

## A COMPARATIVE ANALYSIS OF ENGLISH AND HAUSA NAME TRUNCATIONS

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### **Abstract**

This study is a comparative analysis of English and Hausa name truncations from the perspective of prosodic morphology. The intention of the study is to examine the similarities and differences between two genetically unrelated languages in their morphological structures in name truncation. A collection of names that are found in written works: *the Online Dictionary of First Names* (2006) and *English Japanese Name Truncation* (Avaram 2010) is used and for Hausa, *Onomastic Treasure of the C I A (1965) Sunayen Hausawa na Gargajiya da Ire-Iren Abincin Hausawa* (Yahaya 1979) are used as source of data. The contrastive analysis of morphology of the names focuses on phonological aspects such as syllable, stress and tone. The study discovered that English and Hausa have similar truncatory process' in names consisting of materials which are not adjacent from the source names, truncated names with onset consonant replaced and truncated names that end in vowels. English differs from Hausa in truncated names with stress vowel change, truncated names with dental fricative replaced with (t) and (r) replaced with (l). Hausa differs from English in trisyllabic truncated name and truncated name that contain glottal and a vowel. These reveal that truncation in English has to do with syllable and stress while in Hausa it is based on syllable and tone.

**Key words:** Name Truncations, Syllable Survives Dropping syllable.

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### **Introduction**

Truncation is the shortening of a word or stem by removing part of it and leaving the rest. The term "name truncation" which falls under the scope of prosodic morphology is described as a process where a morphological category is typically marked through lack of material in the derived form as compared to the base form. It is one of the processes of word formation whereby a personal name is shortened or clipped either from the back, the middle or the front. For instance, an English name like **Elizabeth** is truncated as **Beth** or **Liz**; similarly, in Hausa, **Rabi'atu** is truncated as **Rabi**. Plag (2003) observes that name

truncation is common among people of the same age, status or social group whereby they tend to portray familiarity. Truncated names are found to frequently occur in vocative speech acts (that is) when they are used as terms of address.

The culture of shortening names in Nigerian communities is a known phenomenon among different tribes who speak the same or different language practice this culture of name truncation. The practice of shortening names has neither age limit nor gender between speaker and bearer. Moreover, people often truncate names for a number of reasons which may not be obviously

understood without carrying out a research. Sometimes the same name can be truncated in different forms, but this may be linked to the speech community the speaker and bearer belongs. However, in attested cases in Hausa speaking communities, some names tend to be shortened and at the same time confused the bearer for instance; the personal name *Abubakar* has different forms of truncations e.g. *Buba*, *Abor*, *Bukar* and *Abbakar*. If the speaker happens to be Kanuri by tribe and the bearer is Hausa while mingling, then the bearer will be addressed with the new form of name truncation which is based on the speakers' language background that is Kanuri. The truncated form of *Abubakar* in Hausa is *Abu*, *Abbakar* or *Bukar*. Now the bearer will be addressed as *Abukar* or *Abor* which sound entirely different from *Hausa* form of name truncation.

Similarly, when the Hausa speaker truncates a bearer from Kanuri background with the same personal name *Abubakar* and truncates the name as *Garba* which is same experienced with the Hausa bearer. However, there are difficulties encompasses name truncation which include ignorance of the rules governing the truncation of names across languages. For instance, an English name *Elizabeth* is often truncated wrongly as *Eli* which violets English rule of name truncation, the English name truncation strongly adhered to syllable that is all segment must be on *onset*, *nucleus and coda (ONC)* as in *Elizabeth* > *Beth*. The consequences of the ignorance of rules governing name truncation may lead to misunderstanding between speaker and bearer. Because whenever the name of a person is truncated it may either show positive attitude, familiarity towards the bearer or otherwise offend the bearer due to lack of knowledge from the speaker on how to truncate the name properly.

Another difficulty associated with name truncation which varies from one language to another is that of assumption and universal rules from the speaker. The

assumption: when speaker of another language for instance Kanuri speaker assumed a rule of name truncation and then apply it to Hausa bearer, thereby truncating a personal name from another language thus, *Abubakar* as *Abor* assuming that is applicable (here the speaker is unaware of the rules governing name truncation in his language or another) then the bearer will be confused. The universal rule is that the speaker is aware of rules governing name truncation in his language and applies it to another language; also it will confuse the bearer. That is to say Hausa speakers tend to truncate English names the way Hausa ones are truncated as in the case of *Elizabeth* truncated as *Eli* while the two languages are genetically unrelated with separate rules in name morphology, different origin and source of the names.

It is worthy to note that some languages borrowed names. English and Hausa languages are no exception; English native speakers borrowed names due to certain factors like religion, and migration. Most English given names are not derived from the English language. According to *Online Dictionary of Etymology and History of First Names*, The Angles and Saxons were continental Germanic tribes who began settling in Britain in the 5th century. They absorbed or displaced the native Celtic population who had for several centuries been under Roman rule. The Anglo-Saxons used old English Germanic names such as *Alfred*, *Allison*, *Alonzo*, *Almanzo*, *Alvin*, *Ammery*, *Emery Anna* and *Anah*.

Hausa native speakers are also affected with such borrowed names due to certain factors like religion and migration and language contact. It could be deduced from the foregoing that there are complications in truncating names among Hausa people. Name is an important aspect of human social life; without it, many social activities would not have been easily done or be possible. This is because people use names to refer to one another and it is also used among people to engage in a series of social

activities as people interact with each other in their everyday living. In this regard, a name is an essential reality of everyday life and it is so complex that the dynamic reality cannot be well conceived except when the dynamics in name culture are examined.

Name truncations as one of the dynamics in almost all societies around the globe where names tend to be shortened for a number of reasons. Therefore, this study finds it necessary to analyze the morphology of names in English and Hausa to capture the structure of the two languages at the name level in relation to name truncation. Moreover, to give a better understanding on how truncation processes are carried out morphologically in English and Hausa and to explain the important link between societal existing cultural practices and patterns of shortening names within the society.

### **Methodology**

Purposive sampling technique is used for the selection of these truncated names. Thus, the study considers only those possible truncated names from the documents. For English, one hundred and Four (104) names are selected and for Hausa, ninety-seven (97) names are also selected. *The Online Dictionary of First Names* is retrieved from

<http://www.oxfordreference.com> also the research consulted library for materials.

The sources of data for this study are documents. The study relies on secondary sources alone. Secondary sources such as collections of names that are found in written works for English, *The Online Dictionary of First Names* (2006) and *English Japanese Name Truncation* (Avaram 2010) is used and for Hausa, *Onomastic Treasure of the C I A (1965)* *Sunayen Hausawa na Gargajiya da Ire-Iren Abincin Hausawa* (Yahaya 1979) are used.

The study employs comparative method of data analysis for data presentation, after going through the possible truncated names in English and Hausa, the data is sorted out manually and presented in the tables. The data is then analyzed in terms of comparison and interpreted based on identified similarities and differences in the morphological aspect of name truncations in both languages from the perspective of prosodic morphology.

### **Data Presentation**

After going through the possible truncated names in English and Hausa, the data were sorted out manually and presented in the tables 1 and 2 respectively.

Table 1. English Names

Base form	Truncated form
Abigail	Gail
Abraham	Ab
Alber	Bert
Alexander	Xander
Alonzo	Lonzo
Amelia	Mel
Ara'bella	Bella
Arthur	Art
Augustus	Guss
Beatrice	Bea
Derek	Del
Flora	Floss
Harry	Hal
James	Jim
Joseph	Joe
Margret	Peg
Margret	Meg
Mathew	Mat
Richard	Dick

Table 2. Hausa Names

Base form	Truncated form
Abdulmalik	Malik
Abubakar	Buba, Abbakar
Aishatu	A'i
Aliyu	Ali
Auwal	Lawan
Idirisu	Idi
Inuwa	Inu
Jafa'ar	Jaff
Kabiru	KB
Kandala	Dela
Laraba	Larai
Tijjani	TJ
Ubaidullah	Uba

### Data Analysis

The data is analyzed in terms of comparison, starting with English. In truncating English names several processes are followed which has to do with prosodic units such as syllable and stress. In truncating the names there is variation as to the part of the base form which is preserved as a segmental material where the first syllable of the source name may provide the

segmental material. The segmental material filling the template taken from the first syllable must satisfy the following conditions as posited by Avram (2010): either it has an onset or it carries primary or secondary stress syllable. Segmental material taken from secondary stress syllable is rarer in English truncated names as shown in the table 3

Table 3. English truncated names as presented by Avaram (2010:3-9)

<b>First syllable Survives</b>	<b>Primary Stress Syllable Survives</b>	<b>Secondary Stress Syllable Survives</b>
Albert – Al	Albert - Bert	Abigail – Gail
Abigail – Ab	Adolphus - Dolph	
Alexander - Alex	Alexander – Xan	
Clifford - Cliff		
Clinton – Clint		
	Elizabeth – Liz	Elizabeth – Beth
		Margret – Greta
Daniel – Dan		

After going through the truncated names other process of truncation has been identified as in the subsequent tables:

Table 4. Monosyllabic English truncated names

<b>Base form</b>	<b>Truncated form</b>
Abigail	Gail
Abraham	Ab
Alber	Bert

Among the truncated names in English monosyllabic truncated names are identified which shows that the segmental

material from the source names have one syllable as indicated in the table above.

