

Aggregate Earnings and (Un)employment Rate: Evidence from Nigeria

Ndubuisi Odoemelam^{1*}, Ofoegbu, N. Grace¹ and Okafor, G. Regina¹

¹*Department of Accountancy, Faculty of Business Administration, University of Nigeria, Enugu Campus, Nigeria.*

Authors' contributions

This work was carried out in collaboration among all authors. Author NO designed the study, performed the statistical analysis, wrote the protocol and wrote the first draft of the manuscript. Authors NO and OGR managed the analyses of the study. Author ONG managed the literature searches. All authors read and approved the final manuscript.

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ABSTRACT

The purpose of this study is to investigate the association between aggregate accounting earnings of quoted Nigerian firms and (un)employment changes. This study examined the influence of selected macroeconomic variables on the relationship between aggregate earnings and (un)employment change. This study analyzes aggregated earnings of 101 quoted firms and (un)employment rate data from the year 2006 to 2017. Aggregated earnings yearly observations were used in this study, with each yearly observation equal to the cross-sectional sum of sample firms' yearly earnings. Results show that corporate aggregate earnings growth is (negatively) positively and significantly associate with (un)employment changes. Selected macroeconomic indicators statistically and significantly influence the aggregate earnings growth association with (un)employment changes. Robustness of our analysis in this study allowed us to document in strong terms that in an emerging economy, corporate aggregate earnings significantly associated with (un)employment (i.e., as corporate earnings increases, more investment will be made, and job seekers will be employed thereby reducing the unemployment rate). One implication of our results is that aggregate accounting earnings contain information about (un)employment changes in Nigeria.

*Corresponding author: E-mail: ndubuisi.odoemelam@uniport.edu.ng;

Our results suggest that effective monetary policies aimed at reducing inflation and interest rate as well as enabling economic policies encouraging and efficient mobilizing of fund from surplus side to deficit side of the economy will reduce unemployment and lead to employment.

Keywords: Aggregate earnings; (un)employment; macroeconomic variables; quoted firm; Nigeria.

1. INTRODUCTION

The literature on the symbiotic relationship between aggregate earnings and macroeconomic variables is gaining recognition in both economics and accounting in recent years. In response to the call to bridge the gap in the literature of the potentially significant role that accounting information content could play in the economic growth process [1,2,3] many studies have investigated the aggregate earnings informativeness at a macro level about gross domestic products (GDP) growth [4,5], inflation forecast [6], unemployment [7], Federal policy action [8], macroeconomic forecasters error [9]. In deciding to employ job seekers and laying off employees, managers consider the earnings abilities of their companies, and often investment decisions that may lead to employment, information about the cash cow internally and externally available to finance projects (i.e., financial deepening) is also considered as well as the inflationary trend and real interest rate. The information about the calculations earnings of firms is generally incognizance of macroeconomic variables such as interest and inflation rates. Since corporate earnings is a result of microeconomic activities of an individual firm in the economy, by aggregating earnings information of the firms, aggregate earnings can provide insights on aggregate (un)employment activities. We investigate this conjecture and document that firms' aggregate earnings are associated with national (un)employment. Importantly, the information embedded in the inflationary trend, financial deepening, and real interest rate is influential to the relationship that exists between aggregate earnings and (un)employment rate.

Firms are at the center of economic activities such as knowledge and skill spillovers, linkages, dynamic economies of scales and labour pooling, the economic/financial outcome of these companies' activities should have a multiplier effect on the economy. This study draws on the general view of [10] "that the design and evaluation of financial reporting must adopt at least in part an aggregate perspective." There are a wealth of theoretical arguments in support

of the impact of accounting earnings on economic growth. In one example, [10] pointed out that accounting variables can be leading indicators for some aspect of economic activity because they reflect real events in firms and their product and factors markets. Also, aggregate after-tax earnings is a component of the US Gross Domestic Product, which is a reasonably large percentage. [11] showed return on investment as a predictor of macroeconomic variables.

In this study, we argued that given that accounting earnings are valued relevance at the firm-specific level, to what extent has it contributed to the increase or decrease of the (un)employment rate of a given country? As companies are at the center of economic activities such as knowledge and skill spillovers, linkages, dynamic economies of scales and labour pooling, the economic/financial outcome of these companies' activities should have a multiplier effect on the economy. On the front of capital market growth in particular evidence has shown that accounting earnings is value relevant [12,10,13,14,15,16,17], aggregate earnings risk related to return risk [18,19].

Under the emerging economy, aggregate earnings are presumed to support economic growth, but the literature has yet to show direct evidence of relationships between aggregate corporate profits and (un)employment change. Whereas, the predictive ability of aggregate earnings on economic growth, few studies have been carried out. From, the U.S, aggregate accounting earnings growth predicts GDP growth and professional macroeconomic forecaster GDP growth error [5], unemployment [8]. [11] showed return on investment as a predictor of macroeconomic variables. [6] demonstrate the macroeconomic information content of aggregate earnings from the labour market's perspective. From the angle of monetary policy [8] investigate whether the negative association between aggregate earnings and returns is a function of the monetary policy news in aggregate earnings. [6] study predicts and finds that the interaction of firm-level and aggregate-level shocks explain a significant portion of shocks to macroeconomic

activity. The study assumed that the relationship between uncertainty and economic growth is most pronounced when both firm-level and aggregate-level uncertainty are high simultaneously. [20] examined whether the impact of firm-level accounting earnings to the informativeness of the aggregate is moved towards earnings with specific financial reporting characteristics. [4] show that adverse changes in aggregate earnings predict future GDP growth, while positive changes in earnings do not. [9] provided further evidence about the ignorance of macroeconomic forecasters about the effect of the information content of aggregate earnings surprises on future inflation hence they do not fully utilize this information in generating their forecasts.

Most of the literature that studies on aggregate earnings are from a developed economy and none from an emerging economy. Also, these studies did not consider the possible influence of financial deepening, inflation, and real interest rate changes in determining the relationship between aggregate earnings growth and (un)employment changes. Because of the apparent variables bias and deficiency of literature on the relationship between aggregate earnings and (un)employment, our study is aimed at first, to investigate the association between aggregate earnings growth and (un)employment change. Second, providing empirical evidence on whether the association between aggregate earnings growth and (un)employment is influenced by financial deepening, inflation rate, and the real interest rate.

Our study has provided several insights and contributions to the current literature on aggregate earnings in fourfold. First, this paper revealed that the aggregate earnings (AAE) of the sampled firms is negatively correlated with unemployment change (U) and positively associated with employment (N). Second, the study shows a stable (negative) positive influence of financial deepening on (un)employment changes. Third, we document that inflation changes associate (positively) negatively with (un)employment. Fourth, we reported that real interest rate associate (positively) negatively with (un)employment changes. Higher inflation and real interest rate primarily discourage portfolio investments, whether private or official sources of capital finance such expenditure. While financial deepening primarily captures the movement of

idle funds, implying mobilizing fund from the surplus side of the economy to the deficit, which brings about the growth of earnings. On this note, we show an association of aggregate earnings with employment after controlling for inflation, financial deepening, and real interest rate.

The rest of the study is structured as follows: Section 2 presents the intuitional Setting for the study. Section 3 conceptual underpinnings and hypothesis development. Section 4 reviews the extant literature on aggregate earnings. The research design is revealed in section 5. Section 6 presents the empirical results and discussion, while section 7 concludes the paper.

2. INTUITIONAL SETTING IN NIGERIA

The Nigerian economy is one of the leading emerging economies in Africa. Nigeria is generally classified as a civil law country, with a trade regime that remains heavily protectionist that has limited development of several employment-intensive sectors of the economy [21]. The Nigerian population is about 180 million people, having 7.3% gross domestic product (GDP) growth, 33.1% of the population below the poverty line and 24% unemployed as at 2013 has had a truncated history about her economic growth. The Nigerian economy is facing many problems [22]. Falling oil prices, inconsistency in policy, and insecurity have produced shocks which have compounded an already challenging development environment inadequate infrastructure, high unemployment (9.9 percent) and a high poverty rate (above 50 percent in the northern states) [23]. According to [24], "Nigeria has expanded manufacturing employment in the low-, medium-, and high-tech sectors, while the resource-based manufacturing sectors have contracted." [24] further stated that Nigeria lags behind other LICs in terms of the importance of the services sector, implying that contribution of this sector to growth is low. Also, lack of adequate infrastructure and poor investment environment have hindered firm efficiency in Nigeria. In one example, inadequate electricity supply. In most cases, macroeconomic policy, infrastructure, and the overall investment climate have a more significant impact on the performance of firms.

