

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

Abstract

The purpose of this study is to investigate the association between aggregate accounting earnings of quoted Nigerian firms and (un)employment changes. Also, 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. Also, 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. 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.

Key Words: 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 (ICAEW, 2017; Leuz & Wysocki, 2016; Venter, Gordon, & Street, 2018) many studies have investigated the aggregate earnings informativeness at a macro level about gross domestic products (GDP) growth (e.g., Gaertner, Kausar, & Steele 2015; Konchitchki and Patatoukas, 2014a), inflation forecast (e.g., Kalay, Nallareddy, & Sadka, 2018), unemployment (e.g.,

39 Hann, Li, & Ogneva, 2016), Federal policy action (e.g., Gallo, Hann, & Li, 2016),
40 macroeconomic forecasters error (e.g., Kothari, Shivakumar, & Urcan 2012). In deciding to
41 employ job seekers and laying off employees, managers consider the earnings abilities of
42 their companies, and often investment decisions that may lead to employment, information
43 about the cash cow internally and externally available to finance projects (i.e., financial
44 deepening) is also considered as well as the inflationary trend and real interest rate. The
45 information about the calculations earnings of firms is generally incognizance of
46 macroeconomic variables such as interest and inflation rates. Since corporate earnings is a
47 result of microeconomic activities of an individual firm in the economy, by aggregating
48 earnings information of the firms, aggregate earnings can provide insights on aggregate
49 (un)employment activities. We investigate this conjecture and document that firms' aggregate
50 earnings are associated with national (un)employment. Importantly, the information
51 embedded in the inflationary trend, financial deepening, and real interest rate is influential to
52 the relationship that exists between aggregate earnings and (un)employment rate.

53 Firms are at the center of economic activities such as knowledge and skill spillovers,
54 linkages, dynamic economies of scales and labour pooling, the economic/financial outcome
55 of these companies' activities should have a multiplier effect on the economy. This study
56 draws on the general view of Ball and Sadka (2015) "that the design and evaluation of
57 financial reporting must adopt at least in part an aggregate perspective." There are a wealth
58 of theoretical arguments in support of the impact of accounting earnings on economic growth.
59 In one example, Ball and Sadka (2015) pointed out that accounting variables can be leading
60 indicators for some aspect of economic activity because they reflect real events in firms and
61 their product and factors markets. Also, aggregate after-tax earnings is a component of the
62 US Gross Domestic Product, which is a reasonably large percentage. Min, Kang, Lee, and
63 Roh (2018) showed return on investment as a predictor of macroeconomic variables.

64 In this study, we argued that given that accounting earnings are valued relevance at the
65 firm-specific level, to what extent has it contributed to the increase or decrease of the
66 (un)employment rate of a given country? As companies are at the center of economic
67 activities such as knowledge and skill spillovers, linkages, dynamic economies of scales and
68 labour pooling, the economic/financial outcome of these companies' activities should have a
69 multiplier effect on the economy. On the front of capital market growth in particular evidence
70 has shown that accounting earnings is value relevant (e.g., Gkougkousi, 2014 ; Ball & Sadka,
71 2015; Jour, Creedy and Gurum, 2010; Barth, Landsman, Lang, & Williams, 2012; Barth, Li,
72 & McClure, 2017; Elbakry et al., 2017; Givoly, Hayn, & Katz, 2017), aggregate earnings risk
73 related to return risk (Shroff, 2002; Ball, Sadka and Sadka, 2009).

74 Under the emerging economy, aggregate earnings are presumed to support economic
75 growth, but the literature has yet to show direct evidence of relationships between aggregate
76 corporate profits and (un)employment change. Whereas, the predictive ability of aggregate
77 earnings on economic growth, few studies have been carried out. From, the U.S, aggregate
78 accounting earnings growth predicts GDP growth and professional macroeconomic forecaster
79 GDP growth error (Konchitchki and Patatoukas, 2014a), unemployment (Gallo, Hann, & Li,
80 2016). Min, Kang, Lee, and Roh (2018) showed return on investment as a predictor of
81 macroeconomic variables. Hann et al. (2016) demonstrate the macroeconomic information
82 content of aggregate earnings from the labour market's perspective. From the angle of
83 monetary policy Gallo, Hann, & Li, (2016) investigate whether the negative association
84 between aggregate earnings and returns is a function of the monetary policy news in
85 aggregate earnings. Kalay, Nallareddy, & Sadka (2018) study predicts and finds that the
86 interaction of firm-level and aggregate-level shocks explain a significant portion of shocks to
87 macroeconomic activity. The study assumed that the relationship between uncertainty and
88 economic growth is most pronounced when both firm-level and aggregate-level uncertainty

89 are high simultaneously. Ball, Gallo, and Ghysels (2019) examined whether the impact of
90 firm-level accounting earnings to the informativeness of the aggregate is moved towards
91 earnings with specific financial reporting characteristics. Gaertner, Kausar, & Steele (2015)
92 show that adverse changes in aggregate earnings predict future GDP growth, while positive
93 changes in earnings do not. Kothari, Shivakumar, & Urcan (2012) provided further evidence
94 about the ignorance of macroeconomic forecasters about the effect of the information content
95 of aggregate earnings surprises on future inflation hence they do not fully utilize this
96 information in generating their forecasts.

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

107 Our study has provided several insights and contributions to the current literature on
108 aggregate earnings in fourfold. First, this paper revealed that the aggregate earnings (AAE)
109 of the sampled firms is negatively correlated with unemployment change (U) and positively
110 associated with employment (N). Second, the study shows a stable (negative) positive
111 influence of financial deepening on (un)employment changes. Third, we document that
112 inflation changes associate (positively) negatively with (un)employment. Fourth, we reported
113 that real interest rate associate (positively) negatively with (un)employment changes. Higher

114 inflation and real interest rate primarily discourage portfolio investments, whether private or
115 official sources of capital finance such expenditure. While financial deepening primarily
116 captures the movement of idle funds, implying mobilizing fund from the surplus side of the
117 economy to the deficit, which brings about the growth of earnings. On this note, we show an
118 association of aggregate earnings with employment after controlling for inflation, financial
119 deepening, and real interest rate.

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

125 **2 Intuitional Setting in Nigeria**

126 The Nigerian economy is one of the leading emerging economies in Africa.
127 Nigeria is generally classified as a civil law country, with a trade regime that remains
128 heavily protectionist that has limited development of several employment-intensive sectors of
129 the economy (Treichel, 2010). The Nigerian population is about 180 million people, having
130 7.3% gross domestic product (GDP) growth, 33.1% of the population below the poverty line
131 and 24% unemployed as at 2013 has had a truncated history about her economic growth. The
132 Nigerian economy is facing many problems (Uwakaeme, 2015). Falling oil prices,
133 inconsistency in policy, and insecurity have produced shocks which have compounded an
134 already challenging development environment inadequate infrastructure, high unemployment
135 (9.9 percent) and a high poverty rate (above 50 percent in the northern states) (International
136 Monetary Fund, 2016). According to Eberhardt & Teal (2010, p.99), "Nigeria has expanded
137 manufacturing employment in the low-, medium-, and high-tech sectors, while the resource-

138 based manufacturing sectors have contracted.” Eberhardt & Teal (2010) further stated that
139 Nigeria lags behind other LICs in terms of the importance of the services sector, implying
140 that contribution of this sector to growth is low. Also, lack of adequate infrastructure and poor
141 investment environment have hindered firm efficiency in Nigeria. In one example, inadequate
142 electricity supply. In most cases, macroeconomic policy, infrastructure, and the overall
143 investment climate have a more significant impact on the performance of firms.