Table 5. Disyllabic English truncated names

<b>Base form</b>	<b>Truncated form</b>
Alexander	Xander
Alonzo	Lonzo
Ara’bella	Bella

The disyllabic English truncated names, shows that the segmental materials from the source names have two syllables after

truncation has taken place as indicated in the table above.

Table 6. Truncated names which are not adjacent to their source name

<b>Name</b>	<b>Truncated name</b>
Augustus	Guss
Flora	Floss
Jeremy	Jem
Philippa	Pippa

These truncated names consisting of material which are not adjacent from the source name, this happen when a segmental material from the source name is not taken

from a single syllable in the source name rather randomly but within the source name with or without addition as in the table above.

Table 7. Truncated names with changes in onset consonants

Name	Truncated form
Margret	Peg
Richard	Dick
Robert	Bob
William	Bill

Changes in segmental material truncated names with onset consonant replaced; here the segmental material has no relation with

the source name, especially comparing with those truncation processes that conform to syllable and stress in table 7 above.

Table 8. Truncated names with vowel change.

Base Form	Truncated form
Amelia	Mel
James	Jim
Margret	Meg
Michael	Mik

Exceptional truncated names with stressed vowel changed after the truncation has taken place /i/ turned into /ε/, /ei/ into /i/,

/a:/ into /ε/, and /ai/ into /i/ as shown in the table above.

Table 9. Truncated names with consonant replacement

Name	Truncated form
Arthur	Art
Mathew	Mat
/r/	/l/
Harry	Hal
Derek	Del

After truncation has taken place the source names that have dental fricative /θ/ are generally avoided and replaced with /t/, in

some truncated names postvocalic /r/ is replaced with /l/ as indicated in the table above.

Table 10. Truncated names ended with vowel

Base form	Truncated form
Beatrice	Bea
Joseph	Joe
Louis	Lou

After truncation has taken place the truncated forms of the names end in vowel as contrast to those end in consonants as shown in the table above

On the other hand, in truncating Hausa names several processes are observed which has to do with prosodic units such as syllable and tone. However, Hausa is not a stress language therefore, stress cannot be used in truncating names in Hausa. Name truncation in Hausa sometimes takes an

emotional tone where addresses are called with a friendlier, more passionate and more amiable tone also the intimacy is marked by tone and the truncation process came up with the ways short forms are formed through the process of dropping the first or last syllables of the first name and for some

trisyllabic names by dropping the first and the last syllable and it became disyllabic after the truncation process has taken place.

Table 11 Hausa Truncated Names

<b>Dropping Second Syllable</b>	<b>Dropping First Syllable, Last Syllable and Retains Second Syllable</b>	<b>Dropping First Syllable</b>
Abdulganiyyu – Abdul		Abdulganiyyu - *Ganiyyu
Abdulhadi – Abdul		Abdulhadi - Hadi
Abdulhamid – Hamid		Abdulhamid – Hamid
Abdulkabir – Kabir		Abdulkabir – Kabir
		Isma’ila – sama’ila
Zainabu – Zainab		Zainabu – Abu
Zakariyya’u - Zakari		Zakariyya’u – Ya’u

The model used above is adopted from Salihu (2014) Hausa names depicts various processes apart from Salihu (2014) model

of approach, some processes are found under the syllable dropping as can be seen in the subsequent tables;

Table 12. Monosyllabic Hausa truncated names

<b>Base form</b>	<b>Truncated form</b>
Zainabu	Abu
Ubaidullah	Uba

After truncation has taken place the truncated form of the names has become monosyllabic as shown in the table above.

Table 13. Disyllabic Hausa truncated names

<b>Base form</b>	<b>Truncated form</b>
Abubakar	Buba
Abdulmalik	Malik
Balarabe	Bala

After truncation has taken place, the truncated form of the names become

disyllabic. Majority of Hausa truncated names are disyllabic as shown in table.

Table 14. Trisyllabic Hausa truncated names

<b>Base form</b>	<b>Truncated form</b>
Abdulmumini	Mumini
Abdulsalami	Salami
Isma’ila	Sama’ila

As contrast to English truncated form of names some Hausa truncated form of names

become trisyllabic after truncation has taken place.

Table 15. Truncated Names which are not Adjacent to Their Source Names and Affectionate Truncation Forms

Base form	Truncated form
Abubakar	Abbakar
Tijjani	TJ – Tijja
Kabiru	KB – kabir

Truncated names consisting of material which are not adjacent from the source names *Abubakar* > *Abbakar* the segmental material from the source name is not taken from a single syllable in the source name rather randomly but within the source name without addition as in the table above. Also *Tijjani and Kabiru* these names has two alternate truncation process the first one is formal while the former is highly informal but still exist among youth of same age. *Tijjani* > *Tijja and Kabiru* > *Kabir* this process is formal while the affectionate truncated form is informal.

The affectionate truncated names are derived through truncating the proper names in Hausa this process look like acronym especially for the two names: *Tijjani* > **TJ** and *Kabiru* > **KB**. Acronyms are formed through abbreviating a group of words where initial alphabets of the words are retained for instance **NTA**< Nigerian Television Authority. As contrast to acronyms affectionate Hausa truncated forms are formed through syllable “*Kabiru*” has 3 syllables: “**Ka bi ru**” the onset of the first syllable /**K**/ and the onset of the second syllable /**B**/ are retained to come up with the truncated form **KB**. Same applied to *Tijjani* >**TJ**

Table 16. Truncated names with addition of segmental material or change of based form segment.

Base form	Truncated form
Auwal	Lawan
Kandala	Dela
Kandala	Deluwa
Kandala	Delu
Juwairiyy a	Zuwaira

After truncation has taken place the truncated form of the names experienced changes or addition of segmental material

of the based form as shown in the table above.



Table 16. Truncated Names that ended with vowels ending in /a/, /e/, /o/ and /u/

<b>Base Form</b>	<b>Truncated Form ending in /a/</b>
Rabi'atu	Rabi'a
Sa'adatu	Sa'a
<b>Base Form</b>	<b>Truncated Form ending in /e/</b>
Saudatu	Saude
Kandala	Kande
<b>Base Form</b>	<b>Truncated Form ending in /i/</b>
Laraba	Larai
Zulaihatu	Zulai
<b>Base Form</b>	<b>Truncated Form ending in /o/</b>
Ibrahim	Ibro
Maryam	Mairo
<b>Base Form</b>	<b>Truncated Form Ending In /u/</b>
Zakariyya'u	Ya'u
Asma'u	Ma'u

As found in English after truncation has taken place the truncated form of names end

in vowels also Hausa names portray such process as shown in the table above

Table 17. An exceptional case for a truncated name that contained a glottal and a vowel in Hausa

<b>Base Form</b>	<b>Truncated Form</b>
Aishatu	A'i

As contrast to English truncated form where there is no truncated form of name that contain a vowel solely

