefore, governments must be proactive on their part by ensuring a good working environment for companies to survive and to be sustainable. Judging by the findings from the study, there is need for South Africa and other African countries to quickly initiate policies and measures that can control inflation and exchange rates as this will have positive effects on GDP growth by lowering inflation and exchange rates. Although competitive advantage does help in individual company analyses, there is need for government to be proactive in their policy decision making because companies react differently to shocks from outside. Furthermore, some companies may not be able to depend on the industry to which they belong. Therefore, stability and sustaining macroeconomic variables over a long period is germane for company performance (Baye and Ceylan, 2017) as growth in the volatility rate of macroeconomic variables had a negative impact on ROA and ROE. This implies that the appreciation of the South African currency and increases in economic growth, together with growth in share prices, allows smooth economic activities with a smooth running of the business and thereafter enhances the company’s return on assets. Looking at these findings, it is important to highlight that, amongst other independent variables, economic growth and company performance are highly correlated, which means that economic growth has a high impact on a company’s performance compared to other variables (Kanwal and Nadeem, 2013). This suggests that the likelihood of a company increasing its return on assets as a measure of company performance depends largely on the economic status of the country in which the company is performing its activities. This is consistent with the findings of Kanwal and Nadeem (2013); Ifeacho and Ngalawa (2014); Soukhakian and Khodakarami (2019); and Ali, Nzotta, Akujuobi and Nwaimo, (2020). This infers that volatility growth of macroeconomic variables is negatively related to company performance as represented by ROA and ROE (Issah and Antwi, 2017). Hence, this paper scientifically contributed to the body of knowledge and concluded that companies’ managements around the world should be cautioned as the findings revealed that pandemic have long run ripple effect on companies than short run effect especially companies with strong liquidity and solvency foundation. The short run effects are severe on companies that are having liquidity problem or that are struggling financially before the pandemic. By implication, this may lead to more companies distress and liquidation if companies and governments fail to take proactive action. Therefore, this paper is an insight to stakeholders such as managers, and Directors to ensure good governance and governments to ensure good working environment.

Conclusion

The study aimed at establishing insight into the relationship between macroeconomic variables and the performance of listed companies in South Africa. The second aim of the study was to also contribute to the existing literature explaining that an empirical relationship exists between a company's performance and macroeconomic variables at both domestic and global latitudes for investors and policymakers. The study used return on assets and returns on equity and measures of company performance. To achieve these objectives, the study performed panel unit root tests to select the appropriate approach for long run and short run relationships. The results from the unit root tests indicated that variables under consideration are a mixture of I (0) and I (1). From the unit root results, the panel ARDL was the appropriate model for both long run and short run analyses. The long run results revealed that a co-integration or long run relationship exists between a company's performance and macroeconomic variables. It was also found that economic growth is the dominant variable that positively influences both returns on assets and returns on equity. A high inflation rate was also found to impede company performance in the long run. The short-term dynamic suggests the absence of macroeconomic variables on a company's performance. This implies that short-term changes in the company's performance are caused by internal factors rather than external factors. Based on this study’s findings, it is recommended that policymakers and economic authorities should introduce and implement strategies that favour and enhance economic growth, which will result in better company performance. Given that the company’s short run performance may depend on internal factors, the internal policy, business strategies and decisions should be taken with precaution. Hence, this paper scientifically contributed to the body of knowledge and concluded that companies’ managements around the world should be cautioned as the findings revealed that pandemic have long run ripple effect on companies than short run effect especially companies with strong liquidity and solvency foundation. The short run effects are severe on companies that are having liquidity problem or that are struggling financially before the pandemic.
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Author Contributions: Conceptualization, AB., HT, GF.; Methodology, AB., HT, GF.; Data Collection, AB., HT, GF.; Formal Analysis AB., HT, GF.; Writing—Original Draft Preparation, AB., HT, GF.; Writing—Review And Editing, AB., HT, GF. All authors have read and agreed to the published the final version of the manuscript.

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Informed Consent Statement: Informed consent was obtained from all subjects involved in the study.

Data Availability Statement: The data presented in this study are available on request from the corresponding author. The data are not publicly available due to privacy.

Conflicts of Interest: The authors declare no conflict of interest.

References


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