144 Because we can observe the performance of these firms, measure by corporate
145 earnings at the aggregate level, we can aggregate firms’ earnings. This allows for the analyses
146 of the informational content of aggregate earnings on (un)employment changes, in
147 cognizance of the consequences of the government trade policies-macroeconomic poly. Thus,
148 the Nigeria setting provides an opportunity to investigate the association between firm
149 performance and (un)employment rates.

150 **3. Conceptual Underpinnings and Hypothesis development**

151 Within the past five years, accounting researchers have aimed at investigating the
152 macroeconomic content of aggregate earnings (see Gaertner, Kausar, & Steele 2015;
153 Konchitchki and Patatoukas, 2014a; Kalay, Nallareddy, & Sadka, 2018; Hann, Li, & Ogneva,
154 2016; Gallo, Hann, & Li, 2016; Kothari, Shivakumar, & Urcan 2012). Many of these papers
155 report predictive ability, especially in the US setting, and many did not control for other
156 macroeconomic indicators. Conceptually and considering our study setting and dataset,
157 (un)employment prediction by aggregate earnings is not our objective; instead, the
158 association between (un)employment rate and aggregate earnings. Next, that follows is how
159 this association concept is influenced by financial deepening, inflation, and real interest rate.

160

161 **3.1 (Un)employment Rate**

162 The growth of every developed and developing economy requires expansion of the
163 labour market as well as a labour force. For instance, Britain's economy grows by expanding
164 the labour market. When there is massive investment in the economy, the multiplier effect
165 will yield a decrease(increase) in (un)employment. Horvath and Zhong (2019) agreed that job
166 creation is a metric for economic development and that one of the strategies for creating these
167 jobs is by reducing the cost of doing business. On the other hand, Sikka (2015) is of the view
168 that "accounting calculations and discourses prioritise the interests of capital over labour and
169 the state and have systematically eroded labour's share of the gross domestic product." The
170 companies prefer using a smaller number of employees to maximise productivity. They see
171 wages and salaries to workers as a cost and claiming to embrace cost minimization principle.
172 In doing so, the rate of employment remains static while the unemployment rate increases
173 every year, especially in an emerging economy such as Nigeria.

174 As noted in Hann, Li, and Ogneva (2016), from a neoclassical economics perspective,
175 the demand for labour by firm's is determined by its product demand and shape of its
176 production function. Hann et al. (2016) and Roys (2016) further explained that the extent of
177 earnings news captures shocks to future profitability due to shift in product demand, that
178 positive earnings news should lead to additional investment and hiring, and vice versa can
179 cause downsizing and layoffs. This understanding agrees with the sectoral shift hypothesis by
180 Lilien (1982) that unemployment is driven in part by cross-sectional shifts across sectors. The
181 hypothesis links cross-sectional variation in firm-level and industry level performance to
182 aggregate performance. The intuition is as the firms make adequate profits or earnings *ceteris*
183 *paribus* will invest part of the earnings, employment rate and production should increase, and
184 the corresponding decrease in the unemployment rate.

185 The reduction of the level of unemployment has been a vital macroeconomic
186 objective of various governments. According to Hann et al. (2016), "as a primary

187 macroeconomic indicator, the unemployment rate is followed by a broad range of 5 economic
188 agents and is embedded in various economic policy decisions, which brings it to the forefront
189 of macroeconomists' agenda." Voberner et al. (2017) are of the view that national
190 unemployment is a significant factor in an overall sense of labour market insecurity. Hence,
191 Kessler *et al.*, (2019) pointed out that "a decrease in national unemployment, and with the
192 associated rise in job security, would likely contribute to increases in mental health and well-
193 being." Achieving this economic goal helps to curb the social menace and to create a
194 conducive environment for other social, political, and economic activities to thrive. The
195 informativeness or the ability of the different earnings components to
196 predict unemployment rates is of practical importance only if accounting
197 earnings contain information that is incremental to other available
198 macroeconomic indicators (Hann et al. 2016). Generally, unemployment is said to
199 be a situation in which qualified individuals that are willing to work at a prevailing wage rate
200 are unable to do so for lack of job opportunities.

201 Onodugo, Obi, Anowor, Nwonye, and Ofoegbu (2017) lamented that the rate at which
202 unemployment is increasing in Nigeria is worrisome despite the acclaimed economic growth
203 in GDP. This implies that there are specific fundamental issues that need to be addressed,
204 such as companies' activities around job creation. Looking inward at the activities of
205 corporate as it relates to unemployment. Porter and Kramer (2019) stated that it is so evident
206 that huge earnings been recorded in the financial statement of entities have done little to
207 reduce the high level of unemployment. Considering the view of Hann et al.
208 (2016), intuitively if the aggregate of profit after tax (PAT) has a piece
209 of incremental information about either or both gross national income (GNI)

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

212 **3.2 Aggregate Earnings**

213 The accounting earnings information is said to be value relevant when it can alter the
214 economic choices of the users, and it is described as the usefulness of financial statement
215 information to outside parties in the firm. Konchitchki, (2016, p.29) observed “that corporate
216 profits are a component of GDP and are likely to be correlated with other GDP components, a
217 firm’s expected earnings downward pattern captured by earnings downside risk is linked to
218 an expected downward macroeconomic trend through its role in corporate profits, a driver of
219 economic activity.” In the long run, for instance, corporate profits, dividend, and share prices
220 move in the same direction (Kothari, Shivakumar and Urcan, 2012).

221 Corporate profits represent the value-added by a firm, which is capital. Corporate
222 earnings are because of corporate economic activities, and these economic activities of
223 corporate entity involve the production of goods and services, which is aggregated at the end
224 of the years to the gross domestic product. Again, out of these earnings workers are being
225 paid, the wages and salaries of the workforce of various entities form part of per capita
226 income. Also, firms finance their economic activities through retained earnings, which is part
227 of equity. Firms retained most of their profits to finance new investment and growth
228 (Kanodia and Sapra, 2016). While losses lead to lower owner's equity or even cynical owner's
229 equity, if firms have **cynical** owner’s equity, it can lead to the liquidation of all assets and an
230 option of shutting down the company which will trigger loss of jobs and reduction in the
231 production of goods and services.