Because we can observe the performance of these firms, measure by corporate earnings at the aggregate level, we can aggregate firms' earnings. This allows for the analyses of the

informational content of aggregate earnings on (un)employment changes, in cognizance of the consequences of the government trade policies-macroeconomic policy. Thus, the Nigeria setting provides an opportunity to investigate the association between firm performance and (un)employment rates.

3. CONCEPTUAL UNDERPINNINGS AND HYPOTHESIS DEVELOPMENT

Within the past five years, accounting researchers have aimed at investigating the macroeconomic content of aggregate earnings [4,5,6,7,8,9]. Many of these papers report predictive ability, especially in the US setting, and many did not control for other macroeconomic indicators. Conceptually and considering our study setting and dataset, (un)employment prediction by aggregate earnings is not our objective; instead, the association between (un)employment rate and aggregate earnings. Next, that follows is how this association concept is influenced by financial deepening, inflation, and real interest rate.

3.1 (Un)Employment Rate

The growth of every developed and developing economy requires expansion of the labour market as well as a labour force. For instance, Britain's economy grows by expanding the labour market. When there is massive investment in the economy, the multiplier effect will yield a decrease(increase) in (un)employment. [25] agreed that job creation is a metric for economic development and that one of the strategies for creating these jobs is by reducing the cost of doing business. On the other hand, [26] is of the view that "accounting calculations and discourses prioritise the interests of capital over labour and the state and have systematically eroded labour's share of the gross domestic product." The companies prefer using a smaller number of employees to maximise productivity. They see wages and salaries to workers as a cost and claiming to embrace cost minimization principle. In doing so, the rate of employment remains static while the unemployment rate increases every year, especially in an emerging economy such as Nigeria.

As noted in [7], from a neoclassical economics perspective, the demand for labour by firm's is determined by its product demand and shape of its production function. [7,27] further explained that the extent of earnings news captures shocks to future profitability due to shift in product

demand, that positive earnings news should lead to additional investment and hiring, and vice versa can cause downsizing and layoffs. This understanding agrees with the sectoral shift hypothesis by [28] that unemployment is driven in part by cross-sectional shifts across sectors. The hypothesis links cross-sectional variation in firm-level and industry-level performance to aggregate performance. The intuition is as the firms make adequate profits or earnings *ceteris paribus* will invest part of the earnings, employment rate and production should increase, and the corresponding decrease in the unemployment rate.

The reduction of the level of unemployment has been a vital macroeconomic objective of various governments. According to [7], "as a primary macroeconomic indicator, the unemployment rate is followed by a broad range of 5 economic agents and is embedded in various economic policy decisions, which brings it to the forefront of macroeconomists' agenda." [29] are of the view that national unemployment is a significant factor in an overall sense of labour market insecurity. Hence, [30] pointed out that "a decrease in national unemployment, and with the associated rise in job security, would likely contribute to increases in mental health and well-being." Achieving this economic goal helps to curb the social menace and to create a conducive environment for other social, political, and economic activities to thrive. The informativeness of the different earnings components to predict unemployment rates is of practical importance only if accounting earnings contain information incremental to other available macroeconomic indicators [7]. Generally, unemployment is said to be a situation in which qualified individuals that are willing to work at a prevailing wage rate are unable to do so for lack of job opportunities.

[31] lamented that the rate at which unemployment is increasing in Nigeria is worrisome despite the acclaimed economic growth in GDP. This implies that there are specific fundamental issues that need to be addressed, such as companies' activities around job creation. Looking inward at the activities of corporate as it relates to unemployment. [32] stated that it is so evident that huge earnings been recorded in the financial statement of entities have done little to reduce the high level of unemployment. Considering the view of [7], intuitively if the aggregate of profit after tax (PAT) has a piece of incremental information about either or both gross national income (GNI) and

gross domestic products (GDP), earnings in the context of our study will have a significant association with the (un)employment rate.

3.2 Aggregate Earnings

The accounting earnings information is said to be value relevant when it can alter the economic choices of the users, and it is described as the usefulness of financial statement information to outside parties in the firm. [33] observed “that corporate profits are a component of GDP and are likely to be correlated with other GDP components, a firm’s expected earnings downward pattern captured by earnings downside risk is linked to an expected downward macroeconomic trend through its role in corporate profits, a driver of economic activity.” In the long run, for instance, corporate profits, dividend, and share prices move in the same direction [9].

Corporate profits represent the value-added by a firm, which is capital. Corporate earnings are because of corporate economic activities, and these economic activities of corporate entity involve the production of goods and services, which is aggregated at the end of the years to the gross domestic product. Again, out of these earnings workers are being paid, the wages and salaries of the workforce of various entities form part of per capita income. Also, firms finance their economic activities through retained earnings, which is part of equity. Firms retained most of their profits to finance new investment and growth [34]. While losses lead to lower owner's equity or even cynical owner's equity, if firms have common owner's equity, it can lead to the liquidation of all assets and an option of shutting down the company which will trigger loss of jobs and reduction in the production of goods and services.

According to [7], the negative average earnings component news estimates are linked to a disproportionate share of adverse macro shocks. Our study period covers financial crisis of 2007-2008 and subsequent Great Recession of 2008-2009, this represents such shocks [7,35]. Based on the above, we state the hypotheses thus:

H1a: Aggregate earnings positively and significantly associated with the employment rate.

H1b: Aggregate earnings negatively and significantly associated with the unemployment rate.

3.3 Control Variables

In our analysis, we include control variables that have been hypothesized to be correlated with (un)employment rate. The control variables are selected macroeconomic variables- inflation, interest rate, and financial deepening to control the aggregate earnings-(un)employment relationship. Inflation does not only affect (un)employment, but it also affects the financial activities of a country by affecting the interest rates, which has a direct effect on financial deepening, mobilizing fund from surplus to deficit side of the economy [36]. Hence, capital-aggregate earnings and labour are the two vital factors of every theory of economic development. On the one hand, aggregate earnings growth has a positive effect on economic growth, both in Cobb-Douglas production function and in other various models [36,7]. On the other hand, a country’s overall development depends on the labour force. These variables have also been used extensively in the literature to control the finance-growth relationship (e.g., inflation [36,37] aggregate earnings-GDP growth prediction [38]. For [39], “financial deepening propels economic growth through both a more rapid capital accumulation and productivity growth, with the latter channel being the strongest.” According to [40], inflation is defined “as a continuing rise in the average level of prices for real goods and services.” In consideration of what defined inflation, aggregate demand, and aggregate supply side of the economy play a significant role. [40], further explained that aggregate demand is determined by macroeconomic policies while aggregate supply is influenced by the availability of labour and capital services that government policies in the short run. [41] pointed out that inflation is considered by investors in making investment decisions, while [42] are of the view that “aggressive monetary policy can stabilize the economy by cutting interest rates on liquid assets.” High inflation and extremely volatile interest rates affects financial performance of firms and influence annual decisions [43,40].

Accordingly, first, we expect that the unemployment rate is positively associated with inflation and real interest rate, while it is negatively associated with financial deepening. Lastly, we expect that the employment rate is negatively associated with inflation and real interest rate, while it is positively associated with financial deepening. Fig. 1 is a graphical correlation of (un)employment and aggregate earnings and selected macroeconomic indicators.

