

**A COMPARATIVE STUDY OF DETERMINANTS OF CAPITAL
STRUCTURE OF MULTINATIONAL AND DOMESTIC FIRMS IN
NIGERIA**

KEHINDE OLUFEMI OYENEYE
(PG18/08/001)

B.Sc. (LASU), M.Sc. (LAGOS) and M.Phil. Economics (IFE)

SEPTEMBER, 2023

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A Thesis Submitted to

The Department of Economics, College of Business and Social Sciences in
Partial Fulfilment of the Requirements for the Award of Doctor of Philosophy
(Ph.D.) Degree in Economics of Crawford University, Igbesa, Ogun State,
Nigeria.

SEPTEMBER, 2023

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AUTHOR: Kehinde Olufemi **OYENEYE**

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DEGREE: Ph.D. (Economics)

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This thesis with title “A Comparative Study of Determinants of Capital Structure of Multinational and Domestic Firms in Nigeria” by Kehinde Olufemi OYENEYE has been read and approved as meeting the requirement for the award of the Doctor of Philosophy (Ph.D) Degree in Economics in the Department of Economics, College of Business and Social Sciences, Crawford University, Faith City, Igbesa, Ogun State, Nigeria.

Professor E. O. Ogunleye
(Supervisor)

Date

Dr. Comfort. M. Amire
(Co-Supervisor)

Date

Professor A. O. Abisoye
(Head of Department)

Date

Dr. J. C. Ngwama
(Internal Examiner)

Date

Professor A. J. Adeola
(Dean, Postgraduate School)

Date

ATTESTATION

I hereby attest that this research work was carried out at the Department of Economics,
College of Business and Social Sciences, Crawford University, Igbesa, Ogun State, Nigeria.

Head of Department
Professor A. O. Abisoye

Date

DEDICATION

This thesis is dedicated to God Almighty, the Alpha and Omega and the source of my strength.

ACKNOWLEDGEMENTS

Foremost, all thanks, all honour and all glory be given to Almighty God, for the gift of life and enabling grace throughout. May His name be praised for ever and ever, Amen.

My profound appreciation goes to my able and unassuming Supervisors, Prof. E. O. Ogunleye and Associate Prof. Comfort. M. Amire for their persistent motivation, intellectual guidance and kind gestures while painstakingly going through this thesis. I have benefitted from their wealth of knowledge and experience. May the Almighty God reward them abundantly, Amen.

I am also indebted to my Head of Department, Dr. Adeleke. Oyende for his untiring love and ever ready attitude to ensure that all is well with his students. May God crown all his efforts with success Amen. Similarly, I express my gratitude to members of staff (both the academic and non-teaching staff) of the Department of Economics. In similar vein, I convey my debt of gratitude to the Deans of Postgraduate School, Prof. Adewole J. Adeola (current) and Prof. Gabriel L. Adeola (immediate past), Dean, College of Business and Social Sciences, Prof. A. Abisoye, Director, School of Part Time Studies, Dr. Olalekan R. Kesinro for numerous words of encouragement while the Programme was on.

I pay glowing tribute to the Board of Trustees, Apostolic Faith Church as well as the founding fathers for buying into the vision of establishing this life changing citadel of learning - Crawford University, where academics, morals and development of the human spiritual mind occupy pedestal position. It is indeed heart-warming to be part of the pioneer doctoral students of this great University. My unalloyed appreciation also goes to the Vice Chancellor, Prof. Ruben J. Kolo and his Management team for providing the ambience for proper learning and granting the pioneer doctoral students the rare opportunity to interact with the Vice Chancellor to address our concerns. May almighty God crown all your efforts with great success Amen.

I equally appreciate the principal officers of the University for their moral and prayer support during the course of this programme. May God bless them all Amen.

To all my lecturers, notably, Prof. O. Omobitan, Prof. J. Macaver, Associate Prof. J. O. Saka, Associate Prof. Comfort M. Amire, Dr. M. M. Ologundudu for their time and efforts in impacting the necessary knowledge. May God bless them all Amen. This study also benefited from constructive correction and suggestion from eminent scholars such as Prof. Adegbenga I. Aladegbola, Associate Prof. O.S. Enilolobo, Dr. Sunday. Eleboda, Dr. G. Ogunlusi and Dr. S. Ogunwa. Thank you and God bless you all Amen.

My unreserved thanks to my examiners Prof. B. A. Folorunso and Dr. Justice C. Ngwama for contributing meaningfully to my work. Also, Mrs. Sarah Afolayan – *the eagle-eye editor*, for carrying out thorough editing and proof-reading of this work, may the good Lord bless you abundantly.

I also want to recognise the invaluable encouragements and mentorship I enjoyed from erudite Professors such as Emeritus Prof. Peter A. Okebukola, Prof. Solomon O. Makinde, Prof. Moses T. Ige and Prof. Isaac A. Ajayi. None of you will lose your rewards in Jesus name Amen. Also to my mostly respected spiritual fathers, Rev. Peter Awomoyi, Rev. Umarudeen Olowosile, Rev. S. Tifase, Rev. Festus A. Oyeniya, Rev. Benjamin Oni, Rev. Kayode Ajiboye, Rev. F. Akinmerese, who watched over my soul in constant prayers, may you all live long to enjoy the fruits of your labour in Jesus name Amen.

To the prayer warriors, Bro. Adegbenga Aladegbola, Bro. Taiwo Alamu, Bro. Alexandar Oguntuase, Bro. Samuel A. Ogunwa, Bro. Taiwo O. Oyeneye, Sis. Olusola Aina and Sis. Ruth Oguntuwase who constantly carried my numerous requests concerning this programme to God, may almighty God stand by you all and crown all your efforts with success. Amen.

I enjoyed the comradeship of my classmates in the doctoral programme, namely: E. Omoare (the Governor), F. H. Kolawole, O. Alao, K. Agbabiaka, A. F. Ojo, S. Idoko (Miss), Mr. Ogunseye (The Law) and my Taiwo Oyeneye. May God bless you all Amen.

I also appreciate my generous and caring mother Mrs. S. Oyeneye for her persistent prayer for my success in life; you shall eat the fruit of your labour in good health with long life and will not lack any good thing in life, Amen. I also use this medium to remember my late father's untiring love and prayers for the success of his children, family and all who come across him. I know one glorious day we shall meet again at Jesus feet Amen.

Many thanks to my siblings, Tope Eboda, Seyi Ayeni (now late, may her gentle soul rest in peace), Esther Filani, Deborah Soneye, Dorcas Oyeneye and my twin brother Taiwo Oyeneye for their prayers and moral support while this programme was on. May God bless you all and crown all your efforts with endless success Amen. Similarly, special thanks to my uncle Mr Olorunwa Oyeneye for his constant prayers and moral support. May God bless him richly Amen.

Finally, I want to appreciate my loving and affectionate wife Mrs. Temitayo Oyeneye for her physical, spiritual and emotional support throughout this programme. May God bless you richly, Amen. Also to my kids, Faith, Feranmi and Ezekiel, for their prayers and bearing with me while the programme lasted. You will all fulfil your God given purpose in life, rise above your equals and make good success in this life and that to come in Jesus' Mighty Name Amen.

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ABSTRACT

This study investigated the determinants of capital structure of multinational corporations (MNCs) and domestic corporations (DCs) in Nigeria. The main objective is to investigate how capital structure determinant affect multinational firms and domestic firms in Nigeria. To achieve this, fifty-three non-financial firms listed on the Nigerian Stock Exchange (NSE) over the period of 2005 to 2019 were examined. Five firm-specific factors (leverage, profitability, tangibility, age and size), four macroeconomic factors that vary over time (GDP growth rate, Interest rate, Inflation rate and exchange rate) and four foreign macroeconomic factors that vary over time but country-specific (GDP growth rate, Interest rate, Inflation rate and exchange rate) were sourced from several editions of NSE fact book, several annual reports of included firms, Central Bank of Nigeria (CBN) Statistical Bulletins and World Development Indicators. Four issues were specifically examined. The first was to determine if multinational firm's leverage ratio differs significantly from that of domestic firms. The second issue was to investigate the effect of firm-specific factors on MNCs and DCs. The third was to determine the influence of macroeconomic factors on MNCs and DCs. Finally, the study examined the effect of home country macroeconomic factors on multinational firms only. Panel data analysis was conducted for all models using the Generalized Least Squares (GLS) technique based on period-weight and cross-section weight. The analysis was anchored on two major theories of capital structure; the dynamic trade-off theory and pecking-order theory. The result showed that leverage ratio of multinational firms differs and significantly lower than that of domestic firms. Some factors like profitability, tangibility, interest rate and size were found to be largely responsible for the difference. Based on profitability, the result further showed that domestic firms follow the theoretical prediction of trade-off theory while multinational firms follow the theoretical prediction of pecking-order theory. Interest rate and exchange rate were revealed to have similar impact on leverage ratio for both MNCs and DCs in Nigeria and are significant at per cent. In addition, the inclusion of parent-country macroeconomic factors improves the explanatory power of the model in terms higher adjusted R^2 . Finally, the study showed that both category of firms pursued target leverage and that both MNCs and DCs respond to deviation from target leverage at the same rate (0.29), resulting in a speed of adjustment of 3.4. Some of the major recommendations from the study is that policy makers and managers of firms should first consider the macroeconomic conditions at home and abroad before taking decision on how much debt to retain in their capital so that over exposure will not affect the firm value and eventual liquidation. In summary, the study showed that MNCs and DCs do not have the same capital structure and are influenced by firm-specific variables and macroeconomic variables differently. The government is encouraged to be aware of the effect of macroeconomic factors on leverage decision of firms and therefore should put in place policies that will make the macroeconomic conditions more favourable to MNCs and DCs financial stability.

CHAPTER ONE

INTRODUCTION

1.1 Background to the Study

Capital refers to the sum of financial assets that is available to a business enterprise in order to start a business operation, meet up with daily operational expenses, grow existing business ventures and or, expand the scale of operations in the domestic environment or in foreign country. Financial asset can be in form of debt or equity. The mixture of debt capital and equity capital is generally referred to as capital structure (Brealey, Myers & Allen, 2003; Abeywardhana, 2017). The choice of the right mixture of debt and equity is of paramount importance to both the managers of firms and producers of funds in corporate finance. Managers determine and decide on day-to-day operation of a business entity. Debt holders (bond holders) provide the debt capital while shareholders are the owners and they provide the equity capital. Thus, the concept of capital mix or capital structure becomes a very imperative concept in firms' financing decision or options to fund providers and users.

In the financial management literature, the traditionalist advocated that there is a right combination of equity and debt, such that the market value of a firm is at the maximum (Solomon, 1963; Pandey, 2007). A combination that gives this maximum is referred to as optimal capital structure. For this traditional approach, debt should exist in a firm's capital only up to a particular point, beyond which, any increase in leverage will become sub-optimal and eventual reduction in firm's value.

By definition, optimal capital structure is the mixture of debt and equity in such a manner that produces higher firms' value. In the literature several factors have been identified as variables

that could affect optimal capital structure. One of these factors is bankruptcy cost which is important because it is associated with a firm in distress and can be direct or indirect (Lee & Kwok, 1998). Examples of direct costs are legal, accounting and administrative costs that is associated with legal proceeding while examples of indirect costs are loss of customers, loss of sales and important employees. Practically, the probability of bankruptcy rises as more debt usage rises and lowers when debt usage reduces. For this reason, debt is encouraged up to a point where the marginal benefits of debts is equal to the marginal expected loss due to bankruptcy costs (Lee & Kwok, 1998; Abeywardhana, 2017). One major established benefit of debt is tax savings as a result of interest deductions before tax payment. This is technically referred to as “debt-tax shield”. Other concepts that have been suggested as explanations for the existence of optimal capital structure are “agency cost” in Jensen and Meckling (1976) and Arnold (2008) “non-debt tax shield” in DeAngelo and Masulis (1980), Fama and French (2002), “firm size effect” in Scott and Martin (1975), Tiwari and Krishnankutty (2014) and “asymmetric information” in Ross (1977) and Myers, (2003).

The contribution of Modigliani and Miller (1958) changes the pace for search for optimal capital structure of firms. Since then, a substantial amount of effort has been put forward in corporate finance theory to determine the factors that influence a firm’s choice of capital mix. The most important question facing companies in need of finance is whether to raise debt capital or equity capital or mixture of both equity and debt capital. This is important because a wrong mix of finance will not only affect financial performance but it can threaten the survival of firms. Again, an economy will grow when firms are growing and will depress when firms are failing, this also makes the question of choice of capital very imperative not only to the individual firm but also to the national economy. Salawu (2007) opined that the

contributions of firms to an economy amongst others are; production of goods and services, generating employment opportunities, providing incomes in terms of profit, dividends and wages to households, generating tax income to government and changing the structure of an economy.

Before the introduction of Structural Adjustment Programme (SAP) in 1986, the business environment in Nigeria was heavily regulated in terms of foreign exchange policy (Fixed Exchange Rate Policy), firms ownership structure (Higher government holdings in certain firms), and generally less competitive business environment (Chete, Adeoti, Adeyinka & Ogundele, 2012; Abah & Peter, 2016; Awe & Luis, 2019) . Sequel to the introduction of Structural Adjustment Programme (SAP) of 1986 in Nigeria, firms and businesses operating environment changed. For instance, there is more flexibility for financial manager in choosing the capital structure for their firms. Many firms now operate in a largely deregulated and increasingly competitive environment (Salawu, 2012).

Today, the business environment is largely and highly competitive and such makes the study of industrial finance decision an interesting one. One of the major concerns of researchers in this area of industrial finance is to establish factors that influence funds managers' decision on the capital structure to pursue. These factors can be divided into two broad categories; the firm-specific or internal or microeconomic factors and the macroeconomic or external factors (Hermanns, 2006).

Review of related literature showed that most studies focused on investigating the determinants of capital structure of firms by classifying firms into different sectors or industries where they belong while ignoring the peculiar nature of multinational firms

(Salawu & Akinlolu, 2008; Akinleye, 2012; Nsika, Arene & Okpukpare, 2014; Paseda, 2016; Segun & Abiodun, 2020). Other set of studies in Nigeria focused on the impact of capital structure on firm's performance (Salawu, 2007; Oke & Afolabi, 2011; Dauda, 2012; Iorpev & Kwanum, 2012).

However, the peculiarity of multinational firms as captioned in the theory of multinational enterprises which hinges on the nature of the "specific advantage" of the firms, makes it imperative to approach or study firms' capital structure by isolating the multinational from the domestic firms. For instance, the specific-advantage hypothesis postulates that multinational firms transfer firm-specific advantages internally across borders, thus, multinational firms are internationally mobile.

Several studies have documented interesting and systematic differences in standard determinants of capital structure among multinational and domestic firms in different countries. For instance Shumi and Barry (2009) studied Japanese multinational and domestic corporations, Mari, Aaro and Kadri (2011) focused on multinational and domestic companies in Baltic States. Others are Usha and Zhou (2008), Lee and Kwok (1988), and Imed and Jean-Claude (2001). It is therefore important to investigate the behavior of standard determinants of capital structure of multinational and domestic firms in Nigeria. This is because several studies have shown that MNCs and DCs do not pursue the same leverage ratio which is an important factor for firm to survive (Lee & Kwok 1988; Shumi 2015).

1.2 Statement of the Problem

In corporate finance, the market value of a firm is equal to the present value of its expected future free cash flow discounted by its weighted average cost of capital (Dauda, 2012). The

weighted average cost of capital is a function of the amount of debt and equity mix in the capital structure of firms. One key reason for this study is the danger of firm's failure when there is a wrong mix of debt-equity ratio. When a firm fails there are several negative impacts on the individual household, the community, firms and the country at large. One of the major reasons for firms' failure or bankruptcy is capital structure of firms. Ikpesu and Eboiyehi (2018) identified causes of financial distress to include severe competitors, declining assets-liability ratios, cash flows problems and poor capital structure. Thus, it is important to investigate what should determine the value of debt a firm should maintain in her capital structure.

Typically, financing with debt increases common stockholders expected return on capital but as debt rises, return to shareholders becomes more volatile due to payment of more interest to bondholders before dividend payment. Eventually, this drives up the default risk premium on equity and lowers the firm's value (Dauda, 2012).

Thus, to maintain a healthy firm and better return to common stockholders, it is important to determine the trade-off between debt and equity usage in such a manner that will result in optimal capital structure that will maximize firms value (Ross, Waterfield & Jaffe, 2005).

In financing decision, managers try to balance the benefit and cost associated with debt financing. This decision of trying to establish an optimal capital structure has led many researchers to come up with several theories on optimal capital structure. However, to date, none is conclusive (Baltaci & Ayaydin, 2014). As a result, the major concern in literature is identifying factors that influence debt and or equity financing within firms. For instance, Kim (1978, 1982), Bradley, Jarrell and Kim (1984), Jalilvard and Harris (1984), Fischer, Henkel

and Zecher (1989), James and Lemma (1990), Baker and Wurgler (2002), Mark and Robberts (2005), Huang and Ritter (2009), Getzmann and Lang (2010), Dang, Gaurett and Nguyen (2010), Paul (2010), Jorge and Anthonio (2017), Dimitris, Georgios and Theofanis (2019) and Bas (2021) focused more on developed economy and never took into consideration the specific character of multinational and domestic firms. These types of studies could lead to misleading result and eventually unwholesome policy formulation that may result in bankruptcy.

Thus, it is imperative to separately investigate factors that affect foreign firms and domestic firm's capital structure, because, theoretically and empirically, substantial differences have been repeatedly reported in empirical studies that compares foreign-owned firms and domestic-owned firms. For instance, studies by Fatemi (1988), Lee and Kwok (1988), Doukas and Pantzalis (2003) studied the capital structures of multinational and domestic firms in USA. They all reported that the multinational firms manifested less debt than the domestic firms. In contrast, Mittoo and Zhang (2008) reported that the multinational firms in Canada have higher leverage relative to the domestic firms. Similarly, the study by Shumi and Barry (2009) reported a significant difference in the determinants of capital structure of multinational and domestic firms in Japan. These mixed results underlined one of the major reasons for study of this nature in Nigeria.

In Nigeria today, studies on the determinants of capital structure, never separated the multinational firms from domestic firms (Akinlolu 2008; Peseda 2016; Salawu & Segun & Abiodun 2020). It is very imperative to embark on this study, because foreign owned firms usually outperform the domestic ones in terms of profitability, sales volume and ability to adapt to different business environment, not only in Nigeria but also in most countries of the

world (Willmore, 1986; Christain, B., 2004; Shumi & Barry 2009; Shumi 2015). Considering the importance of capital structure particularly when it affects the survival of business, it is important to investigate and compare the determinants of leverage for multinational and domestic firms in Nigeria.

Lee and Kwok (1988) opined that several local factors in host country can actually influence the capital structure and capital structure determinants of multinational affiliate differently from domestic firms. Foremost, in an attempt to reduce political risk, a foreign affiliate may borrow more from local market. This is generally seen as a financial cover for periods when the political atmosphere is not favorable to doing business in the host country. Similarly, foreign affiliate may go for more debt in the local market as a result of high inflation rate because rising inflation comes with currency devaluation. Raising more debt in this situation will help reduce asset exposure and increase liability exposure which is fair for the firms finance. Another reason why multinational firms may rely more on debt usage is incentives package from host government in order to attract foreign investment thereby encouraging industrialization and strengthening local economy. This package may include access to loan at a reduced interest rate which in particular may encourage the use of more debts in their financing options. At the same time, certain situation may discourage multinational firms from debt usage. For instance, the government of host country may require that foreign affiliates maintain a certain minimum percentage of capital in form of equity investment as a fair share of capital to the host country. This condition will definitely reduce debt usage in their capital. Finally, Multinational firm affiliate may also patronize the parent company to raise debt capital because of under-developed capital markets in the host country. This is true with most country including Nigeria where we have foreign affiliate of firms from developed

countries. This may prompt multinational firms affiliate to raise either debt or equity from their parent country.