Table 18. Truncation Processes across the two Languages

<b>Process</b>	<b>English</b>	<b>Hausa</b>	<b>Remarks</b>
<b>Monosyllabic truncated names</b>	Abigail – Gail Albert – Bert Abraham – Ab Evelyn – Lyn Samuel – Sam	Zainabu – Abu Aliyu – Ali Idrisu – Idi Inuwa - Inu	Whereas monosyllabic truncated names are common to both English and Hausa languages, segmental materials are taken from primary and secondary stressed syllables in the truncated names which is more common to English. While In Hausa stress has no place in the truncation process of the names.
<b>Disyllabic truncated names</b>	Alexander – Xander Alonzo – Lonzo	Abubakar – Buba Balkisu – Balki	Both English and Hausa languages exhibit disyllabic truncated names,
<b>Trisyllabic truncated names</b>		Abdulumuni – Mumuni Isma’ila – sama’ila Abdulsalami – Salami	Trisyllabic truncated names are not common in English, but in Hausa the trisyllabic are common.
<b>Truncated names consist of material which are not adjacent from the source name</b>	Augustus – Guss Flora – Floss Jeremy – Jem Philippa – Pippa	Abubakar – Abbakar Tijjani – TJ Kabiru - KB	Although truncated names consist of materials which are not adjacent from the source names are found in both English and Hausa languages, the former exhibits fewer types and informal than the latter which is highly formal with more types.
<b>Truncated names with onset consonant replaced</b>	Margret – Peg Richard – Dick Robert – Bob William – Bill	Auwal – Lawan Juwairiyya – Zuwaira Kandala – Delu	it seems truncated names with onset consonant replaced in the two languages are formal in English Hausa respectively
<b>Truncated names with stress vowel change</b>	Amelia – Me Margret – Meg		This process could be found in English but Hausa lacks it.
<b>Truncated names with Dental fricative replaced with (t) and (r) replaced with (l)</b>	Arthur – Art Harry – Hal		Also process is found in English but Hausa lacks it.

<b>Truncated name that contained glottal and a vowel</b>		Aishatu – A’i	For English there is no truncated name that contained a vowel solely but, for Hausa this truncation process is possible.
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### Findings of the Study

Having analyzed the names in the two languages; English and Hausa the above table helped in displaying the similarities and differences that are found in the processes of name truncations. The study realizes the following findings:

- I. Both languages are prosodically operated defined over syllable or feet in which the first syllable of the source names both provide segmental material.
- II. Segmental materials filling the template are taken from the first syllable in English as it carries primary and secondary stress syllable.
- III. Stress is not featured in the process of name truncation in Hausa - only syllable and tone feature.
- IV. Segmental materials are taken from both primary and secondary stress syllables in English name truncation.
- V. Both Hausa and English languages share common monosyllabic, disyllabic truncated names while trisyllabic truncated name is attributed to Hausa language alone.
- VI. Some of the processes of name truncation in this study could be found in both languages:
  - a. Truncated names with materials not adjacent from the source names
  - b. Truncated names with onset consonant replaced
  - c. Truncated names that end with vowels
- VII. Processes employed by English name truncation alone:
  - a. Truncated names with stress vowel change
  - b. Truncated names with dental fricative replaced with (t) and (r) replaced with (l)

VIII. Processes employed by Hausa name truncation alone:

- a. Trisyllabic truncated name
- b. Truncated name that contain glottal and a vowel

The importance of these findings lies in the fact that it illustrates the crucial link between personal names and how people truncate these names in both languages under comparison in order to show positive attitudes toward the bearer and it also shows familiarity.

### Conclusion

In conclusion, this research work on comparative analysis of English and Hausa name truncations has attempted to revealed to a great extent, how diverse, similar and different the languages are at level of the morphology of name truncation. English as a base language whose name truncation processes are used to elicit name truncation processes in Hausa for the purpose of comparative study. The study found that the two languages shares truncatory process in names consisting of materials which are not adjacent from the source names, truncated names with onset consonant replaced, truncated names that ended with vowels. English differs with Hausa in; truncated names with stress vowel change, truncated names with dental fricative replaced with (t) and (r) replaced with (l)

### References

- A Dictionary of First Names (2006). 2<sup>nd</sup> edition, retrieved from <http://www.oxfordreference.com> accessed on 17<sup>th</sup> October 2018
- Avaram, A. A. (2010). English and Japanese Name Truncations. *Academic Journal of Modern Philosophy*, vol 4 (2015) 7-23

- Martin, J. (1988). Subtractive Morphology as Dissociation. In H. Borer (ed.), *Proceedings of the Seventh West Coast Conference on Formal Linguistics*, 229–240. Stanford: CSLI Publications.
- McCarthy, J. and Alan P. (1994). The Emergence of the Unmarked. Optimality in Prosodic Morphology. In M. González (ed.), *NELS 24: Proceedings of the North East Linguistic Society*, 333–379. Amherst: GLSA.
- McCarthy, J. and Alan, P. (1986 -1996). Prosodic Morphology (Technical Reports of the Rutgers Center for Cognitive Science 32).
- McCarthy, J. and Alan, P. (1986 -1996). Prosodic Morphology (Technical Reports of the Rutgers Center for Cognitive Science 32).
- McCarthy, J. and Alan, P. (1990). Foot and Word in Prosodic Morphology: the Arabic Broken Plural. *Natural Language and Linguistic Theory* 8. 209–283.
- McCarthy, J. and Alan, P. (1993a). Prosodic Morphology I: *Constraint Interaction and Satisfaction*. New Brunswick: Rutgers Center for Cognitive Science.
- McCarthy, J. and Alan, P. (1995b). Prosodic Morphology. In John Goldsmith (ed.). *The Handbook of Phonological Theory*, 318–366. Cambridge, Mass.; Oxford: Blackwell.
- McCarthy, J. and Alan, P. (1998). Prosodic Morphology. In Andrew Spencer (ed.). *The Handbook of Morphology*, 283–305. Oxford: Blackwell.
- McCarthy, J. and Alan, P. (1999). Faithfulness and Identity in Prosodic Morphology. In Harry van der Hulst & Wim Zonneveld (eds.), *The Prosody Morphology Interface*, 218–309. Cambridge: CUP.
- McCarthy, J. (1979). *Formal problems in Semitic phonology and morphology: Dissertation*, Massachusetts Institute of Technology.
- Onomastic Treasure of the CIA (1965). 10th December 1965 Central Intelligence Agency
- Plag, I. (2003). *Word-formation in English*, Cambridge University Press.
- Raper, P.E. (1983). *Sociology and the study of names*. Pretoria: Human Sciences Research
- Rowling, J.K. (2000). *Harry Potter and the Goblet of Fire*. London: Bloomsbury.
- Sa'ad, H. T. and Tahir, C. (1999). "Reflection on Fulani Anthroponymy: A Study of Fulbe Names in Old Adamawa Emirate" in *Journal of Nomadic Studies* No.2. pp. 2-23
- Salihu, H. (2014). "The Sociolinguistics Study of Gender Address Patterns in the Hausa Society" In: *International Journal of Social Science and Humanity*, Vol. 4, No. 1, January 2014
- Sanusi, I. O. (2012). "The Stereo typed Pattern of Batonu Names, A Reflection of Counting System" Department Of Linguistics And Nigerian Languages KAJOLLS, *Katsina Journal of Linguistics And Literary Studies*.
- Yahaya, I. Y. (1979). *Sunayen Hausa Nagargajiya da Ire-ren Abincin Hausawa*. Kano: Cibiyar Nazarin Harsunan Nijeriya, Jami'ar Bayero Kano.

**THE DYNAMICS AMONG CRUDE OIL AND GOLD PRICE MOVEMENT ON THE EXCHANGE RATE AND STOCK MARKET INDEX IN NIGERIA**

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**Abstract**

This study empirically investigates the dynamic relationships between crude oil and gold price movements on Nigeria's exchange rate and stock market index using the Autoregressive Distributive Lag technique on the monthly data spanning from 1991 to 2019. The ARDL results revealed that in the short-run and long-run, oil prices positively influence the price of Nigeria's stock and inversely affect the exchange rate, while gold price inflation brings about a fall in Nigeria stock prices and an increase in Nigeria exchange rate in the short-run and long-run respectively. We suggest that the monetary authority develop a sound monetary policy that will stabilise the exchange rate since stability in the exchange rate might aid both investors and regulators interested in the collective behaviour and risk-return trade-off of stock return, gold and oil price returns in Nigeria.

**Keywords:** ARDL, Exchange rate, Gold price, Oil price, Stock price

**JEL Classification:** C32, E52, L61, F31, G15

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**1.0 INTRODUCTION**

The most widely traded commodities in the globe are oil and gold, making them the most popular economic indicators (Mongi, & Aymen, 2017), both are used as investment assets, and they are closely related to the origin of the stock market and are influenced by the exchange rate, any fluctuation on decisions about oil or gold investment portfolios influence the exchange rate and can affect the stock market returns. Consequently, suppliers of commodities follow the evolution of the stock price, exchange rate, and commodity markets to infer the movement or trend of each market to design substitution investment strategies (Singhala, Choudhary, Biswal, 2019).

