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Financial Slack and Firm Performance: Evidence from Africa

By Demis Hailegebreal Hailu, Man Wang, Abdurahman Aliyi Ibrahim & Misraku Molla Ayalew

Dongbei University of Finance

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Keywords: *Africa, Financial slack, Firm Performance.*

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Financial Slack and Firm Performance: Evidence from Africa

Demis Hailegebreal Hailu [α], Man Wang [σ], Abdurahman Aliyi Ibrahim [ρ] & Misraku Molla Ayalew [ω]

Abstract- This study explores the relationship between financial slack and firm performance using a sample of firms in African countries. This study employed a split sample analysis to unmask the real picture of slack and performance nexus. We also used a baseline sample (using 923 firms) analysis to show how the result is ambiguous. By using 530 African firms (212 high and 318 low financial firms), this study found that while high available slack has adverse effects, low available slack has a favourable impact on firm performance. However, the study confirms while high potential slack has a positive influence, low potential slack hurts African firms' performance. These results depicted that while agency theory offers a strong prediction when dealing with high available slack, the resource-based theory provides a reliable forecast when dealing with high potential slack. This study finally suggests the application of split-sample analysis in studies like this.

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I. Introduction

The resource-based theory highlighted that firms are a bundle of resources that drive sustainable competitive advantage and superior performance (Barney, 1991). That is, rent discrepancies derived performance differences, attributable to a resource having intrinsically different levels of efficiency in the sense that they enable firms yielding a better return. From the perspectives of resource-based theory, organizational resources are thought to safeguard a firm at the times of environmental turmoil, lessens the conflict among employees, and boost firm performance. In short, the resource-based theory, *Ceteris paribus,* depicted that organizational slack drive firm performance. However, the agency theory (Jensen & Meckling, 1976) argued that organizational slack is unproductive and accumulates because of poor management. This theory deals with the delegation relationship between principals and agents — the principal delegates specific tasks and decisions to an agent based on an explicit or implicit contract. However, the principal-agent relation is always incomplete due to limited information, unable to predict the future, and high cost of the entire agreement. Thus, the action taken by the agent might adversely influence the welfare of the principal. Also, agency theory argued that organizational slacks are inefficient and accumulated due to poor management or utilization of resources that might, in turn, hinder the firm's competitive advantage, thereby yield low performance.

Following the conflicting argument of the resource-based and agency theories, the management literature gives a great emphasis on the influence of organizational slack on firm performance. Accordingly, prior studies explore the impact of organizational slack on firm performance using a sample of firms (1) in developed countries such as US (Daniel, Lohrke, Fornaciari, & Turner Jr, 2004; United Nations, 2015; Wiersma, 2017; Zamfir, 2016), Sweden (Page, 2010), Europe (Gral, 2013), and (2) in emerging countries such as China (Chen & Miller, 2007; Liu, Ding, Guo, & Luo, 2014; Peng, Li, Xie, & Su, 2010; Yang & Chen, 2017) and India (Altaf & Shah, 2017).

However, as far as we know, there is no study, in the area, conducted using a sample of African firms. Moreover, previous studies are very general. Most of the prior studies explored the vague association between financial slack and firm performance(Altaf & Shah, 2017; De Carolis, Yang, Deeds, & Nelling, 2009; George, 2005; B.-N. Kim, Lee, Wi, & Lee, 2017; S. Lee, 2011; Wan & Yiu, 2009). We argued that a different level of financial slack affects firm performance differently. However, these studies failed to explore the impact of different level of financial slack on firm performance. We are aware that prior studies tried to explore the curve-linear relationship between financial slack and firm performance (Huang & Chen, 2010; Justin Tan, 2003; Zhong, 2011). These studies used the square or and cube values of financial slack to denote high financial slack. However, we believed that these square and cube values of financial slack are not real figures, thereby might mislead the result. The current study thus contributed to the literature by investigating the slack-performance nexus using sample firms in the developing region (Africa). This study further contributed to the literature by unmasking the real picture of slack-performance nexus via split sample analysis. We believed that the result of this study provides essential managerial implications and future research directions.

The Osiris and the World Bank databases are the sources of the data for this study. The *Osiris*

Author α: Demis Hailegebreal Hailu, Accounting school, Dongbei University of Finance and Economics, Dalian city, P.O.B 116025, P.R. China, Jimma University, Jimma-Ethiopia. e-mail: dhgebreal@gmail.com
Author σ: Accounting School, Dongbei University of Finance and Economics, Internal Control Research Centre in China, Dalian city, P.O.B 116025, P.R. China. e-mail: manwang123@163.com
Author ρ: Accounting school, Dongbei University of Finance and Economics, Dalian city, P.O.B 116025, P.R. China.
e-mail: obboleso@gmail.com
Author ω: Accounting school, Dongbei University of Finance and Economics, Dalian city, P.O.B 116025, P.R. China, Dilla University, Dilla-Ethiopia. e-mail: missmolla@yahoo.com

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database offers both financial and non-financial firm-level data of 1285 firms in 33 African countries, allowing us to extract the necessary firm-level data. The study excluded the financial institutions considering their slack accumulation might be unique and may affect the result. Thus, the study used a sample of non-financial firms. This study further excludes non-financial firms that have no the required data for ten years; from 2007 to 2016. The availability of data determines the study period. The study also excludes firms that did not report R&D investment in the last ten years. The final sample then included 923 firms in ten African countries covering a period from 2007 to 2016. For the split sample analysis, we draw a sample of 530 firms with high and low financial slacks. The bank deposit to GDP (a measure of banking sector development), the stock market capitalization to GDP (a proxy of stock market development), and annual GDP growth rate (a control variable), and governance indicators (control of corruption, regularity quality, and the rule of law) are obtained from the *World Bank database*.

Like previous studies, this study started by investigating the vague relationship between financial slack and firm performance. We used the word "vague" to show that prior studies examine the slack-performance nexus without considering the effects of different levels of financial slack (e.g., high and low) on firm performance. Therefore, the result is unclear (vague). We started the investigation using 923 samples of African firms. This sample encompasses all sample firms with high financial slack, low financial slack, mixed financial slack, and overlapped financial slack. Then we split the sample into two groups— high financial slack and low financial slack. To do so, we excluded firms with overlapped and mixed financial slack. By overlapped financial slack, we mean that firms' financial slack above and below the regional average during the study period. Some firms 'financial slack is laid down above and below the regional average across years. Some other firms have high available slack and low potential slack while others have low available slack and high potential slack. We used the phrase "mixed financial slack" to denote these firms (firms with high available slack and low potential slack and firms with low available slack and high potential slack). It is challenging to classify firms with overlapped financial slack and mixed financial slack as "high" or "low" financial slack. Thus, we dropped firms with mixed and overlapped financial slack, and we draw a final sample of 530 firms encompassing 212 firms with high financial slack and 318 firms with low financial slack.

To alleviate the potential effects of outliers on the result, we winsorized all variables (except governance indicators) at the 1st and 99th percentile of their distribution. We employed robust Ordinary Least Square (OLS) regression model following Hausman fixed-random specification test and Breusch-Pagan Lagrange multiplier (LM). To check whether the main result is sensitive or not, we did robustness checks using alternative firm performance measures and regression model. We started our analysis with descriptive statistics. The descriptive statistics depicted that there exists a heterogeneous financial slack and firm performance across the countries. Following the descriptive statistics, we employed the heteroscedasticity and multicollinearity tests. There exists a heteroscedasticity problem, and we used a robust OLS regression model to remedy this problem. We applied the Variance Inflation Factors (VIF) to assess the presence of multicollinearity, but it is not an issue in the model. Thus, all variables are retained in the model.

The overall regression result shows that available slack and firm performance (Tobin's q and ROA) have a significant negative association and potential slack has a significant positive correlation with firm performance (Tobin's q and ROA). Based on this overall regression (vague) result, it is difficult to confirm the arguments of theories. It is also difficult to generalize that available slack has an adverse effect, and potential slack has a favourable impact on firm performance. Because the result does not show the link between different level financial slacks and firm performance and masks the real picture of slack-performance nexus, we understand from this that this vague result has to be explored using different levels of financial slack. We thus did a split sample analysis that explores the high slack-performance and low slack-performance nexus and unmasks the real pictures slack-performance nexus. The result shows that high available slack has a strong negative association with firm performance, while low available slack has a strong positive correlation with firm performance. This result implied that agency theory generates strong perdition when dealing with high available slack. The result further shows that while high potential slack has a strong positive association, low potential slack has a weak negative association with firm performance. This particular result implied that the resource-based theory offers strong prediction when dealing with high potential slack (i.e., low debt-equity ratio).

II. Hypothesis Development

a) *Available slack and firm performance*

According to Sharfman, Wolf, Chase, and Tansik (1988), available slack refers to resources such as cash and cash equivalents that a firm can redeploy in a short time. Both the behavioural and the resource-based theories argued that such slack provides buffers that can absorb dynamic environments, resolve conflicts, and improve the firm's innovativeness. These all collectively drive sustainable and superior firm performance. Several empirical studies confirm the perspectives of behavioural and resource-based theories by showing that available slack has a positive

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association with firm performance. A positive relationship between available slack and firm performance can be viewed in different ways: greater resilience to external shocks, mitigating organizational conflicts, and enhancing innovation and performance. Available slack is a buffer from the external environment, protecting firms from a negative influence on their performance for three major reasons. First, available slack mitigates disruption in internal business operation, increases the firm's efficiency, by absorbing external environmental shocks (Thompson, 1967a). Second, available slack allows the firm flexible in handling fluctuations in response to a dynamic environment (Sharfman et al., 1988). The following empirical studies prove these facts.

By employing a meta-analysis, Daniel et al. (2004) examined the relationship between financial slack and firm performance. The study was conducted based on 88 samples from 66 studies (N=54,249), and the result depicts a positive correlation between available slack and firm performance. Taking a sample of the European pharmaceutical industry during the financial crisis of 2007 to 2010, Gral (2013) explored the financial slack and corporate performance nexus. The study investigated the role of financial slack to boost performance during environmental turmoil (during the financial crisis). This study, in particular, confirms that available slack used as a cushion during an economic downturn or crisis. The author found a positive correlation between available slack and performance during the world financial crisis from 2007 to 2010. This result supported the viewpoint of the resource-based and the behavioural theories in that; firms use financial slack to improve their performance during environmental hardship.

Similarly, By taking a sample of Bulgarian firms, Rafailov (2017) investigated the financial slack and firm performance nexus. The study confirms that financial slack served as a buffer that protects firms in an uncertain and dynamic environment. Moreover, this study implies that financial slack lessens conflicts in the firm, enhances innovations, and improves a firm's long-term growth. The result shows a positive association between financial slack and performance, particularly for small firms. This study further found a weak non-linear linkage between financial slack and firm performance, suggesting that dominantly, financial slack has a positive influence on the Bulgarian firms' performance.

Based on the perspective of resource-based and agency theory, S. Lee (2011) investigated how financial slacks influence firm performance by using a panel data set of 1852 U.S. firms from 1990 to 2008. The result shows a positive financial slack and performance association, confirming the resource-based theory. Similarly, incorporating the behavioural and institutional viewpoints, again, Vanacker, Collewaert, and Zahra (2017) explored "*Slack resources, firm performance, and the institutional context*" using a large dataset of 162,633 private firms of 26 European countries. This study proposed a country's legal frameworks that influence executives' deployment of slack resources. Notably, the authors investigated the moderating effect of creditor and employee rights on the link between slack and performance. The study found that financial slack improves performance at diminishing rates. The study further found that it has a more positive effect on performance in countries with weaker credit rights than human slack. This study finally suggested that excess financial slack enhances performance, mainly when firms operate in countries with weaker creditor rights.

Using longitudinal data on 900 private firms from 1994 to 1997, George (2005) investigated the correlation between financial slack and performance. The authors have drawn a sample with diverse industries, such as five technology-intensive and five nontechnology-intensive industries. The author extended the argument of behavioural and resource constraint theories of the firm regarding public firms' performance to private firms. While behavioural theory argued that excess available slack drives firm performance, the resource-constraint theory explains that firms with fewer available slack are more likely to be efficient as they find ways to leverage and stretch their available resources. The study suggested a combination of behavioural and resource constraints arguments are necessary to explain the slack-performance association in privately owned firms.

An influential article entitled "*From Crisis to Opportunity: Environmental Jolt, Corporate Acquisitions, and Firm Performance*" has studied byWan and Yiu (2009) and published in *Strategic Management Journal.* This study integrates the external environmental situation into the investigation of corporate attainments during an environmental shock that alters the levels of environmental generosity. The authors emphasized the Asian economic crisis, particularly in Hong Kong and Singapore, by arguing, compared to other countries in Asia, fewer firms in Hong Kong and Singapore were bankrupted during the crisis. The authors further argued that these two countries are highly similar in economic, institutional, and cultural features. The study period covers 11 years from 1994 to 2002 and 48 firms from Hong Kong and 30 firms from Singapore. This study suggested that available (unobserved) slack improves a firm's performance and accentuate the positive association between corporate acquisition and firm performance at the time of environmental turmoil. However, this study found that available slack has a negative influence on firm performance and makes the acquisition-performance linkage more negative before and after environmental shocks.

Similarly, Paeleman (2012) has studied "*the interaction between the financial and human slack and its influence on performance*" of French firms. The

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authors used longitudinal data from 733 ICT firms. This study analyzes the interaction effects of the financial and human slacks based on the integration of slack in the Emergent Stage and later stages of development of firms. This measure reflects the available slack. The result of this study demonstrates that having high levels of available slack is determining firm performance. Using a panel data set of 450 software firms, Latham and Braun (2009) investigated the correlation between financial slack and firm performance during the economic recession from 2001 to 2003. The result depicted that firms with more available slack confirmed a more rapid rate of performance decline in the early phase of economic downturn, but later on, in the recession, they demonstrated a quick rate of performance recovery. This result supported the viewpoints of behavioural theory that organizational slack serves as a cushion during environmental turmoil.