232 According to Hann et al., (2016), the negative average earnings component news
233 estimates are linked to a disproportionate share of adverse macro shocks. Our study period

234 covers financial crisis of 2007-2008 and subsequent Great Recession of 2008-2009, this
235 represents such shocks (Hann et al.,2016; Beaver, Joan, McNichols, Marriner, & Wang,
236 2015). Based on the above, we state the hypotheses thus:

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

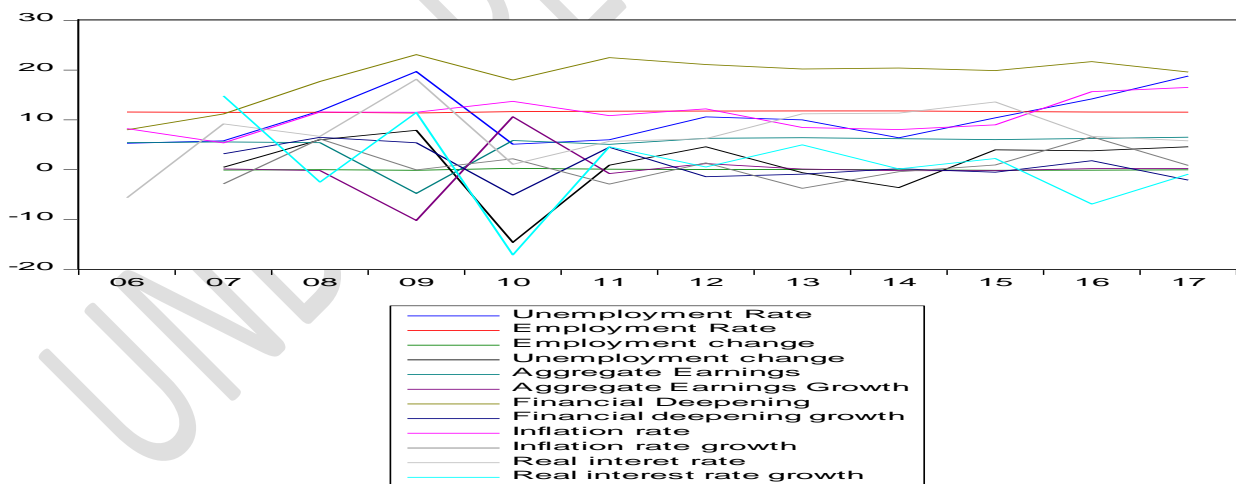
238 *H1b: Aggregate earnings negatively and significantly associated with the unemployment*
239 *rate*

240 **3.3. Control Variables**

241 In our analysis, we include control variables that have been hypothesized to be correlated
242 with (un)employment rate. The control variables are selected macroeconomic variables-
243 inflation, interest rate, and financial deepening to control the aggregate earnings-
244 (un)employment relationship. Inflation does not only affect (un)employment, but it also
245 affects the financial activities of a country by affecting the interest rates, which has a direct
246 effect on financial deepening, mobilizing fund from surplus to deficit side of the economy
247 (Bist, 2018). Hence, capital- aggregate earnings and labour are the two vital factors of every
248 theory of economic development. On the one hand, aggregate earnings positive growth has a
249 positive effect on economic growth, both in Cobb-Douglas production function and in other
250 various models (Bist, 2018; Hann et al. 2016). On the other hand, a country's overall
251 development depends on the labour force. These variables have also been used extensively in
252 the literature to control the finance-growth relationship (e.g., inflation (Bist, 2018;
253 Christopoulos & Tsionas, 2004) (e.g., aggregate earnings-GDP growth prediction (Saini and
254 White, 2015). For Badjun (2009), "financial deepening propels economic growth through
255 both a more rapid capital accumulation and productivity growth, with the latter channel being
256 the strongest." According to Klinefelter et al. (2019), inflation is defined "as a continuing
257 rise in the average level of prices for real goods and services." In consideration of what
258 defined inflation, aggregate demand and aggregate supply side of the economy play a major

259 role. Klinefelter et al. (2019), further explained that aggregate demand is determined by
 260 macroeconomic policies while aggregate supply is influenced by the availability of labour
 261 and capital services that government policies in the short run. Konchita (2013) pointed out
 262 that inflation is considered by investors in making investment decisions, while Bayer et al.
 263 (2019) are of the view that “aggressive monetary policy can stabilize the economy by cutting
 264 interest rates on liquid assets.” High inflation and extremely volatile interest rates affects
 265 financial performance of firms and influence annual decisions (Levi and Maki 1978;
 266 Klinefelter et al. 2019).

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



273
 274 Figure 1: Graphical correlation of (un)employment and aggregate earnings, and
 275 selected macroeconomic indicators
 276

277
 278 **4 Related Empirical Studies**

279 The value relevance of accounting information at a micro level should translate to the
 280 economic growth of any economy (MSCI Barra, 2010). Hann et al. (2016) examined the

281 macroeconomic information content of aggregate earnings from the labour market's
282 perspective. The study anchored on the understanding of the labour economics literature to
283 differentiate macro value relevance in aggregate GAAP earnings and its components that is
284 statistically significant in predicting aggregate job creation and destruction, labour income,
285 and unemployment. Their results suggest that aggregate earnings information explains future
286 labour market aggregates as well as an incremental to other macroeconomic variables at near-
287 term horizons. Hann et al (2016) pointed out that aggregate core earnings and unique items
288 are the primary sources of information. However, the study explained that the news contains
289 in the core earnings, and the individual item is of different degrees. Generally, Hann et al.
290 (2016) result suggest that aggregate earnings contain essential information about future
291 labour market conditions, with the nature of such information varying across earnings
292 components. According to Hann et al. (2016), "earnings growth dispersion contains
293 information about trends in labour reallocation, unemployment change, and, ultimately,
294 aggregate output." The study found that government statistical agencies saddled with the
295 responsibility of macroeconomic forecast do not incorporate this important information about
296 earnings in their various estimates. Consequently, earnings growth dispersion significantly
297 predicts future restatements in nominal and real GDP growth (and unemployment change).

298 From the angle of monetary policy, Gallo et al. (2016) investigated whether the
299 negative association between aggregate earnings and returns is a function of the monetary
300 policy news in aggregate earnings. The study used Federal funds futures data and constructed
301 a measure of policy news. They reported that aggregate earnings carry financial information
302 about the Federal's policy actions. Also documented in the study is that when policy surprises
303 are controlled, the negative aggregate earnings -returns association is not loud and majorly
304 noticed in periods with negative policy surprises, that tend to trigger a more significant
305 market reaction. According to Gallo et al. (2016), aggregate earnings convey policy news,

306 and the market reacts negatively to policy surprises, which drives the negative aggregate
307 earnings-returns association. Kalay, Nallareddy, & Sadka (2018) study predicts and finds
308 that the interaction of firm-level and aggregate-level shocks explain a significant portion of
309 shocks to macroeconomic activity. The study assumed that the relationship between
310 uncertainty and economic growth is most pronounced when both firm-level and aggregate-
311 level uncertainty are high simultaneously. The same vain, Kalay et al. (2018) hypothesize that
312 aggregate earnings affect unemployment most when both firm-level dispersions are high and
313 aggregate performance is low, based on the sectoral shift theory. The study concluded that
314 their assumptions and empirical results show that the interactive effect of firm-level and
315 aggregate-level shocks are more significant than the sum of the individual effects

316 In consideration of the possible effect of specific financial reporting characteristics on
317 the value relevance of aggregate accounting earnings at the macroeconomic level, Ball,
318 Gallo, and Ghysels (2019) examined whether the impact of firm-level accounting earnings to
319 the informativeness of the aggregate is moved towards earnings with specific financial
320 reporting characteristics. The study first aimed at investigating whether considering the
321 smoothness of firm-level earnings increases the informativeness of aggregate earnings for
322 future real GDP, and if so, whether macroeconomic forecasters use this information
323 efficiently. Ball et al. (2019) adopted a recently developed mixed data sampling methods and
324 revealed that the aggregate is moved towards firms with smoother earnings and that this
325 composition of aggregate earnings outperforms traditional weighting schemes. The study
326 further documented that this tilted aggregate has a stronger positive association with forecast
327 revisions and that analysts who utilize earnings the most in their forecasts appear to impound
328 the informativeness of earnings smoothness fully.