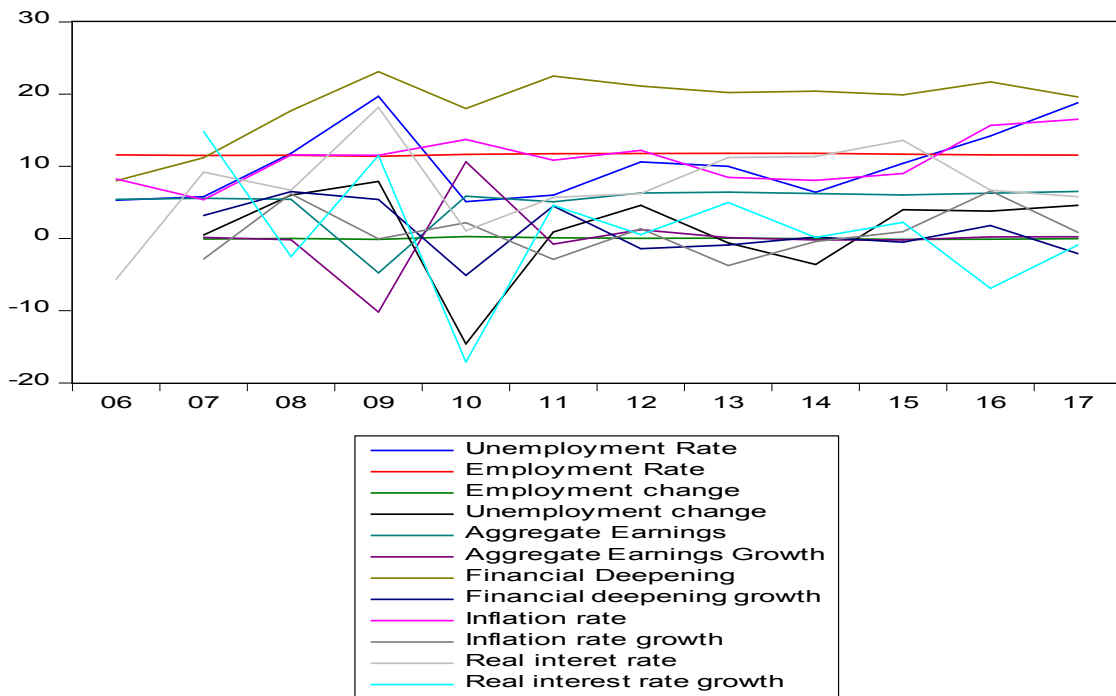


Fig. 1. Graphical correlation of (un)employment and aggregate earnings, and selected macroeconomic indicators

4. RELATED EMPIRICAL STUDIES

The value relevance of accounting information at a micro level should translate to the economic growth of any economy [44]. [7] examined the macroeconomic information content of aggregate earnings from the labour market’s perspective. The study anchored on the understanding of the labour economics literature to differentiate macro value relevance in aggregate GAAP earnings and its components that are statistically significant in predicting aggregate job creation and destruction, labour income, and unemployment. Their results suggest that aggregate earnings information explains future labour market aggregates as well as an incremental to other macroeconomic variables at near-term horizons. [7] pointed out that aggregate core earnings and unique items are the primary sources of information. However, the study explained that the news contains in the core earnings, and the individual item is of different degrees. Generally, [7] result suggest that aggregate earnings contain essential information about future labour market conditions, with the nature of such information varying across earnings components. According to [7], “earnings growth dispersion contains information about trends in labour reallocation,

unemployment change, and, ultimately, aggregate output.” The study found that government statistical agencies saddled with the responsibility of macroeconomic forecast do not incorporate this important information about earnings in their various estimates. Consequently, earnings growth dispersion significantly predicts future restatements in nominal and real GDP growth (and unemployment change).

From the angle of monetary policy, [8] investigated whether the negative association between aggregate earnings and returns is a function of the monetary policy news in aggregate earnings. The study used Federal funds futures data and constructed a measure of policy news. They reported that aggregate earnings carry financial information about the Federal’s policy actions. Also documented in the study is that when policy surprises are controlled, the negative aggregate earnings -returns association is not loud and majorly noticed in periods with negative policy surprises, that tend to trigger a more significant market reaction. According to [8], “aggregate earnings convey policy news, and the market reacts negatively to policy surprises, which drives the negative aggregate earnings-returns association.” [6]

study predicts and finds that the interaction of firm-level and aggregate-level shocks explain a significant portion of shocks to macroeconomic activity. The study assumed that the relationship between uncertainty and economic growth is most pronounced when both firm-level and aggregate-level uncertainty are high simultaneously. The same vein, [6] hypothesize that aggregate earnings affect unemployment most when both firm-level dispersions are high and aggregate performance is low, based on the sectoral shift theory. The study concluded that their assumptions and empirical results show that the interactive effect of firm-level and aggregate-level shocks are more significant than the sum of the individual effects.

In consideration of the possible effect of specific financial reporting characteristics on the value relevance of aggregate accounting earnings at the macroeconomic level, [20] examined whether the impact of firm-level accounting earnings to the informativeness of the aggregate is moved towards earnings with specific financial reporting characteristics. The study first aimed at investigating whether considering the smoothness of firm-level earnings increases the informativeness of aggregate earnings for future real GDP, and if so, whether macroeconomic forecasters use this information efficiently. [20] adopted a recently developed mixed data sampling methods and revealed that the aggregate is moved towards firms with smoother earnings and that this composition of aggregate earnings outperforms traditional weighting schemes. The study further documented that this tilted aggregate has a stronger positive association with forecast revisions and that analysts who utilize earnings the most in their forecasts appear to impound the informativeness of earnings smoothness fully.

[4] based on results from previous literature that accounting earnings convey negative economic news in a timelier manner than good news, anchored on conditioning KP's GDP growth forecast model on the sign of earnings changes, [4] show that adverse changes in aggregate earnings predict future GDP growth, while positive changes in earnings do not. Furthermore, [4] found that professional macro forecasters underreacted to the information contained in detrimental changes in aggregate earnings about future GDP growth and provided additional evidence implying that accounting conservatism drives the incremental usefulness of negative earnings rather than other

determinants of asymmetric timeliness in earnings.

[9] provided further evidence about the ignorance of macroeconomic forecasters about the effect of the information content of aggregate earnings surprises on future inflation hence they do not fully utilize this information in generating their forecasts. [9] reported that earnings news, aggregated across firms releasing earnings in three months, predicts forecast errors in Producer Price Index (PPI) released in the subsequent two months. Whereas, aggregate earnings surprises do not predict forecast errors for the Consumer Price Index (CPI). That investigating this predictive ability of aggregate earnings is driven by a broad cross-section and not industry type. The study further documented that the bond market's reaction to PPI news is predictable based on previously released aggregate earnings news. [9] in conclusion, in strong terms, pointed out that macroeconomic forecasters and bond market investors do not take full cognizance of the information in aggregate earnings surprises for future PPI.

At the macro level, [5] stated that aggregate accounting earnings had been used to predict capital market growth, emphasizing the need to consider whether the same information can be used to predict economic growth. [38] agreed with the evidence provided by [5] by providing further evidence. [10] stressed the point that the design and investigation of accounting information content necessarily should involve addressing aggregate effects. However, many researchers have not given adequate attention to this area. The few studies on the effect of accounting information content on economic growth have shown contradictory results. [5,38] are empirical studies on the effect of accounting information on economic growth, showing much emphasis on earnings predictability power on Gross Domestic Product (GDP).

[5] study centered on the US economy to consider the relationship between data on subsequent real GDP growth and earnings from quarterly returns of the largest US firms. The study documented that 'accounting profitability data aggregated across the 100 largest firms have predictive content for subsequent real Gross Domestic Product'. Thus, demonstrating the potential usefulness of accounting information content to improve macroeconomic

forecasting. Precisely, the study reported as follows: (i) aggregate accounting earnings growth is a significant leading indicator of GDP growth and (ii) professional macro forecasters do not fully impound the predictive content embedded in publicly available accounting earnings data. They contributed to macroeconomics research by identifying aggregate accounting earnings growth as an incrementally significant predictor of GDP growth.

[38] in supporting [5] contributed further in the knowledge of the predictive ability of corporate earnings on the gross domestic product (GDP) by introducing volatility (fear index) and the debt-to-equity ratio (firm leverage) on the relationship between aggregate earnings and GDP growth. [38] study sought to examine the effects of macroeconomic conditions of (i) market volatility and (ii) firm leverage on the relationship between aggregate earnings and GDP growth. The study sample is made up of 94 quarterly observations spanning from Q1:1988 to Q2:2011 data obtained from the Compustat Quarterly US dataset. Earnings growth (Δ Earnings) is measured as the year-to-year change in scaled quarterly income and was scaled by sales. They aggregated quarterly time series of earnings by constructing and using value-weighted cross-sectional averages with weights based on market capitalization as of the beginning of the quarter. The study sample is restricted to firms with December fiscal year-ends. Also, they delete firm-quarter observations that fall in the top and bottom one percentile of each quarterly cross-section of Earnings and Δ Earnings. The study found that the predictive power of aggregate earnings on future GDP growth is influenced significantly by changes in market volatility and average firm leverage. They reported that increasing levels of market volatility are associated with earnings being more predictive of future GDP growth. They believed the constraining influence of volatility on the discount rate signaling effect of earnings. Furthermore, they found aggregate earnings predict GDP growth less when debt-to-equity levels have peaked, and that this result in the inability of earnings to predict GDP growth when capital is constrained. These findings buttress the point that the importance of controlling for macroeconomic factors such as the level of market volatility and substantial leverage when assessing the ability of aggregate earnings to forecast growth in GDP.