Recently, B.-N. Kim et al. (2017) have explored "*the effect of slack resource on firm performance and innovation*" based on the behavioural and pecking order theories using 53 Korean listed pharmaceutical firms for over five years (from 2010 to 2015). The result confirms the behavioural theory by finding a positive influence of available slack on performance.

Several studies further confirm the arguments of agency theory. Agency theory argued that high available slack is a source of management inefficiency and agency problems that hinder investment and innovation and provides managers with opportunities to involve in excessive diversification, empire-building, and on-the-job shirking(Jensen & Meckling, 1976). Also, available slack encourages unreasonable investment by management in personal projects that are unrelated to the owner's interests. The following empirical studies confirm these arguments. For instance, De Carolis et al. (2009) investigated "*Weathering the Storm: The benefit of resources to high-technology ventures navigating adverse events*" using the total of 104 events representing 57 US and Canada public biotechnology companies (25% of publicly traded biotechnology companies) from 1992 to 2003. The authors hypothesized that slack buffers the firm from the negative impact of adverse events. The result shows that the influence of slack on the ability of a firm to weather adverse events is not endogenously determined. More specifically, the study revealed that an increase in the current ratio (available slack) increases the negative impact of an adverse event (inconsistent with the hypothesis developed). Therefore, the result confirmed agency theory, that the existence of available slack amplifies (creates agency problem), rather than lessens, the impact of the adverse event.

Similarly, Altaf and Shah (2017) have studied slack and performance nexus in India. This study investigated the influences of various forms of slack (financial, human resources, and innovation slacks) on the firm's performance. The study covers a panel dataset of 426 Indian firms for five years, from 2011 to 2015. The result of this study confirms agency theory by confirming a negative linkage between available slack and performance. This suggested that firms need to strengthen corporate governance to improve the commitment of available slack (lessens agency problems). It also suggested that managers should realize that "the resource allocation decision is a zero-sum game—keep in mind the opportunity cost of slack resources and deploy resources based on cost-benefit analysis."

Moreover, Stan, Peng, and Bruton (2014) argued that most prior studies on slack have inclined to study private firms in developed economies such as the US. Thus, they investigated the influence of slack on the performance of state-owned enterprises (SOEs) in emerging economies. The argument of this study extended that the behaviour of SOEs is questionable since they prioritize goals such as social welfare and full employment in a different way than their private (POEs) counterparts do. The author further argued that the difference between SOEs and POEs impacts their sources and use of slack because of the ownership, budget constraints, and agency relations. The authors then developed an institutional change life cycle model to investigate the slack-performance linkage of SOEs. One of the propositions of this study is that excess unabsorbed (available) slack adversely influences the performance of SOEs, as it weakens their strategic response to environmental changes. Their argument for this proposition is, the presence of absorbed slack allows SOEs to buffer their technical core and, however, bring them a false sense of safety, because of the immediate availability of resources to deal with potential problems. Hence, management becomes reluctant and irresponsive to external demands and fail to adapt to a dynamic environment.

Furthermore, previous studies also show keeping the optimum level of available slack improves firm performance. Such studies found a non-linear relationship between available slack and firm performance and suggest that various levels of available slack might affect performance differently. For instance, too much available slack leads to managerial miss behaviour and aggravates agency problems, while too little available slack hurts the firm's exploitation of investment opportunities (Triantis, 2000). Thus, both too much and few available slacks inhabit firm performance, which lefts the optimum level of slacks are having a favourable impact on firm performance. For instance, using survey data, Zhong (2011) explored the association between slack and firm performance in China. The author used survey data from 47 pharmaceutical and chemical firms operating in Henan

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province, and 50 individuals (intermediate managers, senior managers, general managers, presidents, and others) answered the questionnaires. The study found a complex curvilinear available slack-performance nexus. Mainly, the available slack and performance exhibited an inverse N-shape association. The result broadly demonstrates the curvilinear association differs depending on industry conditions and slack resources. The result implies that keeping optimum available slack is favourable to the firm's performance; however, little and much slack inhibits firm performance. This study finally suggested the essentials of further investigations into intervening factors influencing the slack-performance nexus.

We inclined to the argument of agency theory due to the following reasons. Our study is conducted using African sample firms, and the agency problem might be substantial in Africa, where there are relatively weak corporate governance and an underdeveloped financial system. In Africa, the lack of effective regulatory and institutional frameworks, the lack of transparency and market discipline are the primary obstacles of good corporate governance (Rossouw, 2005). Besides, the financial system development still lags compared to other regions in the world (Hailu, 2019). The agency problem with the weak corporate governance and underdeveloped financial system will lead to unproductive use of available slack by the management of the firm. Prior studies also confirmed the argument of agency theory (Altaf & Shah, 2017; De Carolis et al., 2009; B.-N. Kim et al., 2017; Stan et al., 2014).

The practical implication of agency theory is that slack downsizing will lead to economic efficiency. Similarly, studies have shown that keeping a low level of available slack promotes firm performance (Nohria & Gulati, 1996). Besides,Geoffrey Love and Nohria (2005) explore the performance consequence of slack downsizing entitled "*Reducing Slack: The Performance Consequences of Downsizing by Large Industrial Firms, 1977–93*". This study was conducted using the 100 largest U.S. industrial firms from 1977 to 1993. The author conceptualized downsizing as an effort to slack reduction and confirmed that slack downsizing is more likely to lead to better performance when firms have high available slack.

Likewise, emphasizing on high-tech IPOs, Mousa, Marlin, and Ritchie (2013) examined configurations of slack and its performance implication. The study included 172 U.S. IPOs over five years (2001-2005) with average total assets of $220 million and 1,410 employees. The authors used cluster analysis to identify the configuration that leads to a reduction in sample size to 162 IPOs. The study developed five configurations. The first configuration includes high slack firms with innovational slack focus, and the second configuration comprises firms with low overall slack. While the third configuration includes average slack firms with no focus, the fourth configuration contains firms with little slack. The fifth configuration comprises young firms with high financial and managerial slack. The study measured available slack using working capital and cash reserves. The study thus suggested the presence of a distinct configuration of available slack and associated performance differences among configurations. That is, different available slack configurationsare linked with various levels of performance. Notably, configuration 2 with the lowest levels of available slack demonstrated a higher level of performance. However, configuration 5, with the highest level of available slack, showed a lower level of performance. In short, this study found that a low level of available slack is associated with better firm performance.

In conclusion, the above arguments show that while high available slack harms, low available slack improves firm performance. Considering the weak corporate governance and the underdeveloped financial system in Africa, we thus developed the following hypothesis.

Hypothesis 1: High available slack has a negative relationship with firm performance, but low available slack has a positive relationship with firm performance.

b) Potential slack and firm performance

Behavioural and resource-based theories consider potential slack as a promoter of firms' competitive advantage, thereby positively influencing performance. These theories further argued that potential slack improves firm performance by eliminating goal conflicts, embodying a cushion in a hostile environment, playing a stabilizing role, maintaining sustainable competitive advantage, and promoting a firm's innovativeness. More importantly, these theories argued that potential slack influences management decisions to continue or not to continue innovative projects that possibly produce competitive advantage and superior firm performance. Moreover, the more potential slack resources a firm has, the easier it is for the firm to handle unforeseen internal and external shocks that maintain successful innovation (Barney, 1991; Cyert & March, 1963). That is, firms cannot achieve a competitive advantage and superior performance without such slacks (Barney, 1991; Cyert & March, 1963; Thompson, 1967b). Several empirical studies confirmed these arguments.

A meta-analysis of Daniel et al. (2004) on the relationship between financial slack and firm performance shows an important performance implication of potential slack. The study was conducted based on 88 samples from 66 studies (N=54,249) and found a positive potential slack and performance nexus.

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Moreover importantly, this study found that studies controlling for industry-relative performance demonstrated a strong positive potential slack-performance relationship than those not including these controls. Again, they found that studies using lagged financial slacks did not indicate a robust positive slack-performance nexus than those employing the current year slack. Finally, this study highlighted that the essentials of further research into exploring the influencing factors affecting the slack-performance relationship.

Similarly, Gral (2013) explored the financial slack and corporate performance nexus. The study investigated the role of financial slack to boost performance during environmental turmoil (during the financial crisis, between 2007 and 2010). The result confirmed a positive potential slack and performance nexus, suggesting potential slack used as a cushion during an economic downturn or crisis. This result supported the viewpoint of the resource-based and the behavioural theories in that; firms use potential slack to improve their performance during environmental hardship. Also, Rafailov (2017) examined slack and performance nexus by using Bulgarian firms. The study confirms that potential slack served as a buffer that protects firms in an uncertain and dynamic environment. Moreover, this study implies that potential slack lessens conflicts in the firm, enhances innovations, and improves a firm's long-term growth. This study demonstrated a positive association between potential slack and performance, particularly for small firms. This study further found a weak non-linear linkage between potential slack and firm performance, suggesting that dominantly, potential slack has a positive influence on the Bulgarian firms' performance.

Using 218 U.S. listed manufacturing firms, Wiengarten, Fan, Lo, and Pagell (2017) have studied, "*The differing impacts of operational and financial slack on occupational safety in varying market conditions.*" The GMM regression result of this study found that a decline in potential slack harm workers; however, this effect declines when firms hold higher levels of potential slacks. The result implied that firms with high potential slack could better cope with increased coupling because they can quickly address problems. The result further indicated that potential slack makes a firm to be able to restore a state of reliability when external jolt trickles down the operational level. Thus, holding appropriate potential slack can reduce the negative safety implications of effort to increase efficiency.

Based on the resource-based and agency theory, S. Lee (2011) investigated how financial slack affects firm performance. The author used the FGLS regression and Granger causality test, and the result found a positive potential slack and performance association. The result thus supported the resource-based theory by finding a positive influence of potential slack on performance. Similarly, based on the behavioural and institutional viewpoints, Vanacker et al. (2017) examined slack, resource, firm performance, and the institutional context. This study proposed a country's legal frameworks that influence executives' deployment of slack resources. The result shows that potential slack improves performance at diminishing rates. The result further indicates that potential slack has a more favourable impact on the performance of firms in countries with weaker credit rights. This study finally suggested that excess potential slack enhances the performance of firms operating in countries with weaker creditor rights.

This study argued that different levels of potential slack might have various influences on firm performance. The existing literature operationali zed potential slack as a debt to equity ratio (Bourgeois III, 1981; Hailu, 2019). This kind of slack indicates the ability of a firm to secure resources with the structure of external financing—debt and equity financing. The employment of such slack resources involves the firm incurring future expenses (cost of borrowing) and, in turn, influences the firm value or performance (Geiger & Cashen, 2002).

The debt-equity ratio explained the financing decision of firms. The firm's financing decision may also affect its value. For instance, high debt-level (low potential slack) may lead to a decline in performance that ultimately brings about bankruptcy (Ukaegbu & Oino, 2014). Beside, Fama and French (2002) argued that excess debt (low potential slack) leads to higher agency costs that lower firm performance. However, as potential slack increases (i.e., a decline in a debt-equity ratio), it is difficult to imagine that undisciplined experimentation will happen since it is not currently available resources within the firm. That is, unlike high available slack, high potential slack is not exposed for unproductive (unreasonable) investment. Hence, we developed the following hypothesis.

Hypothesis 2: High potential slack has a positive relationship with firm performance, but low potential slack has a negative relationship with firm performance.

III. Data and Methods

a) Data

The source of firm-level data is the *Osiris* database. This database provides financial and non-financial data for firms in 33 African countries, among others. This database allows us to obtain necessary data related to financial slack, R&D investment, financial performance, and other control variables, such as firm size and firm growth. The source of the country-level data is the World Bank database. The World Bank database provides the bank deposit to GDP (%) and stock market capitalization to GDP (%) of countries in the world from 1960 to the present. The countries'

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annual GDP growth rate and the governance indicators (control of corruption, regularity quality, and the rule of law) are also obtained from this database.

We have passed through different steps to draw the final sample of this study. *First*, we exclude financial institutions such as banks and insurance companies by considering their slack accumulation might be unique. Therefore, the sample is drawn from the non-financial firms operating in Africa. *Second*, we exclude those firms that have no data for the last ten years, from 2007 to 2016, because this study covers ten years based on data availability. *Third*, firms with missed values of net income, total sales, total assets, current assets, current liabilities, total liabilities, equity, and R&D expenditures are excluded. The final sample thus comprises 923 firms in ten Africa countries for ten years (2007 to 2016).

This study categorized firms as high and low financial slack firms for split-sample analysis based on the level of their financial slack. The extant literature defined financial slack as a resource over the minimum requirement in the firms (Bourgeois III, 1981; George, 2005; Nohria & Gulati, 1996). However, existing literature did not explicitly determine how much is the excess slack resources in the firm. It is difficult to specify the resource above the minimum requirement of firms due to different characteristics of firms such as the industry engagement, operation, size, and age, among others.

Therefore, as far as we know, there is no standard (benchmark) to categorize financial slack as high and low. Due to the lack of such parameters in theories and existing literature, we used the regional average financial slack as a benchmark to classify firms as high and low financial slack firms. The regional average available slack and potential slack are 2.1 and 0.75, respectively (see Table 5.1). The current ratio is the measure of available slack, and an increase in this ratio indicated a rise in available slack (Bourgeois III, 1981). Therefore, we classify firms with current ratio (cr) greater or equal to the regional average (i.e., cr≥ 2.1) as "high available slack" firms and firms with current ratio below the regional average (i.e., cr $<$ 2.1) as "low available slack" firms.