The price link connecting the internal and external economy is the exchange rate (Liu,

Failler, Peng, & Zheng, 2020). Therefore, in a market-based economy, crude oil price fluctuation will cause a change in the exchange rate. Relevant empirical literature proves that crude oil prices and the exchange rate have a long-run equilibrium relationship, and its fluctuation will result in to change in the exchange rate (Chang, Huang & Chin, 2013; Hussain, Zebende, Bashir & Ding, 2017). Similarly, Degiannakis, Filis & Arora (2017) suggest that the stock market's response towards change in oil price depends upon factors such as a change in oil price, emerging economy, and oil-exporting oil-importing, developed economy, etc. Therefore, most global economies rely on crude, so its prices are expected to affect the various fundamental of an economy, especially the stock market. Sathyanarayana & Gargasha (2018); Singhala et al. (2019); Kumar

(2019) empirical obtained that oil price fluctuation influences shock in the stock market significantly. Likewise, in Nigeria, Abraham (2016) obtains that the stock market's response towards change in oil price depends on three fundamental factors: importing oil price fluctuation, oil subsidies, and quantity of crude exported.

Similarly, Sujit & Kumar (2011); Kumar, Biswal & Swain (2019) ascertained that the gold and exchange rates vary; fluctuations in the exchange rate can significantly influence gold prices. For instance, during economic contraction or when the economy is in recession, potential investors impulse to shift their investible funds in gold. Consequently, increases in the gold price and less stock investment result in a stock market fall. Gold is one of the most hunted investments globally with a stable price (Yahyazadehfar & Babaie, 2012; Bhunia, 2013; Bhunia & Mukhuti, 2013; Tiwari & Gupta, 2015).

The interrelation and interaction between the commodity markets (oil price and gold), exchange rate, and stock market) is very important in Nigeria. Nigeria is a major exporter of crude oil and an importer of petroleum products; oil prices considerably influence the country's exchange rate and the stock market. The oil price is taken as a crucial indicator of the exchange rate movements in Nigeria because both exportation and importation of oil transactions are carried out mainly in USD (\$); hence greater oil demand results in depreciation of the Nigeria currency, Naira (N). For example, in 1985, Nigeria's oil price was valued at \$27 billion at an exchange rate of N0.89 to a dollar, and the stock price was traded at N117.28 billion. With the bit of slash down (4.14%) in the oil price from \$16.33 billion in 1993 to \$15.53 billion in 1994, the Naira appreciated by N0.16 over the US dollar, from N22.05 to N21.89 and stock price floor positively from N42.37 billion to N52.64 billion respectively. However, from 2016 to 2019, Nigeria's oil price fluctuates between an

average of \$65 billion with an average exchange rate of N306 to N360.

Correspondingly, gold price was valued at \$369.80 billion in 1985 at an exchange rate of N0.89 and financial market value at N117.28 billion. Gold price is found to have a progressive trend with the stock prices and exchange rate, exception of 2019 which stock prices have taken declined value from N37.19 billion in 2018 to N29.06 billion. This was associated with the global fall in the crude oil price, which shrunk the financial market. This was reported in the work of Le and Chang (2012), who stated that the stock market is a reason for the increasing gold rate.

Nigeria is the world's tenth producer, the largest reserve of global oil, and the exporter of gold. Before the discovering of oil in Nigeria, it has been the highest and significant source of revenue, accounting for about 90% of total export and not less than 70% of total income, as well as the most contributors of gross domestic product in Nigeria (Madugba, Ekwe & Okezie, 2016). Downward fluctuation in international oil price reduces the price of non-traded goods, reduces real exchange rate and nominal exchange rate depreciation, causes an imbalance in the current account, reallocation of the portfolio, reduction in foreign reserve, and GDP and verse versa. Similarly, fluctuation in oil price driven by aggregate demand raises stock prices, and that moved by market specification falls stock prices. Investors usually become more uncertain about the outlook for corporate earnings during periods of high oil prices, which, in turn, may result in higher equity risk, putting downward pressure on stock prices.

Furthermore, recent empirical evidence has proven the eligibility of gold in the reviving economy. Mindful investors prefer to invest in gold and the stock market to minimise or reduce the systematic shock, which is considered insurance against the risk to invest in gold, as in using gold as a hedging

tool (Bhunia, 2013). Gold is perceived as a store of value, while the stock market is seen as a return of value (Shahzadi, 2016). These gold and stock market characteristics drive investors' behaviour when investing in gold or stocks (Al-Ameer, Hammad, Ismail & Hamdan, 2018). Accordingly, Tiwari and Sahadudheen (2015) show that most oil-importing countries settle their oil import via paying in gold. Therefore, depreciation of the Dollar against Naira may shift potential investors' preference to incorporate gold in their portfolio, leading to a boost in demand for gold, increasing the price, and appreciating Naira's value. This is so because gold is dollar-denominated; any weakness in the Dollar pushes up gold prices, all things being equal. Likewise, declining stock prices increase investors' demand for gold. Gold is perceived as a haven due to its price stability.

It has been noticed that there are non-accessible studies in Nigeria that have attempted to investigate the interrelation among the international oil price, international gold price, exchange rate, and stock price. Therefore, this study fills the gaps in Nigeria and complements the growing global literature on the subject matter. This study aims to analyse the volatility among international oil prices, international gold prices, exchange rates, and stocks in Nigeria. This relationship was modeled using linear or symmetric theory as a theoretical framework. The theory assumes a strong correlation between oil price and macroeconomic variables. This relationship was validated by (Hamilton 1983; Gilbert, 1984) and discovered that oil price significantly impacts macroeconomic variables. Thus, this paper relates to oil and gold prices to macroeconomic variables such as stock market and exchange.

The study's contribution to the knowledge, thus: First to investigate the kind relationship between oil and gold price movement on the exchange rate and stock price in Nigeria to the best of our knowledge. Secondly, the study uses data

from 1991 to 2019, which provides robust findings. Third, the model was evaluated using dynamic ordinary least square methods (ARDL) and estimates different cointegration tests among the variables to make comparisons. The choice for the use of the ARDL approach is that it is suitable for small sample size and robust, accommodates a variety of lag structures, and allows to model the effect of dependent variable appear as the explanatory variable on regressor. However, the problem of spurious correlation may arise due to the dependent variable appearing as an independent variable. Many lags can also reduce the degree of freedom, Multicollinearity problem, etc.

The ARDL techniques were used to examine whether the international oil price and international gold price dynamically influence the exchange rate and stock price in Nigeria's short-run and long-run. Many less developed countries adopt policies to limit increasing global prices fluctuations effect on other macroeconomic variables without understanding the association (short-run or long-run) between them, leading to an unsuccessful desirable outcome. Therefore, this study aimed at identifying the kind of association. This is because the inability to understand this mechanism properly might lead to ineffective monetary policy options to address the instability of the twin price. Fourth, this study would assist the monetary policy regulators to have a clear understanding of the possible relationships between these variables to model dynamic export-import and exchange rate policies that will suit and promote economic growth and development. Fifth, it also provides bases that widen the understanding of policymakers, capital market investors, miners, government, and managers in risk management of portfolio diversification and how to manage oil price fluctuation, gold price, exchange rate and stocks price.

## 2.0 Literature Review

This study is built on Hamilton's symmetric theory as the underpinning theoretical framework. The approach establishes the theoretical relationship between crude oil price and macroeconomic variables. It assumes that oil and macroeconomic variables have a strong correlation; rising oil price influences macroeconomic variables. Several studies not from Nigeria have modelled this relationship using different macroeconomic indicators such as oil price, gold price, exchange rate, and stock prices. The earlier studies showed that this relationship's plausibility was gradually rooted in the developed economies to emerging markets (see Hamilton, 1983; Gilbert, 1984). The current studies that investigate the interactions between oil price, gold price, exchange rate and stock price include Sujit & Kumar (2011), the author's adopted Vector Autoregressive techniques and established that exchange rate is highly affected by changes in other variables whereas, the stock market has fewer roles in influencing the exchange rate. Raza et al. (2016) studied the asymmetric impact of gold, oil prices and their volatilities on stock prices of emerging markets using the NARDL technique and found that gold and oil price volatilities hurt the stock markets of all emerging economies in both short-run and long-run. Bam et al. (2017) observe an independent increase in the stock, oil or gold markets uncertainty coincides with negative returns in different industries. Maghyereh et al. (2017) employed the DCC-GARCH model to estimate dynamic correlations and hedge ratios and found significant spillovers from oil to equities, stressing the over-dependence of the local economies on oil.