5. RESEARCH DESIGN

5.1 Data and Sample Considerations

We selected 101 companies from 173 companies quoted on the floor of the Nigerian Stock Exchange (NSE) based on an elimination process undertaken incognizance of four criteria. A total of 72 firms were excluded: those that were listed after 2006; that are not in operation up to 2017 and those that do not have complete data. Finally, the sample is made of at least 2 companies from each sector (i.e. Agriculture 2, conglomerates 3, construction/real estate 3, consumer goods 18, healthcare 5, ICT 4, Industrial goods 14, natural resources 3, oil & gas 9, services 16 and financials 24) that have consistently submitted their annual reports to the NSE from 2006 to 2017. Hence, twelve years of data from the sample companies covered a period from 2006 to 2017 and are transformed into specific attributes of our variables for the number of years for the research. Yearly reports are considered by stakeholders to be the most important and influential source of corporate information [45].

5.2 Variables and Measures

Aggregate Accounting Earnings_t (AAE_t): Our concern is with documenting associations between aggregate earnings and retrospective (un)employment changes and not predicting future (un)employment rate, therefore, after generating yearly firm-level earnings, the sum across all the firms in the sample is computed to derive a measure of aggregate earnings for each year as follows.

$$AgE_t = \sum_{i=1}^N (Earnings_{i,t}) \quad (1)$$

Where,

Earnings_{i,t} is year t profit after tax (PAT; financial statement item PATY) and N is the number of firms with earnings information available in the financial statement or annual report (see Appendix A).

(Un) Employment Rate is the dependent variables (criterion variables), as noted in [7], from a neoclassical economics perspective, the demand for labour by firm's is determined by its product demand and shape of its production function. [7,27] further explained that the extent of earnings news captures shocks to future profitability due to shift in product demand, that

positive earnings news should lead to additional investment and hiring, and vice versa can cause downsizing and layoffs. This understanding agrees with the sectoral shift hypothesis by [28] that unemployment is driven in part by cross-sectional shifts across sectors. The hypothesis links cross-sectional variation in firm-level and industry-level performance to aggregate performance. The intuition is as the firms make adequate profits or earnings *ceteris paribus* will invest part of the earnings, employment rate and production should increase, and the corresponding decrease in the unemployment rate. The (un) employment rate is measured by total (un) employment, as a percent of the total labor force.

5.3 Model Specification

The dependent variable (criterion variable), (un)employment rate ((U)N) in both economic, finance, and accounting literature [7]. The choice of this variable anchored on [46] that uses job creation as a metric for economic development growth. Models of [5,7] are foundations for our model for this study. Therefore, to suit our study setting due to peculiar nature of the data and none availability of quarterly data, we tend to use modified combination of models of [5,7] for investigating the extent of the association of aggregate earnings of quoted Nigerian firms on the (un)employment rate. Then our model is assumed first that there is no control or mediating variable.

(Un)employment Rate = f (Aggregate Earnings)

The model is specified in an implicit form:

$$U_t/N_t = f(AAE_t) \tag{2}$$

Where,

U_t/N_t = is the (un)employment rate, and a subscript t indicates the year

AAE_t = the sum of accounting earnings of total sample firms and subscript t indicates the year. In our context, yearly observations were used in this study, which is the most common measure used by researchers [47,48], with each yearly observation equal to the cross-sectional sum of sample firms' yearly earnings.

As opined by [49] data on variables with different units of measurement results into the problem of heteroskedasticity, and the problem can be solved by taking the logarithm of the variables. It is also another way of how to deal with the scale issue. [50] believes that logarithmic transformation also mitigates possible violations from normality and reduces possible positively skewed distribution. Hence dependent variable, U/N is in the percentage rate; to mitigate the problem of possible heteroskedasticity because aggregate earnings (AgE) is in the different units of measurement. We take natural log "ln" of AAE and specifying equations (3) in dynamic econometric form; we transform it to:

$$U_t/N_t = \beta_0 + \beta_1 \ln AAE_t + \epsilon_t \tag{3}$$

Where: U_t/N_t (U/N is (un)employment rate, and a subscript t indicates year) is the dependent variables; ln is natural logarithm; β_0, β_1 are regression coefficients with unknown values; AAE, is the independent variable; and ϵ is a random error component. APriori Expectation is such that $\beta_1 > 0$. If accounting information content is informative, it is expected that $\beta_1 > 0$ in equation (3).

Table 1. Shows the measurement and explanation of variables

Dependent	ABBR.		Source	Expected sign
Unemployment Rate	U	Total unemployment, as a percent of the total labor force	World Bank	-
Employment Rate	N	Employment in industry (% of total employment) (modeled ILO estimate)	World Bank	+
Independent				
Aggregate Earnings	AAE	Profit After Tax: the sum across all the firms in the sample is computed to derive a measure of aggregate earnings for each year	Annual Reports	+
Control/moderating variables				
Inflation	Inf	the year-on-year CPI inflation rate	CBN Annual Report	-
Financial Deepening	FD	Financial deepening as % of GDP	CBN	+
Real Interest Rate	RIR			-

We included other potential economic variables that could influence the relationship between aggregate earnings and (un)employment to obviate variable bias. Hence, equation 4 in implicit form thus:

$$U_t/N_t = f \left[\sum_{i=1}^N (Earnings_{i,t}), Inflation_t, Financial\ Deepening_t, Real\ Interest\ Rate_t \right] \quad (4)$$

Taking natural log “ln” of AAE, specifying equation (4) in dynamic econometric forms, we transform it to Simplified in equation form,

$$U_t/N_t = \beta_0 + \beta_1 \ln AAE_t + \beta_2 Inf_t + \beta_3 FD_t + \beta_4 RIR_t + \varepsilon_t \quad (5)$$

Where: U_t/N_t (U/N is (un)employment rate, and a subscript t indicates year) is the dependent variables; ln is natural log; β_0, β_1 are regression coefficients with unknown values; AAE, is the independent variable. APriori Expectation is such that $\beta_1 > 0$. If aggregate earnings are informative, it is expected that $\beta_1 > 0$ in equation (4). Inf= Inflation; FD= Financial Deepening; RIR= Real interest rate; ε_t = error term (is the error term capturing other explanatory variables not explicitly included in the model); β_0 = constant term (is the intercept of the regression) and $\beta_1, \beta_2, \beta_3$ & β_4 = regression coefficients for all the explanatory variables.

Second, we carried out a simple and multiple regression analysis using the OLS method.

6.1 Descriptive Statistics

Table 2 presents descriptive statistics on all variables used in the analysis of the association of aggregate earnings with (un)employment. The table shows that the dependent variables (un)employment rate (U/N) has (10.34)11.63 with a standard deviation of (5.08)0.12978. The minimum and maximum values for the (U/N) series are (5.10)11.39 and (19.17)11.81 respectively. While the minimum and maximum values for lnAAE are -4.76 and 6.52, respectively. The table also indicates that aggregate accounting earnings (lnAAE) and real interest rate (RIR) are the only variables that have negative values as a minimum value and moreover, the corresponding coefficient of skewness of -3.3 for lnAAE. It is an indication that the data is negatively skewed (that most of the data are on the left side of the standard curve). This output lends support to the views of [7] and [35], our study period is characterized by macroeconomic shocks. Results show that aggregate earnings associate more with employment.

6. EMPIRICAL RESULTS AND DISCUSSION

Empirical results in this study are reported in this section as follows. First, we display the descriptive statistics and correlation matrices.