The operational definition of potential slack is different from the available slack. The debt-equity ratio is the measure of potential slack. A decrease in the debt-equity ratio indicated that an increase in the potential slack and vice versa (Bourgeois III, 1981). Thus, we categorize firms with debt-equity ratio (de) below the regional average (i.e., de $<$ 0.75) as "high potential slack" firms and firms with debt-equity ratio equal to and higher than the regional average (i.e., de ≥ 0.75) as "low potential slack firms." Therefore, firms with available slack greater or equal to 2.1 and potential slack less than 0.75 are high financial slack firms. In contrast, firms with available slack less than 2.1 and potential slack greater or equal to 0.75 are low financial slack firms.

We have passed the following procedures to categorize firms as a high and low financial slack group of firms. First, we screened out firms with overlapped financial slack. By "overlapped financial slack," we mean that a single firm's available and potential slack is below and above the regional average during the study period, and it is difficult to group such firms either under a high or a low financial slack category. Thus, we excluded firms with overlapped financial slack. Second, we filtered out firms with mixed financial slack. We found a single firm with high available slack and low potential slack or low available slack and high potential slack. We, thus, used the phrase "mixed financial slack" to denote firms with high available slack and low potential slack and low available slack and high potential slack. It is also difficult to classify such firms under a high or a low financial slack group of firms because they have mixed financial slack. We are also concerned that including such firms in the split sample will mislead the result at large. We thus excluded firms with mixed financial slacks.

Based on these criteria, we dropped 393 firms from the overall sample (i.e., from a sample of 923 firms). The final sample, thus, become 530 firms comprising 212 high financial slack firms and 318 low financial slack firms. The split sample analysis, hence, is based on 212 high and 318 low financial slack firms— a total of 530 firms.

b) Sample distribution

We classified the sample across countries and industries. Table 1 presents a sample distribution. Panel 'A' of Table 1 reports a sample distribution across sample countries. A total sample of this study is 923 non-financial firms in ten African countries. Accordingly, 295 firms (32 percent) of the sample firms are Egyptian, accounted for the largest number. The second-largest, 222 firms (24 percent) of the sample are South African firms. The third-largest, 127 (14 percent), are Nigerian firms. Also, 84 firms (9 percent), 71 firms (8 percent), 52 (6 percent), and 30 firms (3 percent) of the sample are Kenyan, Moroccan, Tunisian, and Ghanaian firms. The smallest, 2 percent and 1 percent of the sample firms are Zambian and Tanzanian and Ugandan firms, respectively. Panel 'B' of Table 2 presents a sample distribution across industries. We classified industries into 12 industry groups based on the Global Industry Classification Standard (GICS). The first-largest, 151 firms (16 percent) of sample firms, are engaged in Services. The second-largest, 136 firms (15 percent) of the sample are manufacturing firms. From a total sample, 106 firms (12 percent) and 86 firms (9 per cent) are Construction and Food & Beverage firms, Trade & Investment, and Energy industries, respectively. Also, 73 firms (8 per cent), 58 firms (6 per cent), 50 firms (5 per cent), 44 (5 per cent), 35 firms (4 per cent), and 19 firms (2 per cent) of the sample firms are Transport,

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Agriculture, Media & Entertainment, Hotel & Tourism, IT & Telecom, and Health care firms respectively.

Table 1: Sample distribution

Panel A: Sample distribution across countries			Panel B: Sample distribution across industries		
Country	Number of firms	Percentage	Industry	Number of firms	Percentage
Egypt	295	32	Service	151	16
South Africa	222	24	Manufacturing	136	15
Nigeria	127	14	Construction	106	12
Kenya	84	9	Food & Beverage	86	9
Morocco	71	8	Trade &Investment	85	9
Tunisia	52	6	Energy	80	9
Ghana	30	3	Transport	73	8
Zambia	18	2	Agriculture	58	6
Tanzania	16	2	Media and Entertainment	50	5
Uganda	8	1	Hotel and Tourism	44	5
			IT and Telecom	35	4
			Healthcare	19	2
Total	923	100		923	100

c) Variables and Measurements

i. *Dependent variables*

This study used firm performance as a dependent variable. The existing literature classified firm performance as market and accounting-based performance. The use of market and accounting-based firm performance metrics has been the subject of numerous debates over the past two decades (Chakravarthy, 1986; Combs, Russell Crook, & Shook, 2005; Johnson, Natarajan, & Rappaport, 1985; Keats, 1988; Lubatkin & Shrieves, 1986; Richard, Devinney, Yip, & Johnson, 2009). To justify and promote the use of market-based performance measures, its advocates underline their advantages over accounting-based firm performance metrics. For example, Lubatkin and Shrieves (1986) argue that market-based performance incorporates all relevant information. Thus unlike accounting-based firm performance metrics, they are not limited to a single aspect of firm performance. Some scholars even openly take the shareholder perspective and propose that maximization of shareholder wealth is the ultimate criterion for the fulfilment of the firm's economic goal (Johnson et al., 1985). Besides, accounting measures are subject to managerial manipulation and distortions due to depreciation policies, inventory valuation, and treatment of specific revenue and expenditure items, differences in the methods of consolidating accounts, and outright lying and fraud (Chakravarthy, 1986).

Knowing that either accounting or market-based measures are perfect, scholars accept both of them as valid measures of a firm's financial performance (Gentry & Shen, 2010; Hoskisson, Wan, Yiu, & Hitt, 1999). Scholars generally treat accounting-based firm performance measures as a measure of past or short term financial performance and market-based measures as a measure of future or long-term performance (Hoskisson, Johnson, & Moesel, 1994; Keats, 1988). Similarly, the current study employed both the accounting-based and the market-based firm performance indicators. The widely used accounting-based performance measures return on assets (ROA) which is a ratio of net income to total assets. ROA measures the operating performance of the firm (Love & Klapper, 2002). Prior studies widely used ROA as a proxy of accounting-based firm performance metrics (Demis H., Man W., & Ali R., 2017; Demis H., Sujatha S., & Daniel T., 2017; Hailu, 2019). Mathematically, we compute the ROA as follows.

$$ROA = \frac{Net\ Income}{Total\ Assets}$$

Prior studies widely used Tobin's q as a measure of the market firm performance (Al-Matari, Al-Swidi, & Fadzil, 2014; R. C. Anderson & Reeb, 2003; Dang, Li, & Yang, 2018; Favero, Giglio, Honorati, & Panunzi, 2006; Gentry & Shen, 2010). Tobin's q plays an essential role in many financial interactions. It has been employed to explain several diverse corporate phenomena, such as a cross-sectional difference in investment (Jose, Nichols, & Stevens, 1986; Malkiel, Von Furstenberg, & Watson, 1979), the relationship between managerial equity ownership and firm value (McConnell & Servaes, 1990; Morck, Shleifer, & Vishny, 1988), the relationship between managerial performance and tender offer gain (Lang & Litzenberger, 1989), investment opportunities and tender offer responses (Lang & Litzenberger, 1989), and financing, dividend, and compensation policies (Chung, 1994; Smith Jr &

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Watts, 1992). These indicated that Tobin's q is a comprehensive market-based measure of firm performance. Consistent with existing literature(Al-Matari et al., 2014; R. C. Anderson & Reeb, 2003; Dang et al., 2018; Favero et al., 2006; Soedarmono, Trinugroho, & Sergi, 2019), we compute Tobin's q as follows.

$$\text{Tobin's q} = \frac{\text{MVE} + \text{BVD}}{\text{TA}}$$

Where MVE is market capitalization or market value of equity (the price of share*number of common shares outstanding), BVD the book value of total debt, TA is the book value of total assets.

ii. *Independent variables*

Again we need to recall that this study explored the relationship between financial slack. Thus, the independent variable is financial slack. Advocates of slack argued that financial slack allows experimentation and innovation, thereby increase profit (Barney, 1991; Cyert & March, 1963). However, proponents of slack argued that financial slack is management inefficiency and a source of the agency problem, thereby inhibits firm performance (Jensen & Meckling, 1976). These conflicting arguments motivated us to explore the relationship between financial slack and firm performance.The existing literature broadly defined financial slack as a resource over the minimum requirement in the firm (Bourgeois III, 1981; Bromiley, 1991; George, 2005; Mishina, Pollock, & Porac, 2004; Nohria & Gulati, 1996).

The existing literature further classified financial slack as available and potential slack (Bourgeois III, 1981; Geoffrey Love & Nohria, 2005; Hailu, 2019). Slack exists as financial reserves that a firm can maintain by holding cash or financial instruments. Such type of slack is unabsorbed or available slack. These reserves are not directly helpful in innovation developments that in turn, influence performance; however, they influence decisions to continue or discontinue R&D projects. This effect occurs as excess financial resources lead to less strict performance monitoring of uncertain projects.

Available slack, which is unabsorbed or currently uncommitted resources, is more easily redeployed, enabling higher managerial discretion. Strict performance monitoring can lead to new activities aborted before a firm has accumulated enough experience to know whether they will ultimately boost its performance (Lounamaa & March, 1987). The impatient assessment led by low slack is mainly damaging for R&D projects, which are vulnerable to cutbacks due to unclear performance signals that they produce (Garud & Van De Ven, 1992). On the other hand, the existence of available slack shows that management has not been utilizing such resources to expand the firm's current operation, thereby adversely affects firm performance (Mishina et al., 2004). Scholars offer useful guidelines regarding the measurement of available slack. Accordingly, the current ratio best operationalizes available slack (Bourgeois III, 1981; Greve, 2003; Hicheon Kim, Kim, & Lee, 2008; Lewis, 2013; Singh, 1986). Consistent with the previous studies, we also measure available slack by a current ratio as follows.

$$Current\ ratio = \frac{Current\ Assets}{Current\ liabilities}$$

Financial slack also exists when the firm borrows less than it potentially could borrow, which is called potential slack. The existing literature measured potential slack employing leverage ratio; debt to equity (Bourgeois III, 1981; Hailu, 2019; Justin Tan, 2003)for which increasing debt reveals decreasing potential slack levels (Bourgeois III & Singh, 1983). This kind of slack indicates the ability of a firm to secure resources with the structure of external financing — debt and equity financing. The employment of such slack resource involves the firm incurring future expense (cost of borrowing) and in turn, influences the firm value (Geiger & Cashen, 2002).

According to Ukaegbu and Oino (2014), a high debt-level (low potential slack) may lead to a decline in performance that ultimately brings about bankruptcy. Beside, Fama and French (2002) argued that excess debt (low potential slack) leads to higher agency costs, implying a negative association between debt ratio and firm performance. However, Bourgeois III (1981) argued that a decrease in the debt-to-equity ratio (high potential slack) shows lower future interest payment that reduces the possibility of creditors to affect management. Consistent with existing literature, we employed a leverage ratio as a measure of potential slack in this study. Mathematically, we computed the potential slack as follows.

$$Potential\ slack = \frac{Debt}{Equity}$$

d) Control variables

i. *Selling and general administrative expenses (sgaes)*

The selling and general administrative expenses should move proportionately with the firm's revenue. An increase in the ratio of selling and general administrative expense to sales between two periods shows a negative signal about future profitability and firm value (M. Anderson, Banker, Huang, & Janakiraman, 2007). More importantly, the ratio of selling and general administrative expense is a measure of operating efficiency. An increase in the ratio reveals management inefficiency and inability to control the costs and vice-versa. Such inefficiency possibly adversely affects firm performance. Thus, this study controlled the selling and general administrative expense to sales ratio in this study. Consistent with prior studies (B.-N. Kim et al.,

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2017; C. L. Lee & Wu, 2016; Murro, Teixeira, Beuren, Scherer, & Lima, 2016; Stan et al., 2014), we used the selling and general administrative expense scaled by sales in this dissertation.

$$\text{sgaes} = \frac{Selling\ and\ General\ adminstrative\ expenses}{Sales}$$

ii. *Firm growth*

We control firm growth in our study because of the following reasons. First, firm growth is closely associated with its survival. Thus, firms experiencing continuous growth will have a higher chance of surviving in the market. Unless the firm is survived, performance and innovation are unthinkable. *Second,* firm growth is a way to introduce innovation and is a knowledge of technological change that influences performance. For instance, if a company needs to grow and survive in a competitive business, it requires to integrate new technologies to be more efficient and competent (Pagano & Schivardi, 2003). In this viewpoint, growth is a challenge a firm must encounter by introducing innovation. Third, firm growth might influence the accumulation of financial slack resources.

More growing firms may use a resource available for development or innovation purpose so that they might end the period with little slack resources. Firm growth is measured in two ways—sales growth and employment growth. Consistent with previous studies (Coad & Hölzl, 2012; Hölzl, 2009; Vickers & Lyon, 2014), we computed sales growth as a disparity between current period sales and previous period sales scaled by previous period sales of firms. We calculated employee growth the same as we did for sales growth.

$$\text{Sales growth (firm)} = \frac{Sales_t - Sales_{t-1}}{Sales_{t-1}}$$

$$\text{Employee growth (employee)} = \frac{Employee_t - Employee_{t-1}}{Employee_{t-1}}$$

iii. *Firm size (size)*

The existing literature widely emphasized the influence of firm size on performance (Aduralere Opeyemi, 2019; Hedija, 2015; J. Lee, 2009; Lopez-Valeiras, Gomez-Conde, & Fernandez-Rodriguez, 2016; Lun & Quaddus, 2011; Olawale, 2017; Y.H. Venus Lun, 2011). The central question address by these studies is whether firm size matters. Results of those studies implied that large firms have huge sales that portion of it used to invest in R&D. Studies further suggested that large firms can access finance for risky R&D projects, thereby maintain higher performance (Nooteboom & Vossen, 1995).