Moreover, the spillovers of gold on the stock markets are insignificant. Mongi & Aymen (2017) found a reverse relationship between stock prices and oil price, but the oil price is significantly and positively affected by gold and USD. The US dollar is negatively affected by the stock market and significantly by oil and gold price.

Similarly, Rahman and Mustafa (2018) employed the ARDL model and discovered the Short-run adverse effects of changes in gold and crude oil prices on US stock market returns. The gold price changes effect is statistically significant but insignificant oil price changes.

A contrary view was Kumar, Biswal & Swain (2019) findings using VAR and obtains that none of the variables (gold, oil, exchange rate, and stock prices) influences each other. Singhala, Choudhary & Biswal (2019) employed the ARDL estimation technique, and the findings suggest that international gold prices positively affect the stock price while oil price affects them negatively. Oil prices negatively influence the exchange rate in the long run, and gold prices do not significantly impact the exchange rate. Umaid, Asad, Zahid, & Umer (2020) found the asymmetric relationship between oil prices, gold prices, exchange rate, and stock prices in Pakistan.

Other studies that investigate the individual's relationships between oil price vs exchange rate and stocks price, gold price vs exchange rate, gold price vs stock price, oil price vs stock price, gold price vs stock prices, and exchange rate vs stock prices both in developing and developed countries are empirically reviewed as well, given as; Ogundipea, Ojeagaa & Ogundipe (2014) observed that a percentage change in oil price results to a more than the percentage change in exchange rate volatility in Nigeria. Fratzscher, Schneider & Robays (2014) found bidirectional causality between the USD and oil prices. Delgado, Delgado & Saucedo (2018) analysed VAR on monthly data and discovered that oil prices are statistically significant against the exchange rate. Liu, Failler, Peng & Zheng (2020) used the Time-Varying Parameter-Vector Auto Regression model. The result indicates that shocks to crude oil prices have immediate and short-term impacts on movements in the exchange rate.



The relation between oil price, exchange rates, and stocks price was modelled by Basher, Haug, & Sadorsky (2012) using SVAR on monthly data from 1988 to 2008 and found that positive oil price shocks tend to decrease USD exchange rates and stock prices on emerging market in the short run. Abraham (2016) examines the effect of crude oil price movement on the Nigerian stock market using the Autoregressive Distributed Lag (ADL) model and found that oil prices are positively related to the performance of the Nigerian stock market. Soyemi et al. (2017) used three-stage least squares (3SLS) and obtained that oil shock directly affects company stock returns in Nigeria. Kelikume & Muritala (2019) discovered that oil prices hurt stock markets in Africa using dynamic panel analysis.

Capie, Mills & Wood (2005) used GARCH and found a negative relationship between gold and exchange rates. Sjaastad (2008) used forecast error data to analyse the relationships between the exchange rates and the price of gold. The findings reveal that appreciations/depreciation of the Dollar influence the price of gold in other currencies. Kanungo and Dang (2021) studied the relationship between Gold price, Crude oil price, and exchange rate in India, employed the Vector Autoregression technique. The findings reveal that the exchange rate negatively affects the stock markets for the Pre-Crisis and Crisis periods and is proportionally related to the stock market for the Post-Crisis period.

Le and Chang (2012) employed VAR and found a significant relationship between stock market prices and gold prices. Shaique, Abdulaziz & Herani (2016) used the VAR estimation technique and obtained no long-run relationship between stock prices (KSE 100 index) and gold prices in Pakistan. Similarly, Al-Ameer, Hammad, Ismail, and Hamdan (2018) employed a cointegration test and found a long-run relationship between gold and the stock market.

Le and Chang (2012) investigated the dynamics between oil price and gold market returns using a structural vector autoregressive technique. They ascertained that oil price fluctuations have a significant and positive contemporaneous transmission effect on actual gold returns. The authors concluded that oil price fluctuations could predict gold price dynamics. Likewise, Wang and Chueh (2013) found a positive interaction between gold and oil prices from 1989-2007. Reboredo (2013) analysed the oil and gold dependence structure using the copula approach and found a positive and significant relationship. Bampinas and Panagiotidis (2015) studied the causal relationship between crude oil and gold prices using dynamic bootstrap causality analysis and found a linear and unidirectional causality running from oil to gold. Tiwari et al. (2020) employed the time-varying Markov switching copula technique and found that gold is a good hedge for oil returns for short and medium investors.

Kumar (2013); Ajaz, Nain, Kamaiah, & Sharma (2017) examines the relationship between the exchange rates and stock prices of IBSA countries (India, Brazil, and South Africa) utilising the Vector Autoregressive techniques and found that volatility spillover between the exchange rates and stock prices of these countries. Similarly, Tang and Yao (2018) reported an indirect relationship between stock prices and exchange rates whereas, Simbolon and Purwanto (2018) obtained a direct and significant relationship between exchange rate and stock prices. Delgado, Delgado & Saucedo (2018) investigate the relationship between the exchange rate and the stock market. The study employed VAR and obtained that the exchange rate has a diminishing and statistical significant impact on the stock market index. Andriansyah and Messinis (2019) employed the Toda Yamamoto causality test to measure the relationship between exchange rates and stock prices of 8 countries and found that exchange rates

Granger causes the stock price fluctuations in all seven countries.

**3.0 METHODOLOGY**

The short-run and long-run association of oil and gold prices with stock prices and exchange rates in Nigeria is examined in this study. This study uses the Brent crude spot price benchmark to proxy international oil price movements denoted as OP. It is measured in USD/barrel. One of the articles of high value traded in Nigeria is Gold, and it is proxies with the international gold spot price. It is measured in USD/ounce and represented by GP. Virtually all international payments done in Nigeria are done in US Dollars, therefore for exchange rate movements, Nigeria (Naira) and US dollar (the US \$) currency pairs are used. They are measured as USD/Naira and represented by ER. In this study, all share index of Nigerian stock is used to proxy the stock price, and SP represents it. We have used price data on levels for all the series; however, the variables are used in their log form in the model estimation. The sample period ranges from 1991 to 2019, and the data is obtained from the Central Bank of Nigeria statistical bulletin.

The model for examining the short-run and long-run association of oil prices, gold prices, stock prices, and exchange rate in Nigeria is modelled after the work of Singhal, Choudhary & Biswal (2019), who examined return and volatility linkages among international crude oil price, gold price, exchange rate and stock markets in Mexico. The functional relationship among these variables is therefore depicted explicitly in Equation 3.1 and 3.2 as thus;

$$\begin{aligned}
 SP_t &= \beta_0 + \beta_1 ER_t + \beta_2 OP_t + \beta_3 GP_t + \mu_t \dots \dots \dots (3.1) \\
 ER_t &= \alpha_0 + \alpha_1 SP_t + \alpha_2 OP_t + \alpha_3 GP_t + \mu_t \dots \dots \dots (3.2)
 \end{aligned}$$

Where; SP is the stock price, ER denotes exchange rate, OP represents oil price, and GP connotes gold price. The  $\mu$  is the error term or random variable that accounts for other variables' effects.