Table 2. Distributional characteristics of sample data

Descriptive statistics									
	N	Minimum	Maximum	Mean	Std. deviation	Skewness	Kurtosis		
	Statistic	Statistic	Statistic	Statistic	Statistic	Std. error	Statistic	Std. Error	
U	12	5.10	19.70	10.3417	5.08321	.811	.637	-1.390	1.232
N	12	11.39	11.81	11.6319	.12978	-.194	.637	-.853	1.232
lnAAE	12	-4.76	6.52	5.0325	3.11738	-3.333	.637	11.338	1.232
FD	12	8.00	23.10	18.6167	4.55369	-1.617	.637	2.017	1.232
Infr	12	5.38	16.52	10.9385	3.30285	.204	.637	-.505	1.232
RIR	12	-5.63	18.18	7.5028	6.07176	-.482	.637	1.330	1.232
Valid N (listwise)	12								

Note: This table provides summary statistics. U is the unemployment rate; N is the employment rate; lnAAE is the natural log of aggregate earnings, the sum across all the firms in the sample is computed to derive a measure of aggregate earnings; FD is the financial deepening; Infr is the inflation rate; RIR is the real interest rate

6.2 Pearson Correlations

Table 3 reports the correlation matrix for the variables of this study. Table 3 results (for Pearson coefficients) show that only two control variables (financial deepening and the real rate of interest) are correlated with each other at the 5% significance level, which indicates that they are necessary measures. However, the variables of interest, (un)employment significantly correlated with the key independent variable (aggregate earnings) (at the 10% and 5% significance level respectively) and inflation rate (at the 5% significance level). More importantly, the result of the Pearson coefficients shows that (un)employment have a significantly (negative) positive correlation with aggregate accounting earnings at the 10% and 5% significance level respectively, which suggests that the higher the aggregate earnings, the (lower)higher the (un)employment.

6.3 Regression Result

Simple regression results are reported in Table 4. Concerning model 3, first, findings show that unemployment is negatively significantly associated with aggregate earnings at the 10% significance level (-0.819; t-statistics -1.836 and p-value= 0.096). Also, the intercept of the regression is negative, correctly signed by the

prior expectation, indicating that aggregate accounting earnings are contributing to a reduction in the unemployment rate. The result agrees with [7]. Furthermore, only 25% of variations in unemployment are explained by variations in the aggregate earnings. Second, results show that aggregate earnings have a significant positive impact on employment changes at 5% significance level (0.025; t-statistics 2.425 and p-value= 0.036), explaining about 37% variations in employment changes. When comparing the results for the two dependent variables- (un)employment, we notice essential differences regarding the intercept of the regression, R² and F-prob results. However, the results of the simple regression analysis support H1a which posits aggregate earnings positively associated with changes in the employment rate.

Table 5 shows the multiple regression analysis on (un)employment reactions to the combination of aggregate earnings and control variables. Considering first, the employment reaction to the combination of aggregate earnings and selected macroeconomic variables, our results in Table 5 revealed that both the independent and control variables of the model are significant with an 89% reliability, with which we prove all the hypotheses at the 1% significance level (p<0.01). More importantly, the intercept of the regression

Table 3. Pearson correlation matrices

Correlation matrix for key variables					
	UIN	AAE	FD	Infr	r
UU	1.0000	0.609*	0.2780	-0.1580	-0.0670
		(0.036)	(0.382)	(0.624)	(0.836)
InAAE	-0.502	1.0000	-0.2480	-0.00300	-0.499
	(0.096)		(0.437)	(0.992)	(0.099)
FD	0.5010	-0.2480	1.0000	0.493	0.610*
	(0.097)	(0.437)		(0.103)	(0.035)
Infr	0.591*	-0.003	0.493	1.0000	-0.149
	(0.043)	(0.992)	(0.103)		(0.645)
RIR	0.486	-0.499	0.610*	-0.149	1.0000
	(0.110)	(0.099)	(0.035)	(0.645)	
N	12	12	12	12	12

*This table presents the Pearson correlation matrices. The upper-right diagonal reports for employment -Pearson correlation coefficients, and the lower-left diagonal- unemployment- Pearson correlation coefficients in bold. The numbers reported in parentheses are p values. *. Correlation is significant at the 0.05 level (2-tailed). U is the unemployment rate; N is the employment rate; InAAE is the natural log of aggregate earnings, the sum across all the firms in the sample is computed to derive a measure of aggregate earnings; FD is the financial deepening; Infr is the inflation rate; RIR is the real interest rate*

Table 4. Summary of OLS regression results of (un)employment reaction to aggregate earnings (AAE)

	$U_t = \beta_0 + \beta_1 \ln AAE_t + \varepsilon_t$			$N_t = \beta_0 + \beta_1 \ln AAE_t + \varepsilon_t$		
	Coeff.	t-value	P-Value	Coeff.	t-value	P-Value
lnAAE	-0.819	-1.836	0.096	0.025	2.425	0.036
Constant	14.464	5.542	.000	11.504	188.150	0.000
R ²	0.252			0.370		
Adj. R ²	0.177			0.307		
F-Statistics	3.372			5.878		
Prob. F	0.096			0.036		
n	12			12		

Table 4 describes the relationship between aggregate earnings for a sample of Nigerian firms quoted on the Nigerian Stock Exchange and (un)employment in the period 2006 to 2017. The table shows the regression coefficients (Coeff.) t-values, total explanatory power (adj. R²), F-statistics, the probability of F, number of observation (n) for the total sample

Table 5. Summary of OLS regression results of (un)employment reaction to aggregate earnings and control variables

Variable	Symbol	Unemployment (U)			Employment (N)		
		Coef	T value	P-value	Coef	T value	P-value
Intercept	Cons	1.613	0.413	0.692	11.324	140.616	0.000
Aggregate Earnings	AAE	-0.316	-1.090	0.312	0.024	4.011	0.005
Financial Deepening	FD	-0.687	-3.228	0.072	0.037	5.504	0.001
Inflation	Infr	1.586	4.420	0.003	-0.035	-4.773	0.002
Real Interest Rate	RIR	0.768	3.228	0.014	-0.015	-3.060	0.018
R ²		0.843			0.898		
Adj. R ²		0.754			0.840		
F-Statistics		9.429			15.414		
Prob. F		0.006			0.001		
Durbin- Watson		2.028			2.011		
Mean VIF		2.8092			2.8092		
n		12			12		

Table 5 describes the relationship between aggregate earnings for a sample of Nigerian firms quoted on the Nigerian Stock Exchange and (un)employment in the period 2006 to 2017. The table shows the regression coefficients (Coeff.) t-values, total explanatory power (adj. R²), F-statistics, the probability of F, number of observation (n) for the total sample. U is the unemployment rate; N is the employment rate; lnAAE is the natural log of aggregate earnings, the sum across all the firms in the sample is computed to derive a measure of aggregate earnings; FD is the financial deepening; Infr is the inflation rate; RIR is the real interest rate

is, correctly signed per the prior expectation, implying first that aggregate earnings are contributing significantly to economic growth in Nigeria through employment. The finding of aggregate earnings association in the context of our study is in tandem with the reports of [7,8] that aggregate earnings contain information about macroeconomic variables.

Recall in Table 4, without control variables, the coefficient and T-value of AAE is 0.025 and 2.425 respectively and significant at the 5% level, which is consistent with our H1. Hence,

comparatively with the results in Table 5, when control variables are included in the model, the T value (4.011) of AAE becomes more strongly positive and improved significantly at the 1% level. There are two implications to these findings. First, the employment reaction to aggregate earnings can be attributed to the influence the macroeconomic variables -control variables. Second, after controlling for these macroeconomic indicators, the importance of aggregate earnings becomes more significant. These results further agree with hypothesis 1b.

In cognizance of the control variables, the coefficient of financial deepening (*FD*) is positive and strongly significant at the 1% level, implying that the employment reacts more positively as funds are moved from the surplus side to deficit side of the economy. The finding agrees with [39] that "financial deepening propels economic growth through both a more rapid capital accumulation and productivity growth. The coefficient of *inflation* is negative and significant at the 1% level, consistent with the prediction that higher inflation discourages investors from investing their funds that will generate employment [40]. Hence, the higher the inflation, the lower the income. The coefficient of real interest rate (*RIR*) is also harmful and strongly significant at the 1%, which suggests that the higher the real interest rate, the lower the employment rate.

Regarding the unemployment changes, in Table 4 without control variables, the coefficient of *AAE* is -0.819 and marginally significant, which suggests that aggregate accounting earnings are an important variable in explaining variations in the unemployment. However, the inclusion of the selected macroeconomic variables the model did not improve the explanatory power of aggregate earnings on unemployment. Thus, hypothesis 1b is not confirmed. Also, we examined whether the unemployment rate decline is related to financial intermediation; we found that the *FD* is insignificantly negative, suggesting that the variable is not the major causes of the unemployment changes. Although the intercept is correctly signed which implies the higher the financial deepening activities within the economy, the lower the unemployment rate.