However, Counterarguments are that large firms may become bureaucratic and less efficient, thereby adversely affects firm performance. For instance, Hedija (2015) found that small firms grow faster than their counterparts. Similarly, Olawale (2017) found that firm size in terms of total assets has a negative influence on the firm's financial performance. Due to these arguments, we decided to control firm size in this study. Like previous studies (Aduralere Opeyemi, 2019; J. Lee, 2009; Lopez-Valeiras et al., 2016; Lun & Quaddus, 2011), we employed the natural logarithm of total asset of firms as a measure of firm size.

iv. *R&D investment*

In today's global competition, there is a general agreement that innovation is critical for a firm's competitiveness and superior performance. The R&D investment decision made today influences a firm's growth, competitiveness, and performance in the future. In most of the cases, firms that spend heavily in R&D are more likely to be profitable and successful. Hay (1979) argued that high investment in R&D is generally a high-risk-high-return strategy that is more attractive to shareholders in expectation of better financial performance. This argument implied that emphasizing on R&D may boost a firm's competitive advantage and thus, may improve the firm's ability to gain better performance in the marketplace.

Moreover, empirical studies found a positive association between R&D investment and firm performance (Adeyeye, Jegede, & Akinwale, 2013; Cho, Lim, Kwon, & Sung, 2008; Ehie & Olibe, 2010; Gui-long, Yi, Kai-hua, & Jiang, 2017; Guo, Wang, & Wei, 2018; Hyojoon Kim, Kim, & Cho, 2014; Usman, Shaique, Khan, Shaikh, & Baig, 2017). The result of these studies implied that R&D investment favourable influenced firm performance. However, there are cases in which R&D investment adversely affect a firm's performance. According to investment theory, R&D investment is different from ordinary investment. First, most of the expenditure (except new capital equipment expenses), comprises of wages and salaries of well-educated scientists and engineers.

According to Hall (2010), in practice, 50 per cent of R&D investment is the wages and salaries of those scientist and engineers. We argued that this figure might exceed 50 per cent in the context of Africa. Because most of the time, such scientists and engineers who engaged in complex R&D activities are expatriates. The payment for such expatriates is enormous; that is why we believed that more than 50 percent of R&D investment might go to the payment of scientists and engineers in Africa. Thus, R&D investment may inhibit firm performance in Africa. Prior studies also found an adverse effect of R&D investment on firm performance

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(Cui & Mak, 2002; Hsu & Boggs, 2003; Vithessonthi & Racela, 2016). We compute R&D investment as follows.

$$R\&D\ investment\ (rds) = \frac{R\&D\ expenditure}{Sales}$$

v. *Banking sector and stock market development*

Financial development encompasses enhancements in such functions provided by financial systems like (1) pooling of saving; (2) allocating capital to productive investment; (3) monitoring those investments; and (4) risk diversification (Levine, 2005). These functions can impact saving and investment decision and efficiency. Moreover, financial development reduces asymmetric information, agency problem, financial constraints, promote risk-sharing, and enhance the ability of the financial system to absorb shocks. Furthermore, the well-functioning financial system help firms access external finance, thereby improves their performance. In particular, we argued that a well-functioning banking sector boosts firm performance by providing the required sources of debt financing. Similarly, stock markets offer platforms for equity financing that eliminates firms financing constraints. Summing up, by providing external finance, diversifying risk, providing symmetric information, and reducing agency problems, well-functioning banking sector and stock market promote firm performance.

The banking sector development predominantly measured by the bank deposit to the percentage share of the country's gross domestic product (GDP). Bank deposit to a percentage share of GDP measures the size (depth) of the banking sector development, among others (Beck, Demirgüç-Kunt, & Levine, 2000, 2009; Beck, Demirgüç-Kunt, & Levine, 2010; Cihak, Demirgüç-Kunt, Feyen, & Levine, 2012). Bank deposit to a percentage share of GDP is the ratio of all checking, savings, and time deposits in banks relative to GDP (Beck et al., 2009; Beck et al., 2010; Cihak et al., 2012). Consistent with previous studies of Hailu (2019) and Beck et al. (2010), we thus measured the banking sector development as the bank deposit to GDP. We computed the bank deposit to GDP as follows.

$$Bank\ deposit\ to\ GDP\% = \frac{Bank\ \ deposit}{GDP} * 100$$, where bank deposit is demand, time, and saving deposits

Stock market capitalization (stock market cap) to a percentage share of GDP, among others, measures the size of stock market development (Bayraktar, 2014; Beck et al., 2000; Demirgüç-Kunt & Levine, 1996). Following Demirgüç-Kunt and Maksimovic (1996) and Hailu (2019), we used the ratio of stock market capitalization to a percentage share of GDP as a measure of the stock market development in this study.

$$Market\ capitalization\ to\ GDP\% = \frac{Stock\ market\ capitalization}{GDP} * 100$$

vi. *Economic growth*

Studies empirically suggested that changes in the economic situation have influenced performance and investment decision of firms operating there. Studies further argued that business success and economic conditions are highly linked (Barrot & Sauvagnat, 2016; Bernile, Delikouras, Korniotis, & Kumar, 2017; Giroud & Mueller, 2017). As our study emphasized a cross country investigation, we believed that the economic growth of individual countries could influence the firm performance. Firms in better economic growth may be more profitable than firms in relatively lower economic growth. Therefore, we argued that it is essential to control the economic growth of countries in a study like ours. We used an annual GDP growth rate of sample countries based on constant 2010 U.S dollars (the World Bank computation of annual GDP growth rate).

vii. *Governance indicators*

Since the 1990s, studies have given attention to 'good governance' as both a means of achieving development and development objectives in itself. The World Bank has defined 'good governance' as "*epitomized by expected, open and enlightened policy-making; a bureaucracy imbued with a professional ethos; an executive arm of government accountable for its actions; and a strong civil society participating in public affairs; and all behaving under the rule of law*"(Talvitie, 1994). Because of the growing demand for the measure of the quality of governance, numbers of aggregate governance indicators have been produced, such as World Bank's Worldwide Governance Indicators which are, for instance, political stability and violence, government effectiveness, the rule of law, and control of corruption. The effectiveness of government is intended to serve the interest of the general population, and the cooperation among public and private sectors is crucial for ensuring the betterment of the society and business. On the one hand, the public and the private sectors are depending on each other to operate efficiently and to attain their objectives; thus the public sector could facilitate, via a suitable controlling mechanism and regulatory framework, the effectiveness of the business sector.

On the other hand, the private sector's output could provide a basis for public sector serve the economic health of a country (BOȚA-AVRAM, 2014). In this viewpoint, the business performance should represent the concern of government and the public

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sector, and the primary interest of government must be more accessible business regulations, given the relevance of business outputs for public sectors. Studies also confirm that effective governance influences the effectiveness of business environments (BOȚA-AVRAM, 2014).

There are six world-wide governance indicators— (1) voice and accountability, *(2)* political stability and absence of violence, (3) regulatory quality, (4) government effectiveness, (5) control of corruption, and (6) the rule of law. These indicators have similar measurements ranging from -2.5 (indicating weak governance) to 2.5 (indicating good governance). Due to such similarity, these indicators have higher collinearity with each other. To avoid severe collinearity among the indices, we controlled only three less correlated, namely control of corruption, the rule of law, and regulatory quality. Thus, we explained only these three indicators in this part. Control of corruption captures the perception over the Control of Corruption, including various forms of public power exercises for illegally private gains like additional payments to get things done, but also its negative influences on the business environment. The rule of law estimates the extent to which the public and citizens have confidence in and abide by the rules of society, including the effectiveness of the judiciary system and the security of property right. Regulatory quality evaluates the effects of policies which are perceived as market-unfriendly, such as price controls or inadequate bank supervisions, or excessive regulation which might affect business growth.

We argued that these specific governance indicators have effects on firm-specific performance. In general, it has been accepted that good governance leads to sustainable firm performance. We also argued that these governance indicators influence African firms' performance. The influence of good governance on firms' business success is undoubtful. Good governance indicates fair regularity frameworks, accountability, and transparent policy-making that possibly have a strong favourable impact on firms' business success and sustainability (Ngobo & Fouda, 2012). Besides, good governance ensures a framework of good rules that enhances business success (BOȚA-AVRAM, 2014). We summarize the measurements of these indices in Table 2.

Table 2: Variables and measurements

Variables	Indicator	Measurement
Dependent variables (Firm performance)	Tobin's q	$\text{Tobin}'s\,q = \frac{\text{MVE} + \text{BVD}}{\text{TA}}$
	Return on Assets (ROA)	$\frac{\text{Net Income}}{\text{Total Assets}}$
Independent variables (Financial Slack)	Available slack (cr)	$\frac{\text{Current Assets}}{\text{Current liabilities}}$
	Potential slack (de)	$\frac{\text{Debt}}{\text{Equity}}$
Firm-level control variables	R&D investment (rds)	$\frac{R\&D\ expenditure}{\text{Sales}}$
	Selling general and administrative expense to sales (sgaes)	$\frac{\text{Selling General and Adminstrativeexpenses}}{\text{Sales}}$
	Sales growth (firm)	$\frac{\text{Sales}_t - \text{Sales}_{t-1}}{\text{Sales}_{t-1}}$
	Employment growth (employee)	$\frac{\text{Employee}_t - \text{Employee}_{t-1}}{\text{Employee}_{t-1}}$
	Firm size (size)	Log total assets
Country-level control variables	Banking sector development (bdgdp)	$\frac{\text{Bank deposit}}{\text{GDP}} * 100$
	Stock market development (stmktgdp)	$\frac{\text{Stock market cap}}{\text{GDP}} * 100$
	Economic growth (gdp)	Annual GDP growth rate (%)
	Control of Corruption (CC)	from -2.5 (weak) to 2.5 (strong) governance
	The rule of law (RL)	from -2.5 (weak) to 2.5 (strong) governance
	Regulatory quality (RQ)	from -2.5 (weak) to 2.5 (strong) governance

viii. *Econometric models and estimation techniques*

We specified model 1 to test *hypotheses 1 and 2*.

$$Tobin's\ q_{ij,t}(ROA_{ij,t}) = \alpha + \beta_1 cr_{ij,t} + \beta_2 de_{ij,t} + \beta_3 SGAES_{ij,t} + \beta_4 rds_{ij,t} + \beta_5 size_{ij,t} + \beta_6 firm_{ij,t} + \beta_7 employee_{ij,t} + \beta_8 bdgdp_{j,t} + \beta_9 stmktgdp_{j,t} + \beta_{10} gdp_{j,t} + \beta_{11} CC_{j,t} + \beta_{12} RQ_{j,t} + \beta_{13} RL_{j,t} + \mu + \delta + \theta + \varepsilon \quad \text{(1)}$$

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Where $Tobin's\ q_{ij,t}$ and $ROA_{ij,t}$ are the firm performance of firm i, in a country j and time$t$, $cr_{ij,t}$ and $de_{ij,t}$ are available slack and potential slack of firm i, in a country j, at time$t$, $SGAES_{ij,t}$ is selling general and administrative expense to sales ratio of firm i, in a country j, at time t, $rds_{ij,t}$ is R&D investment of firm i, in a country j, time t, $size_{ij,t}$ is the size of firm i, in a country j, at time t, $firm_{ij,t}$ is the firm's sales growth of firm i, in a country j, at time t, $employee_{ij,t}$ is employment growth of firm i, in a country j, at time t, $bdgdp_{j,t}$ is banking sector development of country j at time t, $stmktgdp_{j,t}$ is stock market development of country j at time t, and $gdp_{j,t}$ is an annual GDP growth rate of country j at time t, $CC_{j,t}$ is control of corruption of country j at time t, $RQ_{j,t}$ is regularity quality of country j at time t, $RL_{j,t}$ is the rule of law of country j at time t, β_1 to β_{12} are coefficients and $\mu, \delta, and\ \theta$ are country, industry, and year fixed effects respectively and ε error term, and α is constant.

We employed the robust Ordinary Least Square (OLS) regression model following Hausma fixed-random specification and Breusch-Pagan Lagrange multiplier (LM) tests. While Hausman fixed-random specification test suggested that a fixed effect model is not appropriate, the Breusch-Pagan Lagrange multiplier (LM) test suggested that OLS is superior over the random effect model. The Breusch-Pagan / Cook-Weisberg test (*chi2 (1) = 30642.05, Prob > chi2 = 0.0000*) suggested that there exists a heteroscedasticity problem. To handle sucha problem, we employed a robust OLS regression model based on the suggestions of statisticians (Wilcox & Keselman, 2004). We further employed the two-step system GMM regression model as a robustness check.

IV. Results

a) Descriptive statistics

We employed descriptive statistics of variables across countries and levels of financial slack. Panel a of Table 3 presents the descriptive statistics across countries, whereas Panel B of Table 3 reported the descriptive statistics of high and low financial slack firms.

While Ugandan and Tanzanian firms report the highest average ROA of 0.15, the highest average ROE of 0.65 is reported by Moroccan firms. Again, Ugandan firms reported the highest average Tobin's q of 1.74 while the lowest Tobin's q is reported by Tanzanian (Tobin's q=0.81), Egyptian (Tobin's q=0.85), and Nigerian (Tobin's q=0.88) firms. The highest average market cap of 5 also reported by Ugandan and Tanzanian firms. In terms of all performance measures, Ugandan firms are found more performing firms compared with other firms in other countries. Overall, African firms reported an average ROA, ROE, Tobin's q, and a market cap of 0.06, 0.54, 1.01, and 3.86, respectively.

The highest (2.42) and the lowest (1.82) average available slack is reported by South African and Ghanaian firms, respectively. Again, the average potential slack ranges from 1.26 by South African firms to 0.036 by Tanzanian firms. These figures indicated that there exists a heterogeneous potential slack across countries. For instance, firms in South Africa have more available slack but have little potential slack compared with firms in other countries. Overall, African firms reported available slack and potential slack of 2.1 and 0.75, respectively.