329 Gaertner et al (2015) based on results from previous literature that accounting
330 earnings convey negative economic news in a timelier manner than good news, anchored on
331 conditioning KP's GDP growth forecast model on the sign of earnings changes, Gaertner et
332 al. (2015) show that adverse changes in aggregate earnings predict future GDP growth, while
333 positive changes in earnings do not. Furthermore, Gaertner et al. (2015) found that
334 professional macro forecasters underreacted to the information contained in detrimental
335 changes in aggregate earnings about future GDP growth and provided additional evidence
336 implying that accounting conservatism drives the incremental usefulness of negative earnings
337 rather than other determinants of asymmetric timeliness in earnings.

338 Kothari et al. (2012) provided further evidence about the ignorance of macroeconomic
339 forecasters about the effect of the information content of aggregate earnings surprises on
340 future inflation hence they do not fully utilize this information in generating their forecasts.
341 Kothari et al. (2012) reported that earnings news, aggregated across firms releasing earnings
342 in three months, predicts forecast errors in Producer Price Index (PPI) released in the
343 subsequent two months. Whereas, aggregate earnings surprises do not predict forecast errors
344 for the Consumer Price Index (CPI). That investigating this predictive ability of aggregate
345 earnings is driven by a broad cross-section and not industry type. The study further
346 documented that the bond market's reaction to PPI news is predictable based on previously
347 released aggregate earnings news. Kothari et al. (2012) in conclusion, in strong terms,
348 pointed out that macroeconomic forecasters and bond market investors do not take full
349 cognizance of the information in aggregate earnings surprises for future PPI.

350 At the macro level, Konchitchki and Patatoukas, (2014a) stated that aggregate
351 accounting earnings had been used to predict capital market growth, emphasizing the need to
352 consider whether the same information can be used to predict economic growth. Saini and

353 White (2015) agreed with the evidence provided by Konchitchki and Patatoukas (2014) by
354 providing further evidence. Ball and Sadka (2015) stressed the point that the design and
355 investigation of accounting information content necessarily should involve addressing
356 aggregate effects. However, many researchers have not given adequate attention to this area.
357 The few studies on the effect of accounting information content on economic growth have
358 shown contradictory results. Konchitchki and Patatoukas (2014a) and Saini and White (2015)
359 are empirical studies on the effect of accounting information on economic growth, showing
360 much emphasis on earnings predictability power on Gross Domestic Product (GDP).

361 Konchitchki and Patatoukas (2014a) study centered on the US economy to consider
362 the relationship between data on subsequent real GDP growth and earnings from quarterly
363 returns of the largest US firms. The study documented that ‘accounting profitability data
364 aggregated across the 100 largest firms have predictive content for subsequent real Gross
365 Domestic Product’. Thus, demonstrating the potential usefulness of accounting information
366 content to improve macroeconomic forecasting. Precisely, the study reported as follows: (i)
367 aggregate accounting earnings growth is a significant leading indicator of GDP growth and
368 (ii) professional macro forecasters do not fully impound the predictive content embedded in
369 publicly available accounting earnings data. They contributed to macroeconomics research by
370 identifying aggregate accounting earnings growth as an incrementally significant predictor of
371 GDP growth.

372 Sanin and White (2015) in supporting Konchitchki and Patatoukas (2014a)
373 contributed further in the knowledge of the predictive ability of corporate earnings on the
374 gross domestic product (GDP) by introducing volatility (fear index) and the debt-to-equity
375 ratio (firm leverage) on the relationship between aggregate earnings and GDP growth. Saini
376 and White (2015) study sought to examine the effects of macroeconomic conditions of (i)

377 market volatility and (ii) firm leverage on the relationship between aggregate earnings and
378 GDP growth. The study sample is made up of 94 quarterly observations spanning from
379 Q1:1988 to Q2:2011 data obtained from the Compustat Quarterly US dataset. Earnings
380 growth (Δ Earnings) is measured as the year-to-year change in scaled quarterly income and
381 was scaled by sales. They aggregated quarterly time series of earnings by constructing and
382 using value-weighted cross-sectional averages with weights based on market capitalization as
383 of the beginning of the quarter. The study sample is restricted to firms with December fiscal
384 year-ends. Also, they delete firm-quarter observations that fall in the top and bottom one
385 percentile of each quarterly cross-section of Earnings and Δ Earnings. The study found that
386 the predictive power of aggregate earnings on future GDP growth is influenced significantly
387 by changes in market volatility and average firm leverage. They reported that increasing
388 levels of market volatility are associated with earnings being more predictive of future GDP
389 growth. They believed the constraining influence of volatility on the discount rate signaling
390 effect of earnings. Furthermore, they found aggregate earnings predict GDP growth less when
391 debt-to-equity levels have peaked, and that this result in the inability of earnings to predict
392 GDP growth when capital is constrained. These findings buttress the point that the
393 importance of controlling for macroeconomic factors such as the level of market volatility
394 and substantial leverage when assessing the ability of aggregate earnings to forecast growth
395 in GDP.

396 ***5. Research Design***

397 ***5.1. Data and sample considerations***

398 We selected 101 companies from 173 companies quoted on the floor of the Nigerian
399 Stock Exchange (NSE) based on an elimination process undertaken in cognizance of four
400 criteria. A total of 72 firms were excluded: those that were listed after 2006; that are not in
401 operation up to 2017 and those that do not have complete data. Finally, the sample is made of
402 at least 2 companies from each sector (i.e. Agriculture 2, conglomerates 3, construction/real

403 estate 3, consumer goods 18, healthcare 5, ICT 4, Industrial goods 14, natural resources 3, oil
404 & gas 9, services 16 and financials 24) that have consistently submitted their annual reports
405 to the NSE from 2006 to 2017. Hence, twelve years of data from the sample companies
406 covered a period from 2006 to 2017 and are transformed into specific attributes of our
407 variables for the number of years for the research. Yearly reports are considered by
408 stakeholders to be the most important and influential source of corporate information
409 (Bozzolan, Trombetta and Beretta, 2009).