Most of the examined studies have established that MNCs and DCs do not pursue same capital structure (Lee & Kwok, 1988; Mittoo & Zang, 2008; Mari, et al., 2011; Shumi, 2015). Similarly, they have been able to show that firm-specific variables like profitability, tangibility, size, agency costs and bankruptcy costs amongst others and macroeconomic variables such as gross domestic product, inflation rate, interest rate and exchange rate have all contributed to reasons why the leverage for MNCs differs from that of DCs. Thus, this study set out to investigate how both firm-specific and macroeconomic variables influence leverage decisions of MNCs and DCs in Nigeria.

1.3 Research Questions

To this end, the pertinent questions that were answered in the course of this study are:

- (i) what is the difference between the capital structure of multinational firms and domestic firms?
- (ii) to what extent do host-country GDP growth rate, inflation rate, interest rate and exchange rate determine the capital structure of multinational and domestic firms?
- (iii) how do firm-specific variables affect multinational firms and domestic firms?
- (iv) to what extent do parent-country GDP growth rate, inflation rate, interest rate and exchange rate affect leverage decision of multinational firms?

1.4 Objectives of the Study

The broad objective of this study is to investigate the determinants of capital structures of multinational and domestic firms in Nigeria. The specific objectives are to:

- (i) determine if there is a difference between the capital structures of listed multinational firms and domestic firms in Nigeria
- (ii) investigate the effect of host-country macroeconomic factors on capital structure of multinational and domestic firms.
- (iii) determine the effect of firm-specific variables on multinational and domestic firms.
- (iv) examine the impact of parent-country macroeconomic variables on multinational firms in Nigeria.

1.5 Statement of Hypotheses

The following hypotheses are relevant in this study and are directly implied from the above objectives.

- (i) There is no difference between the capital structure of multinational firms and domestic firms in Nigeria
- (ii) Host-country GDP growth rate, inflation rate, interest rate and exchange rate do not affect capital structure of multinational and domestic firms differently.
- (iii) Firm-specific factors do not affect multinational firms differently from domestic firms.
- (iv) Parent-country GDP growth rate, inflation rate, interest rate and exchange rate do not affect capital structure of multinational firms.

1.6 Justification for the Study

This study is significant in that it will provide managers of industries useful insight in respect of firms' financial policy at both private and public level. Further, it will provide useful

information in the area of financing to policy makers in respect of domestic firms and multinational firms operating in Nigeria. The study therefore, sets out to empirically examine the relationship between the capital structure of listed multinational firms and domestic firms in Nigeria.

Separating firms into two - domestic and multinational, is a major point of departure from similar studies on determinants of capital structure of listed firms in Nigeria. A brief review of related literature showed that most studies of this nature were done using samples of firms from more developed economy. Shumi and Barry (2009) study Japanese multinational and domestic corporations, Mari, et al., (2011) focused on multinational and domestic companies in Baltic States. Shumi (2015) did a cross-country study on Australia, United States, Japan and United Kingdom. Others are Usha and Zhou (2008), Lee and Kwok (1988) and Imed and Jean-Claude (2001). The increasing liberalization and globalization in recent times certainly require careful investigation of capital structure and determinants of capital structure of multinational and domestic firms in Nigeria. This is important because multinational firms are more guided in choosing their capital structure as a result of some underlying reasons that are pertinent to their operation in several countries. Some of these reasons are differences in taxation, regulation, corporate governance issues, political and economic climate of host and parent country. Lee and Kwork (1988) further explained that studying capital structures of “bi-national” firms, separately from domestic firms is very imperative because foreign exchange risk, political risk, international tax differential, international market imperfections, cooperate international diversification, international availability of capital and local factors influences foreign affiliate’s capital structure.

Interestingly, most result from studies that investigated the capital structure of multinational and domestic firms using samples from developed economy showed that multinational firm's capital structure is not the same with domestic firm on one hand and on the other hand, it is influenced by macroeconomic factors from the parent country. Such outcome justifies examining the determinants of capital structure of listed multinational and domestic firms in Nigeria.

Finally, considering the rapid expansion of multinational firms, their size and financial stability relative to domestic counterpart warrant a further understanding of the determinant of capital structure of multinational and domestic firms in Nigeria. In particular, the specific-advantage hypothesis in the theory of multinational enterprises postulated that multinational firms transfer firm-specific advantages internally and across borders. The above makes the study unique in the sense that it first treated all firms as one, thereafter, firms were separated by country of origin. This method makes it easier to study the influence of both local and foreign factors on multinational and domestic firms in Nigeria.

1.7 Scope of the Study

This study focused on comparative study of the determinants of capital structure of listed multinational and domestic firms in Nigeria. Yearly data of non-financial firms from 2005 to 2019 were utilised. The major factor that influences the selection of year 2005 as start time is that some of the firms examined do not have sufficient data until 2005. The end-period (2019) becomes appropriate because of the disruption of world economy as a result of the coronavirus pandemic that brought the world-wide economy to a stand-still in 2020. This affected firms' capacity to engage in business activities like production or selling of goods and services. Therefore, to avoid observable and unobservable effect of the pandemic and

post-pandemic period, the study end-period was fixed for 2019. Also, the study was limited to non-financial firms listed on the Nigerian Stock Exchange (NSE) over the period of study.

CHAPTER TWO

LITERATURE REVIEW

This chapter presents the review of relevant literature in the study of corporate capital structure. The conceptual, theoretical and empirical underpinnings of determinants of capital structure of firms are discussed. It traces how the ground breaking seminal contribution of Modigliani and Miller (1958) set the pace in the debate of what determines the capital structure of firms to the most recent theory of market timing by Baker and Wurgler (2002). The chapter closes with a sub-section on gap in the literature.

2.1 Conceptual Review

This section discusses important concepts in the study of capital structure of multinational and domestic firms.

2.1.1 Multinational and Domestic Firms

As established in the literature, a multinational corporation is a business enterprise that maintains productive activities in two or more countries (Hennart, 2008; Hill 2005; Okwandu & Jaja, 2001). In measuring the multinationality of firms, researchers have employed different indicators to show the extent to which a firm is multinational in nature. Some of such indicators are ratio of foreign assets to total assets, ratio of foreign sales to total sales, ratio of foreign profits to total profits and number of foreign countries where the firm is active or operating. Researchers have generally adopted one or combinations of these parameters to determine the multinationality of firms.

In Davies and Markusen (2019) the most primal form of multinational firm is a firm with headquarters in the home country and at least one foreign affiliate firm in another country

(host country) and the relationship is such that the parent firm supplies assets and services such as management, technology, intellectual property, marketing and finance to the foreign affiliate . In their study, four features were identified to clarify what is meant by structure of multinational firms. The first is geographic distribution of a firm's establishment, the second is activities performed by various establishment, whether output are final or intermediate, the third has to do with where foreign affiliate sells their output, whether it is in the host market or exported to home country or third countries or where affiliate purchase their inputs. Finally, the fourth characteristic identified was interactions among establishment such as intra-firm flows of goods, services and intangibles. In the words of Eluka, Ndubuisi and Anekwe (2016) multinational corporations are characterized by a parent company in the home country with one or more subsidiaries in the host countries with a common pool of financial, technical and managerial resources. They further noted that a firm is not multinational if it only operates overseas or act as a contractor to foreign firms. For the current study, all firms that operate in Nigeria with headquarters outside the shore of Nigeria were considered as foreign affiliate and therefore a multinational firm.

On the other hand, domestic firms restrict their operations to a single country where they are incorporated. They operate mostly or solely within one country. Although, the products or services of domestic firm are mostly tailored toward the need of the home country, some still engage in foreign sales of goods and services. In this study, all firms incorporated with headquarters in Nigeria were considered as domestic irrespective of whether they engage in foreign trade or not. Once a firm is headquartered in Nigeria, it is regarded as domestic firm.

2.1.2 Firm-Specific Variables

These are firm-level variables which are directly under the control of managers. These variables vary over time and over firms. There are several firm-specific variables identified in the literature as factors that influence the choice of leverage ratio. As a result of data available, four firm-specific variables were included in this study as explanatory variables. In total, five firm-specific variables (including the dependent variable) were used in this study. Capital structure or leverage ratio is the dependent variable while profitability, tangibility, size and age were the independent variables. Following are some conceptual clarification on these variables.

(i) **Capital Structure or Leverage:** According to Drobetz, et al. (2007), and in line with competing capital structure theories, there is no clear cut definition of leverage in the academic literature. Rajan and Zingales (1995), apply two alternative measures of leverage. First, leverage defined as the ratio of non-equity liabilities to total assets. The second defined leverage as the ratio of interest bearing debts to capital. While the first is noted to be widely used and stand to proxy what is left to share-holders in case of liquidation, the second captured employed capital which represent effect of post-financing decisions, (Drobetz et al 2007). Further, leverage is short-term if only short-term liabilities are considered and it is long-term if long-term liabilities are considered. This study adopted long-term measure of leverage by considering the ratio of total liabilities to total assets.

(ii) **Profitability:** Profitability is a measure of a firm's profit relative to its overall expenses. Ratios such as gross profit margin, net profit margin or earnings before interest and tax (EBIT) and profit before tax (PBT) are some of the major concepts used in measuring profitability of firms. Different theory predicts different relationship between leverage and firms profitability. For instance, trade-off theory predicts a positive relationship between

profitability and leverage. The intuition behind the trade-off theory was that more profitable firms will have the capacity and better chance to access debt-capital than less profitable firms. Some of the studies that supported this position are Monomita (2008), Nunkoo and Boateng (2010), Osman (2018), Ahmed and Amina (2019) and Biliquees (2020). On the contrary, pecking-order theory study predicts a negative relationship between profitability and leverage. This is because more profitable firms are expected to rely more on internal fund than less profitable firms. Thus, profitable firms should go for less debt while less profitable firms should go for more debt. Studies like Deesomsak, Pandyal and Pescetto (2004), Salehi and Manesh (2012), Rubi and Oyebola (2017), Sutanuka and Debdas (2021) found that the relationship between leverage and profitability was negative and consistent with the theoretical prediction of pecking-order theory. The current study measured profitability by considering the ratio of profit before tax to turnover.

(iii) **Tangibility:** Tangibility is a concept that measures the proportion of assets in physical form to total assets. In firm finance, it is the ratio of fixed assets to total assets and this is the measure used in this study. Expected relationship between tangibility and leverage vary by theory. For instance, trade-off theory predicts a positive relationship between tangibility and leverage ratio. The intuition is that firms with more tangible assets can easily assess bank loan because these type of asset can stand as good collateral for loan. On the other hand, firms with low or little tangible assets may find it difficult to raise loan. Thus, the higher the tangibility, the higher the leverage ratio and vice-versa. Several studies have confirmed this position (Jorge & Antonio, 2017; Demis & Man, 2018; Ajaya & Swagatika, 2019). On the other hand, pecking order theory predicts the opposite. According to the theory, firms with more tangible asset is expected to be more experience with sound asset

base to make more profits and therefore, should be more profitable than firms with little tangible assets. The theory therefore, suggests a negative relationship between leverage and tangibility. Thus, firms with more tangible assets should use less debt and rely more on internal financing. Studies that found a negative relationship between leverage and tangibility in support of pecking-order theory are Akinlo (2011), Jacek, Leszek and Magdalena (2019), Doaa (2020).

(iv) **Size:** Firm size generally refers to the capacity of a firm which can be measured by using different concepts such as total sales, total assets, number employed and market value of equity. To avoid volatility in measurement, logarithm of total assets was used in this study and this measure is consistent with most studies (Faris, 2010; Intan & Prasetyo, 2016; Sutanuka and Debdas (2021). The trade-off theory suggests a positive relationship between leverage and size. It is believed that the larger the size of a firm, the lower the bankruptcy risk and thus lower bankruptcy cost and therefore, more better access raising debt-capital. Studies like Faris (2010), Merve and Gizem (2018), Jorge and Antonio (2017) and Sutanuka and Debdas (2021) confirmed this position. The pecking-order theory predicted a negative relationship between leverage and firm size. The primary reason for the inverse relationship is that larger firms should possess more capacity to be productive and profitable, thereby relying on internal fund relative to external fund. Several studies have established the prediction of this theory (Kouki & Said, 2012; Yinusa, Ismail, Yulia & Olawale, 2018). However, some studies argued that the relationship is ambiguous as impact of size on leverage could either be positive or negative (Rajan and Zingales, 1995). The positive relationship is premised on the fact that larger corporations tend to have lower bankruptcy risk and thus lowers bankruptcy costs while reduced or lower degree of asymmetric

information problems is the major argument for negative relationship between leverage and firm size.

(v) **Age:** Firm age can either be measured as the period since the creation of a firm and the present time in years or the period between when it goes public and the present time in years. The current measured firm age in terms of the latter definition. Pecking-order theory predicts positive relationship between leverage and firm age while trade-off theory predicts a positive relationship. The intuition for a positive relationship is that the higher the age of firms, the more the experience and expectedly, the higher the profit. Thus, firms with more years of experience should be able to access and use more external fund relative to firms with fewer years of experience. However, the pecking-order theory suggest that as firm ages, the more profitable it should become and eventually should rely more on internal fund. Studies such as Ahmed (2015) and Jorge and Antonio (2017) supported positive relationship while studies from Yinusa, et al., (2018) and Sutanuka and Debdas (2021) established negative relationship.

2.2 Theoretical Review

This section presents the review of relevant theory of capital structure determinants. The section starts with the “irrelevance of capital structure proposition” by Modigliani and Miller (1958) to the market timing theory by (Baker and Wurgler 2002). The section concluded by examining the universality of these theories under the sub-section titled “is there one theory explaining all?”

2.2.1 Irrelevance Theorem by Modigliani and Miller (1958).

Prior to the irrelevance of financial structure of firms by Modigliani and Miller (1958) is the traditional view that stated that debt capital is better than equity because it is cheaper. However, the pioneering work of Modigliani & Miller in 1958 disagrees with the traditional view. They posited that the mix of debt and equity capital does not matter (i.e. irrelevant) in determining the market value of a firm. To them, the “Slicing of the pie” is not the issue because whether a firm Capital Structure is all debt (100 per cent levered) or all equity (100 per cent unlevered), firms’ value is not affected. Their argument was based on the following assumptions:

- (i) perfect capital market with no taxes
- (ii) no transaction costs
- (iii) no bankruptcy cost
- (iv) information is complete and homogenous to all investors.

The main flaw of the Modigliani and Miller Theory is the assumption of the existence of perfect financial market. The major flaw gave birth to other theories of capital structure of firms.

2.2.2 Trade-Off Theory (1963)

The Trade-off Theory was one of the first set of theoretical reactions to the MM irrelevance theory of 1958. Against the first proposition of MM, the reality is that, leverage comes with several costs. Trade off theory was pioneered in their second proposition, (Modigliani & Miller, 1963). In the theory, a trade-off is assumed to exist between cost and benefit of using debt or more debts. This theory suggests that there is an optimal mix of debt and equity. Kraus and Litzenberger (1973) provided a popular version of this theory. According to them, optimal

leverage will occur at the point where benefits of using debts and demerits of using debts (bankruptcy costs) are equal. That is, the point where additional leverage generate an increase in bankruptcy cost that is just enough to offset the tax benefit of using more debts.

Trade off theory is not entirely capable of specifying precise optimal capital structure. However, they do enable us to make three statements about debt usage:

- (i) Higher risk firms ought to borrow less than lower risk firm, other things being equal.
- (ii) Firms that employ tangible assets such as real estate, machines and machinery should borrow more than firms whose values are derived from intangible assets such as patents and goodwill.
- (iii) Higher tax paying firms should borrow more than lower tax paying firms.

This theory thus takes into account the imperfection of the capital market.

There are two versions to this theory. The first is the Classic also known as “Static” trade-off theory which considers only costs and benefits of debt (Brennan & Schwarts, 1984; Bradley, et al., 1984; Myers, 1984). On the other hand, if the optimal or target capital structure varies overtime, we talk about “dynamic” trade-off theory (Fischer, et al., 1989). The major determinants of financial structure under trade-off theory are deductibility of interest payment before tax (debt tax shield) and the bankruptcy cost (financial distress cost). In general sense, the trade-off is used by many researchers to describe several related theories on Capital Structure. The ultimate is that the decision maker(s) try to find a target leverage or optimal leverage where various costs of using debts is compared with the various benefits of using debt such that the marginal cost of using debts are balance with the marginal benefits of using debt. According to Myers (1984) the main implication of trade off theory is that firms should adjust their financial structure to an optimal or a target level if they deviate. Again, firms that

follow the trade-off theory set a target debt ratio, and then move towards the set target by balancing debt tax shield against bankruptcy costs.

2.2.3 Agency Theory (1976)

The main pioneers of agency theory are Jensen & Meckling (1976). Their basic assumption was based on aligning the managers' interest with those of shareholders. To them, when the interest of managers is not perfectly aligned with those of shareholders, Managers tend to waste free cash flow on prerequisites and investments with negative net present value. The focus is on the managers (agent) and shareholders (principal) relationship. Once there is a conflict between the principal and agent, agency cost will result and there will be need for the shareholders to embark on measures to remedy the conflict. According to Jensen & Meckling (1976) agency cost are defined as the sum of the following;

- (i) The monitoring cost paid by the shareholder to control managers and make them act in the best interest of the shareholder (i.e. shareholders wealth maximization).
- (ii) The bonding expenditure by the managers (agents) to convince the shareholders of the quality of their decision and thus increase the shareholders confidence in their decision.
- (iii) The residual loss. This is the cost of divergence between the managers' interest and shareholders' interest.

In order to mitigate the agency problems, Jensen and Meckling (1976) suggested that managers' ownership in the firm should be increased, such that equity base and eventually the equity ownership of the managers will be increased. By 1986, Jensen developed the free cash flow theory in order to control managerial discretion. Free cash- flow is defined as the total available cash after managers have executed projects with positive net present value. Availability of free cash flows gives the managers, the opportunity to embark on projects with

negative NPV, or increase their compensation package. Jensen (1986) suggested the use of debt in the reduction of such free cash flows.

2.2.4 Pecking Order Theory (1984)

The pecking order theory was pioneered by Myers (1984) and Myers & Majluf (1984). The theory is based on the assumption of asymmetric information between manager of firms and investors. The managers and perhaps current shareholders have more information about the company prospects than potential investors and creditors (outsiders). According to Myers (1984) when firms (managers) are faced with new project requiring financing, the pecking order will consider financing the project from internally generated funds first. After internal funds are exhausted, the next is a cheaper source of fund which is debt and if there is need for more funds, next is to raise fund through issuing of equity capital, thus, pecking order suggest raising fund in the following order: first, internally generated fund, second is raising debt and finally is raising new equity. (i.e Internally generated fund →Debt →New equity).

The major empirical implication of this theory is that more profitable firms that have more internal fund will use less debt while less profitable ones will require more debt (Fama & French 2002; Myers, 2003).

2.2.5 Market Timing Theory (2002)

In Corporate Finance, equity market timing refers to the practice of issuing shares at high prices and repurchasing at low prices (Baker & Wurgler, 2002). This is a more recent theory of capital structure theory. This theory was pioneered by Baker and Wurgler (2002) and evident in four different kinds of studies before the theory came to limelight. First, firms tend

to issue equity when market value is low. (Taggart, 1977; Asquith & Mullins, 1986; Jung, Kim & Stulz, 1996; Pagano, Panetta & Zingales, 1998). Second, firms issue equity when the cost of equity is relatively low and repurchase equity when the cost is relatively high (Ritter, 1991; Brav & Gompers, 1997). Third, firms tend to issue equity when investors are too enthusiastic about earning prospects (Loughran & Ritter, 1997; Denis & Sarin, 2001). Fourth and final, managers admit to market timing in anonymous surveys (Graham & Harvey, 2001). Based on these observations and as noted in the contributions of Baker and Wurgler (2002), market timing has large and persistent effect on capital structure. Thus, their market timing theory lends strong support to show that macroeconomic factors or variables and firm specific variables affect capital structure of listed firms.