African firms, overall, reported an average R&D investment (rds) of 0.009, which is less than 1 per cent. Across countries, the average R&D investment ranges from 0.02 by Zambian firms to 0.00002 by Nigerian, Kenyan, and Ugandan firms from 2007 to 2016. The average selling general and administrative expense to sales ratio range from 0.616 in Ghanaian firms to 0.24 in Ugandan firms, indicating there exist a heterogeneous selling general and administrative expense to sales ration across African countries. While Nigerian firms are found to be more growing firms (sales growth of 0.93), Tunisian firms are less growing firms (sales growth of 0.04) for the last ten years. Firm-level employment growth has shown expansion and contraction in Africa. Tunisian firms reported the highest average employment growth of 0.89. However, employment growth has shown contraction in Egypt and Nigeria, with an average growth rate of -0.18 and 0.68, respectively. This contraction in employment by Egyptian and Nigerian firms might have two implications. First, firms in these countries may become more technology intensives than labour-intensive. Second, we have also found that Egyptian and Nigerian firms are the least performing firms both in accounting and market-based performance; hence, their business is contracting, so does the employment. Nigerian firms are larger, with an average logarithm of total assets of 5.87, while Tanzanian firms are smaller, with an average logarithm of total assets of 0.42. The overall average logarithm of total assets is 4.03.

The average bank deposit to GDP ranges from 82.87 in Morocco to 14.33 in Uganda. The average stock market development again ranges from 64.03 in Morocco to 3.92 in Tanzania. This depicted that Morocco has a relatively well-developed banking sector and the stock market. Contrarily, while Uganda is behind in banking sector development, Tanzania left behind in stock market development from other African countries. The continent reported an average banking sector and stock market development of 52.19 and 32.86, respectively, during the study period. While Ghana is the fastest growing economy with an average annual GDP growth rate of 6.8, South Africa is the slowest growing

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economy with an average annual GDP growth rate of 2.17. On average, Africa reported an average GDP growth rate of 3.99 during the last ten years (2007-2016).

Countries such as Nigeria, Uganda, Kenya, and Egypt suffer from a relatively high level of corruption with an average control of corruption index of -1.098, -0.962, -0.990, and -0.653, respectively. However, South Africa has the strongest average control of corruption of 0.075, indicating South Africa strongly fights corruption. The regulatory quality is relatively the worst in Nigeria, Egypt, and Zambia, with an average index of -0.78, -0.482, and -0.474, respectively. However, there exists a positive, relatively strong regulatory quality in South Africa and Ghana with an average index of 0.375 and 0.018, respectively. The rule of law is relatively the worst again in Nigeria, Kenya, Egypt, and Zambia, with an average index of -1.08, -0.77, -0.397, and -0.376, respectively. However, the rule of law is relatively strict in South Africa and Ghana, with an average index of 0.124 and 0.029, respectively. This implied that while the extent to which citizens have confidence in abiding by the rule of law is weak in Nigeria, Kenya, Egypt, and Zambia, it is strong in South Africa and Ghana. The average control of corruption, regulatory quality, and the rule of law of all sample countries are -0.513, -0.254, and -0.35, respectively.

In conclusion, while South Africa and Ghana have relatively good governance, Nigeria, Egypt, and Kenya have weak governance. On the other hand, eight out of ten countries have given a negative governance score for the last ten years. This implied that governance, in the region, is very weak.

On average, high financial slack firms reported an average available slack (cr) and potential slack (de) of 3.8174 and 0.2436, respectively. Low financial slack firms reported an average available slack and potential slack of 1.1598 and 2.1809, respectively. This indicated that while high financial slack firms have high current assets and low debts, low financial slack firms have low current assets and high debts. High financial slack firms reported better market and accounting firm performance than their counterparts during the study period. The average Tobin's q and market cap of high financial slack firms are 2.4754 and 4.02, respectively. The average ROA and ROE of high financial slack firms are 2.5296 and 0.9086, respectively. However, low financial slack firms reported an average of Tobin's q and a market cap of 1.0360 and 3.6555. These firms also reported an average ROA and ROE of 0.0878 and 0.6759. These figures show that high financial slack firms are performing better than low financial slack firms.

High financial slack firms have higher R&D investment as compared to their low counterparts. An average R&D investment of high financial slack during the study period is 0.0097 (0.97 %). However, an average R&D investment of low financial slack firms is only 0.0005 (0.05 %). This implied that firms with high current assets and low debts have better engagement in R&D projects than low financial slack firms. High financial slack firms reported average logarithm total assets of 5.8807, while the low financial slack firms reported average logarithm total assets of 2.8561. This indicated that large firms have high current assets and little debts as compared to their low counterparts.

High and low financial slack firms have approximately equal selling general and administrative expense to sales ratio. On average, high financial slack and low financial slack reported the selling general and administrative expense to sales ratio of 0.1831 and 0.1895, respectively. This figure does not indicate that high and low financial slack firms have the same selling general and administrative expenses. Instead, it shows that the selling general and administrative expense in proportion to the sales of high and low financial slack is almost the same. High financial slack reported better sales growth than their low counterparts. High and low financial slack firms reported an average sales growth of 2.0246 and 0.6603, respectively. This shows that high financial slack firms are more growing firms than low financial slack firms.

While high financial slack firms reported the average employment growth of 0.6985, low financial slack firms reported average employment growth of -0.2546. These figures show that while high financial slack recorded positive employment growth, low financial slack firms reported a contraction in employment growth. This might indicate two facts. First, low financial slack firms might be more technology intensives, and the demand for human capital declines through time. Second, low financial slack firms are low performing firms (they reported low performance); hence, their business is contracting, so does their employment.

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Table 3: Descriptive statistics across countries

	Panel A: Descriptive statistics across countries											Panel B: Descriptive statistics across subsamples	
Variables	Egypt	Ghana	Kenya	Morocco	Nigeria	South Africa	Tanzania	Tunisia	Uganda	Zambia	All countries	High financial slack	Low financial slack
ROA	0.060 (0.100)	0.0440 (0.100)	0.054 (0.120)	0.070 (0.067)	0.060 (0.100)	0.053 (0.240)	0.150 (0.190)	0.050 (0.110)	0.150 (0.210)	0.070 (0.100)	0.060 (0.140)	2.5296 (2.7379)	0.0878 (0.7248)
ROE	0.500 (0.350)	0.550 (0.620)	0.450 (0.290)	0.650 (0.730)	0.380 (0.400)	0.430 (0.570)	0.450 (0.400)	0.510 (0.660)	0.440 (0.420)	0.410 (0.240)	0.540 (1.430)	0.9086 (22.0038)	0.6759 (2.3437)
Tobin's q	0.850 (0.990)	1.050 (0.942)	0.981 (1.407)	0.940 (1.150)	0.880 (1.910)	1.350 (6.230)	0.810 (0.700)	0.940 (0.970)	1.740 (2.080)	0.857 (1.003)	1.010 (3.260)	2.4754 (27.8263)	1.0360 (4.9636)
Market cap	3.180 (2.590)	4.300 (1.930)	4.470 (2.530)	4.740 (1.720)	2.610 (2.980)	4.830 (2.560)	5.050 (3.910)	3.640 (2.150)	5.100 (2.950)	3.740 (2.430)	3.860 (2.705)	4.0207 (2.5860)	3.6555 (2.8406)
cr	2.330 (4.540)	1.820 (1.753)	1.950 (2.2)	1.870 (1.060)	1.290 (0.950)	2.420 (7.620)	1.910 (1.010)	2.000 (1.730)	0.500 (0.250)	2.000 (1.950)	2.100 (4.700)	3.8174 (1.7673)	1.1598 (0.4426)
de	0.970 (3.740)	0.071 (0.160)	0.045 (0.138)	0.350 (0.750)	0.640 (16.910)	1.260 (1.840)	0.036 (0.040)	0.270 (0.770)	0.150 (0.230)	0.090 (0.470)	0.750 (6.700)	0.2436 (0.2054)	2.1809 (1.9065)
sgae	0.153 (2.163)	0.616 (4.691)	0.269 (0.497)	0.176 (0.186)	0.260 (0.250)	0.310 (1.93)	0.270 (0.190)	0.250 (0.240)	0.240 (0.080)	0.270 (0.150)	0.240 (1.730)	0.1831 (2.2025)	0.1895 (0.2381)
rds	0.010 (0.100)	0.003 (0.018)	0.00002 (0.0002)	0.0003 (0.0053)	0.00002 (0.00018)	0.017 (0.120)	0.0001 (0.0004)	0.0004 (0.0013)	0.0000 (0.00013)	0.020 (0.170)	0.009 (0.086)	0.0097 (0.0742)	0.0005 (0.0034)
size	5.160 (1.300)	1.151 (4.072)	0.490 (0.259)	0.500 (0.190)	5.870 (1.300)	5.810 (1.770)	0.420 (0.220)	0.530 (0.480)	0.520 (0.300)	0.430 (0.230)	4.030 (2.710)	5.8807 (1.2255)	2.8561 (2.6956)
firm	0.900 (1.3)	0.07 (0.536)	0.061 (0.110)	0.070 (0.065)	0.930 (0.690)	0.730 (2.240)	0.200 (0.160)	0.040 (0.090)	0.070 (0.072)	0.130 (0.150)	0.610 (1.380)	2.0246 (52.3860)	0.6603 (19.6356)
Employee	-0.180 (0.390)	0.580 (5.789)	0.850 (1.436)	0.740 (2.960)	-0.680 (0.470)	0.050 (0.610)	0.850 (1.150)	0.890 (0.840)	0.880 (1.820)	0.800 (4.170)	0.101 (1.740)	0.6985 (15.5908)	-0.2546 (0.7147)
bdgdp	64.670 (7.130)	20.914 (2.203)	37.954 (2.861)	82.870 (4.240)	20.730 (5.760)	59.960 (2.050)	18.090 (0.650)	51.000 (3.980)	14.330 (1.620)	18.170 (1.110)	52.190 (20.050)		
stmktgdp	40.100 (24.70)	7.839 (0.826)	30.678 (5.017)	64.030 (14.050)	17.750 (9.730)	32.500 (10.790)	3.920 (0.280)	18.550 (3.470)	20.770 (5.830)	13.380 (0.860)	32.860 (20.840)		
gdp	4.190 (1.84)	6.844 (3.195)	5.229 (2.091)	3.870 (1.280)	4.98 (2.62)	2.170 (1.750)	6.700 (1.040)	2.770 (2.170)	6.130 (1.990)	6.520 (2.340)	3.990 (2.400)		
CC	-0.653 (0.077)	-0.082 (0.085)	-0.990 (0.070)	-0.308 (0.099)	-1.098 (0.112)	0.075 (0.126)	-0.580 (0.157)	-0.146 (0.102)	-0.962 (0.096)	-0.383 (0.068)	-0.513 (0.404)		
RQ	-0.482 (0.288)	0.018 (0.113)	-0.244 (0.079)	-0.140 (0.060)	-0.780 (0.089)	0.375 (0.092)	-0.407 (0.053)	-0.191 (0.198)	-0.213 (0.034)	-0.474 (0.033)	-0.254 (0.324)		
RL	-0.397 (0.216)	0.029 (0.073)	-0.770 (0.239)	-0.198 (0.079)	-1.088 (0.073)	0.124 (0.035)	-0.434 (0.068)	-0.027 (0.111)	-0.359 (0.046)	-0.376 (0.111)	-0.350 (0.371)		

Note: This Table reported the descriptive statistics across countries based on the overall sample and levels of financial slack based on subsamples. The overall sample and the subsample comprises 923 firms and 530 firms, respectively. The standard deviation is in parenthesis. cr is available slack, de is potential slack, sgaes is selling general and administrative expense to sales ratio, rds is R&D investment, size is firm size, firm is firms' sales growth, employee is firms' employment growth, bdpgdp is the banking sector development, stmktgdp is the stock market development, gdp is annual GDP growth rate, CC is control of corruption, RQ is regularity quality, RL is the rule of law

b) Correlation analysis and multicollinearity test

Table 4 reported the descriptive matrix and multicollinearity test. Panel A of Table 4 reported the correlation matrices and Panel B of Table 4 reported the multicollinearity test using the Variance Inflation Factor (VIF). The highest correlation coefficients, in our study, are 0.688, 0.581, 0.547, and 0.529, which are the correlation between the rule of law and control of corruption, the rule of law and regularity quality, banking sector and stock market development, and regularity quality and control of corruption, respectively. The correlation coefficient between available slack and selling general and administrative expense to sales ratio is -0.011. The negative coefficient implied that an increase in selling general and administrative expense leads to a decline in the available slack, The correlation between potential slack and available slack is -0.131indicating an increase in the available slack leads

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to a decrease in debt-level (an increase in potential slack). This also implied that firms with available slack might accumulate more potential slack because such firms tend to use their internal finance for their investment. Similarly, GDP is negatively (r=-0.080) and positively (r=0.221) correlated with the banking sector and the stock market development.

Variance Inflation Factor (VIF) is employed to detect the presence of multicollinearity problem. The rule of thumb —most commonly the rule of 10 (associated with the VIF) is a sign of severe multicollinearity problem. This rule appears in both statistical articles and advanced textbooks (Miles, 2014). When VIF reaches this threshold value (VIF ≥ 10), it indicates that there exists a severe multicollinearity problem. Control of Corruption (CC) and the rule of law (RL) have the highest VIF of 6.82 and 6.3, respectively. However, these VIFs are lower than the threshold value of 10. The rest VIFs are reasonably small. This implied that our model is free from multicollinearity problem, and thus, all variables are retained in the model.