410 *5.2. Variables and measures*

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

$$417 \quad AgE_t = \sum_{i=1}^N (Earnings_{i,t}) \quad (1)$$

420 Where,

421 Earnings_{i,t} is year t profit after tax (PAT; financial statement item PATY) and N is the
422 number of firms with earnings information available in the financial statement or annual
423 report (see Appendix A).
424

425 **(Un) Employment Rate** is the dependent variables (criterion variables), as noted in Hann,
426 Li, and Ogneva (2017), from a neoclassical economics perspective, the demand for labour by
427 firm's is determined by its product demand and shape of its production function. Hann et al.
428 (2017) and Roys (2016) further explained that the extent of earnings news captures shocks to
429 future profitability due to shift in product demand, that positive earnings news should lead to

430 additional investment and hiring, and vice versa can cause downsizing and layoffs. This
 431 understanding agrees with the sectoral shift hypothesis by Lilie (1982) that unemployment is
 432 driven in part by cross-sectional shifts across sectors. The hypothesis links cross-sectional
 433 variation in firm-level and industry level performance to aggregate performance. The
 434 intuition is as the firms make adequate profits or earnings *ceteris paribus* will invest part of
 435 the earnings, employment rate and production should increase, and the corresponding
 436 decrease in the unemployment rate. The (un)employment rate is measured by total
 437 (un)employment, as a percent of the total labor force

438
 439 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			-

440

441

442

443 4.3 Model Specification

444 The dependent variable (criterion variable), (un)employment rate ((U)N) in both
445 economic, finance, and accounting literature (e.g., Hann et al., 2016). The choice of this
446 variable anchored on Gabe, (2017) that uses job creation as a metric for economic
447 development growth. Models of Konchitchki and Patatoukas (2014) and Hann et al. (2016)
448 are foundations for our model for this study. Therefore, to suit our study setting due to
449 peculiar nature of the data and none availability of quarterly data, we tend to use modified
450 combination of models of Konchitchki and Patatoukas (2014) and Hann et al., (2016) for
451 investigating the extent of the association of aggregate earnings of quoted Nigerian firms on
452 the (un)employment rate. Then our model is assumed first that there is no control or
453 mediating variable.

454 (Un)employment Rate = f (Aggregate Earnings)

455 The model is specified in an implicit form:

$$456 U_t/N_t = f(AAE_t) \quad (2)$$

457 Where,

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

459 AAE_t = the sum of accounting earnings of total sample firms and subscript t indicates the
460 year. In our context, yearly observations were used in this study, which is the most common
461 measure used by researchers (e.g., Barth, Beaver & Landsman, 1998; Barth et al. 2000), with
462 each yearly observation equal to the cross-sectional sum of sample firms' yearly earnings.

463 As opined by Kotsyannis (2003:287) data on variables with different units of
464 measurement results into the problem of heteroskedasticity, and the problem can be solved by
465 taking the logarithm of the variables. It is also another way of how to deal with the scale
466 issue. Foster (1986) believes that logarithmic transformation also mitigates possible
467 violations from normality and reduces possible positively skewed distribution. Hence
468

469 dependent variable, U/N is in the percentage rate; to mitigate the problem of possible
 470 heteroskedasticity because aggregate earnings (AgE) is in the different units of measurement.
 471 We take natural log “ln” of AAE and specifying equations (3) in dynamic econometric form;
 472 we transform it to:

$$473 \quad U_t/N_t = \beta_0 + \beta_1 \ln AAE_t + \varepsilon_t \quad (3)$$

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

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

$$482 \quad U_t/N_t = f \left[\begin{array}{l} N \\ \sum_{i=1}^N (Earnings_{i,t}), Inflation_t, Financial Deepening_t, Real Interest Rate_t \end{array} \right] \quad (4)$$

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

$$489 \quad U_t/N_t = \beta_0 + \beta_1 \ln AAE_t + \beta_2 Inf_t + \beta_3 FD_t + \beta_4 RIR_t + \varepsilon_t \quad (5)$$

490 Where: U_t/N_t (U/N is (un)employment rate, and a subscript t indicates year) is the
 491 dependent variables; ln is natural log; β_0, β_1 are regression coefficients with unknown values;
 492 AAE, is the independent variable. **APriori Expectation is such that $\beta > 0$.** If aggregate
 493 earnings are informative, it is expected that $\beta > 0$ in equation (4). Inf= Inflation; FD= Financial
 494 Deepening; RIR= Real interest rate; ε_{jt} = error term (is the error term capturing other

495 explanatory variables not explicitly included in the model); β_0 = constant term (is the intercept
 496 of the regression) and $\beta_1, \beta_2, \beta_3$ & β_4 = regression coefficients for all the explanatory variables.

497 **6 Empirical Results and Discussion**

498 Empirical results in this study are reported in this section as follows. First, we display
 499 the descriptive statistics and correlation matrices. Second, we carried out a simple and
 500 multiple regression analysis using the OLS method.

501 **6.1 Descriptive Statistics**

502 Table 2 presents descriptive statistics on all variables used in the analysis of the
 503 association of aggregate earnings with (un)employment. The table shows that the dependent
 504 variables (un)employment rate (U)N has (10.34)11.63 with a standard deviation of
 505 (5.08)0.12978. The minimum and maximum values for the (U)N series are (5.10)11.39 and
 506 (19.17)11.81 respectively. While the minimum and maximum values for InAAE are -4.76
 507 and 6.52, respectively. The table also indicates that aggregate accounting earnings (InAAE)
 508 and real interest rate (RIR) are the only variables that have negative values as a minimum
 509 value and moreover, the corresponding coefficient of skewness of -3.3 for InAAE. It is an
 510 indication that the data is negatively skewed (that most of the data are on the left side of the
 511 standard curve). This output lends support to the views of Hann et al. (2016) and Beaver et al.
 512 (2015), our study period is characterized by macroeconomic shocks. Results show that
 513 aggregate earnings associate more with employment.

514 Table 2

Descriptive Statistics									
	N	Minimum	Maximum	Mean	Std. Deviation	Skewness	Kurtosis		
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Std. Error
U	12	5.10	19.70	10.3417	5.08321	.811	-.390	.637	1.232
N	12	11.39	11.81	11.6319	.12978	-.194	-.853	.637	1.232
InAAE	12	-4.76	6.52	5.0325	3.11738	-3.333	11.338	.637	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								

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

519

520 6.2 Pearson Correlations

521

522 Table 3 reports the correlation matrix for the variables of this study. Table 3 results

523 (for Pearson coefficients) show that only two control variables (financial deepening and the

524 real rate of interest) are correlated with each other at the 5% significance level, which

525 indicates that they are necessary measures. However, the variables of interest,

526 (un)employment significantly correlated with the key independent variable (aggregate

527 earnings) (at the 10% and 5% significance level respectively) and inflation rate (at the 5%

528 significance level). More importantly, the result of the Pearson coefficients shows that

529 (un)employment have a significantly (negative)positive correlation with aggregate accounting

530 earnings at the 10% and 5% significance level respectively, which suggests that the higher

531 the aggregate earnings, the (lower)higher the (un)employment.