This study model the dynamic movements among international oil prices, international gold prices, exchange rates, and the stock market index in Nigeria. To test the long-run relationship between oil, exchange rate, stock price, and gold price, the ARDL-bound approach (Pesaran, Shin, and Smith, 1996) is used. Unit root tests (ADF and Phillip-Perron) were initially applied in this study on both the series at the levels and the first difference. This is done to check the variables' stationery and ascertain that none has a quadratic trend I(2). In the second step, the ARDL model is estimated with the optimal lag specifications based on the Akaike information criterion (AIC). This is followed by bounds testing to check for a co-integrating relationship between the dependent and the explanatory variables. Since there has been no consensus about the directions of the long-run relationships, each variable is used as the dependent variable in turns and check for the model that the evidence of cointegration is found. Hence, the ARDL form of the model specified for this study is presented in equations 3.2 and 3.4;

$$\begin{aligned}
 \Delta LSP_t = c_0 + c_1 t + \pi_1 LSP_{t-1} + \pi_2 LER_{t-1} + \pi_3 LOP_{t-1} + \pi_4 LGP_{t-1} + \sum_{i=1}^p \gamma_i \Delta LSP_{t-i} \\
 + \sum_{j=1}^q \delta_j \Delta LER_{t-j} + \sum_{k=1}^r \theta_k \Delta LOP_{t-k} + \sum_{l=1}^s \phi_l \Delta LGP_{t-l} + \varepsilon_t \dots \dots \dots (3.2)
 \end{aligned}$$

$$\Delta LER_t = c_0 + c_1t + \pi_1 LSP_{t-1} + \pi_2 LER_{t-1} + \pi_3 LOP_{t-1} + \pi_4 LGP_{t-1} + \sum_{i=1}^p \gamma_i \Delta LSP_{t-i} + \sum_{j=1}^q \delta_j \Delta LER_{t-j} + \sum_{k=1}^r \theta_k \Delta LOP_{t-k} + \sum_{l=1}^s \phi_l \Delta LGP_{t-l} + \varepsilon_t \dots \dots \dots (3.4)$$

$$\Delta LSP_t = c_0 + c_1t + \pi_1 LSP_{t-1} + \pi_2 LER_{t-1} + \pi_3 LOP_{t-1} + \pi_4 LGP_{t-1} + \sum_{i=1}^p \gamma_i \Delta LSP_{t-i} + \sum_{j=1}^q \delta_j \Delta LER_{t-j} + \sum_{k=1}^r \theta_k \Delta LOP_{t-k} + \sum_{l=1}^s \phi_l \Delta LGP_{t-l} + ECMt - 1 + \varepsilon_t \dots \dots \dots (3.5)$$

$$\Delta LER_t = c_0 + c_1t + \pi_1 LSP_{t-1} + \pi_2 LER_{t-1} + \pi_3 LOP_{t-1} + \pi_4 LGP_{t-1} + \sum_{i=1}^p \gamma_i \Delta LSP_{t-i} + \sum_{j=1}^q \delta_j \Delta LER_{t-j} + \sum_{k=1}^r \theta_k \Delta LOP_{t-k} + \sum_{l=1}^s \phi_l \Delta LGP_{t-l} + ECMt - 1 + \varepsilon_t \dots \dots \dots (3.5)$$

Where;

$c_0$  is the intercept,  $c_1$  is the slope of the time trend,  $\pi_1$  is slope of one lag period of LSP,  $\pi_2$  is slope of LER,  $\pi_3 =$  slope of LOP,  $\pi_4 =$  slope of LGP.  $p, q, r, s$  are the periods of the differenced term of the response variable and the regressors, respectively, while  $ECMt - 1$  and  $\varepsilon_t$  is the error correction mechanism and error term. The error correction mechanism measures the speed of adjustment when disequilibrium occurs in the short-run to ascertain equilibrium in the long-run. Therefore, the lag structure of this model is  $ARDL(p, q, r, s)$ . Equations 3.2 and 3.3 are the long-run model while 3.4 and 3.5 capture the short-run. Furthermore, according to Pesaran and Shin (1995) and Pesaran, Shin, and Smith (1996), it is necessary to examine whether the variables of interest are co-integrated i.e. existence of long-run relationship among the variables under study using the ARDL F-Bounds cointegration test approach, provided that the stationarity properties of the underlying

variables are I(0) and I(1) or a mixture of I(0) and I(1).

In carrying out this exercise, i.e., examination of the existence of long-run relationship among the variables, a test of the hypothesis was conducted, and the  $H_0 := \pi_1 = \pi_2 = \pi_3 = \pi_4 = 0$  was tested against the  $H_1 := \pi_1 \neq \pi_2 \neq \pi_3 \neq \pi_4 \neq 0$ . The t- statistics were also used to explore the significance of the features in the model, and the null hypothesis is  $H_0 := \pi_1$ . According to Pesaran, Shin, and Smith (2001), the  $H_0 := \pi_1 = \pi_2 = \pi_3 = \pi_4 = 0$  is rejected when long-run co-movement or cointegration is established among  $LSP_t, LER_t, LOP_t$  and  $LGP_t$ , which implies that a long-run relationship exist among the variables under examination. Since cointegration exists among the underlying variables, the ARDL model is employed to estimate the dynamic short and long-run impact and relationship between the variables in the model.

4.0 RESULTS AND DISCUSSION

Table 3 Unit root test result

Variable	ADF			PP		
	Level	First diff.	Remark	Level	First diff.	Remark
Stock	1.63	10.24***	I(1)	1.74	16.06***	I(1)
Exchange rate	4.27***	12.71***	I(0)	4.34***	12.43***	I(0)
Oil price	2.28	15.21***	I(1)	2.22	15.19***	I(1)
Gold price	1.60	16.26***	I(1)	1.71	16.07***	I(1)

Source: Authors computation (2021) \*\*\*  $p < 0.001$ ; \*\*  $p < 0.01$ ; \*  $p < 0.05$

Table 3 above shows the ADF and the PP unit root test results for stock price, exchange rate, oil price, and gold price. It is clear from the table that all the variables are integrated of order one except the exchange rate, which is stationary. The statistical implication of this is that estimation using

the variables in level will not follow the standard distribution, and the issue of spuriousity is feasible. There is a need first to conduct a cointegration test, and an ARDL-Bound test approach is adopted due to its flexible nature to accommodate mixed integrated variables.

Table 5 Estimated long-run coefficients

Model 1	Coef.	t-stat.	Model 2	Coeff	t-stat.
$ER_t$	0.96	5.37***	$SP_t$	-0.54	-0.13
$OP_t$	1.00	3.85***	$OP_t$	-1.05	-2.11**
$GP_t$	-0.58	-2.02**	$GP_t$	1.32	2.20**
Const.	5.13	4.24***	Const.	1.27	0.53

Source: Authors' computation (2021) \*\*\*  $p < 0.001$ ; \*\*  $p < 0.01$ ; \*  $p < 0.05$

Long-run coefficient estimates of the cointegration equations (Stock price equation and Exchange rate equation) are presented in Table 5. The results of the stock price equation reveal that the rise in the power of the Dollar against Naira (exchange rate depreciation) has positive and statistically significant effects on Nigeria's stock price. By implication, a percentage increase in the exchange rate would cause an increase in stock price by 0.96%. This corroborates the findings of Kumar (2013), Simbolon and Purwanto (2018), Andriansyah and Messini (2019). They found the exchange for having an appreciating effect on stock price but otherwise, was the findings of (Mongi and Aymen, 2017; Delgado and Saucedo, 2018; Tang and Yao, 2018).

Likewise, the oil price has positive and statistically significant effects on Nigeria's stock price. By implication, a one percent increase in the oil price would increase stock price by 1%. This corroborates the findings of Haug and Sadorsky (2012); Abraham (2016); Soyemi et al. (2017), whose studies obtained a positive relationship between oil price shocks and stock prices. However, Mongi and Aymen (2017); Kelikume & Muritala (2019) discovered a contrary view, and the oil price hurts stock markets.

On the other hand, a rise in the gold price is revealed to be negatively and statistically significant to the stock price. This implies that a 1 percent increase in the gold price would result in a 0.58% decline in stock price. This corresponds to the empirical

outcome of Shaique et al. (2016); Rahman and Mustafa (2018), that there is a negative relationship between stock prices and gold prices but disputed by Le and Chang (2012); Al-Ameer et al. (2018); Singhala et al. (2019), whose findings revealed long run and significant positive relationship between stock market prices and gold prices.

In the same manner, the results of the exchange rate equation reveal that stock price hurts the exchange rate and statistical insignificance. Especially, a percentage increase in the stock price would bring about 0.54% deflationary in the exchange rate. This corresponds with the empirical discovery of Mongi and Aymen (2017); Delgado et al. (2018); Tang & Yao (2018), who obtains an indirect relationship between stock prices and exchange rates.

It also revealed that oil prices negatively and significantly influence the exchange rate in the long run. This indicates that a

percentage increase in oil price would prompt 1.05% depreciation in the exchange rate (i.e., currency appreciation of oil-exporting countries). This is an outcome implying that increasing oil prices is likely to boost Nigeria's oil revenues and, as a result, trigger currency appreciation. Al-Mulali and Che-Sab (2012), Mongi and Aymen (2017), Muritala (2019) found similar results in their studies.