Table 4: Correlation analysis

	Panel A: correlation analysis													Panel B: Multicollinearity test	
	1	2	3	4	5	6	7	8	9	10	11	12	13	VIF	1/VIF
cr	1													1.04	0.958046
de	-0.131	1.000												1.13	0.886865
rds	-0.032	-0.073	1.000											1.1	0.912241
sgaes	-0.011	-0.010	0.140	1.000										1.09	0.917975
size	-0.078	0.313	-0.222	-0.014	1.000									1.32	0.755053
firm	0.058	0.070	-0.096	-0.038	0.272	1.000								1.09	0.917671
employee	0.022	-0.243	-0.026	-0.073	-0.667	-0.193	1.000							1.0	0.995309
bdpgdp	0.090	0.021	0.042	0.126	0.072	0.027	0.070	1.000						3.06	0.326806
stmktcgdp	0.046	0.006	0.019	0.121	0.004	0.007	0.077	0.547	1.000					3.4	0.294513
gdp	-0.024	-0.059	-0.019	0.072	-0.219	-0.068	0.094	-0.080	0.221	1.000				1.38	0.722783
CC	0.066	0.022	0.080	-0.092	0.111	0.034	0.176	0.310	0.057	-0.356	1.000			6.82	0.146637
RQ	0.047	-0.004	0.068	-0.124	0.037	0.012	0.270	0.392	0.276	-0.228	0.529	1.000		3.67	0.27229
RL	0.071	-0.012	0.081	-0.042	0.073	0.026	0.227	0.432	0.274	-0.246	0.688	0.581	1.000	6.36	0.157269
Mean VIF														2.5	

This Table reported the correlation analysis and the Variance Inflation Factor (VIF). Panel A reported the correlation analysis while Panel B reported the Variance Inflation Factor (VIF). Where cr is available slack, de is potential slack, sgaes is selling general and administrative expense to sales ratio, rds is R&D investment, size is firm size, firm is firms' sales growth, employee is firms' employment growth, bdpgdp is the banking sector development, stmktgdp is the stock market development, gdp is the annual GDP growth rate, CC is control of corruption, RQ is regularity quality, and RL is the rule of law

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c) Regression Results

Table 5 reported the relationship between financial slack and firm performance. Panel A of Table 5presented the slack-performance nexus using the overall sample of 923 African firms. This sample encompasses all firms with mixed, overlapped, high, and low financial slack. The result shows that the association between available slack (cr) and Tobin's q is negative and statistically significant at 10 percent (*r=-0.002*, *p=0.061*), and the relationship between available slack (cr) and ROA is negative and statistically significant at 1 percent (*r=-0.01, p=0.001*). The result also shows that the relationship between potential slack and Tobin's q is positive and statistically significant at 1 percent (*r=-0.014, p=0.007*) and the correlation between potential slack and ROA is positive and statistically significant at 1 percent (*r=-0.02, p=0.000*). These negative coefficients show an increase in potential slack (i.e., a decline in debt-equity) boosts firm performance (Tobin's q and ROA).

In conclusion, while available slack has a significant negative association with firm performance, potential slack has a significant positive relationship with firm performance. This result is consistent with agency and resource-based theories and empirical studies. The agency and resource-based theories broadly assumed the negative and the positive relationship between financial slack and firm performance, respectively. Prior studies further confirmed both negative and positive association between financial slack and firm performance (Altaf & Shah, 2017; De Carolis et al., 2009; George, 2005; B.-N. Kim et al., 2017; S. Lee, 2011; Wan & Yiu, 2009).However, this result is very vague. It does not show which level of financial slack (high or low financial slack) has a positive or negative association with firm performance. We argued that the vagueness of this result masks the real picture of slack-performance nexus. Considering the ambiguity of the result reported in Panel A of Table 5, we did a split sample analysis. We argued that this analysis would possibly unmask the real picture of the slack-performance nexus.

To avoid these ambiguous results, we breakdown the overall sample into subsamples using the regional average financial slack, as explained in the methodology. The final subsample includes 530 firms (i.e., 212 high and 318 low financial slack firms). Before running the regression, we run an independent t-test to evaluate if there is a significant difference between these high and low financial slack firms. The test demonstrates significant differences between the two groups of firms — high available slack firms (M=3.8, SD=3.6) and low available slack firms (*M= 1.2, SD=0.6*), *t = -41, Pr (T >t) =0.0000* and high potential slack firms (*M= 0.24, SD=0.47*), and low potential slack firms (*M= 2.2, SD=2.6), t = 34, Pr (T >t) =0.0000* In short, there is a significant difference between the groups of high and low financial slack firms (i.e., high financial slack firms have significantly higher average financial slack as compared to low financial slack firms). This difference allows us to run a split sample analysis.

Panel B and Panel C of Table 5reported the split sample analysis results. While Panel B reported the relationship between high financial slack and firm performance, Panel Creported the relationship between low financial slack and firm performance. The result is interesting. The split sample analysis unmasked the real picture of slack-performance nexus. High available slack (cr) is negatively and strongly associated with Tobin's q (*r=-0.023, p=0.000*) and negatively and significantly correlated with ROA (*r=-0.024, p=0.000*). However, low available slack has a positive strong association with Tobin's q (*r=0.1379, p=0.001*) and significant positive relationship with ROA (*r=0.023, p=0.009*). High potential slack (de) has strong positive relationship with Tobin's q (*r=-0.036 p=0.003*) and significant positive association with ROA (*r=-0.11 p= 0.000*). However, low potential slack has an insignificant negative association with Tobin's q (*r=0.0028, p=0.681*) and ROA (*r=0.00001, p=0.987*). We have to note that the negative coefficient between potential slack and firm performance indicated a positive relationship and vice versa.

The result clearly shows that agency theory provides a strong prediction when dealing with high available slack. Agency theory (Jensen & Meckling, 1976) argued that the availability of slack is a waste incurred by an agent's pursuit of own interests, apathy, and incompetence, which is more harmful for an organization than a buffer. This theory further argued that slack is a source of agency problem and exists due to management inefficiency. Moreover, available slack hinders firm performance by promoting imprudent R&D activities that hardly maintain performance (Jensen & Meckling, 1976; Leibenstein, 1969). It also encourages unreasonable investment by management in personal projects (Leibenstein, 1969; Nohria & Gulati, 1996) and worsen the motivation to capture new opportunities (Tseng, Tansuhaj, Hallagan, & McCullough, 2007). More generally, agency theory argued that available slack is a signal in the overall value of a firm and inefficiency that must be eliminated (Jensen & Meckling, 1976; Nohria & Gulati, 1996).

This result also supported our argument in developing hypothesis 1. We argued that the accumulation of high available slack will leads to agency problem in African firms due to the presence of weak governance and underdeveloped financial system in the region. In Africa, maintaining good governance is challenging due to lack of transparency, lack of adequate regulatory and institutional frameworks, and lack of market discipline (Rossouw, 2005). More importantly, the descriptive statistics of this study shows

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that except South Africa and Ghana, other sample African countries have very weak governance indexes (control of corruption, the rule of law and regulatory quality) for the last ten years (2007 to 2016). This implied there exists weak governance, and maintaining good governance remains the big challenge of the region.

Besides, the financial system development in the region is left behind the rest of the world (Hailu, 2019). We tried to compare the African banking sector and stock market development with Asia's, European's, and the world's banking sector and the stock market. Astonishingly, both the banking sector and the stock market development in Africa is even below the world average banking and stock market development for the last 55 years (1961 to 2016). The region is very far from Europe and Asia in the banking and the stock market development. The combinations of weak governance and underdeveloped financial system leads to an undesirable use of firms' resources. The immediate output of the underdeveloped financial system (banking sector and stock market) is information asymmetry and agency problems. These problems, in turn, create the frictions preventing firms from making all desired investments. More specifically, these problems lead to unproductive use of firms' available resources (available slack) by the management. Thus, this result is as expected, and hypothesis 1 is confirmed.

The result also shows that the resource-based theory offers a strong prediction when dealing with high potential slack (low debt-equity ratio). The resource-based theory (Barney, 1991) argued that slack in general and potential slack, in particular, is a source of a firm's competitive advantage, thereby positively influencing performance. This theory further explained that potential slack improves firm performance by eliminating goal conflicts, embodying a cushion in a hostile environment, playing a stabilizing role, maintaining sustainable competitive advantage, and promoting a firm's innovativeness. More importantly, this theory argued that potential slack influence management decision to continue or not to continue innovative projects that possibly produce competitive advantage and superior firm performance. This result further shows that unlike available slack, an increase in potential slack will not lead to managerial malpractice. That is, as potential slack increases, it is difficult to imagine that undisciplined experimentation will happen since it is not currently available resources within the firm. This result is as expected, and hypothesis 2 is confirmed.

Table 5 also illustrated the relationship between control variables and firm performance. Amazingly, R&D investment (rds) has a positive association with the performance of overall, high, and low financial slack firms. However, its relationship is stronger on the performance of low financial slack firms. This particular result indicated that firms with low financial slack effectively managed R&D investment in the way it generates superior performance. The selling general and administrative expense to sales ratio (sgaes) and performance of all types of firms (i.e., overall firms, high financial slack firms, and low financial slack firms) have a negative association. Its relationship is stronger with the performance of low financial slack firms, implying, as an expense, the selling general administrative expense adversely affects performance. Its adverse effect, however, is stronger on the performance of firms with low financial slack.

Similarly, firm size (size) is negatively associated with the performance of all types of firms. Astonishingly, the negative relationship of firm size is stronger with the performance of firms with high financial slack. This implied that large firms with high financial slack are more bureaucratic and less efficient than their counterparts, thereby has a strong adverse effect on their performance. Although it is not statistically significant, firms' sales growth (firm) is negatively associated with the performance of all types of firms. This result implied that firm growth in terms of sales is not always favourable for firms return. However, employment growth (employee) has a positive association with firm performance with all levels of financial slack. This implied that human capital is more favourable for firms return. This might be because human capital leads firms to have skilled employees that possibly create change and innovate in the firm.

The banking sector development (bdpgdp) has a positive influence on the performance of firms with high financial slack. This indicated that a well-functioning of banking sector positively influenced firm performance with high available slack and high potential slack (low debt-equity ratio). This implied that firms with more available slack could access external finance. Such firms may use available slack for easily paying their interest payment. Similarly, firms with low debt-level (high potential slack) potentially access external finance from the well-functioning banking sector, thereby improve their performance. Amazingly, the banking sector development has a negative association with the performance of firms with low financial slack. Low financial slack firms are firms with low available slack (i.e., low current ratio) and low potential slack (i.e., high debt-equity ratio). The low current ratio and the high debt-equity ratio implied that these firms have low current assets and high debts. Such firms faced a shortage of internal finance and excess debts. Though such firms have a limited potential to borrow, further development in the banking sector make it possible to happen. Thus, these firms will borrow more which aggravate the adverse effects of their performance. Hence, by providing more debt for the already indebted firms, the development of banking sector adversely affects the performance of firms with low financial slack.

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However, stock market development (stmktcgdp) has a positive association with performance of all types of firms. This result implied that stock markets offer platforms for equity financing that eliminates firms financing constraints, thereby improves firm performance. We also found a positive association between the annual GDP growth rate (gdp) and performance of all types of firms. However, its association is stronger with the performance of firms with low financial slack. This result implied that economic growth has a favourable influence on African firms' performance. This study also found a fantastic relationship between governance indicators and African firms' performance. Regulatory quality (RQ) and the rule of law (RL) have a strong positive association with firm performance of all types of firms. Astonishingly, the association of this governance indicators (i.e., RQ and RL) with the performance of low financial slack is stronger. However, control of corruption (CC) has a negative association with firm performance. Its relationship with performance is stronger in low financial slack firms. This result implied that corruption is substantial in Africa, and African firms are suffering from it. The result also shows that fighting corruption remains a challenge for Africa.

Table 5: Financial slack and firm performance

	Panel A: Financial slack and performance of the overall sample (923 firms)		Panel B: High financial slack and firm performance (212 firms)		Panel C: Low financial slack and firm performance (318 firms)	
	Tobin's q	ROA	Tobin's	ROA	Tobin's	ROA
cr	-0.0021*** (0.0043)	-0.0100** (0.0032)	-0.230* (0.0060)	-0.2410* (0.0058)	0.1379* (0.0419)	0.2300* (0.0088)
de	-0.0140*** (0.0050)	-0.02*** (0.0041)	-0.3620* (0.0361)	-0.1100* (0.0305)	0.0028 (0.0067)	0.00001 (0.0009)
rds	0.2476 (0.3627)	0.4842* (0.3982)	0.2109 (0.9424)	0.7211* (0.9347)	0.5981* (0.4050)	0.6502** (0.6624)
sgaes	-0.0186 (0.0527)	-0.2228* (0.0354)	-0.1097 (0.1153)	-0.0998 (0.0842)	-0.0835* (0.1252)	-0.0590* (0.0115)
size	-0.0031 (0.0127)	-0.0125 (0.0110)	-0.0355* (0.0336)	-0.1124* (0.0223)	-0.0173 (0.0191)	-0.0125* (0.0020)
firm	-0.0025 (0.0082)	-0.0039** (0.0018)	-0.0008 (0.0239)	-0.0043 (0.0044)	-0.0064 (0.0124)	-0.0019 (0.0012)
employee	0.0109 (0.0275)	0.4381* (0.0365)	0.0260 (0.0593)	0.3799* (0.0656)	0.0464 (0.0453)	0.0127* (0.0043)
bdpgdp	0.0016 (0.0011)	0.0028*** (0.0008)	0.0046*** (0.0023)	0.0007 (0.0014)	-0.0008 (0.0021)	-0.0006 (0.0004)
stmktcgdp	0.0035*** (0.0016)	0.0074** (0.0011)	0.0111** (0.0034)	0.0030 (0.0022)	0.0008 (0.0028)	0.0001 (0.0004)
gdp	0.0023 (0.0072)	0.0002 (0.0059)	0.0093 (0.0169)	0.0021 (0.0128)	0.0292* (0.0143)	0.0032* (0.0014)
CC	-0.4289* (0.1804)	-0.1894* (0.1418)	-0.5114** (0.4026)	-0.5838*** (0.3065)	-0.3512 (0.3308)	-0.0113 (0.0337)
RQ	0.0541** (0.1379)	0.1170*** (0.1064)	0.1700** (0.2909)	0.3765*** (0.2082)	0.0777* (0.2647)	0.0993* (0.0376)
RL	0.1168** (0.1269)	0.2323*** (0.1268)	0.0071** (0.2663)	0.4160*** (0.2169)	0.1616* (0.2934)	0.0424* (0.0461)
_cons	0.9891* (0.1352)	0.7972* (0.1571)	0.8861* (0.2476)	4.6654* (0.3130)	0.5777 (0.5002)	-0.0281 (0.0645)
Number of obs	9,230	9,230	2,120	2,120	3,180	3,180
Prob > F	0.0000	0.0000	0.0000		0.0000	0.0000
R-squared	0.23	0.92	0.55	0.923	0.39	0.97
Country fixed effect	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effect	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effect	Yes	Yes	Yes	Yes	Yes	Yes

This Table reports Robust OLS regression results based on three samples. The first sample includes 923 firms with mixed and overlapped financial slack. While the second sample includes 212 firms with high financial slack, the third sample comprises 318 firms with low financial slack. Standard errors are in parenthesis. cr is available slack, de is

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potential slack, sgaes is selling general and administrative expense to sales ratio, rds is R&D investment, size is firm size, firm is firms' sales growth, employee is firms' employment growth, bdpgdp is the banking sector development, stmktgdp is the stock market development, gdp is the annual GDP growth rate, CC is control of corruption, RQ is regularity quality, RL is the rule of law, * p < 0.01, ** p < 0.05, *** p < 0.1

d) Robustness check

i. *Robustness check using alter native performance measures*

The main result provides evidence that while high available slack has a negative relationship with firm performance, low available slack has a positive association with firm performance. Conversely, while high potential slack has apositive association with firm performance, low potential slack has a negative correlation with firm performance. To check the sensitivity of these results, we did robustness checks using alternative firm performance measures and alternative estimation methods. We tested the sensitivity of these results using market cap and ROE as alternative firm performance metrics.