Results also show that inflation and real interest rates have a significant positive effect on the unemployment rate (1.586; t-statistic= 4.420 and 0.768; t-statistic =3.228, respectively). Such results emphasize the need to consider the real interest rate and inflation in an emerging economy in eradicating unemployment and enhancing employment growth.

6.4 Robustness Checks

We conducted several robustness tests for hypothesis 1. First, if control of only one selected

macroeconomic variable can enhance the reaction of the relationship that exists between aggregate earnings and unemployment. Therefore, we re-examine the results after excluding other control variables. Table 6, column 1 shows the magnitude and significance level of the *lnAAE* coefficient changed while columns 2 and 3, the magnitude and significance level of the *lnAAE* coefficient remain unchanged, indicating that the inflation rate (*Infr*) is the only control variables among the selected macroeconomic variables that exert serious effect on our main results. Interestingly, aggregate earnings remained correctly negatively signed as expected.

Second, the (un)employment reaction to aggregate earnings may depend on the economic growth of a country where companies operate. Hence, in column 4, 5, and 6 of Table 6 avoiding variable biases, we include economic growth proxied by gross domestic annual growth rate (*Gdpagr*) in the regressions. Column 4 shows that the coefficient *Gdpagr* is positive and significant at the level of 1%, whereas that of *lnAAE* coefficient increased in magnitude and significance ($-1.2519^{***} > -0.8160^{*}$, absolute value). In column 5, we add *Gdpagr* in the regression specification for column 1, to check if the effect of inflation on the reaction of unemployment to aggregate earnings change. The coefficient of *Gdpagr* remains negative and weakly significant, whereas that of *lnAAE* still negatively significant ($p < 0.01$) at the 1% level. The coefficient of inflation still positive, but insignificant, suggesting that economic growth combats the effect of inflation. Column 6 adds *Gdpagr*, the annual growth rate of gross domestic product to the model (equation 5). For the unemployment reaction to aggregate earnings and selected macroeconomic variables sign, magnitude and significance level remain almost the same, although the coefficient of *Gdpagr* is negative but insignificant, indicating that economic growth helps to curb unemployment but not significant in our context. Further check on our earlier result about the explanatory power of the combination of aggregate earnings and all selected macroeconomic variables and subsequent inclusion of *Gdpagr* on the variations on unemployment remains almost the same (i.e., Adj $R^2 = 75\%$, $P < 0.01$ and $DW = 2.02$).

Table 6. Robustness check of unemployment rate reaction to aggregate earning with individual macroeconomic variables

Variable	(1) U	(2) U	(3) U	(4) U	(5) U	(6) U
InAAE	-0.8160** (-2.3729)	-0.6570 (-1.5163)	-0.5647 (-1.0968)	-1.2519*** (-3.6393)	-1.1185*** (-3.2819)	-0.53584 (-1.4740)
Infr	0.9070** (2.7944)				0.4975 (1.3964)	1.2940** (2.8016)
FD		0.4478 (1.5094)				-0.5891 (-1.7385)
RIR			0.26182 (0.9903)			0.6528** (2.4708)
Gdpagr				-1.2192*** (-3.2729)	-0.8482* (-1.915)	-0.4006 (-1.0022)
N	12	12	12	12	12	12
Adj. R ²	0.511	0.270	0.176	0.583	0.62	0.7541
DW	1.313	0.898	0.964	1.764	1.685	2.043

All variables are defined in Table 1 except the additional variable Gdpagr, gross domestic product annual percentage growth rate. Values of robust t-statistics are in parentheses. U is the unemployment rate; N is the employment rate; InAAE is the natural log of aggregate earnings, the sum across all the firms in the sample is computed to derive a measure of aggregate earnings; FD is the financial deepening; Infr is the inflation rate; RIR is the real interest rate; Gdpagr is gross domestic product annual growth rate; *Indicate significance at the 10% level; ** Indicates significance at the 5% level; *** Indicates significance at the 1% level; Model Specifications: $N_t = \beta_0 + \beta_1 \ln AA E_t + \beta_2 \ln fr_t + \beta_3 FD_t + \beta_4 RIR_t + \beta_5 Gdpagr_t + \epsilon_t$; $N_t = \beta_0 + \beta_1 \ln AA E_t + \beta_2 FD_t + \epsilon_t$; $N_t = \beta_0 + \beta_1 \ln AA E_t + \beta_2 RIR_t + \epsilon_t$; $N_t = \beta_0 + \beta_1 \ln AA E_t + \beta_2 \ln fr_t + \beta_3 FD_t + \beta_4 RIR_t + \beta_5 Gdpagr_t + \epsilon_t$

Table 7. Robustness check of (Un) employment rate reaction to aggregate earning growth with individual macroeconomic variables

Variable	(1) ΔU	(2) ΔU	(3) ΔU	(4) ΔN	(5) ΔN	(6) ΔN
ΔInAAE	-1.0598** (-3.9848)	-0.6540 (-1.4964)	-0.6680 (-1.3953)	0.0184*** (3.7816)	0.0113 (1.7731)	0.0124 (2.2335)
ΔInfr		1.3431 (0.0589)	1.3140 (2.0583)		-0.0294*** (-3.4885)	-0.0271*** (-3.6618)
ΔFD		-0.3774 (-0.7567)	-0.4008 (-0.7282)		0.0170 (2.3474)	0.0189** (2.9634)
ΔRIR		0.5541 (0.1416)	0.5560 (1.5596)		-0.0143*** (2.9924)	-0.0144*** (-3.4935)
Δ Gdpagr			-0.1512 (-0.2572)			0.0118 (0.1428)
Prob (F-statistic)	0.0031***	0.0216**	0.0624	0.0043***	0.006***	0.008***
N	11	11	11	11	11	11
Adj. R ²	0.5980	0.69	0.635	0.570	0.792	0.845
DW	1.867	1.926	1.9770	0.87	1.2359	1.362

All variables are defined in Table 1 except the additional variable Gdpagr, gross domestic product annual percentage growth rate. Values of robust t-statistics are in parentheses. ΔU is the unemployment rate; ΔN is the employment rate; ΔInAAE is the natural log of aggregate earnings growth, the sum across all the firms in the sample is computed to derive a measure of aggregate earnings; ΔFD is the financial deepening change; ΔInfr is the inflation rate change; ΔRIR is the real interest rate change; ΔGdpagr is gross domestic product annual growth rate change; *Indicates significance at the 10% level; ** Indicates significance at the 5% level; *** Indicates significance at the 1% level;

Model Specifications: $(U_t)N_t = \beta_0 + \beta_1 \Delta \ln AA E_t + \epsilon_t$; $(U_t)N_t = \beta_0 + \beta_1 \Delta \ln AA E_t + \beta_2 \Delta \ln fr_t + \beta_3 \Delta FD_t + \beta_4 \Delta RIR_t + \epsilon_t$; $(U_t)N_t = \gamma_0 + \gamma_1 \Delta \ln AA E_t + \gamma_2 \Delta \ln fr_t + \gamma_3 \Delta FD_t + \gamma_4 \Delta RIR_t + \gamma_5 \Delta Gdpagr_t + \epsilon_t$

6.5 Further Robustness Check

We consider it an important issue not to be neglected as well as sufficient condition to arrive at the cogent conclusion of this paper by exploring the relationship between aggregate earnings growth and (un)employment changes. Thus, we specify the following equations 8,9 and 10 for the further analyses and results reported in Table 7.

$$\Delta U_t/N_t = \gamma_0 + \gamma_1 \frac{AAEt - AAE_{t-1}}{AAEt-1} + \varepsilon_t \quad (6)$$

$$\Delta U_t/N_t = \gamma_0 + \gamma_1 \frac{AAEt - AAE_{t-1}}{AAEt-1} + \gamma_2 \frac{FDt - FD_{t-1}}{FDt-1} + \gamma_3 \frac{Infrt - Infr_{t-1}}{Infrt-1} + \gamma_4 \frac{RIRt - RIR_{t-1}}{RIRt-1} + \varepsilon_t \quad (7)$$

$$\Delta U_t/N_t = \gamma_0 + \gamma_1 \frac{AAEt - AAE_{t-1}}{AAEt-1} + \gamma_2 \frac{FDt - FD_{t-1}}{FDt-1} + \gamma_3 \frac{Infrt - Infr_{t-1}}{Infrt-1} + \gamma_4 \frac{RIRt - RIR_{t-1}}{RIRt-1} + \gamma_5 \frac{Gdpagrt - Gdpagrt-1}{Gdpagrt-1} + \varepsilon_t \quad (8)$$