2.2.6 Is There One Theory Explaining All?

In the words of Myers (2001) “there is no universal theory of debt-equity choice and no reason to expect one”. He noted that several previous studies have expressed the need for a unified framework that incorporates elements of the two major theories (pecking order and trade-off theory) of capital structures. He supported his position with the conclusion of Fama and French (2005) as contained in Souk (2008):

“Thus it is probably time to stop running empirical horse races between them as Stand –alone stories of capital structure, perhaps it is best to regard the two models as stable mates with each having elements of truth that help explain aspects of Financing decisions”

Souk (2008) concluded that the best approach is to combine the basic intuition of the theory. The implication is that, these theories are not mutually exclusive. Thus, empirical

investigation should be based on a nested model which will include all variables as suggested by these theories (Mukherjee & Mahakud, 2011).

In conclusion, Brigham and Gapenski (1996) observed that all theories on capital structure leads to the following conclusion:

- (i) There exists an optimal capital structure or at least an optimal range of structure for every firm.
- (ii) Financial theory is not powerful enough to enable us locate a firm's optimal structure with precision.
- (iii) The optimal capital structure or target capital structure is not set in isolation; rather, it depends on sets of factors.
- (iv) Small deviations from the optimal capital structure do not have a significant influence on firms' value.
- (v) Sequel to the above, managers are generally willing to depart temporarily from the target capital structure in response to fluctuation in operating and or, capital market conditions.

2.3 Empirical Review on Firm-Specific Determinants

In this section, empirical evidence on firm-specific determinants of capital structure of firms is presented. This review is divided into three sub-sections. The first focused on samples from developed countries while the second focused on developing countries and the last focused on literature from Nigeria.

2.3.1 Studies from Developed Countries

The study by Getzmann and Lang (2010) focused on samples from industries in Asia, Europe and U.S.A. capital markets. They sampled homogeneous panel of 2706 companies with market capitalisation of at least one billion US-Dollar. Their analysis covered the period 1995

to 2009. Based on system GMM, profitability was found to affect leverage in the three regions. Tangibility and size were found to further influence the capital structure of firms in Asia. Asian firms showed stronger consistency with the prediction of trade off theory than firms in Europe and USA markets. They further found that speed of adjustment for Asian, Europe and USA are 31%, 56% and 46% respectively. This suggests that firms in Europe adjust faster than firms in Asia and USA while USA firms adjust faster than firms in Asia. Perhaps, level of market development in Europe and USA contributed to faster adjustment.

Cross-country evidence on the determinants of target leverage was provided in the study by Dang, Garrett and Nguyen (2010). They focused on five developed economy, namely France, Germany, Japan, UK and USA. Their sample consisted of 9034 firms with 78,108 firm-year observation. Applying the system GMM technique of dynamic panel, result showed that profitability and non-debt tax shield were negatively related to leverage for all firms across all countries investigated. Again, tangibility and firm size were found to significantly impact on leverage across all countries in the sample. Other firm specific variables that were found to be significant in their study are dividend pay-out, earning volatility and share price. The result also showed that firms in all the countries examined move towards target at speed, ranging from 39% (Japanese firms) to 51% (French firms). Thus, all firms in the sample restored deviations from target between two to three years. Generally, their result was found to be consistent with both trade off and pecking order theories and thus, supporting the complementarity of both theories.

Nunkoo and Boateng (2010) analysed the determinants of capital structure of Canadian firms. Their study was based on a sample of firms listed on Toronto Stock Exchange (TSX) over the period 1996 to 2004. Using a system GMM methodology on 7079 firms, their result showed

that profitability and tangibility have positive impact on leverage while growth and size have a negative effect on leverage.

Kouki and Said (2012) examined 244 French listed companies over the period of 1997-2007. The result from panel fixed effect method showed that the determinants of capital structures in France were consistent with trade-off hypothesis. Also, the results showed no response of determinants to market timing predictions. Firm size was negatively related to leverage, profitability was positively related to book measure of leverage while it was negatively related to market measure of leverage. Growth and Non-debt tax shield were also found to be positive and significant in explaining leverage of French firms. Tangibility was negative while bankruptcy risk was found not to be a significant determinant of leverage.

Jorge and Antonio (2017) investigated capital structure determinants for 26 large Portuguese firms that have investment in Angola over the period of 2006 to 2010. The result showed that profitability was significant and positively related to leverage. The outcome suggests that the higher the profit of Portuguese firms in Angola, the more debt it applies in its capital structure. Further, the results from PCSE methodology showed that age and tangibility were significant and positively related to leverage. Thus, the 26 examined firms majorly follow the predictions of trade-off theory of capital structure.

The study by Jacek, Leszek and Magdalena (2019) focused on food manufacturing industry in Poland over the period 2012 to 2015. Applying fixed effect model on 2961 firm-year level observation showed that most of the variables investigated affect capital structure significantly and were consistent with the prediction of pecking order theory on capital structure. For

instance, tangibility, profitability and non-debt tax shield were negatively related to leverage of examined firms.

Sarah and Mahmoud (2019) investigated the determinants of capital structure of FTSE 100 companies in United Kingdom in 2016. Six explanatory variables were examined using least square technique of analysis. The result from their study showed that it is only growth opportunity that has a negative and significant influence on leverage ratio. Other variables like size, profitability, tangibility, tax and volatility were not statistically significant. The fact that only firms listed in 2016 were examined could be a major shortcoming of their study and main reason why most of the included firm-level factors were not significant.

Again, in UK, Bas (2021) investigated firm-level determinants of capital structure of both listed and unlisted firms in the United Kingdom. Panel pooled OLS methodology was applied on a sample of 12,169 firms over the period 2014 to 2018. The result from the analysis revealed that the most important firm-specific determinant of firms in UK were profitability, tangibility and liquidity. Other factors that were found to be of less important were size, non-debt tax shield and age. Factors such as growth and tax-shield were not statistically significant. The general outlook of the result showed a strong support to pecking order theory of capital structure. This very study showed that the firm-specific variables that were not significant in the cross-section study by Sarah and Mahmoud (2019) became significant in the panel analysis by Bas (2021) for UK firms.

In a recent study, Leszek and Jacek (2022) investigated factors that determine capital structure of firms from Poland and Portugal. A total of 59,400 firms from both countries were examined using panel fixed effect method. The result revealed that firms from Portugal (a

developed economy) use more debt in her capital structure than firms from Poland (an emerging economy). Further, the result showed that tangibility, profitability, liquidity and non-debt tax shield influence leverage of Poland firms negatively while growth and size had positive influence. On the other hand, non-debt tax shield and tangibility exert a positive influence on leverage ratio of Portugal firms. The general outlook is such that Polish firms chose their capital structure in line with the predictions of pecking order theory while Portuguese firms follow the theoretical prediction of trade-off theory.

The general outlook from studies on developed economies showed that most of the studies relied on System-GMM and Fixed-Effect methodology. Firm-specific determinants like profitability, tangibility size and growth were major factors that influence leverage decisions of firms from developed countries. Further, these studies revealed that Trade-off and Pecking-order theories of capital structure complement each other rather than stand alone.

2.3.2.1 Studies from Developing Countries Based on Pooled OLS Technique

The Study by Huang and Song (2002) examined the determinants of capital structure of Chinese firms. Their analysis was based on a sample of 1000 listed firms up to year 2000. Results from pooled OLS showed that leverage is positively related to firm size, non-debt tax shield and fixed asset while a negative relationship was observed between leverage and profitability. Static Trade off theory rather than Pecking-order theory was found to give a better explanation on the behaviour of capital structure of Chinese firms.

Faris (2010) investigated the impact of firm-specific factors on firms listed on Ammon Stock Exchange Jordan. The sample was made up of 95 firms listed over the period 2004 to 2007. The result which was also based on pooled OLS showed that there is a positive and significant

relationship between firm size, tangibility, growth, non-debt tax shield and capital structure of Jordanian industrial firms. However, return on asset was found to be negative while age was not significant. The implication of this is that firm age does not affect leverage decision among industrial firms in Jordan.

Further, Ellii and Farouk (2011) based their study on companies listed on Abu Dhabi Stock Exchange in United Arab Emirates. They examined 33 firms from different industries over the period of 2008-2009 using pooled OLS methodology. Among the variables of interest, profitability was found to be positively related to capital structure while size, expected growth and operating risk were all found to be negatively related to capital structures of selected firms in UAE.

Firms-specific determinants like size, tangibility, profitability, growth and leverage were examined by Salehi and Manesh (2012) on firms from Iran. The pooled OLS methodology on a sampled of 57 firms listed over the period 2004 to 2011 on Tehran Stock Exchange found that profitability and growth were negatively related to leverage while firm size was positive. This result showed that Iran firms follow the predictions of both Trade-off and Pecking order theories of capital structure.

Sangeetha and Sivathaasan (2013) investigated factors that determine capital structure of listed firms in Sri Lanka. Fifty companies listed on Colombo Stock Exchange over the period 2002 to 2006 were examined. Based on pooled OLS, they found out that size was positively related to leverage and this is consistent with the prediction of Trade-off and Agency theory while it contradicts Pecking-order theory predictions. The result further showed that profitability was negatively related to leverage, this is contradictory to the predictions of

trade-off theory, and growth was found to be negatively related and this is well supported by the predictions of agency cost theory.

Ahmed (2015) investigated firm-level determinants of leverage for 49 out of 215 listed firms on Kuwait Stock Exchange for the period 2009 to 2013. The result from the study using pooled OLS showed that eight of the ten explanatory variables included in the study were statistically significant. For instance, age of firms, profitability and past leverage value determines leverage ratio for Kuwait firms. The result further revealed that profitability is negatively related to leverage while past value of leverage, size, tangibility and age of firms are positively related to leverage. The result showed strong support for both pecking order and trade-off theories of capital structure.

In a country-wide study, Demis and Man (2018) examined 13 Africa countries (South Africa, Mauritanius, Egypt, Nigeria, Kenya, Morocco, Tunisia, Tanzania, Namibia, Swaziland, Ivory Coast, Ghana, and Botswana) over the period of 16 years (2000 to 2015). The study investigated the determinant of capital structure for a sample of 254 non-financial firms listed on the respective stock exchange of each of the 13 African countries using pooled OLS methodology. The result revealed that tangibility was significant and positively related to leverage across the examined firms. Thus, firms in these countries follow the theoretical predictions of trade-off theory in choosing leverage ratio when tangibility is considered. Similarly, the relationship between firm size and leverage was also positive and in support of trade-off theory. In contrast, profitability was found to be significant and negatively related to leverage showing support for pecking order theory. Thus, for these 13 African firms examined, leverage ratio is chosen in accordance to the prediction of trade-off theory for some countries and for others pecking order theory.

Tulcanaza, Ana and Lee (2019) studied the determinant of capital structure of 100 Korea firms over the period 2010 to 2017. The result from pooled OLS method showed that profitability and liquidity are negatively related to leverage while tangibility and size were found to be positively related to leverage. Similarly one period lagged value of leverage ratio was found to affect leverage decision in the current period positively.

Ahmed and Amina (2019) examined firm-specific determinants of leverage for 62 Egyptian firms listed over the period 2003 to 2016. Empirical evidence from pooled OLS technique showed that profitability and firm size were significant and positively related to leverage while tangibility was found to be negatively related to leverage. The direct relationship between profitability, firm size and leverage showed that Egyptian firms showed strong support for trade-off theory of capital structure.

The study by Abdul, Raja, Sehrish and Mudeer (2019) examined the determinants of leverage ratio of 558 firms listed in Malaysia. Twelve years period was covered in the study (2005-2016). Pooled OLS was applied on static panel data model. The result revealed that total assets, earning per share and size were negatively related to leverage while current asset was positively related to leverage decision. The result is in line with pecking order theory.

Sutomo, Sugengi, Irene and Harjum (2020) examined the determinants of capital structure for coal mining industry in Indonesia. With the aid of pooled OLS method, their study found that profitability was significant and negatively related to leverage showing support to pecking order theory while asset structure was found to be positively related to leverage ratio. The result showed a strong support for pecking order theory of capital structure.

The studies above showed that profitability influences capital structure according to the prediction of pecking-order theory. That is most studies reviewed using pooled OLS methodology showed strong consistency with the prediction of pecking-order theory since most of the studies showed a negative relationship between leverage and profitability. In contrast, other factors such tangibility, size and age showed support for Trade-off theory of capital structure. Thus, this methodology showed that both theories (Pecking-order and Trade-off) complement each other.

2.3.2.2 Studies from Developing Countries Based on GMM Technique

The study by Saadah and Prijadi (2012) investigated whether manufacturing firms in Indonesia follows the prediction of trade-off and market timing theories using panel GMM approach. They found that non-debt tax shield, tangible asset and intangible asset were negatively related to leverage and their sign supported the prediction of trade-off theory. However, working capital was negatively related to leverage and this is contrary to trade-off theory predictions. They further revealed that the market to book ratio was negative and this is consistent with market timing theory of Baker and Wurgler (2002). Thus, their study concluded that manufacturing firms in Indonesia follows both trade-off and market timing theoretical predictions in choosing leverage ratio.

Mukherjee and Mahakud (2012) examined whether the two leading theories of capital structure (Trade-off or Pecking-order theories) are mutually exclusive or the two theories complement each other in determining optimal capital structures of Indian manufacturing companies over the period 1993-1994 to 2007-2008 with particular reference to variables such as size, tangibility, non-debt tax shield and profitability. Adopting difference-GMM methodology, they found that size, tangibility and non-debt tax shield are significant and

positively related to leverage ratio and consistent with Trade-off theory predictions while profitability was negatively related to leverage ratio and consistent with Pecking-order theory. Thus, the study concluded that Trade-off and Pecking-order theories complement each other in determining capital structures of firms in the manufacturing sector in India. Further investigation showed that the speed of adjustment of manufacturing firms in India was 40 percent.

Also, Tiwari and Krishnankutty (2014) conducted empirical research on how firm's specific factors influence capital structure of Indian firms using system-GMM methodology on 90 firms listed on BSE stock exchange over the period 2002-2009. They found that non-debt tax shield and size are negatively related to capital structures of Indian firms. On the other hand, a positive relationship was found to exist between growth, tangibility and capital structure. They also found that the speed of adjustment for firms listed on the BSE stock exchange India is between 0.50 and 0.55. Generally, the result showed more support for Trade-off theoretical prediction.

Chimwemwe and Chera (2016) conducted a cross-country study on firms from 12 Sub-Sahara Africa countries including Nigeria. The study focused on 412 non-financial firms listed on the stock exchange of respective countries over the period 2004 to 2013. The result from system GMM methodology showed that profitability is significant and negatively related to leverage across firms in 11 countries out of 12 African countries in the sample. This provides evidence that most firms in Sub-Sahara Africa follow the prediction of pecking order theory in leverage ratio decision. The result further revealed that rule of law in Nigeria and Zimbabwe creates opportunities for firms in these countries to increase debt maturity. In order to investigate the speed of adjustment, firms were categorized into three. First, according to banking sector

development follow by stock market development and finally strength of legal system. The result showed that on average, the speed of adjustment is very slow across the three divisions and values are respectively given as 0.116, 0.112 and 0.149. This was found to be due to market imperfection which is as a result of underdevelopment of capital market in most of the countries in Sub-Sahara Africa. The study concluded that it will take 3.6 years for firms with better banking sector development to cover financing gap while it will take 3.23 years for firms with relatively developed capital market and 3.91 years for firms with very strong legal system to correct deviation from target leverage.

Another country-wide study on the determinant of capital structure for five countries (Turkey, Brazil, South Africa, India and Indonesia) was carried out by Osman (2018). The period of study covers 2004 to 2013 and divided into pre-crisis and post- crisis period. Using panel technique of system GMM, the result showed that profitability was positively related to leverage for Indonesia firms but negatively related to leverage for other firms from the remaining four countries. Thus firms in four of the five countries support the pecking order theory of capital structure. In addition, one period lagged leverage ratio was also found to be positively related to leverage in all firms in the five countries. The result further revealed firm size to be positively related to leverage in firms from Turkey, India and Brazil while tangibility was positively related to leverage for firms in India.

For the Middle East and North African (MENA), Mohamed, Aktham and Basel (2018) investigated how institutions, firm-level factors and macroeconomic factors affect choice of leverage ratio by countries in MENA region. The study was based on 444 listed firms from ten MENA countries. The result from the system GMM revealed that one year lagged value of dependent variable has a positive and significant impact on leverage ratio for all included

firms in the study. Further, the study revealed that firm size and tangibility are also significant and positively related to leverage ratio across firms in all countries in MENA region. However, profitability was found to be significant and negatively related to leverage of firms in six out of the ten countries examined. Speed of adjustment was generally reported to be between 42 and 80 percent. Firms from Bahrain had the highest adjustment speed (80%) while firms from Oman had the lowest adjustment speed (42%). Thus, firms' rate of correcting for deviation from the target will be between two and three years. The general outlook of the result showed that firms in the MENA region provide stronger evidence for Trade-off theory relative to Pecking-order theory.

Ajaya and Swagatika (2019) investigated the determinants of capital structure of manufacturing firms in India. The result which was based on panel co-integration and GMM methodology showed that tangibility and non-debt tax shield are significant and positively related to leverage in all the seven manufacturing sector included in the study. This result showed a strong support for trade-off theory and consistent with the result from similar study by Mukherjee and Mahakud (2012). Other factors like growth rate and tax rate included in the study, revealed a varying result, depending on the sector the manufacturing firm belongs.

Shahzad, Azeem, Nazir, Vo & Linh (2020) examined determinants of capital structure from selected countries from South Asian Association for Regional Cooperation (SAARC). Specifically, 3,391 firm-year level observations were obtained from Bangladesh, India, Pakistan and Sri-Lanka. System GMM and SUR procedure were applied on samples listed over the period 2009 to 2014 on stock exchange market of each country. The result from their analysis showed profitability, tangibility and liquidity to exert negative and significant influence on capital structure of firms from the four countries while size showed a mixed

result for the countries. In summary, the result for the four countries followed the theoretical prediction of Pecking-order theory of capital structure.

Further, Abdulazeez, Rohani, Kamarun, Hasniza and Hanita (2020) investigated the determinants of capital structure of firms listed in Malaysia. Two-step difference and system GMM was applied on 827 firms listed over the period 2008 to 2017. They found that profitability, tax-shield, cash flow volatility and liquidity were negatively related to leverage ratio. Further, age, size, inflation rate and interest rate were significant determinants of capital structure. Generally, the results provide strong support to Pecking-order theory. Robustness to methodology was conducted by using different methodology. The outcome showed that results from GLS model, fixed effect model and random effect model were very similar. Generally, the study revealed that firms tend more towards the theoretical prediction of Pecking-order theory of capital structure.

Nguyen and Nguyen (2020) investigated factors influencing capital structure of firms listed on Vietnamese Stock Market. GMM methodology was applied on a sample of 290 non-financial firms listed over the period 2010 to 2018. Results from the study showed that five of the six firm-level factors examined significantly affect leverage ratio decision of Vietnam firms. Tangibility, risk and growth were shown to positively affect leverage while returns on equity exert negative influence on capital structure.