Market cap captures the total market value of a firm's outstanding shares and indicates the prospects of firms. It also provides investors with an indication of a firm's total value of shares. Prior studies used the market cap as the market-based firm performance measure (Al-Matari et al., 2014; Mollah, Al Farooque, & Karim, 2012; Mollah & Talukdar, 2007). Consistent with these studies, we employed a natural logarithm of market cap to deal with a potential outlier problem and substituted it in place of Tobin's q in model 1. Prior studies widely used ROE as an alternative measure of accounting-based performance. It measures the profit made by a firm for its shareholders with the finance made available to the firm by its shareholders. That is, it evaluates the management's effectiveness to maximize the return to shareholders based on their investment in the firm (Alexander & Nobes, 2004). Studies used ROE; the ratio of net income to equity as accounting-based firm performance measures (Demis H., Sujatha S., et al., 2017; Hailu, 2019). Thus, we used market cap and ROE as an alternative market and accounting-based firm performance. We replaced market cap and ROE in place of Tobin's q and ROA in model 1. The model thus is specified as follows.

$$Market\ cap_{i,t}(ROE_{it}) = \alpha + \beta_1 cr_{i,t} + \beta_2 de_{i,t} + \beta_3 SGAES_{i,t} + \beta_4 rds_{i,t} + \beta_5 size_{i,t} + \beta_6 firm_{i,t} + \beta_7 employee_{i,t} + \beta_8 bdgdp_{j,t} + \beta_9 stmktgdp_{j,t} + \beta_{10} gdp_{j,t} + \beta_{11} CC_{j,t} + \beta_{12} RQ_{j,t} + \beta_{13} RL_{j,t} + \mu + \delta + \theta + \varepsilon \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots (2)$$

The robust OLS regression result using alternative firm performance (Market cap and ROE) is robust. There exists a strong negative relationship between available slack and performance and a strong positive correlation between potential slack and performance of overall firms (see Panel A of Table 6). Similarly, high available slack is significantly and negatively associated and high potential slack is significantly and positively correlated with firm performance (see Panel B of Table 6). While low available slack has a strong positive association with firm performance, low potential slack has a strong negative association with firm performance (see Panel C of Table 6). These results are consistent with the main result using Tobin's q and ROA as firm performance measures.

Table 6: Robustness check using alternative firm performance

	Panel A: Financial slack and firm performance (923 firms)			Panel B: High financial slack and firm performance (212 firms)			Panel C: Low financial slack and firm performance (318 firms)	
	Marketcap	ROE		Marketcap	ROE		Marketcap	ROE
cr	-0.0166* (0.0105)	-0.0003** (0.0013)		-0.0225** (0.0162)	-0.0021** (0.0022)		0.2857** (0.1827)	0.0045* (0.0092)
de	-0.0353* (0.0144)	-0.0017** (0.0016)		-0.0128** (0.1507)	-0.0289** (0.0142)		0.0633* (0.0202)	0.0049* (0.0020)
rds	-0.4276** (0.7324)	-0.0628 (0.0748)		-0.5534 (0.2699)	-0.0829 (0.1286)		0.6035** (0.9398)	0.6072* (0.0265)
sgaes	-0.3880* (0.1284)	-0.0265 (0.0170)		-0.0441 (0.2591)	-0.0247 (0.0507)		-0.7249* (0.2911)	0.0381* (0.0310)
size	-0.0877* (0.0292)	-0.0018 (0.0032)		-0.0253 (0.0599)	-0.0054 (0.0065)		-0.2041* (0.0566)	-0.0088 (0.0059)
firm	-0.0031 (0.0171)	-0.0006 (0.0018)		-0.0054 (0.0377)	-0.0080** (0.0041)		-0.0374 (0.0272)	-0.0004 (0.0026)
employee	0.1193*** (0.0724)	0.0269* (0.0095) 0.0013*		0.1707 (0.1428) 0.0008	0.0311 (0.0201) 0.0019**		0.1981 (0.1357) -0.0012	0.0019 (0.0138) -0.0001

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bdpgdp	0.0020 (0.0026)	(0.0004)		(0.0050)	(0.0009)		(0.0057)	(0.0006)
stmktcgdp	-0.0048 (0.0033)	-0.0011* (0.0005)		-0.0016 (0.0069)	-0.0027** (0.0012)		-0.0055 (0.0072)	-0.0007 (0.0008)
gdp	0.0134 (0.0167)	0.0001 (0.0024)		0.0628*** (0.0362)	0.0032 (0.0067)		0.0402 (0.0346)	-0.0016 (0.0036)
CC	-0.7198*** (0.3773)	-0.1800* (0.0460)		-1.3517 (0.8958)	-0.3756* (0.1456)		-0.3280 (0.8250)	0.0039 (0.0908)
RQ	0.4992 (0.3266)	0.1002** (0.0456)		0.7896 (0.6547)	0.2026*** (0.1094)		0.0450 (0.6340)	0.0413 (0.0674)
RL	0.0362 (0.3021)	0.0576 (0.0399)		0.5247 (0.6019)	0.0636 (0.0864)		0.8093 (0.7792)	0.0491 (0.0843)
_cons	0.2825* (0.3360)	0.4215* (0.0410)		0.6834* (0.6301)	0.3916* (0.0880)		0.6195* (0.4966)	0.4070* (0.0481)
Number of obs	9,230	9,230		2,120	2,120		3,180	3,180
Prob > F	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000
R-squared	0.17	0.31		0.14	0.65		0.15	0.42
Country fixed effect	Yes	Yes		Yes	Yes		Yes	Yes
Industry fixed effect	Yes	Yes		Yes	Yes		Yes	Yes
Year fixed effect	Yes	Yes		Yes	Yes		Yes	Yes

This Table reports the Robust OLS regression results. The result is based on three samples. The first sample includes 923 firms with mixed and overlapped financial slack. While the second sample includes 212 firms with high financial slack, the third sample comprises 318 firms with low financial slack. Standard errors are in parenthesis. Where cr is available slack, de is potential slack, sgaes is selling general and administrative expense to sales ratio, rds is R&D investment, size is firm size, firm is firms' sales growth, employee is firms' employment growth, bdpgdp is the banking sector development, stmktgdp is the stock market development, gdp is the annual GDP growth rate, CC is control of corruption, RQ is regularity quality, and RL is the rule of law,
. * p < 0.01, ** p < 0.05, *** p < 0.1

ii. *Robustness check using two-step system GMM*

We also used an alternative regression model to check whether the OLS result is robust. We are concerned about the endogeneity problem. Endogeneity is an obstacle for understanding the real association between variables of interest in corporate finance (Abdallah, Goergen, & O'Sullivan, 2015; Li, 2016). Besides, Li (2016) argued that variables are naturally endogenous, instruments are scarce, and causality relations are complex in corporate finance. More specifically, simultaneity (causality) is a source of endogeneity problem in corporate finance studies (Abdallah et al., 2015; M. Roberts & Whited, 2011; M. R. Roberts & Whited, 2013). Our argument in this regard is that there might be causality (simultaneity) from firm performance to financial slack. For example, more profitable firms may accumulate more financial slack. Such causality or endogeneity may create a severe problem in the inference. It leads to biased and inconsistent parameter estimate and incorrect implication, which provide a misleading conclusion and inappropriate theoretical interpretation (M. Roberts & Whited, 2011; Ullah, Akhtar, & Zaefarian, 2018).

Thus, M. Roberts and Whited (2011) suggested that researchers should address the endogeneity problem in their study. The OLS estimator may not be useful to handle such a causality problem. Among others, the use of lagged dependent variable has become a powerful remedy for endogeneity problem (Abdallah et al., 2015; Li, 2016; M. Roberts & Whited, 2011). Arellano and Bond (1991) and Blundell and Bond (1998) developed a generalized method of moments (GMM) model for dynamic panel data estimation. GMM model is appropriate for situations with endogeneity and heteroscedasticity, among others. As we explained earlier, our dataset violates one of the classical linear assumptions of OLS— the homoscedasticity. Thus, the GMM model appropriately handles heteroscedasticity and causality problems (Wintoki, Linck, & Netter, 2012).We employed a two-step system *GMM* model using lagged Tobin's q and ROA. According to Arellano and Bond (1991) and Roodman (2009), two-step system GMM model is more efficient and robust to treat heteroskedasticity and endogeneity problems. Therefore, we developed model 3 using lagged Tobin's q and ROA.

$$Tobin'sq_{i,t}(ROA_{i,t}) = \alpha + \beta_1 Tobin'sq_{i,t-1}(ROA_{i,t-1}) + \beta_2 cr_{i,t} + \beta_3 de_{i,t} + \beta_4 SGAES_{i,t} + \beta_5 rds_{i,t} + \beta_6 size_{i,t} + \beta_7 firm_{i,t} + \beta_8 employee_{i,t} + \beta_9 bdgdp_{j,t} + \beta_{10} stmktgdp_{j,t} + \beta_{11} gdp_{j,t} + \beta_{12} CC_{j,t} + \beta_{13} RQ_{j,t} + \beta_{14} RL_{j,t} + \mu + \delta + \theta + \varepsilon \ldots\ldots\ldots (3)$$

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The two-step GMM model also offers a robust result. The lagged Tobin's q (Tobin's q L1.) and lagged ROA (ROA L1.) have a positive and strong association with Tobin's q and ROA. There is robust evidence that available slack (*cr*) is negatively and significantly associated with both Tobin's q and ROA and potential slack (de) is positively and strongly associated with Tobin's q and ROA in the overall sample (see Panel A of Table 7). The result is also robust regarding the relationship between high financial slack and firm performance (see Panel B of Table 7). While high available slack (cr) is negatively and strongly associated with firm performance, high potential slack is positively and significantly related to firm performance. Panel C of Table 7 also confirms the robust result on the relationship between low financial slack and firm performance. While low available slack and firm performance have a positive association, low potential slack and performance have a negative correlation. These results are also consistent with the result obtained from the robust OLS regression results.

Table 7: Robustness check using two-step system GMM model

	Panel A: Financial slack and firm performance (923 firms)		Panel B: High financial slack and firm performance (212 firms)		Panel C: Low financial slack and firm performance (318 firms)	
	Tobin's q	ROA	Tobin's q	ROA	Tobin's q	ROA
Tobin's q L1.	0.3430* (0.1650)		0.6053* (0.0488)		0.5246* (0.0518)	
ROA L1.		0.1320* (0.2290)		0.2045* (0.0764)		0.9154* (0.0352)
cr	-0.5500*** (0.6810)	-0.0300*** (0.0001)	-0.1680* (0.0603)	-0.1130** (0.0359)	0.5670* (0.3546)	0.1000** (0.0045)
de	-0.2540*** (0.5690)	-0.0040*** (0.0120)	-0.1130** (0.9177)	-0.0844** (0.4855)	0.0742*** (0.0288)	0.0029*** (0.0038)
rds	-0.6150* (0.1980)	-0.9210*** (2.1250)	-0.3928 (0.0828)	-0.2865 (0.0407)	0.908** (0.7728)	0.6554** (0.8086)
sgaes	-0.7700 (0.1800)	-0.0950*** (0.0490)	-0.0559 (0.8329)	-0.4830 (1.0744)	-0.9186 (0.7826)	-0.1409** (0.0660)
size	-0.2300** (0.4390)	-0.5320* (0.2310)	-0.1451 (0.0917)	-0.8144* (0.1089)	-0.2420 (0.1855)	-0.0513 (0.0196)
firm	-0.0260 (0.3470)	-0.0030 (0.0060)	-0.2192** (0.1018)	-0.0025 (0.0682)	-0.0412 (0.0934)	-0.0079 (0.0049)
employee	0.2840 (0.8350)	0.0010 (0.0220)	0.6163*** (0.3164)	0.0743 (0.2295)	0.7595 (0.3146)	0.0206 (0.0264)
bdpgdp	0.4310** (0.6360)	0.0010 (0.0020)	0.0012 (0.0026)	0.0025 (0.0018)	-0.0033 (0.0022)	-0.0015* (0.0004)
stmktgdp	0.1440 (0.5940)	0.0001 (0.0010)	0.0058 (0.0037)	0.0003 (0.0027)	0.0056*** (0.0030)	0.0015* (0.0005)
gdp	0.9780** (1.7150)	0.0020 (0.0040)	0.0097 (0.0262)	0.0077 (0.0215)	0.0076 (0.0135)	0.0097* (0.0031)
CC	-0.7970 (1.4480)	-0.0200 (0.0870)	-0.1302 (0.2086)	-0.2994 (0.2755)	-0.1686 (0.2354)	-0.0276 (0.0207)
RQ	0.9950 (1.5600)	0.0570 (0.0840)	0.6434** (0.3121)	0.1011 (0.3099)	0.1099 (0.2007)	0.0603** (0.0283)
RL	0.9730** (2.0250)	0.1030** (0.0490)	0.2009 (0.3238)	0.0618 (0.2403)	0.6508* (0.2659)	0.0561*** (0.0304)
_cons	0.691* (0.400)	0.2250* (0.9170)	0.7693 (0.6128)	4.3458* (0.7041)	0.4944 (0.0738)	0.3943* (0.1294)
Number of obs.	9229	9229	2119	2119	3179	3179
Number of groups	923	923	212	212	318	318
AR(1)	0.476	0.339	0.45	0.102	0.239	0.280
AR(2)	0.974	0.922	0.356	0.679	0.165	0.190
Sargan	1.000	0.934	0.201	0.983	0.657	0.101
Hansen	0.400	0.117	0.193	0.224	0.381	0.125