However, gold price was found to have a positive and significant effect on the exchange rate. That is, one percent inflation in gold price would cause exchange to appreciate by 1.32%. This means a rise in the price of gold is shown to give rise to exchange rate depreciation. This discovery validates the work of Capie et al. (2005) and contrasts to the previous studies (Jain and Biswal, 2016; Jain and Ghosh, 2013; Sjaastad, 2008), gold price was not found to exert any significant impact on the exchange rate.

**Table 6** Estimated short-run (ECM) coefficients

Model 1	Coeff.	t-stat.	Model 2	Coeff.	t-stat.
$\Delta SP_{t-1}$	0.14	2.75***	$\Delta SP_{t-1}$	-	-
$\Delta SP_{t-2}$	0.14	2.72***	$\Delta SP_{t-2}$	-	-
$\Delta SP_t$	-	-	$\Delta SP_t$	-0.00	-0.14
$\Delta ER_t$	-0.11	-1.18	$\Delta ER_t$	-	-
$\Delta ER_{t-1}$	-	-	$\Delta ER_{t-1}$	0.40	7.65***
$\Delta ER_{t-2}$	-	-	$\Delta ER_{t-2}$	-0.24	-4.57***
$\Delta OP_t$	0.36	2.65***	$\Delta OP_t$	-0.01	-1.88*
$\Delta GP_t$	-0.02	-1.85*	$\Delta GP_t$	0.02	2.90***
$Ecm_{t-1}$	-0.34	-3.98***	$Ecm_{t-1}$	-0.01	-2.04**

**Source:** Authors' computation (2021) \*\*\*  $p < 0.001$ ; \*\*  $p < 0.01$ ; \*  $p < 0.05$

Table 6 presents the short-run estimates for stock price and exchange rate models. The results for the stock price equation revealed that the oil price has an appreciation and significant effect on the stock price. By implication, a 1 percent inflate in the oil price would lead to a 0.36% improvement

in the stock price in Nigeria. In addition, the result also indicates that the exchange rate has a negative and insignificant effect on the stock price. A percentage increase in the exchange rate would cause the stock price to decrease by 0.11%. Similar to the discovery of Tang and Yao (2018).

Likewise, a negative and statistically significant relationship was established between the gold price and stock price. Implying that a percentage increase in the gold price would bring about 0.02% deflation in the stock price in Nigeria. This was also established by Rahman and Mustafa (2018). The results for the exchange rate equation revealed that the stock price has an adverse and insignificant impact on the exchange rate. A percentage increase in the stock price would decrease the exchange rate by 0.00%. Delgado and Saucedo (2018) ascertained alike. Oil price was obtained to have an inverse and statistically significant impact on the exchange rate. A percentage increase in oil price would result in a 0.01% decrease in the exchange rate. This is in line with the empirical findings of (Mongi and Aymen, 2017; Muritala, 2019)

Furthermore, the gold price was found to have a positive and significant effect on the exchange rate. A percentage increase in the gold price would cause the exchange rate to appreciate by 0.02%. In the studies of (Al-Ameer et al., 2018; Singhala, 2019) similar relationship was obtained. The error correction term is correctly signed for both, and it shows that about 34% and 10% of disequilibria in the stock price and the exchange rate due to one-time temporary shock is corrected within a year. After obtaining long-run and short-run ARDL results, there is a need to test for the assumptions of the technique used (Normal distribution of error term, serial correlation, and heteroscedasticity) as well as the stability of the estimated model to determine whether the method of analysis adopted passed the classical OLS assumption and stability test or not, established in table 7 and 8 below:

### **5.0 Conclusion and Policy Recommendations**

This study empirically investigates the dynamic relationships among crude oil and gold price movements on Nigeria's exchange rate and stock market index, using

monthly data from January 1991 to December 2019. The presence of long-run relationships among the variables is tested by using the ARDL-bound test approach. The findings of the stock price model revealed that oil price has both short-run and long-run positive and statistically significant effects on Nigeria's stock price, while gold price inflation brings about a decline and statistical significance in Nigeria stock prices both in the short long-run.

On the other hand, the oil price increase decreases the exchange rate (i.e., appreciation in Naira exchange rate to Dollar) for the exchange rate model. It is statistically significant both in the short-run and long-run, while both in the short-run and long-run increase the gold price would lead to a rise in the exchange rate (i.e., depreciation in Naira exchange rate to Dollar). Based on these, the following were recommended:

The monetary authority should develop a sound monetary policy to stabilise the exchange rate since its instability has both long-run and short-run implications in macroeconomic variables. Fair stability in exchange rate might aid both investors and regulators interested in the determinants of the joint behavior and risk-return trade-off of stock return and volatility in Nigeria.

As one of the major exporters of oil, Nigeria should devise strategies to ensure stability in the capital markets by vigorously pursuing pro-growth policies irrespective of the shocks in oil price and other exogenous macroeconomic indicators.

Gold price is found to have an inverse and positive effect on the stock price and exchange rate. Therefore, bold steps are suggested to be taken by the government while including building resilience investment and risk strategies, intervening in the market to correct the unfavourable effect of gold price on stock price and exchange rate, and negotiating for

internalisation of Naira for direct payment among gold exporting Nations to reduce unhealthy dollar exchange effect on Naira.

The government should press more for new ways to diversify the economy from oil dependence. This is because oil price was found to have both long-run and short-run appreciating effects on the stock price and an inverse effect on the exchange rate.

## 6.0 References

- Ajaz, T., Nain, M. Z., Kamaiah, B., & Sharma, N. K. (2017). Stock prices, exchange rate and interest rate: Evidence beyond symmetry. *Journal of Financial Economic Policy*, 9(1); 2–19. <https://doi.org/10.1108/JFEP-01-2016-0007>
- Al-Ameer, M., Hammad, W., Ismail, A. & Hamdan, A. (2018). The Relationship of Gold Price with the Stock Market: The Case of Frankfurt Stock Exchange. *International Journal of Energy Economics and Policy*, 8(5), 357-371.
- Al-Mulali, U. & Che-sab, C. N. B. (2012). Oil prices and the real exchange rate in oil-exporting countries. *OPEC Energy review*, 36(4); 375-382. <https://doi.org/10.1111/j.1753-0237.2012.00216.x>
- Andriansyah, A., & Messinis, G. (2019). Stock prices, exchange rates and portfolio equity flows: A Toda-Yamamoto panel causality test. *Journal of Economic Studies*, 46(2); 399–421. <https://doi.org/10.1108/JES-12-2017-0361>
- Abraham, T. W. (2016). Exchange rate policy and falling crude oil price: effect on the Nigerian stock market. *CBN Journal of Applied Statistics*, 7(a); 111-123
- Bampinas, G., Panagiotidis, T. (2015). On the relationship between oil and gold before and after financial crisis: Linear, nonlinear and time-varying causality testing. The Rimini Centre for Economic Analysis, Italy. Working paper, WP 15-04.
- Basher, S. A., Haug, A. A. & Sadorsky, P. (2012). Oil prices, exchange rates and emerging stock markets. *Energy Economics*, 34(1); 227-240.
- Bams, D., Blanchard, G., Honarvar, I., & Lehnert, T. (2017). Does oil and gold price uncertainty matter for the stock market? *Journal of Empirical Finance*, 44(c), 270–285.
- Bhunja, A and Mukhuti, S. (2013). The impact of domestic gold price on stock price indices- An empirical study of Indian stock exchanges, *Universal Journal of Marketing and Business Research*, 2(2); 035-043.
- Bhunja, A. (2013). Cointegration and Causal Relationship among Crude Price, Domestic Gold Price and Financial Variables-An Evidence of BSE and NSE. *Journal of contemporary issues in Business research* 2(1); 1-10.
- Capie, F., Mills, T. C. & Wood, G. (2005). Gold as a hedge against the dollar. *Journal of international financial markets, institutions and money*, 15(4); 343-352. <https://doi.org/10.1016/j.intfin.2004.07.002>
- Chang, H.F.; Huang, L.C.; Chin, M.C. (2013). Interactive relationships between crude oil prices, gold prices, and the NT-US dollar exchange rate-a Taiwan study. *Energy Policy*, 63; 441–448.
- Degiannakis, S., Filis, G, & Arora, V. (2017). Oil prices and stock markets. US energy information and administration: Washington, DC
- Delgado, N. A. B., Delgado, E. B. & Saucedo, E (2018). The relationship between oil prices, the stock market and the exchange rate: Evidence from Mexico. *North American journal of economics and finance*, 45; 266-275. <https://doi.org/10.1016/j.najef.2018.03.006>
- Fratzscher, M., Schneider, D. & Robays, I. V. (2014). Oil prices, exchange rates and asset prices, Working