Sutanuka and Debdas (2021) examined the determinants of capital structure and speed of adjustment for 132 non-financial firms listed on the stock exchange in India over the period 1998 to 2018. Using the Panel method of system GMM, the result revealed that profitability, growth and age follow the prediction of pecking order theory while the result for liquidity,

size and tangibility follow the prediction of trade-off theory. In essence, profitability and age were found to be negatively related to leverage while growth, liquidity, size and tangibility were found to be positively related to leverage ratio. Further investigation revealed that it will take about three years for deviation in target leverage to be fully corrected since the speed of adjustment is found to be 44 per cent. So far, studies on India non-financial firms have been able to reveal that first, the speed of adjustment for firms in India ranges between 40 and 55 percent. Thus, any distortion or deviation from target leverage will be restored within three years. Second, firms from India follow the theoretical predictions of both pecking order and trade-off theories of capital structure.

Studies above showed that profitability, tangibility, size and age are important firm-specific determinants of capital structure of firms. The relationship between these factors and capital structure is relatively the same with results obtained under pooled OLS methodology. Generally, profitability was found to be negatively related to leverage in most studies and consistent with Pecking-order theory while other firm-specific variables were positively related to leverage in line with the theoretical prediction of Trade-off theory of capital structure.

2.3.2.3 Studies from Developing Countries Based on Fixed and Random Effect Technique

Mumtaz and Atta (2017) explored factors that determine capital structure for firms listed on the Pakistan Stock Exchange over the period 2005 to 2014 using panel fixed effect model. The result showed consistency with pecking order and trade-off theory predictions. That is profitability was significant and negatively related to leverage ratio while size, tangibility and non-debt tax shield were positively related to ratio.

In Asia, Jancinta, Malfuzer and Salvan (2017) investigated the determinant of capital structure for listed firms in Malaysia, Singapore and Thailand for the period 2004 to 2013. The Panel fixed effect regression analysis result showed that profitability was significant and negatively related to leverage for the three countries. This outcome showed a strong support for Pecking-order theory among firms in the three countries. In addition, the result revealed that firms in the three countries have a target leverage ratio since the past lagged value of leverage is significant and thus affect leverage in current period positively. Further, size and tangibility were significant and positively related to leverage ratio among firms in the three countries. Generally, the result from the three countries provides evidence for pecking order and trade-off theories.

Merve and Gizem (2018) conducted a study on the determinants of capital structure for non-financial firms in Turkey. The sampled firms were listed over the period 2009 to 2016. The result from fixed effect methodology showed that five of the seven firm-level factors included in the study were significant. Specifically, size and tangibility were positively related to leverage, thus, showing a strong support for trade-off theory. Profitability on the other hand was found to be negatively related to leverage, thus, providing evidence for Pecking-order theory.

Khaki and Akin (2020) explored factors affecting leverage ratio of firms from countries in Gulf Cooperation Council (GCC). In particular, 329 non-financial firms listed over the period 2009 to 2017 were examined from stock exchange market in Bahrain, Kuwait, Qatar, Oman, Saudi Arabia and United Arab Emirate. Panel random effect technique was applied on samples from Qatar while fixed effect method was applied on samples from other countries. Generally, the result showed that size, tangibility and growth influence leverage positively

while factors such as profitability, age, financial constraint, liquidity and government ownership exert negative influence on leverage decision of firms from GCC. Again, the results showed strong support for both Pecking-order and Trade-off theories of capital structure.

For Ghana, James, Shaorong and Eugene (2020) examined the consistency of factors that determines capital structure of Ghanaian SMEs with Pecking-order or Trade-off theories of capital structure. Their study sample consists of 187 SMEs over the period 2008 to 2013. With the aid of panel fixed effect model, their result showed that profitability, age and liquidity have positive influence on leverage while size, growth and tangibility affect leverage negatively. To a large extent, SMEs in Ghana are more consistent with pecking order theory of capital structure.

Tazvivinga, Mouton and Pelcher (2021) examined the determinants of retailing firms listed on the Johannesburg Securities Exchange (JSE) in South Africa. The study applied panel fixed effect methodology on 17 retailing firms listed over the period 2009 to 2018. The empirical result revealed profitability, age, growth, tangibility and size to be significant and positively related to leverage usage among retailing firms in South Africa. This result showed strong support to trade-off theory of capital structure.

Vukasin and Dorde (2021) examined factors determining capital structure of 141 largest non-financial firms in Serbia over the period 2009 to 2017. The result from panel fixed effect methodology showed that when short-term leverage is considered, firms followed the predictions of pecking order theory while for long-term leverage, firms aligned with trade-off theory of capital structure. The results further showed that profitability, tangibility, liquidity

and cash gap exert negative and significant influence on capital structure while size exerts positive and significant influence on capital structure of large firms in Serbia. Growth, volatility and tax-shield were not significant.

In cross-country study, Ibrahim and Ariba (2021) examined the factors that affect leverage of firms in the oil and gas industry from firms in GCC. Twenty-two firms from six countries (Saudi Arabia, United Arab Emirate, Kuwait, Omar, Qatar and Bahrain) were examined over the period 2010 to 2019. The Panel method of random effect was applied on the sample from these countries. The result showed that size and tangibility were significant and positively related to leverage while profitability was negatively related to leverage ratio. Thus, firms in the six countries' oil and gas sector support both Trade-off and Pecking-order theories of capital structure.

In Bab, Muhammad and Ghazal (2022) cross-country study on determinants of capital structure of firms from South Asia countries, a total of 480 firms over the period 2009 to 2017 were extracted from stock exchanges from Pakistan, India and Sri-Lanka. The result from the fixed effect panel regression showed that five of the eight firm-level factors included in the model were statistically significant. On average, factors such as tangibility, non-debt tax shield, profitability and volatility were the major factors that affect leverage among firms in the three countries. These studies have been able to establish the fact that firms financial behaviour is affected by several factors according to predictions of different theory of capital structure. So far, it is clear that there is no stand-alone theory of capital structure. But rather, these theories complement each other.

Nabil (2022) investigated the determinant of capital structure of 207 Algerian firms over the period 2013 to 2017. The result from Panel fixed effect model revealed that profitability, tangibility, debt tax shield and non-debt tax shield have a statistically significant impact on leverage ratio of non-financial firms in Algeria. Non-debt tax shield was found to be negatively related to leverage while other firm-level factors were found to be positively related to leverage. Thus, the result showed a strong support to trade-off theory of capital structure. Again, the result showed that there is no single theory to explain firms' financial behavior.

So far and irrespective of technique of analysis, studies from developing countries revealed that majority of firms align with Pecking-order and Trade-off theories of capital structure while very few align with market timing and agency theory. In all, most important firm-specific variables that influence capital structure of firms includes, profitability, size, tangibility, age, liquidity and non-debt tax shield.

2.3.2.4 Studies from Developing Countries Based on PCSE and GLS Techniques

Farhan, Khaled and Avijit (2016) examined the determinant of capital structure for pharmaceutical firms in Bangladesh. Six firm-level variables were investigated in the study. The result showed that three variables were significant while three were not significant. The result from Correlated Panels Corrected Standard Error (PCSE) model further revealed that profitability was negatively related to leverage while tangibility was positively related to leverage. In line with most studies, the result showed consistency Pecking-order theory.

Intan and Prasetyo (2016) investigated factors that determine capital structure of firms in the telecommunication industry of Indonesia. Firms listed over the period 2008 to 2015 were

examined. The analysis which was based on GLS technique showed that tangibility, risk and interest rate were positively related to leverage while size and GDP were negatively related to leverage. Their study purely showed that both macroeconomic and microeconomic factors are important factors for leverage decision in Indonesia.

Shalini and Mahua (2019) examined factors that determine the capital structure of S&P BSE 500 firms excluding financial firms. Their sample consists of 416 companies listed over the period 2000 to 2014 and from 14 industrial sectors. The results from the random effect GLS model showed that four of the eight included variables are important determinant of leverage for the 416 firms examined. In particular, profitability, non-debt tax shield, effective tax paid and firm size are major factors that influence capital structure of S&P BSE 500.

Imam, Eka and Hersungodo (2020) investigated factors that determine leverage ratio of listed manufacturing firms in Indonesia. Ninety-four firms listed firms over the period 2011 to 2018 were examined using LISREL software. The result showed that profitability, non-debt tax shield and agency cost had a negative and significant influence on leverage ratio while asset growth, size, firm growth and risk exert positive influence on leverage. Generally, the result revealed a strong support for Pecking order theory of capital structure.

For Indonesia, Utami, Gumanti, Subroto and Khasanah (2021) investigated factors that affect capital structure of firms listed in the manufacturing sector. GLS method was applied on 154 public companies over the period 2010 to 2018. The results showed that past value of debt, profitability, tangible assets, size, and age are important determinants of leverage ratios for firms over the period of study. The general outlook showed that firms in this sector respond more to pecking order theory than the trade-off theory. In general, reviews on firms from

different sectors of Indonesia showed that three important theories that influence capital structure in Indonesia manufacturing sector are trade-off, pecking-order and market timing theories. These outcomes strongly support the notion that “no one theory explains it all”.

Bhattacharjee and Dash (2021) focused on determinants of capital structure of firms in the cement industry in India. They applied pooled OLS and GLS fixed and random effect on sample of 25 firms over the period 2003 to 2011. The result showed that two factors- profitability and collateralisable value of asset are major in determining leverage ratio of firms in the cement sector. Profitability was negatively related to leverage while collateralisable value of assets was positively related to leverage. Other factors like growth, non-debt tax shield and size were not significant.

Recently, Muhammad, Muhammed and Mosharrof (2022) investigated factors that influence capital structure of firms in Bangladesh. Fixed effect and Panel Corrected Standard Error (PCSE) methodologies were applied on 63 listed firms over the period 2005 to 2019. Generally, the showed that size, liquidity, non-debt tax shield, asset structure and age are major factors that determine capital structure of firms in Bangladesh. These five firm-level factors exert a negative influence on leverage ratio of examined firms. These two pair of result showed that firms from Bangladesh follow the prediction of pecking order theory of capital structure.

In summary, studies on developing economies have showed that the two major leading theories that explain choice of leverage among non-financial firms in developing economy are pecking-order and trade-off theories. This is because most studies examined in this section showed strong support to these theories. Further, the current sub-section showed that most

recent studies are beginning to deviate from the traditional panel data analysis techniques to other techniques like GLS and PCSE panel analysis method. Perhaps, the nature of most recent data requires the use of one or more of these methods. For instance, when most of the assumptions of OLS break down, the next alternative is GLS technique. This is one the reason for the use GLS technique in this study.

2.3.3 Studies from Nigeria

One of the earliest studies that examined the determinants of capital structures of non-financial firms in Nigeria is the study by Akinlo (2011). The study applied pooled OLS methodology on a sample of 66 firms over the period 1999 to 2007. The result showed that out of six firm-specific variables, only tangibility and profitability had significant effect on capital structure. Tangibility and profitability were negatively related to leverage, confirming pecking order theory predictions.

Another study on determinants of capital structure of non-financial firms in Nigeria is the study by Ogbulu and Emeni (2012). Using a cross-sectional survey research design on a sample of 124 firms listed on the Nigerian Stock Exchange in 2008. They found that size is positively related to leverage. Other factors such as tangibility, growth and profitability were found to be insignificant.

Further study in Nigeria has shown that firm-level factors affect capital structure of listed non-financial firms. In Rubi and Oyebola (2017) profitability, tangibility, firm size and non-debt tax shield were shown to affect capital structure of non-financial firms significantly. With the aid of econometric method of system GMM, profitability was observed to be negatively related to leverage while tangibility and firm size were observed to be positively related to

leverage. Thus, the results showed support for both pecking order and trade-off theories of capital structure.

Yinusa, et al., (2018) examined capital structure determinant for 115 listed firms in Nigeria. The study applied system GMM technique for these 115 firms over the period 1998 to 2016. The result showed that firm-level factors like profitability, firm risk and dividend were positively related to leverage while tangibility, size, age and growth were found to be negatively related to leverage ratio. Their result showed more support to trade-off theory of capital structure.

The study by Sanyaolu, Job-Olatunji and Ogunmefun (2018) focused on firms from three sectors of Nigerian economy. They examined firms from oil and gas, food and beverages and building materials sectors. A total of ten listed firms over the period 2007 to 2016 were analysed using panel random effect technique. The results from the analysis showed that tangibility exert positive and significant influence on leverage ratio of firms from these sectors while other factors like liquidity and growth were not significant. The percentage of tangible asset in these sectors could be a major reason for the finding tangibility to be a major determinant of capital structure of firms from these sectors.

In Biliqees (2020) five large manufacturing firms listed on Nigerian Stock Exchange over the period 2008 to 2018 were examined. The result from the panel fixed effect methodology showed that all the five explanatory variables included in the model were statistically significant and thus influences capital structure of these firms. The result further revealed tangibility, profitability and non-debt tax shield influence leverage ratio positively while

growth and size influence leverage negatively. Finally, the result showed a strong empirical support to trade-off theory of capital structure.

The above empirical review on firm-specific factors and capital structure of firms revealed that most firms follow the predictions of pecking order and trade-off theories of capital structure in choosing the leverage ratio. Notable among the firm specific variables were profitability, age, firm size, tangibility, and non-debt tax shield. For profitability, majority of the studies reviewed, revealed a negative relationship between profitability and debt usage, suggesting that as profit increases, leverage ratio reduces. This outcome is consistent with the prediction of pecking order theory of capital structure. Again, most of the studies reported a positive relationship between leverage and factors such as age, firm size, tangibility, and non-debt tax shield. This shows that as any of these variables goes up, debt usage will also rise. This provides strong evidence for trade-off theory. In essence, the results show that no one theory can explain it all.

2.4 Macroeconomic Variables and Capital Structure of Firms

Yeh and Roca (2012) investigated the impact of macroeconomic conditions on capital structure of firms in petrochemical, textile and electronics industries in Taiwan over the period 1983 to 2007. They used two-step dynamic panel data, GMM estimation technique on a sample of 19 listed firms. Their main objective is to examine the impact of macroeconomic conditions on capital structure across period before and after the Asian financial crisis of 1997-98. They found that, macroeconomic condition and economic growth are significant and

positively related to leverage in the three industries over the period 1983-96 (before crises). However the relationship was not significant after the crises. Their findings suggest that macroeconomic variable is an important determinant of capital structure of firms.

In the study by Salehi and Manesh (2012) firm specific factors were used to control the impact of macroeconomic factors on capital structure of 59 Iranian firms over the period of 2004 to 2011. The firms specific variables in their model were profitability, growth and firm size, while the macroeconomic variable were GDP growth, market size and inflation rate. Their result from pooled OLS showed that macroeconomic factors have the most effect on capital structure. They finally noted that after adding the macroeconomic factors like GDP growth, capital market size and inflation rate into the specified panel model, the elaborating power in terms of f-statistics improved considerably.

Sett and Sarkhel (2010) investigated the impact of macroeconomic variables and financial development on capital structure of Indian firms over the period 1981 to 2007. The result from pooled OLS showed that most of the macroeconomic variables included in the model affect leverage. For instance, stock market development, banking sector development, inflation rate and effective tax rate were found to have a significant impact on leverage of firms in Indian. They particularly found that stock market development was negatively related to leverage while banking sector development, inflation rate and effective tax rate were positively related to leverage in Indian.

A related study to the above on Indian firm is the study by Monomita (2008). Macroeconomic factors that were considered were inflation rate, stock market performance, interest rate and GDP growth rate. The result from the cross-section study showed that inflation rate correlate

negatively with leverage while rate of interest on long term deposit was positively related to leverage.

The study by Sutanuka and Debdas (2021) focused on 132 non-financial firms listed on India Stock Exchange over the period 1998 to 2018. The result from the system GMM revealed that GDP growth rate and inflation rate are significant macroeconomic factors that affect leverage of the 132 firms examined. GDP growth rate was found to be negatively related to leverage while inflation rate was found to be positively related to leverage of examined firms. Thus, studies from Indian have been able to establish the fact that macroeconomic variables like GDP growth rate, interest rate, Inflation rate, stock market development and banking sector development affect firm leverage.

Muyiwa, Olorunfemi and Bamidele (2017) examined the effect of macroeconomic variables on capital structure of 115 listed firms in Nigeria. The study covers the period 1998 to 2012. Based on panel GMM, the result showed that factors like interest rate, inflation rate and institutional quality were significant and negatively related to leverage. The implication is that these three variables tend to lower leverage ratio as they rises.

In the study by Rubi and Oyebola (2017) on non-financial firms showed that some macroeconomic factors that were included in their study on determinant of optimal capital structure for listed firms on Nigeria Stock Exchange were found to be statistically significant. Specifically, Inflation rate and GDP growth rate were positively related to leverage. The results correspond to theoretical expectation of trade-off theory for inflation rate and pecking order theory for GDP growth rate.

In the study by Dang, Garerett and Nguyen (2010) some macroeconomic variables like equity premium, term structure of interest rate, GDP growth, rule of law, creditors right, ownership concentration and anti-director rights were included in their analysis of capital structure. They sampled 9034 firms from France, Germany Japan, UK and USA over the period 1980 to 2007. Using GMM estimation technique, they found that high equity premium affects leverage positively while interest rate affects leverage negatively. Generally, all macroeconomic variables in their model have the expected sign. However, only interest rates and creditors' rights were significant.

Demis and Man (2018) investigated the determinant of capital structure for 13 African countries including Nigeria. The result of the study which covered listed firms from 2000 to 2015 revealed that macroeconomic factors like GDP growth rate, interest rate, banking sector development and corporate tax rate are important determinant of capital structure for African firms. Further, the result showed that GDP growth rate was found to be positively related to leverage among the class of countries that were termed "lower" in terms of banking sector development and stock market development. Interest rate was also found to be positively related to leverage among some other classes like "Upper" and "Middle" in terms of banking sector development and stock market development. Thus, GDP growth rate and interest rate are key macro-factors for listed firms in Africa.

Osman (2018) examined the capital structure of listed firms in Turkey, Brazil, South Africa, India and Indonesia. The study showed that macroeconomic factors affect leverage decision differently in each of the five country included in the study. For instance, exchange rate was found to be significant and negatively related to leverage for Indian firms. GDP growth rate was found to be significant and positively related to leverage for firms in India and Turkey.

Studies reviewed above showed that macroeconomic factors do significantly impact on capital structure decisions of firms. Such macroeconomic variables are GDP growth rate, market size, inflation rate, commercial paper spread, GDP, unemployment rate, CPI, interest rate, equity premium, stock market development, banking sector development, effective tax rate, exchange rate and stock market performance. This current study focused on macroeconomic variables such as GDP growth rate, inflation rate, interest rate and exchange rate.

2.5 Empirical Evidence on Comparison of Domestic and Multinational Firms' Capital Structure

Very few scholars have attempted studies comparing the determinants of capital structure of domestic firms with multinational Corporations. One of the earliest works in this area is the study by Lee and Kwok (1988) both examined whether or not U.S. based multinational corporations have different capital structures than U.S. domestic corporations. The primary focus of the work is to investigate whether or not U.S multinational (MNCs) and domestic (DCs) firms have same level of agency cost, bankruptcy cost and debt ratios. Using a two-way ANOVA, the result revealed that U.S. MNCs have higher agency cost than DCs. This was attributed to political risk and market imperfection. Further, the result on bankruptcy cost showed that U.S. MNCs tend to have higher bankruptcy cost than DCs. This finding is contrary to popular opinion in the literature. Part of the reasons given includes foreign exchange risk, slowdown of foreign economies in the 1970s as a result of high inflation and higher energy costs. Finally, their result showed that the capital structure of MNCs is lower and significantly different from that of DCs.

The study by Todd (1996) investigated if there are systematic differences in the traditional determinants of capital structure between MNCs and DCs with stocks traded on the New York Stock Exchange. Leverage was modeled as a function of both traditional capital structure determinant and specific international factors. The result from Mann-Whitney U-test and t-test showed that international factors such as political risk and exchange rate risk are very important determinant of capital structure of multinational firms. The result further revealed that multinational firms have higher agency cost than the domestic firms and this is consistent with the study by Lee and kwok (1988).