532

533 Table 3

Correlation Matrix for key variables

	U\N	AAE	FD	Infr	r
UU	1.0000	0.609* (0.036)	0.2780 (0.382)	-0.1580 (0.624)	-0.0670 (0.836)
InAAE	-0.502 (0.096)	1.0000	-0.2480 (0.437)	-0.00300 (0.992)	-0.499 (0.099)
FD	0.5010 (0.097)	-0.2480 (0.437)	1.0000	0.493 (0.103)	0.610* (0.035)
Infr	0.591*	-0.003	0.493	1.0000	-0.149

	(0.043)	(0.992)	(0.103)		(0.645)
RIR	0.486 (0.110)	-0.499 (0.099)	0.610* (0.035)	-0.149 (0.645)	1.0000
N	12	12	12	12	12

534 This table presents the Pearson correlation matrices. The upper-right diagonal reports for
535 employment -Pearson correlation coefficients, and the lower-left diagonal- unemployment-
536 Pearson correlation coefficients in bold. The numbers reported in parentheses are p values. *.
537 Correlation is significant at the 0.05 level (2-tailed). U is the unemployment rate; N is the
538 employment rate; lnAAE is the natural log of aggregate earnings, the sum across all the firms
539 in the sample is computed to derive a measure of aggregate earnings; FD is the financial
540 deepening; Infr is the inflation rate; RIR is the real interest rate.
541

542 6.3 Regression Result

543 Simple regression results are reported in Table 4. Concerning model 3, first, findings
544 show that unemployment is negatively significantly associated with aggregate earnings at the
545 10% significance level (-0.819; t-statistics -1.836 and p-value= 0.096). Also, the intercept of
546 the regression is negative, correctly signed by the prior expectation, indicating that aggregate
547 accounting earnings are contributing to a reduction in the unemployment rate. The result
548 agrees with Hann et al. (2016). Furthermore, only 25% of variations in unemployment are
549 explained by variations in the aggregate earnings. Second, results show that aggregate
550 earnings have a significant positive impact on employment changes at 5% significance level
551 (0.025; t-statistics 2.425 and p-value= 0.036), explaining about 37% variations in
552 employment changes. When comparing the results for the two dependent variables-
553 (un)employment, we notice essential differences regarding the intercept of the regression, R^2 ,
554 and F-prob results. However, the results of the simple regression analysis support *H1a* which
555 posits aggregate earnings positively associated with changes in the employment rate

556 **Table 4**
557

558	Summary of OLS Regression Results of (un)employment Reaction to aggregate Earnings	
559	(AgE):	
560	$U_t = \beta_0 + \beta_1 \ln AgE_t + \varepsilon_t$	$N_t = \beta_0 + \beta_1 \ln AgE_t + \varepsilon_t$

	Coeff.	t-value	P-Value	Coeff.	t-value	P-Value
InAgE	-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					

561

562 **Table description**

563 . Table 4 describes the relationship between aggregate earnings for a sample of Nigerian
564 firms quoted on the Nigerian Stock Exchange and (un)employment in the period 2006 to
565 2017. The table shows the regression coefficients (Coeff.) t-values, total explanatory power
566 (adj. R²), F-statistics, the probability of F, number of observation (n) for the total sample. U is
567 the unemployment rate; N is the employment rate; InAAE is the natural log of aggregate
568 earnings, the sum across all the firms in the sample is computed to derive a measure of
569 aggregate earnings; FD is the financial deepening; Infr is the inflation rate; RIR is the real
570 interest rate.

571

572 Table 5 shows the multiple regression analysis on (un)employment reactions to the
573 combination of aggregate earnings and control variables. Considering first, the employment
574 reaction to the combination of aggregate earnings and selected macroeconomic variables, our
575 results in Table 5 revealed that both the independent and control variables of the model are
576 significant with an 89% reliability, with which we prove all the hypotheses at the 1%
577 significance level ($p < 0.01$). More importantly, the intercept of the regression is, correctly
578 signed per the prior expectation, implying first that aggregate earnings are contributing
579 significantly to economic growth in Nigeria through employment. The finding of aggregate
580 earnings association in the context of our study is in tandem with the reports of Hann et al.
581 (2017); Gallo et al. (2016) that aggregate earnings contain information about macroeconomic
582 variables.

583 Table 5

584
585

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	<i>Cons</i>	1.613	0.413	0.692	11.324	140.616	0.000
Aggregate Earnings	<i>AAE</i>	-0.316	-1.090	0.312	0.024	4.011	0.005
Financial Deepening	<i>FD</i>	-0.687	-3.228	0.072	0.037	5.504	0.001
Inflation	<i>Infr</i>	1.586	4.420	0.003	-0.035	-4.773	0.002
Real Interest Rate	<i>RIR</i>	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		

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Table description

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

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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

598 macroeconomic variables -control variables. Second, after controlling for these
599 macroeconomic indicators, the importance of aggregate earnings becomes more significant.
600 These results further agree with hypothesis 1b.

601 In cognizance of the control variables, the coefficient of financial deepening (*FD*) is
602 positive and strongly significant at the 1% level, implying that the employment reacts more
603 positively as fund are moved from the surplus side to deficit side of the economy. The finding
604 agrees with Badjun (2009) that “financial deepening propels economic growth through both a
605 more rapid capital accumulation and productivity growth. The coefficient of *inflation* is
606 negative and significant at the 1% level, consistent with the prediction that higher inflation
607 discourages investors from investing their fund that will generate employment (Klinefelter et
608 al. (2019). Hence, the higher the inflation, the lower the income. The coefficient of real
609 interest rate (*RIR*) is also harmful and strongly significant at the 1%, which suggests that the
610 higher the real interest rate, the lower the employment rate.

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

621 Results also show that inflation and real interest rates have a significant positive effect
622 on the unemployment rate (1.586; t-statistic= 4.420 and 0.768; t-statistic =3.228,

623 respectively). Such results emphasize the need to consider the real interest rate and inflation
 624 in an emerging economy in eradicating unemployment and enhancing employment growth.

625 **6.4 Robustness checks**

626 We conducted several robustness tests for hypothesis 1. First, if control of only one
 627 selected macroeconomic variable can enhance the reaction of the relationship that exists
 628 between aggregate earnings and unemployment. Therefore, we re-examine the results after
 629 excluding other control variables. Table 6, column 1 shows the magnitude and significance
 630 level of the *InAAE* coefficient changed while columns 2 and 3, the magnitude and
 631 significance level of the *InAAE* coefficient remain unchanged, indicating that the inflation
 632 rate (*Infr*) is the only control variables among the selected macroeconomic variables that
 633 exert serious effect on our main results. Interestingly, aggregate earnings remained correctly
 634 negatively signed as expected.