- Paper No. 1689, European Central Bank, Frankfurt am Main.
- Hussain, M.; Zebende, G.F.; Bashir, U.; Ding, D.H. (2017). Oil price and exchange rate co-movements in Asian countries: Detrended cross-correlation approach. *Phys.*, 465; 338–346.
- Jain, A. & Biswal, P. C. (2016). Dynamic linkages among oil price, gold price, exchange rate, and stock market in India. *Resources policy*, 49; 179-185. <https://doi.org/10.1016/j.resourpol.2016.06.001>
- Jain, A. & Ghosh, S. (2013). Dynamics of global oil prices, exchange rate and precious metal prices in India. *Resources policy*, 38(1); 88-93. <https://doi.org/10.1016/j.resourpol.2012.10.001>
- Kelikume, I. & Muritala, O. (2019). The impact of changes in oil price on stock market: Evidence from Africa, *International Journal of Management, Economics and Social Sciences*, 8(3); 169-194. <http://dx.doi.org/10.32327/IJMESS/8.3.2019.11>
- Kumar, A., Biswal, S. K. & Swain, P. K. (2019). A dynamic association between stock markets, Forex, gold and oil prices in Indian. *Revista Espacios*, 40(6). 1 – 20
- Kumar, M. (2013). Returns and volatility spillover between stock prices and exchange rates: Empirical evidence from IBSA countries. *International Journal of Emerging Markets*, 8(2); 108–128. <https://doi.org/10.1108/17468801311306984>
- Kumar, S. (2019). Asymmetric impact of oil prices on exchange rate and stock prices. *Quarterly Review Economics and Finance*, 72; 41–51. <http://dx.doi.org/10.1016/j.qref.2018.12.009>
- Kanungo, A. K. & Dang, P. (2021). Period analysis of the relationship between Gold, Crude oil, exchange rate and India's Stock Market. *Journal of Business Strategy, Finance and Management*, 2(1 & 2); 28 -43
- Le, T. H. & Chang, Y. (2012). Oil price shocks and gold returns. *International Economics*, 131(3); 71-104.
- Liu, Y., Failler, P., Peng, J. & Zheng, Y. (2020). Time-Varying Relationship between Crude Oil Price and Exchange Rate in the Context of Structural Breaks. *Energies*, 13(2395); 1-17. <https://doi.org/10.3390/en13092395>
- Madugba, J. U., Ekwe, M. C. & Okezie, S. O. (2016). Evaluation of the contribution of oil revenue on economic development in Nigeria. *International journal of economics and finance*, 8(6); 210 – 218. <http://dx.doi.org/10.5539/ijef.v8n6p210>
- Maghyreh, A. I., Awartani, B., & Tziogkidis, P. (2017). Volatility spillovers and cross-hedging between gold, oil and equities: Evidence from the Gulf Cooperation Council countries. *Energy Economics*, 68(October 2016), 440–453.
- Mongi, A & Aymen, B. R. (2017). Oil, Gold, US dollar and Stock market interdependencies: A global analytical insight. *European Journal of Management and Business Economics*, 26 (3); 278-293. <https://doi.org/10.1108/EJMBE-10-2017-016>
- Ogundipea, O. M., Ojeagaa, P. & Ogundipe, A. A. (2014). Oil Price and Exchange Rate Volatility in Nigeria. *Journal of Economics and Finance*, 5(4); 1-9
- Rahman, M. & Mustafa, M. (2018). Effects of Crude Oil and Gold Prices on US Stock Market: Evidence for USA from ARDL Bounds Testing. *Finance and Market*, 3(1); 1 – 9. <https://doi.org/10.18686/fm.v3i1.1055>
- Reboredo, J.C. (2013). Is gold a hedge or safe haven against oil price



- movements? *Resources Policy* 38; 130–137.
- Pesaran, M. H., Shin, Y. and Smith, R. (2001). Bounds testing approaches to the analysis of level relationships. *Journal of Applied Econometrics*, 16: 289-326.  
<http://dx.doi.org/10.1002/jae.616>
- Pesaran, M.H., Shin Y., and Smith R. (1996). 'Testing the existence of a long-run relationship', DAE Working Paper Series No. 9622, Department of Applied Economics, University of Cambridge.
- Pesaran, M.H. & Shin, Y., (1995). "An Autoregressive Distributed Lag Modelling Approach to Cointegration Analysis," Cambridge Working Papers in Economics 9514, Faculty of Economics, University of Cambridge.
- Raza, N., Jawad Hussain Shahzad, S., Tiwari, A. K., & Shahbaz, M. (2016). Asymmetric impact of gold, oil prices and their volatilities on stock prices of emerging markets. *Resources Policy*, 49(C); 290–301
- Sathyanarayana, S. & Gargesha, S. (2018). Fluctuations in Crude, Gold & Forex Prices and its Impact on Stock Market: Evidence from Sensex and Nifty 50. *International Journal of Management Studies*, 5(4); 1 – 16.  
<http://dx.doi.org/10.18843/ijms/v5iS4/01>
- Shahzadi, C. (2016), Gold and oil prices versus stock exchange: A case study of Pakistan. *Journal of Business Economics and Management*, 10(4), 349-360.
- Shaique, M., Abdulaziz & Herani, G. M. (2016). Impact of gold prices on stock exchange market: a case of Karachi stock exchange market of Pakistan. *International Journal of Accounting and Economics Studies*, 4(1); 60-63.  
<https://doi.org/10.14419/ijaes.v4i1.5899>
- Singhala, S., Choudhary, S. & Biswal, P. C. (2019). Return and volatility linkages among International crude oil price, gold price, exchange rate and stock markets. *Resources Policy*, 60; 255–261.
- Simbolon, L., & Purwanto. (2018). The influence of macroeconomic factors on stock price: The case of real estate and property companies. *Global tensions in financial markets*, 34(1); 2–19.  
<https://doi.org/10.1108/S0196-382120170000034010>
- Sjaastad, L. A. (2008). The price of gold and the exchange rates: Once again. *Resources policy*, 33(2); 118-124.  
<https://doi.org/10.1016/j.resourpol.2007.10.002>
- Soyemi, K. A., Akingunola, R. O. O., & Ogebe, J. (2017). Effects of oil price shock on stock returns of energy firms in Nigeria. *Kasetsart Journal of Social Sciences*. XXX(C); 1-8
- Sujit, K. S. & Kumar, B. R. (2011). Dynamic relationship among gold price, oil price, exchange rate and stock market returns. *International Journal of Applied Business and Economic Research*, 9(2); 145-165
- Tang, X., & Yao, X. (2018). Do financial structures affect exchange rate and stock price interaction? Evidence from emerging markets. *Emerging Markets Review*, 34(C); 64- 76.  
<https://doi.org/10.1016/j.ememar.2017.10.004>
- Tiwari, S. & Gupta, B. (2015). Granger Causality of Sensex with Gold Price: Evidence from India. *Global Journal of Multidisciplinary Studies*, 4(5); 50-54.
- Tiwari, A. K. & Sahadudheen (2015). Understanding the nexus between oil and gold. *Resource policy*, 46(2); 85–91.  
<https://doi.org/10.1016/j.resourpol.>
- Tiwari, A. K., Aye, G. C., Gupta, R., & Gkillas, K. (2020). Gold-oil dependence dynamics and the role of geopolitical risks: Evidence from a Markov-switching time-varying

- copula model. *Energy Economics*, 88(C). 420-430  
<https://doi.org/10.1016/j.eneco.2020.104748>
- Umaid A. S., Asad, M., Zahid, A. & Umer, M. (2020). Asymmetrical relationship between oil prices, gold prices, exchange rate, and stock prices during global financial crisis 2008: Evidence from Pakistan, *Cogent Economics & Finance*, 8(1); 1 – 20.  
<https://doi.org/10.1080/23322039.2020.1757802>
- Wang, Y. S. & Chueh, Y. L. (2013). Dynamic transmission effects between the interest rate, the US dollar, and gold and crude oil prices. *Economic Modelling*, 30 (C); 792-798.
- Yahyazadehfar M. & Babaie, A. (2012). Macroeconomic Variables and Stock Price: New Evidence from Iran, Middle-East. *Journal of Sciences research*. 11(4); 408-415.