Shumi (2005) considered if there are differences in the determinants of capital structure of MNCs and DCs of sampled Australian firms between 1992 and 2001. His approach was quite different from those by Lee and Kwok (1998) and Todd (1996). To separate multinational and domestic firms, a dummy variable was introduced into the model, thereafter, cross-sectional Tobit regression was applied. The result showed that there is no significant difference in leverage ratios between Australian multinational and domestic firms. Further, the result showed that firm specific-factors like growth, profitability and size are significant determinant for both MNCs and DCs. Bankruptcy cost was found not significant for domestic firms but however, was significant for multinational firms.

Shumi and Barry (2009), investigated whether there are systematic differences in standard capital structure determinants of MNCs and DCs for samples from Japan. 209 MNCs and 147 DCs were examined over the period 1994 to 2003. Pooled cross-sectional time series analysis was applied on the data. The method also involves introducing a dummy variable to separate the two types of firms in the model. The result showed that Japanese MNCs differ significantly from DCs on most variables included in the model. Further, Japanese MNCs

have significant lower leverage ratio than DCs. This finding is consistent with studies from USA. Business risk was found to be significant for domestic firms but not significant for multinational firms. In addition, foreign exchange risk was found not to be significant for domestic firm but rather for multinational firms. In summary, the interaction terms on factors such as age, non-debt tax shield, growth, profitability, size and political risk differs in explaining capital structure of MNCs and DCs in Japan.

Some cross-country studies on differences between MNCs and DCs capital structure includes study by Mitto and Zhang (2008). The duo compared the capital structure of multinational corporations in Canada and USA. They applied pooled OLS methodology and Wilcoxon Rank Sum test on 1821 firm-year level observation over the period 1998 to 2002, the result showed that Canadian MNCs have higher leverage than their DCs which according to the study, is as a result lower agency cost associated with MNCs' operating in the USA. Comparing the two countries, the result generally showed that the sensitivity of leverage differs across the two countries because of home and host country factors on one hand and differences in country specific factors on the other hand.

Mari, et al., (2011) investigated whether there are systemic differences in capital structure between local firms and multinational corporation subsidiaries operating in the Baltic States (Estonia, Latvia and Lithuanian) over the period 2000 to 2008. Basing their analysis on a 87,000 firm-year level observations, the result from fixed effect model showed that local firms are more levered than the MNCs subsidiaries. These differences were driven by better access of the MNCs to external finance and local firm's access to credit during the year of economic boom.

A wider cross-country analysis was carried out by Shumi (2015) with focus on MNCs and DCs in Australia, USA, Japan, UK and Malaysia. The study based their analysis on 6038 DCs and 5918 MNCs across the five countries. The result from pooled OLS showed that foreign exchange risk, size and collateral value of assets are the only factors that are significant across the DCs in the sampled countries. The result also showed that MNCs in the USA held lower leverage than the DCs. This is contrary to DCs in Malaysia because the DCs hold lesser leverage than the MNCs. In summary, the long-term debt ratio in Australia, Japan, UK, and Malaysia MNCs is lower than the long-term debt ratio in the USA.

The review above has showed that, the standard firm-specific determinants of capital structure, the country-specific determinants in host and parent country affects capital structure of MNCs and DCs differently within and across different countries. It should also be noted that all these articles, except the works by Lee and Kwok (1998) and Todd (1996), introduced a dummy variable in their study to separate multinational firms from domestic firms. Thus, the current study follows this methodology in building the model one for this study.

2.6 Summary of Articles Reviewed

Table 2.1 below shows tabulation by author/year, country, technique of analysis and findings. The summary table shows that about 13 per cent of the literature focused on determinants of capital structure of multinational and domestic firms. It is worthy to note that all reviewed literature on MNCs and DCs are majorly from more developed economy. On methodology, about 9 per cent of articles reviewed adopted the GLS technique of estimation. This is generally the best path to follow in the presence of autocorrelation and cross sectional dependence in the panel data structure. This is one of the reasons for the adoption of GLS in this current study.

Table 2.1 Summary of Literature Reviewed

SN	Author/Year	Country	Method Used	Findings
1	Abdul, Raja, Sehrish and Mudeer (2019)	Malaysia	Pooled OLS	Total assets, earning per share and size were negatively related to leverage while current asset was positively related to leverage
2	Abdulazeez, Rohani, Kamarun, Hasniza and Hanita (2020)	Malaysia	Two-step difference GMM, system GMM and GLS	Profitability, tax-shield, cash flow volatility and liquidity were negatively related to leverage ratio. Age, size, inflation rate and interest rate were also significant determinants of capital structure
3	Ahmed and Amina (2019)	Egypt	Pooled OLS	Profitability and firm size were significant and positively related to leverage while tangibility was found to be negatively related to leverage
4	Ahmed Mohammed (2015)	Kuwait	Pooled OLS	Profitability was negatively related to leverage while past value of leverage, size, tangibility and age of firms were positively related to leverage.
5	Ajaya and Swagatika (2019)	India	System GMM	Tangibility and non-debt tax shield were significant and positively related to leverage. Growth rate and tax rate were also significant.
6	Akinleye (2012)	Nigeria	Vector Error Correction Model	Speed of adjustment was found to be 16.17 percent
7	Akinlo (2011).	Nigeria	Pooled OLS	Tangibility and profitability were negatively related to leverage
8	Bhattacharjee and Dash (2021)	India	Pooled OLS and GLS	Profitability was negatively related to leverage while collateralisable value of assets was positively related to leverage. Other factors like growth, non-debt tax shield and size were not significant.
9	Chimwemwe and Chera (2016)	12 Sub-Sahara Africa countries including Nigeria	System GMM	Profitability was significant and negatively related to leverage across firms in 11 countries out of 12 African countries in the sample. Result further revealed that rule of law in Nigeria and Zimbabwe creates opportunities for firms in these countries to increase debt maturity.
10	Dang, Garerett and Nguyen (2010)	France, Germany, Japan, UK and USA	System GMM	Profitability, tangibility, size and non-debt tax shield were found to significantly determine leverage across all countries. Interest rates and creditors' rights were also significant. Speed of adjustment ranges from 39% (Japanese firms) to 51% (French firms)
11	Demis and Man (2018)	13 Africa countries (South Africa, Mauritanius, Egypt, Nigeria, Kenya, Morocco, Tunisia, Tanzania, Namibia, Swaziland, Ivory Coast, Ghana, and Botswana)	Pooled OLS	Tangibility, firm size were positive and significant. Profitability was negative and significant . Dividend payout, earning volatility, share price, GDP growth rate and interest rate were other key factors for listed firms in Africa.
12	Doaa (2020)	Nine MENA	Pooled OLS and Fixed Effect	Profitability and liquidity were significant and negatively related to leverage in nine countries. Firm size and tangibility were also found to be positively related to leverage for firms in the region.

13	Ellii and Farouk (2011)	United Arab Emirates	Pooled OLS	profitability was found to be positively related to capital structure while size, expected growth and operating risk were all found to be negatively related to capital structures of selected firms
14	Farhan, Khaled and Avijit (2016)	Bangladesh	Correlated Panels Corrected Standard Error (PCSE) Model	Profitability was negatively related to leverage while tangibility was positively related to leverage
15	Faris (2010)	Jordan	Pooled OLS	firm size, tangibility, growth, non-debt tax shield were positive and significant. Return on asset was found to be negative while age was not significant
16	Getzmann and Lang (2010)	Asia, Europe and U.S.A	System GMM	Profitability was found to affect leverage in the three regions. Tangibility and size were found to further influence the capital structure of firms in Asia. speed of adjustment for Asian, Europe and USA are 31%, 56% and 46% respectively.
17	Huang and Song (2002)	China	Pooled OLS	Firm size, non-debt tax shield and fixed asset were positive and significant. Profitability was negative and significant
18	Ibrahim and Ariba (2021)	Gulf Council Countries (GCC), Saudi Arabia, United Arab Emirate, Kuwait, Omar, Qatar and Bahrain	Random Effect	Size and tangibility were significant and positively related to leverage while profitability was negatively related to leverage.
19	Intan and Prasetyo (2016)	Indonesia	GLS	Tangibility, risk and interest rate were positively related to leverage while size and GDP were negatively related to leverage
20	Jacek, Leszek and Magdalena (2019)	Poland	Fixed Effect	Tangibility, profitability and non-debt tax shield were negatively related to leverage
21	Jancinta, Malfuzer and Salvan (2017)	Malaysia, Singapore and Thailand	Fixed Effect	Profitability was significant and negatively related to leverage for the three countries. Lagged value of leverage is significant and thus affect leverage in current period positively. Size and tangibility were significant and positively related to leverage ratio among firms in the three countries
22	Jorge and Antonio (2017)	Angola	Fixed Effect, Random Effect and PCSE	Profitability, age and tangibility were significant and positively related to leverage.
23	Kouki and Said (2012)	France	Fixed Effect	Firm size and tangibility were negatively related to leverage. Growth, profitability and non-debt tax shield were also found to be positive and significant in explaining leverage of French firms.
24	Lee and Kwok (1988)	USA	Two-way ANOVA on multinational (MNCs) and domestic (DCs) firms	Result showed that the capital structure of MNCs is lower and significantly different from that of DCs. Further, the result showed that U.S. MNCs have higher bankruptcy cost and agency cost than DCs
25	Mari, Aaro and Kadri (2011)	Baltic States (Estonia, Latvia and Lithuanian)	Fixed Effect with Dummy Model on MNCs and DCs	Local firms are more levered than the MNCs subsidiaries

26	Merve and Gizem (2018)	Turkey	Fixed Effect	Size and tangibility were positively related to leverage. Profitability on the other hand was found to be negatively related to leverage
27	Mitto and Zhang (2008)	Canada and USA	Pooled OLS with Dummy Model and Wilcoxon test on MNCs and DCs	Canadian MNCs have higher leverage than their DCs. Results also showed that the sensitivity of leverage differs across the two countries because of home and host country factors on one hand and differences in country specific factors on the other hand
28	Mohamed, Akthan and Basel (2018)	Middle East and North African (MENA)	System GMM	Lagged dependent variable, size and tangibility were positive and significant. profitability was negative and significant in six out of the ten countries examined. Firms from Bahrain had the highest adjustment speed (80%) while firms from Oman had the lowest adjustment speed (42%).
29	Monomita (2008)	India	Cross Sectional Analysis	Inflation rate correlate negatively with leverage while rate of interest was positively related to leverage.
30	Mukherjee and Mahakud (2012)	India	Difference GMM	Size, tangibility and non-debt tax shield are significant and positively related to leverage ratio. Speed of adjustment is 40 percent.
31	Mumtaz and Atta (2017)	Pakistan	Fixed Effect	Profitability was significant and negatively related to leverage while size, tangibility and non-debt tax shield were positively related to leverage.
32	Muyiwa, Olorunfemi and Bamidele (2017)	Nigeria	System-GMM	Interest rate, inflation rate and institutional quality were significant and negatively related to leverage
33	Mwangi, Anyango and Ameyna (2012)	Kenya	Pooled OLS	Speed of adjustment was found to be 5.3%
34	Nabil (2022)	Algeria	Fixed Effect	Profitability, tangibility, debt tax shield and non-debt tax shield were significant determinants of leverage
35	Nunkoo and Boateng (2010)	Canada	System GMM	Profitability and tangibility have positive impact on leverage while growth and size have a negative effect on leverage.
36	Ogbulu and Emeni (2012)	Nigeria	Cross-Sectional Analysis	Size is positively related to leverage while tangibility, growth and profitability were found to be insignificant
37	Osman (2018)	Turkey, Brazil, South Africa, India and Indonesia	System GMM	Profitability was positively related to leverage for Indonesia firms but negatively related to leverage for other firms from the remaining four countries. One period lagged leverage was also found to be positively related to leverage in all firms in the five countries. size was positively related to leverage in firms from Turkey, India and Brazil while tangibility was positively related to leverage for firms in India. Further, exchange rate was found to be significant and negatively related to leverage while GDP growth rate was found to be significant and positively related to leverage.
38	Rubi and Oyebola (2017)	Nigeria	system GMM	profitability was negatively related to leverage while tangibility and firm size were positively related to leverage. Also Inflation rate and GDP growth rate were positively related to leverage.
39	Rubio and Sogorb (2011)	Spain	Demeaned FM two-stage and	Speed of adjustment were 24.9 percent and 30.8 percent for system and difference GMM respectively.

			Sytem GMM	
40	Saadah and Prijadi (2012)	Indonesia	System GMM	Non-debt tax shield, tangible asset and intangible asset were negatively related to leverage
41	Salehi and Manesh (2012)	Iran	Pooled OLS	Profitability and growth were negatively related to leverage while firm size was positive. Results also showed that macroeconomic factors like GDP growth, capital market size and inflation rate improved elaborating power of the model.
42	Sangeetha and Sivathaasan (2013)	Sri Lanka	Pooled OLS	Size was positively related to leverage while profitability and growth were negatively related to leverage
43	Sett and Sarkhel (2010)	India	Pooled OLS	Stock market development was negatively related to leverage while banking sector development, inflation rate and effective tax rate were positively related to leverage in Indian.
44	Shalini and Mahua (2019)	India	GLS	Profitability, non-debt tax shield, effective tax paid and firm size are major factors that influence capital structure
45	Shumi (2005)	Australia	Cross-Sectional Tobit Regression with Dummy model on MNCs and DCs	No significant difference in leverage ratios between Australian multinational and domestic firms. Also firm specific-factors like growth, profitability and size are significant determinants for both MNCs and DCs. Bankruptcy cost was not significant for domestic firms but significant for multinational firms.
46	Shumi (2015)	Australia, USA, Japan, UK and Malaysia	Pooled OLS with Dummy Model on MNCs and DCs	Exchange rate, size and collateral value of assets are the only factors that are significant across the DCs. MNCs in the USA held lower leverage than the DCs. DCs in Malaysia held lesser leverage than the MNCs. Long-term debt ratio in Australia, Japan, UK, and Malaysia MNCs is lower than the long-term debt ratio in the USA
47	Shumi and Barry (2009)	Japan	Pooled OLS with Dummy Model on MNCs and DCs	Japanese MNCs have significant lower leverage ratio than DCs. Business risk and foreign exchange risk were significant for domestic firms only. Factors such as age, non-debt tax shield, growth, profitability, size and political risk differs in explaining capital structure of MNCs and DCs in Japan.
48	Sutanuka and Debdas (2021)	India	System GMM	Profitability and age were negatively related to leverage while growth, liquidity, size and tangibility were positively related to leverage. Also, GDP growth rate was negatively related to leverage while inflation rate was positively related to leverage. Speed of adjustment for firms in India ranges between 40 to 55 percent
49	Sutomo, Sugengi, Irene and Harjum (2020)	Indonesia	Pooled OLS	Profitability was significant and negatively related to leverage while asset structure was found to be positively related to leverage ratio
50	Tiwani and Krishnankutty (2014)	India	System GMM	Non-debt tax shield and size were negatively related to leverage. Growth and tangibility were positively related leverage. Speed of adjustment for firms listed on the BSE stock exchange India is between 0.50 and 0.55

51	Todd (1996)	USA	Mann-Whitney U-test and t-test on MNCs and DCs	Political risk and exchange rate risk are significant determinants of capital structure of multinational firms. Also multinational firms have higher agency cost than the domestic firms.
52	Tulcanaza, Ana and Lee (2019)	Korea	Pooled OLS	Profitability and liquidity are negatively related to leverage while tangibility and size were positively related to leverage. One period lagged value of leverage influence leverage in the current period positively.
53	Utami, Gumanti, Subroto and Khasanah (2021)	Indonesia	GLS	Past value of debt, profitability, tangible assets, size, and age are important determinants of leverage
54	Yeh and Roca (2012)	Taiwan	System GMM	Macroeconomic condition and economic growth are significant and positively related to leverage in the three industries before crises but not significant after the crises.
55	Yinusa, Ismail, Yulia and Olawale (2018)	Nigeria	System GMM	Profitability, firm risk and dividend were positively related to leverage while tangibility, size, age and growth were negatively related to leverage.

Source: Author's computation (2023)

2.7 Gaps in the Literature

A review of the literature on capital structure of firms listed on the Nigerian Stock Exchange (NSE) showed that most literature in Nigeria are yet to investigate the impact of parent-country macroeconomics variables like GDP growth rate, inflation rate and interest rate on capital structure of listed multinational firms in Nigeria. Similarly, this study analyzed how firm-specific variables and macroeconomics variables determine the capital structure of multinational and domestic firms in Nigeria. Most developed country have established how some of these macroeconomic and firm-specific variables affects the capital structure of multinational firms differently from that of domestic firms. Thus, the gap this study intends to fill in the literature is to investigate, analyze and compare how these macroeconomic and firm-specific factors affect capital structure of listed multinational and domestic firms in Nigeria. The empirical review on capital structure determinants in Nigeria showed that, some studies (Obboh, Isa, & Adekoya, 2012; Iorpev & kwanum, 2012; Onaolapo & Kajola, 2010; Oke & Afolabi, 2011; Salawu, 2007) focused on the impact of capital structure on firms'

performance. Others that studied the determinants of capital structure never separated the multinational firms from domestic firms (Segun & Abiodun, 2020; Peseda 2016; Akinlo 2011; Salawu & Akinlolu, 2008). Therefore, this study set out to investigate the determinants of capital structure of multinational and domestic firms and to embark on a robust comparison of how these factors or determinants affect each of multinational and domestic firms in Nigeria. This is because foreign owned firms usually outperform the domestic ones not only in Nigeria but also in most countries of the world (Willmore, 1986; Christain, 2004; Shumi & Barry 2009). Considering the importance of capital structure particularly when it affect business survival, this study therefore, investigated the determinants of leverage for listed multinational and domestic firms in Nigeria. The essence is to come up with appropriate recommendations to relevant policy makers, about both macroeconomic factors and firm-specific factors to consider when choosing available financing options for each of multinational and domestic firm.

CHAPTER THREE

METHODOLOGY

3.1 Theoretical Framework

Since the seminal work of Modigliani and Miller (1958) the choice of financing depends largely on two major theories of capital structure. First is the trade-off theory that recommends optimal level at the point where the marginal benefit of debt is equal to marginal cost of debt. Thus, firms can achieve optimal capital structure by balancing tax shield and bankruptcy cost or financial distress cost. Deductibility of interest paid on debt before tax and bankruptcy cost and agency cost were identified by Fama and French (2002), Bradley, et. al., (1984) and Jensen & Meckling (1976) as major variables that determine optimal capital structure of firms. The second is the pecking-order theory by Myers and Majluf (1984). According to the theory, financial managers will prefer financing with internally generated revenue to debt financing, and will prefer debt financing to equity financing. This is due to information asymmetry. Consistent with these two theories, Lee and Kwok (1988) suggested concepts such as agency cost, bankruptcy costs, non-debt tax shields, liquidation costs, collateral value, market power, size and asymmetric information as variables that explains the existence of optimal capital structure. To go further, a partial adjustment model is proposed in this study in order to capture the dynamics of adjustment of leverage when there is deviation. That is to determine the speed of adjustment. This model development is described as follows.