This Table reports the results of a two-step system GMM model based on three distinct samples. The first sample includes 923 firms with mixed and overlapped financial slack. While the second sample includes 212 firms with high financial slack, and the third sample comprises 318 firms with low financial slack. For the diagnostic tests: Arellano-Bond test for serial correlation (AR(1) and AR(2)) and the Sargan and Hansen tests of the validity of over-

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identification restriction, p-values are reported. The null hypothesis of the Arellano-Bond test for serial correlation is no autocorrelation. The null hypothesis of the Sargan test is over-identifying restrictions are valid. The null hypothesis of the Hansen test is that instruments as a group are exogenous. If the p-values of the Arellano-Bond, the Sargan, and the Hansen tests are above 0.05, the null hypotheses are accepted (Roodman, 2009). As can be seen from this Table, the p-values of the Arellano-Bond, Sargan, and the Hansen tests are not less than 0.05. We thus can conclude that there is no first-order and second-order serial correlation. The Sargan test of over-identification gives higher p-values for all models, suggesting that there is no problem of over-identification. Similarly, the Hansen test offers high p-values in all models, implying that instruments as a group are exogenous. Robust standard errors in parenthesis. Standard errors are in parenthesis. Tobin's q L1 is one year lagged Tobin'sq, ROA L1 is a one year lagged ROA, cr is available slack, de is potential slack, sgaes is selling general and administrative expense to sales ratio, rds is R&D investment, size is firm size, firm is firms' sales growth, employee is firms' employment growth, bdpgdp is the banking sector development, stmktgdp is the stock market development, gdp is the annual GDP growth rate, CC is control of corruption, RQ is regularity quality, RL is the rule of law

* $p < 0.01$, ** $p < 0.05$, *** $p < 0.1$

iii. *Robustness check using Instrumental variables*

In the preceding section, we applied the ad hoc solution in dealing with the potential endogeneity problem. We lagged the dependent variables and used a two-step system GMM model to do so. However, statisticians argued that this approach could not evaluate how severe the endogeneity problem is (Shepherd, 2010). They also argued that the best way to deal with endogeneity is an IV estimator (Ebbes, Papies, & van Heerde, 2016). Thus we further applied instrumental variables to deal with a potential endogeneity problem.

Scholars strongly suggested the application of an instrument in the study where there is a potential endogeneity problem. An instrument is a variable that is correlated with the endogenous (independent) variable but only affects the dependent variable via its effect on the independent variable. In other words, a valid instrument variable has a strong correlation with the endogenous variable but only affects the outcome variable via its effect on the treatment variable (Windmeijer, Farbmacher, Davies, Davey Smith, & White, 2015). This study explores the association between financial slack and firm performance, and there might be a potential causality from firm performance to financial slack, as explained earlier. The Durbin and Wu–Hausman tests confirm this situation. The significant level of the Durbin and Wu–Hausman tests (see Table 8) implied that financial slack is endogenous and should be treated as an endogenous variable. Thus, we decided to apply instruments in addition to the two-step system GMM to draw a rigorous conclusion.

We used tax payments and wages & salaries as instrumental variables. Our argument for choosing these variables as the instruments is that both tax payments and wages & salaries could significantly affect financial slack, thereby impacts firm performance. Firms with high tax payments and wages & salaries might have little financial slack, which in turn influences their performance, and the reverse is true for firms with low tax payments and wages & salaries. Besides, we choose these variables following statistical tests. The tests confirm that tax payments and wages & salaries are valid instruments (see Table 8).

Table 8 presents the results of two-stage least square (2sls), the most common IV estimator, using tax payments and wages & salaries as instruments. The two-stage least square (2sls) exhibits a robust result. There is robust evidence that available slack (*cr*) and potential slack (*de*) are negatively and positively associated with the performance of overall firms, respectively (see Panel A of Table 8). The result is also robust regarding the relationship between high financial slack and firm performance (see Panel B of Table 8). While high available slack (cr) is negatively and strongly associated with firm performance, high potential slack is positively and significantly related to firm performance. Panel C of Table 8 also confirms the robust result regarding low financial slack and firm performance nexus. Low available and low potential slacks have a positive and negative association with firm performance.

We thus can conclude that the association between financial slack and firm performance is not sensitive to different performance measures and estimation techniques. The robustness check using alternative firm performance measures and estimation techniques (GMM and 2sls) offer consistent results with the main findings using OLS.

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Table 8: Robustness check using Instrumental variables

	Panel A: Financial slack and performance of Overall firms		Panel B: High financial slack and performance		Panel C: Low financial slack and performance	
	Tobin's q	ROA	Tobin's q	ROA	Tobin's q	ROA
cr	-0.1282** (0.1087)	-0.0270** (0.0735)	-0.3730* (0.7191)	-0.1160* (0.3767)	0.3375* (1.6901)	0.1131* (0.1549)
de	-0.2539** (0.1381)	-0.1598*** (0.0934)	-0.4055* (5.8800)	-0.1068* (3.0799)	0.1299*** (0.2674)	0.0398*** (0.0245)
rds	0.1126 (0.7711)	0.1926* (0.5212)	0.7978 (8.5555)	0.4055* (4.4813)	0.4869* (3.8739)	0.6495** (4.9380)
sgaes	-0.0143 (0.0628)	-0.2187**** (0.0424)	-0.2947 (0.6474)	-0.2932 (0.3391)	-0.5790* (0.4718)	-0.0890* (0.0432)
size	-0.0072 (0.0363)	-0.0404*** (0.0245)	-0.2113* (0.2656)	-0.0315* (0.1391)	-0.0900 (0.0643)	-0.0168* (0.0059)
firm	-0.0118 (0.0137)	-0.0037 (0.0092)	-0.0058 (0.0383)	-0.0054 (0.0201)	-0.0112 (0.0226)	-0.0041** (0.0021)
employee	0.0806 (0.0668)	0.4808* (0.0451)	0.4933 (0.8928)	0.5750 (0.4676)	0.0205 (0.0873)	0.0157** (0.0080)
bdpgdp	0.0026*** (0.0014)	0.0022* (0.0009)	0.0050*** (0.0058)	0.0015 (0.0031)	-0.0173 (0.0110)	-0.0008 (0.0010)
stmktcgdp	0.0040* (0.0015)	0.0071* (0.0010)	0.0091 (0.0183)	0.0036 (0.0096)	0.0196 (0.0127)	0.0001 (0.0012)
gdp	0.0014 (0.0079)	0.0001 (0.0053)	0.0317 (0.0598)	0.0062 (0.0313)	0.0235* (0.0231)	0.0027* (0.0021)
CC	-0.2180 (0.2146)	-0.3169* (0.1450)	-0.3954** (0.5886)	0.5204*** (0.3083)	-0.9129 (0.6528)	-0.0252 (0.0598)
RQ	0.0158 (0.1563)	0.1255 (0.1057)	0.8031** (2.6088)	0.0473** (1.3665)	0.1207* (0.8824)	0.1373*** (0.0809)
RL	0.1491* (0.1413)	0.2216* (0.0955)	0.6941** (1.5814)	0.1450** (0.8283)	0.6437* (1.3088)	0.1256* (0.1200)
_cons	0.3118* (0.3125)	0.6120* (0.2112)	0.0643* (2.1288)	0.1537* (1.1150)	0.2479* (1.5820)	0.2093* (0.1450)
No of obs	9,230	9,230	2,120	2,120	3,180	3,180
Wald	59.96*	81.50*	54.41*	87.13*	54.36*	64.20*
Durbin	13.9364*	14.9550*	17.0228*	16.4302*	17.4520*	16.9762*
Wu-Hausman	12.9603*	12.4678*	13.4533*	13.1610*	13.6901*	13.454*
eigenvalue	16.9		14.2		18.38	

This Table reports the two-stage least square (2sls) regression results. Tax payments (tax) and wages and salaries (wages) are instrumental variables. We used the natural logarithm of tax payments and wages & salaries, and we winsorized them into their 1st and 99th percentile of distribution to handle the effects of potential outliers. The null hypothesis of the Durbin and Wu–Hausman tests is that the financial slack can be treated as exogenous. Here both test statistics are highly significant in all models, so we reject the null of exogeneity; we must continue to treat available (cr) and potential (de) slacks as endogenous. The difference between the Durbin and Wu–Hausman tests of endogeneity is that the former uses an estimate of the error term's variance based on the model assuming the variables being tested are exogenous. In contrast, the latter uses an estimate of the error variance based on the model assuming the variables being tested are endogenous. According to Stock and Yogo (2002), weak instruments cause instrumental-variables estimators to be biased, and hypothesis tests of parameters estimated by instrumental-variables estimators may suffer from severe size distortions. The minimum eigenvalue statistic tests for weak instruments (Stock & Yogo, 2002) and the eigenvalue greater than 10 shows instruments are strong (Staiger & Stock, 1994). The minimum eigenvalue statistic is greater than 10 in all panels, indicating instruments are not weak. The Wald test (Wald) in all panels has higher values and statistically significant, suggesting the models are correctly specified. cr is available slack, de is potential slack, sgaes is selling general and administrative expense to sales ratio, rds is R&D investment, size is firm size, firm is firms' sales growth, employee is firms' employment growth, bdpgdp is the banking sector development, stmktgdp is the stock market development, gdp is annual GDP growth rate, CC is control of corruption, RQ is regularity quality, RL is the rule of law

* $p < 0.01$, ** $p < 0.05$, *** $p < 0.1$

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V. Conclusion and Implication

This study explores the relationship between financial slack and firm performance using African sample firms. The conflicting arguments of theories and the mixed results of prior studies motivated this study. While the resource-based theory argued that financial slack derives firm performance, agency theory argued that financial slack hinders firm performance. Previous studies further explored the slack-performance nexus based on the arguments of these theories and found mixed results. The source of firm-level data is the Osiris database. This database offers both financial and non-financial firm-level data of 1285 firms in 33 African countries. The study excluded the financial institutions considering their slack accumulation and performance might be unique and may affect the result. Thus, we used a sample of non-financial firms. The study period covers ten years (from 2007 to 2016) based on data availability. We further exclude non-financial firms that have no the required data for ten years. The final sample then included 923 firms in ten African countries covering a period from 2007 to 2016. For split sample analysis, we dropped 393 firms with mixed and overlapped financial slack. Then we used a sample of 533 firms. From this sample, we split the sample into two groups — 212 firms are "high financial slack firms", and 318 firms are "low financial slack firms. We extracted the data for country-level control variables from the World Bank database.

To alleviate the potential effects of outliers on the result, we winsorized all variables (except governance indicators) at the 1st and 99th percentile of their distribution. We employed robust Ordinary Least Square (OLS) regression model following Hausman fixed-random specification test and Breusch-Pagan Lagrange multiplier (LM). The descriptive statistics depicted that there exist a heterogeneous financial slack and firm performance across countries.

Following the descriptive statistics, we tested of heteroscedasticity and multicollinearity problems. We detected heteroscedasticity problem and employed a robust OLS regression model to remedy this problem. But multicollinearity is not an issue in the model. We run the robust OLS regression using the overall all sample firms (i.e., 923 firms). The result shows while available slack has a strong negative association with firm performance, potential slack has a strong positive correlation with firm performance. But this result is vague. It does not show which level of financial slack (high or low financial slack) is negatively or positively associated with firm performance. This ambiguous result thus masks the real picture of slack-performance nexus.

To unmask this relationship, we run a split sample analysis (using 533 firms). This analysis provides a more robust and imperative result regarding the slack-performance nexus. The result shows that high available slack is strongly and negatively associated with the performance of firms while low available slack is positively and strongly related to the performance of firms. This result clearly shows that the agency problem offers a strong prediction when dealing with high available slack. The result further indicates that high potential slack is strongly and positively associated with firm performance, while low potential slack is negatively related to firm performance. This result, however, depicted that the resources-based theory provides a robust prediction when dealing with high potential slack.

The result of this study offers the following essential implications. The resource-based theory generates strong prediction when dealing with high potential slack while the agency theory offers strong prediction when dealing with high available slack. This result further implied that the combination of resources-based and agency theories is essential in explaining the slack-performance nexus. The result also implied that evaluating the effects of different levels of financial slack on firm performance is critical for unmasking the real picture of slack-performance link. The study finally suggested future researchers consider the non-financial slack resources in the study of slack-resource relation.

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