635 **Table 6**
 636 Robustness check of Unemployment rate reaction to aggregate earning with individual
 637 macroeconomic variables

Variable	(1)	(2)	(3)	(4)	(5)	(6)
	U	U	U	U	U	U
<i>InAAE</i>	-0.8160** (-2.3729)	-0.6570 (-1.5163)	-0.5647 (-1.0968)	-1.2519*** (-3.6393)	-1.1185*** (-3.2819)	-0.53584 (-1.4740)
<i>Infr</i>	0.9070** (2.7944)				0.4975 (1.3964)	1.2940** (2.8016)
<i>FD</i>		0.4478 (1.5094)				-0.5891 (-1.7385)
<i>RIR</i>			0.26182 (0.9903)			0.6528** (2.4708)
<i>Gdpagr</i>				-1.2192*** (-3.2729)	-0.8482* (-1.915)	-0.4006 (-1.0022)
<i>N</i>	12	12	12	12	12	12
<i>Adj. R²</i>	0.511	0.270	0.176	0.583	0.62	0.7541
<i>DW</i>	1.313	0.898	0.964	1.764	1.685	2.043

638 All variables are defined in Table 1 expect the additional variable *Gdpagr*, gross domestic
 639 product annual percentage growth rate. Values of robust t-statistics are in parentheses. U is
 640 the unemployment rate; N is the employment rate; *InAAE* is the natural log of aggregate
 641 earnings, the sum across all the firms in the sample is computed to derive a measure of
 642 aggregate earnings; *FD* is the financial deepening; *Infr* is the inflation rate; *RIR* is the real
 643 interest rate; *Gdpagr* is gross domestic product annual growth rate.

644 *Indicate significance at the 10% level

645 ** Indicates significance at the 5% level

646 *** Indicates significance at the 1% level

647 Model Specifications:

648 $N_t = \beta_0 + \beta_1 InAAE_t + \beta_2 Infr_t + \varepsilon_t$

649 $N_t = \beta_0 + \beta_1 InAAE_t + \beta_2 FD_t + \varepsilon_t$

650 $N_t = \beta_0 + \beta_1 InAAE_t + \beta_2 RIR_t + \varepsilon_t$

651 $N_t = \beta_0 + \beta_1 InAAE_t + \beta_2 Inf_t + \beta_3 FD_t + \beta_4 RIR_t + \beta_5 Gdpagr_t + \varepsilon_t$

652

653 Second, the (un)employment reaction to aggregate earnings may depend on the

654 economic growth of a country where companies operate. Hence, in column 4, 5, and 6 of

655 Table 6 avoiding variable biases, we include economic growth proxied by gross domestic

656 annual growth rate (Gdpagr) in the regressions. Column 4 shows that the coefficient *Gdpagr*

657 *is positive* and significant at the level of 1%, whereas that of *InAAE* coefficient increased in

658 magnitude and significance ($-1.2519^{***} > -0.8160^{**}$, absolute value). In column 5, we add

659 *Gdpagr* in the regression specification for column 1, to check if the effect of inflation on the

660 reaction of unemployment to aggregate earnings change. The coefficient of *Gdpagr* remains

661 negative and weakly significant, whereas that of *InAAE* still negatively significant ($p < 0.01$) at

662 the 1% level. The coefficient of inflation still positive, but insignificant, suggesting that

663 economic growth combats the effect of inflation. Column 6 adds *Gdpagr*, the annual growth

664 rate of gross domestic product to the model (equation 5). For the unemployment reaction to

665 aggregate earnings and selected macroeconomic variables sign, magnitude and significance

666 level remain almost the same, although the coefficient of *Gdpagr* is negative but insignificant,

667 indicating that economic growth helps to curb unemployment but not significant in our

668 context. Further check on our earlier result about the explanatory power of the combination

669 of aggregate earnings and all selected macroeconomic variables and subsequent inclusion of

670 *Gdpagr* on the variations on unemployment remains almost the same (i.e., $Adj R^2 = 75\%$,

671 $P < 0.01$ and $DW = 2.02$).

672 **6.5 Further Robustness check**

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

$$677 \quad \Delta U_t/N_t = \gamma_0 + \gamma_1 \frac{AAE_t - AAE_{t-1}}{AAE_{t-1}} + \varepsilon_t \quad (6)$$

$$680 \quad \Delta U_t/N_t = \gamma_0 + \gamma_1 \frac{AAE_t - AAE_{t-1}}{AAE_{t-1}} + \gamma_2 \frac{FD_t - FD_{t-1}}{FD_{t-1}} + \gamma_3 \frac{Infr_t - Infr_{t-1}}{Infr_{t-1}} + \gamma_4 \frac{RIR_t - RIR_{t-1}}{RIR_{t-1}} + \varepsilon_t \quad (7)$$

$$682$$

$$683 \quad \Delta U_t/N_t = \gamma_0 + \gamma_1 \frac{AAE_t - AAE_{t-1}}{AAE_{t-1}} + \gamma_2 \frac{FD_t - FD_{t-1}}{FD_{t-1}} + \gamma_3 \frac{Infr_t - Infr_{t-1}}{Infr_{t-1}} + \gamma_4 \frac{RIR_t - RIR_{t-1}}{RIR_{t-1}} +$$

$$684$$

$$685 \quad \gamma_5 \frac{Gdpagr_t - Gdpagr_{t-1}}{Gdpagr_{t-1}} + \varepsilon_t \quad (8)$$

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

$$689 \quad (U_t)N_t = \beta_0 + \beta_1 \Delta \ln AAE_t + \varepsilon_t \quad (9)$$

$$690 \quad (U_t)N_t = \beta_0 + \beta_1 \Delta \ln AAE_t + \beta_2 \Delta \ln Infr_t + \beta_3 \Delta FD_t + \beta_4 \Delta RIR_t + \varepsilon_t \quad (10)$$

$$691 \quad (U_t)N_t = \gamma_0 + \gamma_1 \Delta \ln AAE_t + \gamma_2 \Delta \ln Infr_t + \gamma_3 \Delta FD_t + \gamma_4 \Delta RIR_t + \gamma_5 \Delta Gdpagr_t + \varepsilon_t \quad (11)$$

692

693 A key takeaway from Further analysis presented in Table 7 is that aggregate
694 accounting earnings growth of the 101 sample firms of this study associate significantly
695 (un)employment changes in Nigeria. We calculate the yearly percentage change of
696 (un)employment, aggregate-level earnings, and control variables. We used growth in
697 (un)employment as the dependent variables. As shown in Table 7, column 1, 2, and 3 the
698 equivalent quality robust checks reveal that coefficient of $\Delta \ln AAE$ is generally negative,
699 which suggests that growth in firms aggregate earnings reduce unemployment growth.
700 Column 1 and 4 of Table 7 report from the regression model of future levels of
701 (Un)employment activities on aggregate earnings measure in equation 9. Results are

702 generally consistent with the prediction and facts that aggregate earnings numbers capture
703 information about (un)employment activities. As shown in columns 1 and 4, the coefficients
704 of $\Delta \ln AAE$ are -1.0598 and 0.0184, and significant at the 5% and 1% levels respectively.