3.2 Partial Adjustment Model

The present study considers a partial adjustment model in order to study the dynamics of capital structure based on the formulations of trade-off theory of capital structure. Following

some previous empirical research works which have Partial Adjustment Model for dynamic capital structure framework (Heshmati, 2001; Miguel & Pindado, 2001; Drobetz, et al., 2007), a dynamic capital structure model is considered in this form.

$$L_{it}^* = f(X_{jit}) \tag{1}$$

Let the optimal debt to equity ratio (optimal leverage) for firm *i* at time *t* be denoted by L_{it}^* , and is a linear function of a set of *N* explanatory variables, X_{jit} such as profitability, age, size, tangibility and so on (Where, $j=1, 2, \dots, N$) that have been used in the past cross-sectional studies of capital structure. These represent firm specific (microeconomic) variables that are firm and time variant. To capture other determinants of capital structure (leverage) in this study, equation one is adjusted to accommodate other set of macroeconomic variables in both host and home countries of MNCs affiliate. This will produce equation 2 as shown below;

$$L_{it}^* = f(X_{jit}, Y_{kt}) \tag{2}$$

(Where $K=1, 2, \dots, M$). Y_{kt} represents vector of time variant determinants that are constant across firms, examples are GDP growth rate, inflation rate and interest rate. The purpose of equations 1 and 2 is to provide an estimate of each firm's optimal leverage which a firm would choose in the absence of information asymmetries, transaction costs and other adjustment costs (Drobetz, *et al*, 2007). In a world without friction, the observed leverage of firm *i* at time *t*, L_{it} should be equal to the optimal or target leverage (i.e $L_{it}=L_{it}^*$).

However, because adjustment from one state to another is costly, firms do not fully adjust their target or optimal leverage from one period to another. As a result, partial adjustment

model of capital structure assumes that the observed level of leverage may deviate from the target level in the short-run but would be adjusted towards the target in the long-run (Hsien-Hung 2011). The partial adjustment model is used in this study to examine the adjustment behaviour and determinants of capital structure rather than test the superiority of capital structure theories.

The adjustment gap between the target capital structure and the observed capital structure can be expressed with the partial adjustment which is given as:

$$L_{it} - L_{it-1} = \delta_{it} (L^*_{it} - L_{it-1}) \quad 3$$

Where L_{it} is the capital structure for firm i at period t , L_{it-1} is the capital structure for firm i at immediate previous period, $t-1$. L^*_{it} is the target capital structure for firm i at current period, period t and δ_{it} is the speed of adjustment to the target capital structure. In the partial adjustment model of capital structure, when $\delta_{it} = 1$, the entire adjustment is made within one period and the firm's observed leverage equals its optimal leverage. Thus, the adjustment to capital structure of a firm would be equal to the adjustment gap. Another possibility is that if $\delta_{it} < 1$, the adjustment is insufficient and the new observed capital structure is below the optimal level. Finally, if $\delta_{it} > 1$, the firm is over-adjusting, and the observed capital structure will be higher than the optimal level.

The Partial Adjustment Model assumes a range between 0 and 1 for the speed of adjustment back to the target leverage. The increase or decrease in the leverage depends on the adjustment gap between target leverage and observed leverage. When the target is lower than the observed, there is a negative adjustment gap and the firm is facing financial constraint of

over-levered. There is need for the firm to adjust leverage downward to the target in order to reduce the risk of bankruptcy. The higher the speed of adjustment (δ_{it}), the greater the adjustment back to the target.

If however, the adjustment gap is positive, the firm faces the financial constraint of the under-levered. Adjustment is done upwards to the target in order to reduce the Weighted Average Cost of Capital (WACC). Prior studies, (Korajczyk & Levy, 2003; Yeh & Roca 2007) observed that target leverage is directly unobservable in the application of Partial Adjustment Model. Thus, the target leverage of firms is suggested to be a linear function of several determinants at both firm specific (microeconomics) and macroeconomic levels (Korajczyk & Levy, 2003; Yeh & Roca, 2012; Drobetz, *et al.*, 2007; Hsien-Hung, 2011). If we substitute equation 2 into equation 3, we will have:

$$L_{it} - L_{it-1} = \delta_{it} (X_{jit} + Y_{kt} - L_{it-1}) \quad 4$$

By rearrangement, equation 4 becomes;

$$L_{it} = \delta_{it} (X_{jit} + Y_{kt}) + L_{it-1} - \delta_{it} L_{it-1} \quad 5$$

$$L_{it} = (1 - \delta_{it}) L_{it-1} + \delta_{it} X_{jit} + \delta_{it} Y_{kt} + \mu_{it} \quad 6$$

Where, μ_{it} is the error-term with zero mean and constant variance. This equation six is the subject of our empirical investigation.

3.3 Model Specification

Based on the theoretical expository of dynamic trade-off theory given earlier, the following models are specified for the purpose of investigating determinants of capital structure of domestic and multinational firms listed on the Nigeria Stock Exchange (NSE), over the periods 2005-2019. The models follow dummy variable technique to capture the unique difference between multinational firms and domestic firms. It particularly follows the specifications given by Mari, et al., (2011) and Shumi (2015).

MODEL 1

$$\begin{aligned}
 LEV_{it} = & \beta_0 + (1 - \delta_{it})LEV_{it-1} + \beta_1PRF_{it} + \beta_2AGE_{it} + \beta_3SIZ_{it} + \beta_4TAN_{it} + \\
 & \beta_5GDP_t + \beta_6INR_t + \beta_7INF_t + \beta_8EXR_t + \beta_9DUM_i + \beta_{10}DUM_i * PRF_{it} + \\
 & \beta_{11}DUM_i * AGE_{it} + \beta_{12}DUM_i * SIZ_{it} + \beta_{13}DUM_i * TAN_{it} + \beta_{14}DUM_i * GDP_t + \\
 & \beta_{15}DUM_i * INR_t + \beta_{16}DUM_i * INF_t + \beta_{17}DUM_i * EXR_t + \epsilon_{it} \quad 7
 \end{aligned}$$

Where β_0 is the constant term, $1 - \delta_{it}$ is the coefficient that gives the speed of adjustment and ϵ is the error term. DUM_i is a dummy variable that takes the value 1 if firm is multinational and value zero if otherwise, the purpose is to help determine if there is a significant difference between leverage for multinational firms relative to domestic firms. Coefficients β_{10} to β_{17} were to show if the explanatory variables are significant in explaining the differences in the capital structure of multinational firms relative to domestic firms. PRF is Profitability, AGE is Age of firms from date of incorporation, SIZ is Size, TAN is Tangibility, GDP is GDP growth rate, INR is Interest Rate, INF is Inflation Rate and LEV

is Leverage ratio or Capital Structure. This model I will help in achieving the objective one of the study.

MODEL II

$$LEV_{it} = \beta_0 + (1 - \delta_{it})LEV_{it-1} + \beta_1Prf_{it} + \beta_2AGE_{it} + \beta_3SIZ_{it} + \beta_4TAN_{it} + \beta_5GDP2_t + \beta_6INR2_t + \beta_7INF2_t + \beta_8EXR2_t + \epsilon_{it} \quad 8$$

To achieve objective four, model II presents macroeconomic variables from parent country of multinational firms only. The four macroeconomics variables in model II carries number “2” this is to show that the variables are specific to parent country of multinational firms’ affiliate in the model. Further and in order to achieve objective two and three, model II was analysed again for all firms using both firm-specific and macroeconomic variables from host country.

3.4 Operational Definition of Variables

Capital Structure or Leverage: According to Drobetz, et al., (2007), and in line with competing capital structure theories, there is no clear cut definition of leverage in the academic literature. Rajan and Zingales (1995), apply two alternative measures of leverage. First, leverage defined as the ratio of non-equity liabilities to total assets. The second defined leverage as the ratio of interest bearing debts to capital. While the first is noted to be widely used and stand to proxy what is left to share-holders in case of liquidation, the second captured employed capital which represent effect of post-financing decisions, (Drobetz et al 2007). Further, leverage is short-term if only short-term liabilities are considered and it is

long-term if long-term liabilities are considered. This study adopted long-term measure of leverage by considering the ratio of total liabilities to total assets.

Profitability: Profitability is a measure of a firm's profit relative to its overall expenses. Ratios such as gross profit margin, net profit margin or earnings before interest and tax (EBIT) and profit before tax (PBT) are some of the major concepts used in measuring profitability of firms. The current study measured profitability by considering the ratio of profit before tax to turnover.

Tangibility: Tangibility is a concept that measures the proportion of assets in physical form to total assets. In firm finance, it is the ratio of fixed assets to total assets and this is the measure used in this study.

Size: Firm size generally refers to the capacity of a firm which can be measured by using different concepts such as total sales, total assets, number employed and market value of equity. To avoid volatility in measurement, logarithm of total assets was used in this study and this measure is consistent with most studies (Faris, 2010; Intan & Prasetyo, 2016; Sutanuka and Debdas (2021).

Age: Firm age can either be measured as the period since the creation of a firm and the present time in years or the period between when it goes public and the present time in years. The current measured firm age in terms of the latter definition.

Gross Domestic Product: This is a major macroeconomic condition variable. It measured the total income of a country at any given year. This factor is to gauge the influence of the national income on capital structure of firms. The current study used GDP annual growth rate to measure the economy performance

Interest Rate: This is another macroeconomic variable that shows how easy it is for firms to access loan facility. It is the price of debt-fund from external sources. This study measured interest rate using the average long term lending rate.

Exchange Rate: This is the rate at which a unit of foreign currency is exchange for a unit of domestic currency. This study used the rate at which a US-Dollar is exchange for a unit of Nigeria naira in real term.

Inflation Rate: This is a macroeconomic variable that tells about a country’s economic stability. It is believed that higher inflation will decrease the benefits of using debts because of likely rise in bankruptcy costs. The nominal consumer price index was used to nrepresent inflation rate in this study.

3.5 *A priori* Expectations

Findings from this study are generally expected to be largely consistent with the theoretical predictions of the two leading theories of capital structure (Trade-off Theory and Pecking Order Theory). Thus, it is expected that results are consistent with the signs given in the following table:

Table 3.1 A *Priori* Expectation

S/N	VARIABLES	EXPECTED SIGNS	
		Pecking Order Theory	Trade-Off Theory
1	Profitability	-	+
2	Age	-	+
3	Size	-	+
4	Tangibility	-	+
5	GDP growth rate	+	-
6	Inflation rate	-	+
7	Interest rate	+	+
8	Exchange Rate	-	+

Source: Researcher (2023)

3.6 Issues in Methodology and Estimation Technique

Panel data are characterized by complex error structures that can often render the classical assumptions and or the BLUE properties about least square estimators of little or no effect. For instance by structure, panel data pooled heterogeneous economic units like household, firms, countries and regions together. Irrespective of the assumptions underlying the pooling of these different units, there will be some degree of heterogeneity among them. Thus, it is important to search for an appropriate method of analysis that can handle the inherent character that can break down Gauss-Markov theorem in the panel data. Reed and Ye (2011) identified non-spherical errors as one of the major problem in the structure of panel data and that if not properly addressed, it can lead to inefficiency and biasedness in the estimation of standard errors. Similarly, De Hoyos and Sarafidis (2006) have documented cross-sectional dependency as another recent potential problem in panel data. Finally, the issue of heteroscedasticity which is a major problem common to virtually all panel data must be consider when choosing the method of analysis. The issues raised become a problem because most common panel data estimators cannot handle these problems simultaneously. In the words of Reed and Ye (2011) most panel data estimators are unable to simultaneously handle both serial correlation and cross-sectional dependence.

Going forward, there is a need to apply a method that can handle these problems simultaneously. Reed and Ye (2011) examined the choice of panel data estimator to apply when data structure suffers from the problem of heteroscedasticity, serial-correlation and cross-sectional dependency simultaneously. In the study, eleven different estimators were examined in terms of efficiency and coverage. In their recommendations, Generalized Least Square (GLS), in specific term Partial Feasible Generalised Least Square (Partial

FGLS)/Estimated Generalised Least Square (EGLS) were observed to out-perform other method of analysis for cases where the number of cross-section is greater than the time period. That is $N > T$. Similarly, Moundigbaye, Rea and Reed (2018) upheld the recommendations of Reed and Ye (2011) on panel methodology in the presence of heteroscedasticity, serial-correlation and cross-sectional dependency. Relying on their recommendations, the variables in the study were analysed using the EGLS method with various options available on E-view 10 statistical package.

The first step was to analyze the data using the conventional estimators such as fixed effect and random effect models. With the aid of hausman test, fixed effect model was chosen. Thereafter, a post result diagnostic test was carried out. The diagnostic test showed that the data suffered from the problems of heteroscedasticity, autocorrelation/serial-correlation and cross-sectional dependence as discuss earlier. This showed that application of OLS method may lead to spurious result. To overcome these problems, the GLS methodology was applied on the data. Details of these results are contained in the appendix.

3.7 Population, Sample and Sources of Data

The study samples were drawn from a population of 106 non-financial firms listed on the Nigerian Stock Exchange (NSE) over the period 2005 to 2019 as at December 2022. Further scrutiny shows that some of these firms were either delisted at one point or the other or do not include complete information that is necessary for the study and therefore cannot be included in the analysis. After much scrutiny, fifty per cent of the study population were eventually qualify for inclusion. This resulted in balanced panel information for 53 firms. Since the objective of the study is to compare domestic and multinational firms,

categorisation as a result of this objective showed that 43 of the 53 firms were domestic while the remaining 10 were multinational. In total 43 domestic firms and 10 multinational firms were sampled. Firm specific variables were sourced from NSE fact book (several issues) and annual reports of firms included in the study. Data on macroeconomic variables for both host and parent countries were sourced from World Development Index. Firm specific variables that were included in the study are profitability, tangibility, size, age and leverage ratio. Macroeconomic variables that were included in the study are inflation rate, GDP growth rate, interest rate and exchange rate. Details of study population size and sample size are contained in the table below.

Table 3.2 Population and Sample Size

SN	SECTOR	POPULATION	SAMPLE	DOMESTIC SAMPLE	MULTINATIONAL SAMPLE
1	AGRICULTURE	5	3	3	0
2	CONGLOMERATES	6	4	2	2
3	CONSTRUCTION/ REAL ESTATE	8	4	4	0
4	CONSUMER GOODS	21	12	7	5
5	HEALTHCARE	7	4	2	2
6	ICT	9	2	2	0
7	INDUSTRIAL GOODS	13	6	6	0
8	NATURAL RESOURCES	4	2	2	0
9	OIL AND GAS	10	6	5	1
10	SERVICES	23	10	10	0
	TOTAL	106	53	43	10

Source: Computed by Author Using Information from NSE (2023)

3.8 Summary of Variables Used

The following table summarises how the firm specific and macroeconomic variables that were included in the model were measured. Leverage ratio is the dependent variable while others are independent variables.

Table 3.3 Variables and Measurement

S/N	Variables	Measurement	Type of Variable
1	Profitability	Profit Before Tax/Turnover	Firm-Specific
2	Age	Number of Years in Existence	Firm-Specific
3	Size	Logarithm of Total Assets	Firm-Specific
4	Tangibility	Fixed Assets/Total Assets	Firm-Specific
5	GDP Growth Rate	Logarithm of real GDP	Macroeconomic Variable
6	Inflation Rate	Consumer Price Index	Macroeconomic Variable
7	Interest Rate	Real Long-Term Lending Rate	Macroeconomic Variable
8	Capital Structure or Leverage ratio	Ratio of Total Liabilities to Total Assets	Firm-Specific Variable

Source: Author's Computation (2023)

CHAPTER FOUR

DATA ANALYSIS, RESULTS AND DISCUSSIONS

This chapter presents the descriptive results, discussion of the firm-level variables and macroeconomics variables used in the study. This is followed by the presentation and discussion of the regression results. The discussion shall follow the order of specific objective of the study.

4.1 Descriptive Analysis of Included Firm-Level and Macroeconomic Variables for All Firms from 2005 to 2019

The descriptive analysis results of the firm-level and macroeconomic variables for all firms are presented in Table 4.1 below. Rows two to five show respectively, the mean, median, maximum, minimum and standard deviation for each of the of variables used in the study. These are measures of central tendencies and distribution around the mean value of each variable included in the model. In addition, rows six to nine shows respectively, skewness, kurtosis, Jarque-Bera statistics and the probability value of Jarque-Bera statistics. These are descriptive statistics for normality test of variables in the model. Foremost, the gap between the mean and the median value for all variables except profitability is very close suggesting a moderate issue of skewness in the data. Profitability records the highest standard deviation followed by exchange rate. For other variables, the standard deviation is between 0.29 and 16.79. The coefficient of variation, which is computed by dividing the standard deviation by the mean and multiplying the outcome by one hundred measures the variability of each variable and is presented in row twelve. Skewness and kurtosis are two ways to reveal the shape of the distribution. Negative skew suggest the tail is on the left while positive skew indicate that the tail is on the right. A value near zero or zero indicates that there is no

skewness in the distribution and that the distribution is symmetrical. Based on the result in table 4.1 profitability, gross domestic product and interest rate are negatively skewed. Others are positively skewed except size that was found with value 0.02 indicating that it is the only variable that is free from skewness. On the other hand, Kurtosis measure whether the distribution is light-tailed or heavily-tailed relative to normal distribution. A kurtosis of three (3) shows that the distribution is normal, if less than three it is platykurtic meaning the data produce fewer and less extreme outlier relative to normal distribution and if greater than three it is leptokurtic meaning that the outlier is more than that of normal distribution. The result in the table below showed that leverage, profitability and tangibility are leptokurtic that is they are heavily tailed compare to normal distribution while size, gross domestic product, interest rate and exchange rate are platykurtic that is they are light-tailed relative to normal distribution. Age and inflation rate with approximately a kurtosis of 3 revealed that they are relatively normal in their distribution producing same outliers as with the normal distribution.

From the descriptive results from the table, profitability (PRF) is the most volatile among all the nine variables with coefficient of variation of about 27778 per cent. The next volatile variable is leverage (Lev) with coefficient of variation of approximately 86 per cent. In the class of the macroeconomic variables, gross domestic product (GDP), is the most volatile with coefficient of variation of 61 per cent. For all the variables, the least volatile is size (SIZ) with coefficient of variation of approximately 14 per cent while for macroeconomic variable the least volatile is interest rate (INR) with coefficient of variation of approximately 22 per cent. Further, the table revealed that all included variable are not normally distributed because, the probability values for Jaque-Bera is significant at one per cent and thus failed to reject the

hypothesis that all variables are normally distributed. This should not pose a serious econometric problem for a panel data structure with fewer time periods.

Table 4.1 Descriptive Summary for All Firm-Specific and Macroeconomic Variables from 2005 to 2019

	LEV	PRF	TAN	SIZ	AGE	GDP	INF	INR	EXR
Mean	0.661881	-13.4495	0.507859	15.82469	50.79245	4.906000	11.39200	11.33333	186.3613
Median	0.611446	0.051808	0.490346	15.67446	50.00000	5.490000	11.60000	12.00000	157.3100
Maximum	13.69871	1.299491	4.595186	20.79851	96.00000	9.540000	18.60000	14.00000	306.9200
Minimum	-0.051969	-10533.6	0.005959	10.68946	8.000000	-1.58000	6.600000	6.000000	118.5700
Std. Dev.	0.572027	373.6215	0.291411	2.138765	16.79221	2.991414	3.076622	2.517643	67.62616
Skewness	15.39429	-28.1333	3.509423	0.017447	0.319267	-0.52817	0.622126	-0.91406	0.945357
Kurtosis	341.8602	792.6506	50.03467	2.356653	2.974797	2.416147	2.999156	2.806884	2.243486
Jarque-Bera	3835020.	20759899	74912.99	13.75061	13.52691	48.25386	51.28293	111.9408	137.3732
Probability	0.000000	0.000000	0.000000	0.001033	0.001155	0.000000	0.000000	0.000000	0.000000
Sum	526.1954	-10692.3	403.7483	12580.63	40380.00	3900.270	9056.640	9010.000	148157.3
Sum Sq. Dev.	259.8086	1.11E+08	67.42696	3632.006	223890.8	7105.157	7515.688	5032.792	3631199.
Coefficient of Variation	86.424448	-2777.96	57.3803	13.51537	33.06045	60.98355	27.01082	22.21776	36.29298
Observations	795	795	795	795	795	795	795	795	795

Source: Author's computation using E-View (2023)

4.2 Comparing Descriptive Statistics for Included Firm-Specific Variables for Domestic Firm and Multinational Firms.

The table 4.2 below presents the statistics for skewness, kurtosis, Jarque-Bera probability value and coefficient of variation for domestic and multinational firms. This section is concerned primarily with comparing the behavior of the variables under domestic and multinational firms. Foremost, age is positively skewed under domestic but skewness became negative for sample size under multinational. All other variable follow a consistent order of skewness for both domestic and multinational firms. For kurtosis statistics, age is platykurtic under domestic firm but leptokurtic under multinational firm. Again, leverage is leptokurtic

for domestic firm and platykurtic for multinational firm. Size is platykurtic for both domestic and multinational firms while profitability and tangibility are leptokurtic for both domestic and multinational firms. The Jarque-Bera test shows that all variables under domestic firms reject the hypothesis that the variables are normally distribution while only leverage and tangibility under multinational firms failed to reject the hypothesis that variables are normally distributed. Among all variables, profitability is most volatile for domestic and multinational firms with coefficient of variation of approximately 2778 and 282 per cent respectively. Size is least volatile under domestic firms while age is least volatile under multinational firms.