We take natural log “ln” of AAE and specifying equations (6, 7 and 8) in dynamic econometric form; we transform them to

$$(U_t)N_t = \beta_0 + \beta_1 \Delta \ln AAE_t + \varepsilon_t \quad (9)$$

$$(U_t)N_t = \beta_0 + \beta_1 \Delta \ln AAE_t + \beta_2 \Delta \ln fr_t + \beta_3 \Delta FD_t + \beta_4 \Delta RIR_t + \varepsilon_t \quad (10)$$

$$(U_t)N_t = \gamma_0 + \gamma_1 \Delta \ln AAE_t + \gamma_2 \Delta \ln fr_t + \gamma_3 \Delta FD_t + \gamma_4 \Delta RIR_t + \gamma_5 \Delta Gdpagrt_t + \varepsilon_t \quad (11)$$

A key takeaway from Further analysis presented in Table 7 is that aggregate accounting earnings growth of the 101 sample firms of this study associate significantly (un)employment changes in Nigeria. We calculate the yearly percentage change of (un)employment, aggregate-level earnings, and control variables. We used growth in (un)employment as the dependent variables. As shown in Table 7, column 1, 2, and 3 the equivalent quality robust checks reveal that coefficient of $\Delta \ln AAE$ is generally negative, which suggests that growth in firms aggregate earnings reduce unemployment growth. Column 1 and 4 of Table 7 report from the regression model of future levels of (Un)employment activities on aggregate earnings measure in equation 9. Results are generally consistent with the prediction and facts that aggregate earnings numbers capture information about (un)employment activities. As shown in columns 1 and 4, the coefficients of $\Delta \ln AAE$ are -1.0598 and 0.0184, and significant at the 5% and 1% levels respectively.

More so, we add control variables and exclude gross domestic product annual growth rate change in equation 10, to enable us to compare results in Table 5. As shown in columns 2 and 5 of Table 7 for the reaction of unemployment and employment changes to aggregate earnings

growth measure and selected macroeconomic variables, respectively, overall, the findings help substantiate the inference that aggregate earnings numbers capture information about (un)employment activities and that this information is influenced by the selected macroeconomic indicators.

Lastly, in columns 3 and 6 of Table 7, we add economic growth variable proxied by gross domestic product annual growth rate changes using the multiple regression specifications of equation 10. We observe that the result remains almost the same as the explanatory power of the joint effect of the combination of aggregate earnings and control variables on (un)employment unchanged. The other robustness checks confirm the validity of the empirical results of our hypotheses, majorly H1.

6.6 Discussion of Findings

The findings of this study are discussed in this section. The finding agrees with the view of [35] that the period is characterized by the economic and financial crisis and the worst recession. This finding is supported by communication theory, a clear view an indication of noise as a result of business cycles that are transmitted on accounting numbers and communicated to

investors for decision making thereby causing wide variations in accounting information. The distribution characteristics of the data revealed that aggregate accounting earnings are negatively skewed and had a negative minimum value in 2009, a year characterized by corporate failure, scandals and financial crisis as noted by [35,7]. The descriptive statistics also indicate that at the year 2009 in which earnings reported by the sampled firms was minimum (-4.76), the unemployment rate was at the highest level of 19.70%. This finding supports the view of [7] that positive earnings news leading to additional investment and hiring whereas negative earnings tending to be downsizing and layoff and in tandem with [27] idea that persistent shocks determine to the extent of changes in employment (i.e., hiring or firing of workers), while transitory shocks result in changes in wages.

The results are consistent with our hypothesis one that states that aggregate accounting earnings of quoted Nigerian firms significantly affect the unemployment of Nigeria. Also, the result agreed with [7], who concluded that aggregate GAAP earnings are valued relevance about the future labor market conditions. Implying that as aggregate earnings increases, unemployment reduces. Our findings provide evidence that earnings provide social benefits as pointed out by [40] pointed out that "a decrease in national unemployment, and with the associated rise in job security, would likely contribute to increases in mental health and well-being.

7. CONCLUSION

We examine how to aggregate accounting earnings informativeness about (un)employment is affected by selected macroeconomic variables. The purpose is to examine whether aggregate earnings associated with (un)employment, taking the effect of other macroeconomic variables into account. Towards this end, we exploit the setting in Nigeria, an emerging economy, where in recent years is facing an economic downturn, also was the rate of inflation and real interest rate are in the two-digit figure.

Consistent with prior research, we generally find that aggregate earnings contain useful information about economic growth indicator (un)employment. We find in one hand, a more positive reaction of employment to aggregate earnings both when the influence of selected

macroeconomic variables is controlled and not controlled than to a negative reaction of unemployment. Interestingly the magnitude and significance of the positive employment reaction to aggregate earnings are positively related to financial deepening and cannot be offset by the negative influence of both inflation and real interest rates. On the other hand, the weak significant negative association between unemployment and aggregate earnings could not be strengthened by the significant negatively related financial deepening but rendered insignificant by the magnitude and significance of inflation and real interest rates.

Additional analysis (i.e., robustness check) also shows that firms aggregate earnings growth associated with unemployment growth than to the employment changes. Our results are consistent with the conclusion that is accounting earnings growth associated with future changes in (un)employment in our study context. Interestingly, aggregate accounting earnings maintained its sign as expected in all the tested models. Our results are robust for emerging economies taken cognizance of strong significant effect of the relationship between aggregate earnings growth and (un)employment changes.

One implication of our results is that aggregate accounting earnings contain information about (un)employment changes in Nigeria. Our results suggest that effective monetary policies aimed at reducing inflation and interest rate as well as enabling economic policies encouraging and efficient mobilizing of fund from surplus side to deficit side of the economy will reduce unemployment and lead to employment.

As such, we contribute to the few accounting literatures on aggregate earnings informativeness about macroeconomic variables in the following ways: First, by applying the same aggregated accounting-based measure-aggregate earnings as [10] in our Nigerian setting, our results reinforce their position that the design and investigation of accounting information content necessarily should involve addressing aggregate effects. Hence, we provide the first evidence.

Second, we reinforce the inferences of [38] but in another dimension by considering the effects of other macroeconomic variables on the relationship between aggregate earnings and

(un)employment changes. Finally, our study also adds to the aggregate earnings literature [20,5] by documenting evidence of aggregate earnings informativeness. The examination of accounting earnings and macroeconomic factors have been relatively unexplored in accounting and economic literature [51].

Our study has caveats. First, [7] opined that the informativeness or the ability of the different earnings components to predict unemployment rates is of practical importance only if accounting earnings contain information that is incremental to other available macroeconomic indicators. However, this still suggests that aggregate earnings per se cannot predict unemployment rates unless the firm's earnings management is adequately curtailed. A prediction that anchored on false accounting earnings likely may result in another round of analyst error in forecasting unemployment, GDP growth, and other macroeconomic indicators. When the information is bias and uncertain, resources are poorly allocated, leading to operating and investment inefficiencies [52].

Finally, this study focuses on yearly reported earnings to examine the long-term association between accounting earnings and (un)employment. The investigation could also be done by using quarterly aggregated accounting earnings (e.g., aggregate corporate earnings always reported by the Bureau of Economic Analysis (BEA) as it is done in a developed economy (e.g., the US, [5], creating a short window around the time accounting information is released. However, Nigerian setting, we are limited to only individual firm's reports. However, to overcome this limitation, we vigorously aggregated accounting earnings from the individual firm for this study bearing in mind that macroeconomic variables are aggregated.