705 **Table 7**
706 Robustness check of (Un)employment rate reaction to aggregate earning growth with
707 individual macroeconomic variables

Variable	(1)	(2)	(3)	(4)	(5)	(6)
	ΔU	ΔU	ΔU	ΔN	ΔN	ΔN
$\Delta \ln AAE$	-1.0598** (-3.9848)	-0.6540 (-1.4964)	-0.6680 (-1.3953)	0.0184*** (3.7816)	0.0113 (1.7731)	0.0124* (2.2335)
$\Delta \ln fr$		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)
$\Delta Gdpagr$			-0.1512 (-0.2572)			0.0118 (0.1428)
<i>Prob (F- statistic)</i>	0.0031***	0.0216**	0.0624	0.0043***	0.006***	0.008***
<i>N</i>	11	11	11	11	11	11
<i>Adj. R²</i>	0.5980	0.69	0.635	0.570	0.792	0.845
<i>DW</i>	1.867	1.926	1.9770	0.87	1.2359	1.362

708 All variables are defined in Table 1 expect the additional variable $Gdpagr$, gross domestic
709 product annual percentage growth rate. Values of robust t-statistics are in parentheses. ΔU is
710 the unemployment rate; ΔN is the employment rate; $\Delta \ln AAE$ is the natural log of aggregate
711 earnings growth, the sum across all the firms in the sample is computed to derive a measure
712 of aggregate earnings; ΔFD is the financial deepening change; $\Delta \ln fr$ is the inflation rate
713 change; ΔRIR is the real interest rate change; $\Delta Gdpagr$ is gross domestic product annual
714 growth rate change.

715 *Indicates significance at the 10% level

716 ** Indicates significance at the 5% level

717 *** Indicates significance at the 1% level

718 Model Specifications:

719 $(U_t)N_t = \beta_0 + \beta_1 \Delta \ln AAE_t + \varepsilon_t$

720 $(U_t)N_t = \beta_0 + \beta_1 \Delta \ln AAE_t + \beta_2 \Delta \ln fr_t + \beta_3 \Delta FD_t + \beta_4 \Delta RIR_t + \varepsilon_t$

721 $(U_t)N_t = \gamma_0 + \gamma_1 \Delta \ln AAE_t + \gamma_2 \Delta \ln fr_t + \gamma_3 \Delta FD_t + \gamma_4 \Delta RIR_t + \gamma_5 \Delta Gdpagr_t + \varepsilon_t$

722

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

727 findings help substantiate the inference that aggregate earnings numbers capture information
728 about (un)employment activities and that this information is influenced by the selected
729 macroeconomic indicators.

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

736 **6.6 Discussion of findings**

737 The findings of this study are discussed in this section. The finding agrees with the view of
738 Beaver et al (2015) that the period is characterized by the economic and financial crisis and
739 the worst recession. This finding is supported by communication theory, a clear view an
740 indication of noise as a result of business cycles that are transmitted on accounting numbers
741 and communicated to investors for decision making thereby causing wide variations in
742 accounting information. The distribution characteristics of the data revealed that aggregate
743 accounting earnings are negatively skewed and had a negative minimum value in 2009, a
744 year characterized by corporate failure, scandals and financial crisis as noted by Beaver et al
745 (2015) and Hann et al. (2016). The descriptive statistics also indicate that at the year 2009 in
746 which earnings reported by the sampled firms was minimum (-4.76), the unemployment rate
747 was at the highest level of 19.70%. This finding supports the view of Hann et al. (2017) that
748 positive earnings news leading to additional investment and hiring whereas negative earnings
749 tending to be downsizing and layoff and in tandem with Roys (2016) idea that
750 persistent shocks determine to the extent of changes in employment (i.e.,

751 hiring or firing of workers), while transitory shocks result in changes in
752 wages.

753 The results are consistent with our hypothesis one that states that
754 aggregate accounting earnings of quoted Nigerian firms significantly affect the
755 unemployment of Nigeria. Also, the result agreed with Hann et al. (2016), who concluded
756 that aggregate GAAP earnings are valued relevance about the future labor market conditions.
757 Implying that as aggregate earnings increases, unemployment reduces. Our findings provide
758 evidence that earnings provide social benefits as pointed out by Kessler *et al.* (2019) pointed
759 out that “a decrease in national unemployment, and with the associated rise in job security,
760 would likely contribute to increases in mental health and well-being.

761 **7. Conclusion**

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

768 Consistent with prior research, we generally find that aggregate earnings contain
769 useful information about economic growth indicator (un)employment. We find in one hand, a
770 more positive reaction of employment to aggregate earnings both when the influence of
771 selected macroeconomic variables is controlled and not controlled than to a negative reaction
772 of unemployment. Interestingly the magnitude and significance of the positive employment
773 reaction to aggregate earnings are positively related to financial deepening and cannot be
774 offset by the negative influence of both inflation and real interest rates. On the other hand, the
775 weak significant negative association between unemployment and aggregate earnings could

776 not be strengthened by the significant negatively related financial deepening but rendered
777 insignificant by the magnitude and significance of inflation and real interest rates

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

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

790 As such, we contribute to the few accounting literature on aggregate earnings
791 informativeness about macroeconomic variables in the following ways: First, by applying the
792 same aggregated accounting -based measure- aggregate earnings as Ball and Sadka (2015) in
793 our Nigerian setting, our results reinforce their position that the design and investigation of
794 accounting information content necessarily should involve addressing aggregate effects.
795 Hence, we provide the first evidence.

796 Second, we reinforce the inferences of Saini and White (2015) but in another
797 dimension by considering the effects of other macroeconomic variables on the relationship
798 between aggregate earnings and (un)employment changes. Finally, our study also adds to the
799 aggregate earnings literature (e.g., Ball et al. (2019); Konchitchki and Patatoukas, 2014a) by
800 documenting evidence of aggregate earnings informativeness. The examination of accounting

801 earnings and macroeconomic factors have been relatively unexplored in accounting and
802 economic literature (Klein & Marquardt, 2006)

803 Our study has caveats. First, Hann et al. (2017) opined that the
804 informativeness or the ability of the different earnings components to
805 predict unemployment rates is of practical importance only if accounting
806 earnings contain information that is incremental to other available
807 macroeconomic indicators. However, this still suggests that aggregate
808 earnings per se cannot predict unemployment rates unless the firm's
809 earnings management is adequately curtailed. A prediction that anchored on
810 false accounting earnings likely may result in another round of analyst
811 error in forecasting unemployment, GDP growth, and other macroeconomic
812 indicators. When the information is bias and uncertain, resources are poorly allocated,
813 leading to operating and investment inefficiencies (Shahab, Clinch, and O'Neill, 2018).

814 Finally, this study focuses on yearly reported earnings to examine the long-term
815 association between accounting earnings and (un)employment. The investigation could also
816 be done by using quarterly aggregated accounting earnings (e.g., aggregate corporate
817 earnings always reported by the Bureau of Economic Analysis (BEA) as it is done in a
818 developed economy (e.g., the US, Konchitchki and Patatoukas, 2014a), creating a short
819 window around the time accounting information is released. However, Nigerian setting, we
820 are limited to only individual firm's reports. However, to overcome this limitation, we
821 vigorously aggregated accounting earnings from the individual firm for this study bearing in
822 mind that macroeconomic variables are aggregated.

823 In cognizance and consistent with these stated and other caveats to this study, we do
824 not conclude that aggregate earnings have no predictive power. Instead, we firmly conclude

825 that in the context of our study aggregate earnings growth associated with (un)employment
826 rate changes, and this symbiotic relationship is significantly influenced by other
827 macroeconomic variables. Moreover, there is a need for further study in this area of micro to
828 macro accounting and doing so, scholars adding the effect of IFRS and political instability as
829 control variables is recommended.

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