Table 4.2 Comparing Descriptive Statistics for Firm-Specific Data

Variable	Domestic Firms				Multinational Firms			
	Skewness	Kurtosis	Jarque-Bera P-Value	Coefficient of Variation	Skewness	Kurtosis	Jarque-Bera P-Value	Coefficient of Variation
LEV	15.39429	341.8602	0.000000	86.4244479	0.05425	2.60044	0.58527	26.780868
PRF	-28.13325	792.6506	0.000000	-2777.9583	-3.25265	19.90226	0.00000	282.29981
TAN	3.509423	50.03467	0.000000	57.3802965	0.36616	3.63892	0.05226	39.436772
SIZ	0.017447	2.356653	0.001033	13.5153674	0.55659	2.35819	0.00574	25.656894
AGE	0.319267	2.974797	0.001155	33.060445	-0.53728	3.67290	0.00658	6.6877176

Source: Author's computation using E-View (2023)

4.3 Univariate Properties of the Study Variables

This section presents the univariate properties of the study variables by conducting a unit root test on each variable included in the study. The major reasons for conducting unit root test for studies of this nature are to help in determining the type of analysis to undertake or help determine variables that can be safely combined in a regression analysis. For this study, the main reason is to help determine if the study variables can be safely combined in a regression in order to avoid spurious result. There are six options available in E-view environment for

checking whether series are stationary or not. The current study employed three of these six options. These options are based on Levin, Lin & Chu t statistics, Im, Pesaran and Shin W -Statistics, and ADF-Fisher Chi-square statistics. Further, the lag length was based on Akaike Info Criterion (AIC) and Schwarz Info Criterion (SIC) for automatic lag length selection. Further, because of the possible heterogeneity in the data, the unit root was examined selecting individual effects option and individual effects & trends option. The result is presented in table 4.3 below. The table reported the probability value (P-value) attached to the test statistics of each of the techniques at level. Interpretation and discussion was based on the statistical significance of the probability value. The null-hypothesis for each of the method and technique suggest that the series have unit root process. P-value that is less than five percent ($P\text{-value} < 0.05$) or one percent ($P\text{-value} < 0.01$) rejects the null hypothesis meaning the concerned series is stationary at level. This implies that results from linear combination of such variables will not produce spurious results.

As evidenced by the result presented in the table below, twelve variables were tested to confirm whether series in each of the variable is stationary or not at level. The first four set of variables {Leverage (LEV), Profitability (PRF), Size (SIZ) and Tangibility (TAN)} are firm-level variables. The results showed that all the four variables are stationary by both AIC and SIC criteria when individual effect is selected. Thus, the four firm-level data are integrated of order zero, that is $I(0)$. By this result, the study can safely conclude that all the firm-level data included in the model are stationary at level. The second set of variables are macroeconomic variables and they are divided into two groups; the domestic macroeconomic variables (Gross Domestic Product (GDP), Interest rate (INR), Inflation rate (INF) and Exchange rate (EXR).

The second group is foreign macroeconomic variables and is country specific, and they are GDP2, INR2, INF2 and EXR2. Based on individual effects and trends, the results revealed that GDP, INR and INF are significant at the five per cent level and therefore, these variables are $I(0)$ that is stationary at level using both AIC and SIC criteria. EXR is stationary at level when Levin, Lin and Chu statistics is applied using both AIC and SIC. Thus, it is convenient to conclude that the domestic macroeconomic variables are stationary at level. Finally, the tables showed that the P-value for GDP2 and INF2 rejects the hypothesis that there is a unit root in the process when individual effects are considered for both variables. Similarly, the P-value rejects the hypothesis that there is unit root in the series for both INR2 and EXR2 when individual effects and trends are considered. The summary is that the included variables, both firm-level and macroeconomic, are stationary at level. That is they are $I(0)$ and therefore it is safe to combine the variables for valid results.

Table 4.3 Panel Unit Root Test result

SN		Method Based on AIC (P-VALUE AT LEVEL)			Method Based on SIC (P-VALUE AT LEVEL)		
Variables	Exogenous Variable	Levin, Lin &Chu	Im, Pesaran and Shin	ADF-Fisher Chi-Square	Levin, Lin &Chu	Im, Pesaran and Shin	ADF-Fisher Chi-Square
		LEV	Individual Effects	0.0000	0.0000	0.0000	0.0000
	Individual Effects and Trends	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
PRF	Individual Effects	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Individual Effects and Trends	0.8805	0.0000	0.0000	0.3828	0.0000	0.0000
SIZ	Individual Effects	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Individual Effects and Trends	0.0007	0.5545	0.2886	0.0000	0.0628	0.1125
TAN	Individual Effects	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Individual Effects and Trends	0.0000	0.0265	0.0018	0.0016	0.0390	0.0035
GDP	Individual Effects	0.0000	0.9866	1.0000	0.0000	0.9866	1.0000
	Individual Effects and Trends	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
INR	Individual Effects	0.0007	0.1472	0.8828	0.0007	0.1472	0.8828
	Individual Effects and Trends	0.0000	0.0004	0.0120	0.0000	0.0000	0.0000
INF	Individual Effects	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Individual Effects and Trends	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
EXR	Individual Effects	0.9809	1.0000	1.0000	0.9809	1.0000	1.0000
	Individual Effects and Trends	0.0000	0.2265	0.8006	0.0000	0.2265	0.8006
GDP2	Individual Effects	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Individual Effects and Trends	0.0000	0.0010	0.0059	0.0000	0.0010	0.0059
INR2	Individual Effects	0.1648	0.9924	1.0000	0.1648	0.9924	1.0000
	Individual Effects and Trends	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
INF2	Individual Effects	0.0000	0.0021	0.0099	0.0000	0.0021	0.0099
	Individual Effects and Trends	0.0000	0.0819	0.2013	0.0001	0.0819	0.2013
EXR2	Individual Effects	0.8375	0.9988	0.9998	0.8375	0.9988	0.9998
	Individual Effects and Trends	0.0000	0.0012	0.0019	0.0000	0.0012	0.0019

Source: Author's computation using E-View (2023)

4.4 Result of Pairwise Correlation of Firm-Specific and Macroeconomic Variables for All Firms

The purpose of the pairwise correlation is check for the existence of multicollinearity in the variables. Gujarati & Porter (2011) noted that multicollinearity may not have serious theoretical consequences when it is imperfect. However, both documented some practical negative impact on regression outcome when the value is near perfect or high multicollinearity. Amongst the identified consequences are large variances and standard errors of estimators, wider confidence interval and wrong signs for regression coefficients.

Therefore, the study conducted a preliminary investigation using one of the available methods to check for the presence of multicollinearity. Generally and as a rule of thumb, a pairwise correlation that is near 0.8 or above may suggest a serious case of multicollinearity. The result for all exogenous variables in model one is presented in table 4.4 below. The results in the table revealed that the pairwise correlation coefficient in absolute terms ranges between 0.00791 and 0.38879 for all the firm-level data (PRF, TAN, AGE and SIZ). Again for the macroeconomic data, the value ranges between 0.00683 and 0.81775. The general outlook of the result showed that, the combination of these series may not pose a serious problem of multicollinearity. Therefore, the regression results should be reliable for prediction.

Table 4.4 Pairwise Correlation of Firm-Specific and Macroeconomic Variables for All Firms

	PRF	TAN	AGE	SIZ	GDP	INR	INF	EXR
PRF	1.00000							
TAN	-0.06100	1.00000						
AGE	0.02525	-0.12957	1.00000					
SIZ	0.00791	-0.04065	0.38879	1.00000				
GDP	0.03195	-0.06264	-0.20313	-0.15743	1.00000			
INR	-0.03123	0.06403	0.15078	0.10607	-0.77738	1.00000		
INF	-0.00683	-0.01622	0.07876	0.06103	-0.52312	0.21859	1.00000	
EXR	-0.06440	0.05103	0.22832	0.16395	-0.81775	0.61003	0.44628	1.00000

Source: Author's computation using E-View (2023)

4.5 Result of Pairwise Correlation of Firm-Specific and Macroeconomic Variables for Domestic Firms

The result of the pairwise correlation for domestic firms only is presented in table 4.5 below.

The focus was on firm-level variables because the interpretation for macroeconomics variables will be same with what we have under all firms above. Thus, from the results below, the pairwise correlation coefficient in absolute term for firm-level data (Profitability, Tangibility, Size and Age) ranges between 0.00364 and 0.36128. This result showed that, it is

safe to conclude that the firm-level data for domestic firms is free from the problems or consequences of multicollinearity.

Table 4.5 Results of Pairwise Correlation of Firm-Specific and Macroeconomic Variables for Domestic Firms

	PRF	TAN	SIZ	AGE	GDP	INR	INF	EXR
PRF	1.00000							
TAN	-0.06221	1.00000						
SIZ	0.00364	-0.02025	1.00000					
AGE	0.02084	-0.09540	0.36128	1.00000				
GDP	0.03545	-0.06042	-0.15997	-0.20721	1.00000			
INR	-0.03466	0.06711	0.10398	0.15382	-0.77738	1.00000		
INF	-0.00757	-0.00431	0.06090	0.08035	-0.52312	0.21859	1.00000	
EXR	-0.07150	0.05534	0.16659	0.23292	-0.81775	0.61003	0.44628	1.00000

Source: Author’s computation using E-View (2023)

4.6 Result of Pairwise Correlation of Firm-Specific and Macroeconomic Variables for Multinational Firms

Two types of macroeconomic variables were examined for multinational firms in the study. The first set is macroeconomic variables in domestic economy and the second set is from respective home country of multinational firms. The result of the pairwise correlation is as presented in table 4.6 below. The result in the table revealed that the pairwise correlation coefficient ranges between 0.00236 and 0.46759 for about 85 percent of the data point while the coefficient ranges between 0.58996 and 0.81775 for the remaining 35 percent of the data point. This suggests that the coefficients are within safe range. And it can be concluded that the variables included in this study are free from multicollinearity problem.

Table 4.6 Pairwise Correlation of Firm-Specific and Macroeconomic Variables for Multinational Firms

	PRF	TAN	AGE	SIZ	GDP	INR	INF	EXR	GDP2	INR2	INF2	EXR2
PRF	1.00000											
TAN	-0.16105	1.00000										
AGE	-0.21059	-0.12045	1.00000									
SIZ	0.23045	-0.09540	-0.05536	1.00000								
GDP	0.21999	0.00236	-0.21676	-0.27733	1.00000							
INR	-0.13950	-0.03586	0.16090	0.20832	-0.77738	1.00000						
INF	-0.08748	-0.11057	0.08405	0.12999	-0.52312	0.21859	1.00000					
EXR	-0.18030	-0.02989	0.24365	0.28837	-0.81775	0.61003	0.44628	1.00000				
GDP2	-0.06073	0.05052	0.01260	0.02036	-0.23584	0.46759	-0.19273	0.11338	1.00000			
INR2	0.12718	-0.01783	-0.24783	-0.36948	0.76969	-0.58996	-0.33291	-0.78490	-0.14539	1.00000		
INF2	-0.06917	0.00363	-0.06261	-0.31753	0.22133	-0.01191	-0.07190	-0.23115	-0.01627	0.60111	1.00000	
EXR2	0.02868	-0.09019	0.05080	0.24623	-0.34343	0.21637	0.22925	0.41639	0.10748	-0.67706	-0.58876	1.00000

Source: Author's computation using E-View (2023)

In summary, the three sets of pairwise correlation coefficient results for all firms, domestic firms and multinational firms are free from the negative consequences of multicollinearity.

4.7 Results of Diagnostic Tests for the Presence of Heteroscedasticity, Autocorrelation and Cross-sectional Dependence Based on Fixed Effect Method for All Firms

Traditionally, the three basic methods to begin panel data analysis are pooled OLS, fixed effect and random effect model. At each stage a test is conducted to determine the most appropriate.

First and based on Breusch-Pagan test, fixed or random effect was found to be more appropriate than pooled OLS. Second, Hausman test revealed that fixed effect model was more appropriate than the random effect model. Finally, the result of the fixed effect model was examined for the presence of heteroscedasticity, autocorrelation and cross-sectional dependence. The main results from the fixed effect model are contained in the appendix. The fixed effect result was not presented because of the problems which led to the use of

generalized least square. These problems are discussed which are below. Thus, this section present and briefly discuss the result of the diagnostic test based on fixed effect model.

The results of the tests of heteroscedasticity, cross-section dependence and autocorrelation are as presented in table 4.7, table 4.8 and table 4.9 respectively below. For detailed results on the fixed effect and random effect model estimation and hausman test see appendix 1. The null hypothesis for the test in table 4.7 indicated that the errors are homoscedastic. However, with a probability value that is significant at 5%, the null hypothesis is rejected meaning the result from fixed effect model is heteroscedastic. That is the errors are not constant. From table 4.8, the Peaseran cross-section dependence test showed that the variables for all firms suffer from cross-section dependency. The null hypothesis of no cross-sectional dependence was rejected by the p-value at 5% level of significant. This is the second issue which is major in panel data econometrics. Finally, the test of serial correlation or autocorrelation was based on Wooldridge test of autocorrelation in panel data. The result in table 4.9 failed to rejects the null hypothesis of no first-order autocorrelation in the data as the p-value statistics is higher than 5% level of significance. That means the data do not suffer from the problem of autocorrelation.

Table 4.7 Results of Heteroscedasticity Test for All Firms

HETEROSCEDASTICITY TEST
Modified Wald test for groupwise heteroscedasticity in fixed effect regression model
H0: $\sigma(i)^2 = \sigma^2$ for all i
chi2 (53) = 4.4e+05
Prob>chi2 = 0.0000

Source: Author's computation using Stata

Table 4.8 Results of Cross-section Dependence Test for All Firms

CROSS SECTION DEPENDENCE TEST
H0: no cross-section dependence
Pesaran's test of cross sectional independence = 7.762, Pr = 0.0000

Source: Author's computation using Stata

Table 4.9 Results of Autocorrelation Test for All Firms

AUTOCORRELATION
Wooldridge test for autocorrelation in panel data
H0: no first-order autocorrelation
F(1, 52) = 0.430
Prob > F = 0.5148

Source: Author's computation using Stata

4.8 Results of Diagnostic Tests for the Presence of Heteroscedasticity, Autocorrelation and Cross-sectional Dependence Based on Fixed Effect Method for Domestic Firms

In this section, the results for the tests of heteroscedasticity, cross-section dependence and autocorrelation for forty-three domestic firms are presented in table 4.10, 4.11 and 4.12 respectively. Foremost, table 4.10 revealed that the errors are not constant. That is the errors from the fixed effect model are heteroscedastic because the null hypothesis of constant variance is rejected at 5% level of significance. Similarly, the null hypothesis of no cross section dependence is rejected at 5%. Thus, the data for domestic firms is both heteroscedastic and cross-sectionally dependent. Finally and has shown in table 4.12, the data is free from the problem of autocorrelation since the Wooldridge test of autocorrelation in panel data failed to reject the null hypothesis of no autocorrelation at 5%. So far, the major issue is that of heteroscedasticity and cross section dependence.

Table 4.10 Results of Heteroscedasticity Test for Domestic Firms

HETEROSCEDASTICITY TEST
Modified Wald test for groupwise heteroscedasticity in fixed effect regression model
H0: $\sigma(i)^2 = \sigma^2$ for all i
chi2 (43) = 90858.38
Prob>chi2 = 0.0000

Source: Author's computation using Stata

Table 4.11 Results of Cross-section Dependence Test for Domestic Firms

CROSS SECTION DEPENDENCE TEST
H0: No Cross Section Dependence
Pesaran's test of cross sectional independence = 10.454, Pr = 0.0000
Average absolute value of the off-diagonal elements = 0.351

Source: Author's computation using Stata

Table 4.12 Results of Autocorrelation Test for Domestic Firms

AUTOCORRELATION
Wooldridge test for autocorrelation in panel data
H0: no first-order autocorrelation
F(1, 42) = 0.377
Prob > F = 0.5424

Source: Author's computation using Stata

4.9 Results of Diagnostic Tests for the Presence of Heteroscedasticity, Autocorrelation and Cross-sectional Dependence Based on Fixed Effect Method for Multinational Firms

This section presents the results of tests heteroscedasticity, autocorrelation and cross-sectional dependence for ten multinational firms included in the study. Table 4.13, 4.14 and 4.15 presents the respective results for Modified Wald Test of heteroscedasticity, Pesaran cross sectional independence test and Wooldridge test for autocorrelation in panel data. The probability value for heteroscedasticity test failed to accept the null hypothesis that the variance in the error is constant. The probability value for cross section dependence test is not significant at 5%. Thus, the hypothesis of cross sectional independence is accepted meaning, the data for multinational firms do not suffer from the problem of cross sectional dependence. Finally, table 4.15 showed that there is autocorrelation problem in the data since the probability value is significant and thereby rejecting the hypothesis of no first-order correlation in the data.

Table 4.13 Results of Heteroscedasticity Test for Multinational Firms

HETEROSCEDASTICITY TEST
Modified Wald test for groupwise heteroscedasticity in fixed effect regression model
H0: $\sigma(i)^2 = \sigma^2$ for all i
chi2 (10) = 133.14
Prob>chi2 = 0.0000

Source: Author's computation using Stata

Table 4.14 Results of Cross-Section Dependence Test for Multinational Firms

CROSS SECTION DEPENDENCE TEST
H0: No Cross Section Dependence
Pesaran's test of cross sectional independence = -1.042, Pr = 0.2976
Average absolute value of the off-diagonal elements = 0.235

Source: Author's computation using Stata

Table 4.15 Results of Autocorrelation Test for Multinational Firms

AUTOCORRELATION
Wooldridge test for autocorrelation in panel data
H0: no first-order autocorrelation
F(1, 9) = 167.014
Prob > F = 0.0000

Source: Author's computation using Stata

In summary, the model for all firms, domestic firms and multinational firms suffers from the problem of heteroscedasticity. Domestic firm model and multinational model are cross sectionally dependent while only multinational firm suffers from autocorrelation problem. Thus, each of the models suffers from two of the basic econometric problems that are related to panel data analysis. To overcome this problem, the study proceeds to data analysis using Generalized Least Square (GLS) method.

4.10 Presentation and Discussion of Results

The main results of the study were presented and discussed in accordance with the study objectives. Each result presentation was followed by appropriate diagnostic test in order to check for any violation of the econometric technique applied. Discussion of results in accordance to theory prediction, statistical significance and past empirical results conclude the section.