In cognizance and consistent with these stated and other caveats to this study, we do not conclude that aggregate earnings have no predictive power. Instead, we firmly conclude that in the context of our study aggregate earnings growth associated with (un)employment rate changes, and this symbiotic relationship is significantly influenced by other macroeconomic variables. Moreover, there is a need for further study in this area of micro to macro accounting and doing so, scholars adding the effect of IFRS and political instability as control variables is recommended.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1. ICAEW. Growth, development and accounting: seeing the bigger picture. ICAEW thought leadership information for better markets; 2017.
2. Leuz C, Wysocki PD. The economics of disclosure and financial reporting regulation: Evidence and suggestions for future research. *Journal of Accounting Research*. 2016;54(2):525–622.
3. Venter ER, Gordon EA, Street DL. The role of accounting and the accountancy profession in economic development: A research agenda. *Journal of International Financial Management & Accounting*. 2018;29(2):195–218.
4. Gaertner FB, Kausar A, Steele LB. The usefulness of negative aggregate earnings changes in predicting future gross domestic product growth. SSRN; 2015.
5. Konchitchki Y, Patatoukas PN. Accounting earnings and gross domestic product. *Journal of Accounting and Economics*. 2014a;57:76–88.
6. Kalay A, Nallareddy S, Sadka G. Uncertainty and sectoral shifts: The interaction between firm-level and aggregate-level shocks, and macroeconomic activity. *Management Science*. 2018; 64(1):198–214.
7. Hann RN, Li C, Ogneva M. Another look at the macroeconomic information content of aggregate earnings. *Insead*. 2016;1–40.
8. Gallo LA, Hann RN, Li C. Aggregate earnings surprises, monetary policy, and stock returns. *Journal of Accounting and Economics*. 2016;62(1):103–120.
9. Kothari S, Shivakumar L, Urcan O. Aggregate earnings surprises and inflation forecasts; 2012. [SSRN 2194122]
10. Ball R, Sadka G. Aggregate earnings and why they matter. *Journal of Accounting Literature*. 2015;34:39–57.
11. Min B, Kang J, Lee C, Roh T. The q-factors and macroeconomic conditions: asymmetric effects of the business cycles on long and short sides. *International Review of Finance*; 2019.
12. Gkoukousi X. Aggregate earnings and corporate bond markets. *Journal of Accounting Research*. 2014;52(1):75–106.

13. Odoemelam N, Okafor RG, Ofoegbu GN. Effect of international financial reporting standards (IFRS) adoption on earnings value relevance of quoted Nigerian firms. *Cogent Business & Management*. 2019;6:1643520.
14. Barth ME, Landsman WR, Lang M, Williams C. Are IFRS-based and US GAAP-based accounting amounts comparable? *Journal of Accounting and Economics*; 2012.
15. Barth ME, Li K, McClure C. Evolution in value relevance of accounting information. SSRN; 2017.
16. Elbakry AE, Nwachukwu JC, Abdou HA, Elshandidy T. Comparative evidence on the value relevance of IFRS-based accounting information in Germany and the UK. *Journal of International Accounting, Auditing and Taxation*. 2017;28:10–30.
17. Givoly D, Hayn C, Katz S. The changing relevance of accounting information to debt holders over time. *Review of Accounting Studies*; 2017.
18. Shroff PK. The relation between aggregate earnings and security returns over long intervals*. *Contemporary Accounting Research*. 2002;19(1):147–164.
19. Ball R, Sadka G, Sadka R. Aggregate earnings and asset prices. *Journal of Accounting Research*. 2009;47(5):1097–1133.
20. Ball R, Gallo L, Ghysels E. Tilting the evidence: The role of firm-level earnings attributes in the relation between aggregated earnings and gross domestic product. *Review of Accounting Studies*. 2019;24(2):570-592.
21. Treichel V. Putting Nigeria to work. *Putting Nigeria to Work*; 2010.
22. Uwakaeme OS. Economic growth in Nigeria: An empirical investigation of determinants and causal relationship (1980 – 2012). *American Journal of Economics*. 2015;5(1):9–20.
23. IMF. Article IV Consultation — Press Release; Staff Report; and Statement By the Executive Director for Nigeria. 2016;16.
24. Eberhardt M, Teal F. Productivity analysis in global manufacturing production. 2010;515.
25. Horvath J, Zhong J. Unemployment dynamics in emerging countries: Monetary policy and external shocks. *Economic Modelling*. 2019;76:31–49. Available:<https://doi.org/10.1016/j.econmod.2018.07.017>
26. Sikka P. The hand of accounting and accountancy firms in deepening income and wealth inequalities and the economic crisis: Some evidence. *Critical Perspectives on Accounting*. 2015;30:46–62.
27. Ross JF. The information content of accounting reports: An information theory perspective. *Information (Switzerland)*. 2016;7(3).
28. Lilien DM. Sectoral shifts and cyclical unemployment. *Journal of Political Economy*. 1982;90(4):777–793.
29. Shi LP, Imdorf C, Samuel R, Sacchi S. How unemployment scarring affects skilled young workers: Evidence from a factorial survey of Swiss recruiters. *Journal for Labour Market Research*. 2018;52(1).
30. Kessler JG, Ferreira S, Kessler JG, Ferreira S, Ahmadiani M. What makes people happy? Explaining the Cross-National Variation of Life Satisfaction. 2019;1–22.
31. Onodugo VA, Obi KO, Anowor OF, Nwonye NG, Ofoegbu GN. Does public spending affect unemployment in an emerging market? *Risk Governance and Control: Financial Markets & Institutions*. 2017;7(1).
32. Porter ME, Kramer MR. Creating shared value. In: Lenssen G, Smith N. (eds) *Managing Sustainable Business*. Springer, Dordrecht; 2019. Available:https://doi.org/10.1007/978-94-024-1144-7_16
33. Konchitchki Y. Accounting valuation and cost of capital dynamics: Theoretical and empirical macroeconomic aspects. *Discussion of Callen*. *Abacus*. 2016;52(1):26–34.
34. Kanodia C, Sapiro H. A Real effects perspective to accounting measurement and disclosure: Implications and insights for future research. *Journal of Accounting Research*. 2016;54(2):623-676.
35. Beaver WH, Joan H, McNichols MF, Marriner E, Wang ZZ. The information content of earnings announcements: New insights from intertemporal and cross-sectional behavior; 2015.
36. Bist JP. Financial development and economic growth: Evidence from a panel of 16 African and non- African low-income countries. *Cogent Economics & Finance*. 2018;12(1):1–17.
37. Christopoulos DK, Tsionas EG. Financial development and economic growth:

- Evidence from panel unit root and cointegration tests. *Journal of Development Economics*. 2004;73(1):55–74.
38. Saini JS, White TP. The effects of volatility and leverage on the earnings-GDP relation. *Academy of Accounting and Financial Studies Journal*. 2015;19(3):267–282.
39. Badjun M. Financial intermediation by banks and economic growth: A review of empirical evidence. *Financial Theory and Practice*. 2009;33(1988):121–152.
40. Klinefelter DA, Penson JB, Fraser DR, Klinefelter DA, Penson JB, Fraser DR. Effects of inflation on financial markets and agricultural lending institutions. 2019;62(5):1054–1059.
41. Konchitchki Y. Inflation and nominal financial reporting: implications for performance and stock prices. *The Accounting Review*. 2011;86:1045–1085.
42. Bayer C, Luetticke R, Pham-dao L, Tjaden V. Precautionary savings, illiquid assets, and the aggregate consequences of shocks to household income risk. 2019;87(1):255–290.
43. Levine R, Zervos S. Stock market development and long-run growth, policy research working paper 1582, World Bank Economic Review. 2006;10:323-339.
44. MSCI. Is There a Link Between GDP Growth and Equity Returns? 'MSCI Barra Research Bulletin'; 2010. Available: <https://www.msci.com/documents/10199/a134c5d5-dca0-420d-875d-06adb948f578>
45. Bozzolan S, Trombetta M, Beretta S. Forward-looking disclosures, financial verifiability and analysts' forecasts: A study of cross-listed european firms. *European Accounting Review*. 2009;18(3):435–473.
46. Gabe T. The pursuit of economic development: Growing good jobs in U.S. cities and states: London, England: Palgrave Macmillan; 2017
47. Barth ME, Beaver WH, Landsman WR. Relative valuation roles of equity book value and net income as a function of financial health. *Journal of Accounting and Economics*. 1998;25(1):1-34.
48. Ball R, Kothari S, Robin A. The effect of international institutional factors on properties of accounting earnings. *Journal of Accounting and Economics*. 2000; 29(1):1–51.
49. Kotsoyannis A. *Theory of econometrics (2nd ed)*: New York: Palgrave; 2003.
50. Foster G. *Financial statement analysis*, Prentice Hall; 1986.
51. Klein A, Marquardt CA. Fundamentals of accounting losses. *The Accounting Review*. 2006;81(1):179–206.
52. Shahab S, Clinch JP, O'Neill E. Accounting for transaction costs in planning policy evaluation. *Land Use Policy*. 2018;70:263–272.

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