4.11 Presentation of Regression Results for All Firms

The table 4.4.1 below presents the results for all 53 firms (made up of 43 domestic firms and 10 multinational firms) examined in the study. Five firm-specific variables such as lagged

value of leverage, profitability, tangibility, age and size; four macroeconomic variables such as gross domestic product, interest rate, inflation rate and exchange rate; One dummy variable (DUM-takes value one if firm is multinational and zero if domestic) and eight interactive variables (DUM*PRF, DUM*TAN, DUM*AGE DUM*SIZ, DUM*GDP, DUM*INR, DUM*INF and DUM*EXR) were examined in model one. The dependent variable is leverage. Results from the model with interactive variables showed that LEV(-1), profitability and age of the firm were positively related to leverage and are statistically significant at 5% level respectively. This result is similar to the outcome when interactive variables were excluded from the model. It then follows that an increase in these three firm-level variables will lead to higher debt usage among examined firms. Further, tangibility was positively related but not significant. Size was negatively related in the model with interactive term and positively related in the model without interactive term. However, both are not statistically significant.

Among the four macroeconomic variables, interest rate is positively related to leverage and statistically significant at 5% under model with interaction variables but not statistically significant in the model without interaction variables. On the contrary, exchange rate is negatively related to leverage and significant at 5% under model without interaction variable but not significant under model without interaction. Subsequent results in this study have shown that both interest rate and exchange rate affects leverage. The remaining two macroeconomics variables, GDP and inflation rate are negatively and positively related to leverage respectively but none is statistically significant.

The dummy variable-DUM is negatively related to leverage and is statistically significant across the two models. Foremost it implies that there is statistical difference in leverage

between domestic firms and multinational firms. Further, the negative coefficient indicates that multinational firms use less leverage in their capital structure when compared to domestic firms. That is, domestic firms in Nigeria use more debt than multinational firms in Nigeria. The final aspect is results on interaction terms. Interaction terms coefficients on profitability, tangibility, size and interest rate are statistically significant while that of age, GDP, inflation rate and exchange rate are not statistically significant. Profitability, tangibility and interest rate are with negative sign and significant, meaning the three variables contribute to the reason while there is a difference in leverage between multinational and domestic firms. In the real sense, it showed that these three variables cause multinational firms to use less debt than the domestic firms. Finally, the interaction term coefficient on size is positive and significant at 1%. This showed that size also plays a part in the reason why there is a difference in leverage between multinational firms and domestic firm.

Other aspect of the result showed that the Adjusted R^2 of approximately 41% for model with interactive term and 55% for model without interactive term. This showed that the models were able to explain 41% and 55% variations in leverage for model with interactive term and model without interactive term respectively. The F-statistic is significant at 5% for both models meaning that the model is good and well fitted. Finally, the Durbin-Watson statistics is approximately 2.0 meaning the model is free from the problem of serial correlation or autocorrelation.

Table 4.16 Regression Results for All Firms

Variables	Model 1 With Interactive terms		Model 1 Without Interactive terms	
	Coefficient	t-Statistics	Coefficient	t-Statistics
C	0.402105	2.629232***	0.14368	2.090521**
LEV(-1)	0.28376	20.01377***	0.7321	13.75963***
PRF	6.88E-05	18.44157***	5.02E-05	26.58919***
TAN	0.050875	1.480447	0.007598	0.309868
AGE	0.002103	1.927231*	0.000467	2.277853**
SIZ	-0.011238	-1.256008	0.000321	0.126766
GDP	-0.003824	-0.876402	-0.002917	-1.035687
INR	0.006729	2.422397**	0.003651	1.388666
INF	0.001598	0.706	0.001428	1.213695
EXR	0.000153	0.540656	-0.000231	-2.29268**
DUM	-0.743512	-2.851323***	-0.025669	-3.012132***
DUM*PRF	-0.246153	-4.385536***		
DUM*TAN	-0.140991	-1.695434*		
DUM*AGE	0.000278	0.177632		
DUM*SIZ	0.054516	3.717514***		
DUM*GDP	0.005858	0.955828		
DUM*INR	-0.006565	-1.66823*		
DUM*INF	-0.000546	-0.158295		
DUM*EXR	-0.000513	-1.07356		
Adjusted R-squared	0.419252		0.546876	
F-statistic	30.71889***		90.43137***	
Durbin-Watson stat	1.994153		2.176906	

Source: Author's computation using E-View. (2023)

NB: *, ** and *** Indicate Significance at 10%, 5% and 1% respectively.

4.12 Presentation of Cross Section Dependence Test Results for All Firms

The available residual diagnostic test for the generalized least square technique use in this study is cross sectional dependence test. The test is to check if the time series from different cross section are correlated. This may be due to unobserved factors or from spatial or spill-over effects. If the time period is less than the number of cross section (i.e $T < N$),

interpretation is based on Pesaran CD test, if otherwise (i.e $T > N$), interpretation is based on Breusch-Pagan LM test. From table 4.4.1b below the null hypothesis cannot be rejected since the probability value for Pesaran CD is not statistically significant. Thus, the model presented in table 4.16 is free from econometric problem of cross sectional dependence.

Table 4.17 Cross Section Dependence Test for All firms

Residual Cross-Section Dependence Test

Null hypothesis: No cross-section dependence (correlation) in weighted residuals

Test	Model 1 With Interactive Terms			Model 1 Without Interactive Terms		
	Statistic	d.f.	Prob.	Statistic	d.f.	Prob.
Breusch-Pagan LM	1501.608	1378	0.0107	1660.866	1378	0.0000
Pesaran scaled LM	2.354546		0.0185	5.388174		0.0000
Pesaran CD	-0.160743		0.8723	-0.181284		0.8561

Source: Author's computation using E-View (2023)

4.13 Presentation of Regression Results for Domestic Firms

The table below presents the results for 43 domestic firms in the study. The result in column two is based on white cross section standard errors and covariance (WCSEC) while the results in column three is based on white period standard errors and covariance (WPSEC). The purpose is to check for results sensitivity to different ways in error measurement. From the results, it is evident that both results are approximately consistent in terms of sign and size of the coefficients. Three firm-level variables (LEV(-1), profitability and age) in the result were positively related to leverage and are statistically significant at different level. Thus, these three variables tend to increase leverage or debt usage by domestic firms in Nigeria. Further, two macroeconomic variables were found to be statically significant in determining leverage ratio. The first is the interest rate and it is positively related. The sign suggest that as interest rate goes up, domestic firms tend to increase leverage ratio. The second is exchange rate and it is negatively related to leverage ratio. That is the higher the naira exchange rate to US dollar, the lower the leverage ratio for Nigerian domestic firms. It is good to observe that it is the

same set of variables at firm-level (LEV(-1), profitability and age) and macro-level (interest rate and exchange rate) that are statistically significant in both model for all firms (model 1 above) and model for domestic firms (model 2 below). These five variables are therefore very key in determining capital structure of firms in Nigeria.

Other higher statistically test shows that the model for domestic firms is well fitted. Foremost, the Adjusted R² is approximately 51% meaning that about 50 per cent variations in the dependent variables are jointly explained by the independent variables. Similarly, the F-statistic is statistically significant at 1% meaning the whole model for the domestic firm is well fitted and thus be accepted. Finally, the Durbin-Watson statistics is approximately 2.2 meaning the model is relatively free from the problem of serial correlation or autocorrelation.

Table 4.18 Regression Results for Domestic Firms

Variables	Panel EGLS Based on WCSEC		Panel EGLS Based on WPSEC	
	Coefficient	t-Statistics	Coefficient	t-Statistics
C	0.122478	1.585041	0.122478	1.385723
LEV(-1)	0.71133	11.55468***	0.71133	16.68892***
PRF	5.09E-05	28.23871***	5.09E-05	31.3052***
TAN	0.010943	0.454166	0.010943	0.5611
SIZ	-0.002074	-0.639634	-0.002074	-0.585807
AGE	0.000669	1.673396*	0.000669	2.034742**
GDP	-0.001375	-0.35286	-0.001375	-0.437237
INR	0.007237	2.237752**	0.007237	1.937607*
EXR	-0.000225	-1.83842*	-0.000225	-1.933421*
INF	0.002456	1.494276	0.002456	1.167775
Adjusted R-squared	0.507476		0.507476	
F-statistic	69.80496***		69.80496***	
Durbin-Watson stat	2.211967		2.211967	

Source: Author's computation using E-View (2023)

NB: *, ** and *** Indicate Significance at 10%, 5% and 1% Respectively.

4.14 Presentation of Cross Section Dependence Test for Domestic Firms

Again, since the time period is less than the number of cross section, interpretation is based on Pesaran CD test. From table 4.19 below the null hypothesis of no cross section dependence cannot be rejected since the probability value for Pesaran CD is not statistically significant. Thus, the model presented in table 4.18 is free from econometric problem of cross sectional dependence.

Table 4.19 Cross Section Dependence Test for Domestic Firms

Residual Cross-Section Dependence Test

Null hypothesis: No cross-section dependence (correlation) in weighted Residuals

Test	Panel EGLS Based on WCSEC			Panel EGLS Based on WPSEC		
	Statistic	d.f.	Prob.	Statistic	d.f.	Prob.
Breusch-Pagan LM	1084.583	903	0.0000	1084.583	903	0.0000
Pesaran scaled LM	4.272847		0.0000	4.272847		0.0000
Pesaran CD	0.567045		0.5707	0.567045		0.5707

Source: Author's computation using E-View (2023)

4.15 Presentation of Regression Results for Multinational Firms with Foreign Macroeconomic Variables.

The result for multinational firms with foreign macroeconomics is as presented in table 4.20 below. The second column of the table presents the GLS results based on Period Weight Standard Errors and Covariance (PWSEC) and the third column is based on Cross section Weight Standard Errors and Covariance (CWSEC). The purpose is to check the sensitivity of the results to cross section or period weight. It is important to note that except for age of firms that is significant at 10% under period weight and significant at 1% under cross section weight, all other variables under both methods respectively carry the same sign and are significant at same level. Thus, the results are virtually the same. The results showed that lag value of dependent variable and size are positively related to leverage. That is the higher the

leverage in the past period the higher the leverage ratio in the current period. Similarly, as firm size increases, the tendency for multinational firms to use more debt or increase leverage ratio will rise. The other three firm level variables (profitability, tangibility and age) are negatively related to leverage. Thus any reduction in any of these variables will lead to increment in leverage ratio for multinational firms and vice versa. Further, all the four macroeconomic variables (GDP, interest rate, inflation rate and exchange rate) from country of origin of the ten multinational firms examined are statistically significant at 1%. Three of these variables (GDP, interest rate and exchange rate) are positively related to leverage thus revealing that as any of these variable rises, leverage ratio for multinational firms will also rise. Finally, inflation rate is negatively related to leverage suggesting that the higher the rate of inflation the lower the leverage ratio for multinational firms.

The higher order econometrics test showed that the adjusted R^2 is approximately 90% showing that the explanatory variables explained about ninety per cent variation in leverage among multinational firms. The F-statistic is statistically significant at 1% showing that the whole model is good and well fitted. Durbin-Watson statistic of 2.0 showed that the model is free from the problem of autocorrelation or serial correlation.

Table 4.20 Regression Results for Multinational Firms with Foreign Macroeconomic Variables.

Variables	EGLS Based on PWSEC		EGLS Based on CWSEC	
	Coefficient	t-Statistics	Coefficient	t-Statistics
C	-0.036499	-0.367221	-0.036499	-0.376314
LEV(-1)	0.679629	15.15895***	0.679629	15.65886***
PRF	-2.42E-01	-6.065197***	-2.42E-01	-6.173387***
TAN	-0.026459	-1.676365*	-0.026459	-1.728055*
SIZ	0.010851	2.385988**	0.010851	2.457123**
AGE	-0.000617	-1.878552*	-0.000617	-1.853579***
GDP2	0.003713	2.877175***	0.003713	3.110055***
INR2	0.014718	4.930097***	0.014718	5.065675***

INF2	-0.019931	-5.838008***	-0.019931	-5.727959***
EXR2	0.139269	4.497348***	0.139269	4.58584***
Adjusted R-squared	0.896869		0.896869	
F-statistic	135.3104***		135.3104***	
Durbin-Watson stat	2.003623		2.003623	

Source: Author's computation using E-View (2023)

NB: *, ** and *** Indicate Significance at 10%, 5% and 1% Respectively.

4.16 Presentation of Cross Section Dependence Test for Multinational Firms with Foreign Macroeconomic Variables.

For multinational firm, the time period is greater than the number of cross section; therefore, interpretation is based on Breusch-Pagan LM test. From table 4.21 below the null hypothesis of no cross section dependence cannot be rejected since the probability value for Breusch-Pagan LM test is not statistically significant. It therefore follow that the model presented in table 4.20 above is free from econometric problem of cross sectional dependence.

Table 4.21 Cross Section Dependence Test for Multinational Firms with Foreign Macroeconomic Variables

Residual Cross-Section Dependence Test

Null hypothesis: No cross-section dependence (correlation) in weighted Residuals

Test	Panel EGLS Based on PWSEC			Panel EGLS Based on CWSEC		
	Statistic	d.f.	Prob.	Statistic	d.f.	Prob.
Breusch-Pagan LM	11.69382	45	1.0000	11.69382	45	1.0000
Pesaran scaled LM	-3.510779		0.0004	-3.510779		0.0004
Pesaran CD	0.310309		0.7563	0.310309		0.7563

Source: Author's computation using E-View (2023)

4.17 Presentation of Regression Results for Multinational Firms with Domestic Macroeconomic Variables

Two more models were estimated in order to be able to buttress and cross examined regression results for domestic firms and multinational firms. The first model which is presented in this section regressed multinational firms with firm-level and domestic

macroeconomic variables while the second model which will be presented in the next section regressed multinational firms with both firm-level and macroeconomic variables. Table 4.22 below presents the results of multinational firms and domestic macroeconomic variables. The result showed that only age and GDP that is not statistically significant. One year lag value of leverage, size, inflation rate and interest rate in the domestic economy are positively related to leverage ratio. It means, any increment in any of these variables will lead to a rise in leverage ratio. On the other hand, profitability, tangibility and exchange rate are negatively related to leverage. Thus an increase in any of them will reduce leverage ratio.

The adjusted R² is approximately 95% and the F-statistic is significant at 1% showing that the model is well fitted. Also the Durbin-Watson statistic is approximately 2.0 showing that the result is free from serial correlation.

Table 4.22 Regression Results for Multinational Firms with Domestic Macroeconomic Variables

Variables	EGLS Based on PWSEC		EGLS Based on CWSEC	
	Coefficient	t-Statistics	Coefficient	t-Statistics
C	-0.101915	-1.129967	-0.101915	-1.175954
LEV(-1)	0.711775	17.82698***	0.711775	18.47301***
PRF	-2.14E-01	-5.645853***	-2.14E-01	-6.154478***
TAN	-0.047482	-2.689821***	-0.047482	-2.787465***
SIZ	0.018578	4.026775***	0.018578	4.142721***
AGE	-0.00044	-1.410566	-0.00044	-1.497004
GDP	0.001809	0.825334	0.001809	0.834517
INF	0.001831	1.66945*	0.001831	1.793859*
INR	0.00444	2.338598**	0.00444	2.248059**
EXR	-0.000329	-4.76256***	-0.000329	-5.25199***
Adjusted R-squared	0.951087		0.951087	
F-statistic	301.3119***		301.3119***	
Durbin-Watson	1.954824		1.954824	

Source: Author's computation using E-View (2023)

NB: *, ** and *** Indicate Significance at 10%, 5% and 1% Respectively

4.18 Presentation of Cross Section Dependence Test for Multinational Firms with Domestic Macroeconomic Variables

In this model, the time period is greater than the number of cross section; therefore, interpretation is based on Breusch-Pagan LM test. From table 4.23 below the null hypothesis of no cross section dependence cannot be rejected since the probability value for Breusch-Pagan LM test is not statistically significant. It therefore follow that the model presented in table 4.22 above is free from the problem of cross sectional dependence.

Table 4.23 Cross Section Dependence Test for Multinational Firms with Domestic Macroeconomic Variables

Residual Cross-Section Dependence Test

Null hypothesis: No cross-section dependence

Model Two	Panel EGLS Based on PWSEC			Panel EGLS Based on CWSEC		
	Statistic	d.f.	Prob.	Statistic	d.f.	Prob.
Breusch-Pagan LM	10.19677	45	1.0000	10.19677	45	1.0000
Pesaran scaled LM	-3.668582		0.0002	-3.668582		0.0002
Pesaran CD	0.138155		0.8901	0.138155		0.8901

Source: Author's computation using E-View (2023)

4.19 Presentation of Regression Results for Multinational Firms with both Domestic and Foreign Macroeconomic Variables

The table 4.24 below presents the last part of the result on multinational firms. Both domestic and foreign macroeconomic variables were examined in a single model. The purpose is to further examine how the firm-level and domestic macroeconomic variables will behave in the presence of macroeconomic variables from parent country. As mention earlier the analysis was based on Period Weight Standard Error and Covariance (PWSEC) and Cross section Weight Standard Error and Covariance (CWSEC). The two methods yield similar outcome for the five firm-level variables and eight macroeconomic variables used. Except foreign interest rate (INR2), all the variables are statistically significant and are consistent with previous result in terms of sign.

The adjusted R^2 is approximately 93% and the F-statistic is significant at 1% showing that the model is well fitted. Also the Durbin-Watson statistic is approximately 2.1 showing that the result is free from serial correlation.

Table 4.24 Regression Results for Multinational Firms with both Domestic and Foreign Macroeconomic Variables

MODEL THREE Variables	EGLS Based on PWSEC		EGLS Based on CWSEC	
	Coefficient	t-Statistics	Coefficient	t-Statistics
C	-0.079169	-0.786831	-0.079169	-0.803262
LEV(-1)	0.726726	17.91372***	0.726726	19.83541***
PRF	-2.34E-01	-6.713493***	-2.34E-01	-7.417512***
TAN	-0.035923	-2.054309**	-0.035923	-2.172654**
SIZ	0.008764	1.836123*	0.008764	1.873091*
AGE	-0.000631	-2.017553**	-0.000631	-2.064078**
GDP2	0.002435	2.849755***	0.002435	2.795474***
EXR2	0.123308	3.211626***	0.123308	3.33425***
INF2	-0.021885	-6.180029***	-0.021885	-6.60144***
INR2	0.001996	0.452894	0.001996	0.480464
GDP	0.006931	5.306949***	0.006931	5.60617***
INF	0.004194	7.070521***	0.004194	7.543955***
INR	0.009566	7.462561***	0.009566	7.534339***
EXR	-0.000451	-9.729145***	-0.000451	-11.23223***
Adjusted R-squared	0.926587		0.926587	
F-statistic	135.9535***		135.9535***	
Durbin-Watson stat	2.07738		2.07738	

Source: Author's computation using E-View (2023)

NB: *, ** and *** Indicate Significance at 10%, 5% and 1% Respectively

4.20 Presentation of Cross Section Dependence Test for Multinational Firms with both Domestic and Foreign Macroeconomic Variables

In this model, the time period is greater than the number of cross section; therefore, interpretation is based on Breusch-Pagan LM test. From table 4.25 below the null hypothesis of no cross section dependence cannot be rejected since the probability value for Breusch-

Pagan LM test is not statistically significant. It therefore follow that the model presented in table 4.24 above is free from the problem of cross sectional dependence.

Table 4.25 Cross Section Dependence Test for Multinational Firms with both Domestic and Foreign Macroeconomic Variables

Residual Cross-Section Dependence Test

Null hypothesis: No cross-section dependence (correlation) in weighted Residuals

Model Two	Panel EGLS Based on PWSEC			Panel EGLS Based on CWSEC		
Test	Statistic	d.f.	Prob.	Statistic	d.f.	Prob.
Breusch-Pagan LM	13.68057	45	1.0000	13.68057	45	1.0000
Pesaran scaled LM	-3.301358		0.0010	-3.301358		0.0010
Pesaran CD	-0.340024		0.7338	-0.340024		0.7338

Source: Author's computation using E-View (2023)

4.21 Comparing Results on Determinants for Domestic and Multinational Firms.

A cross examination of regression results for domestic and multinational firms is presented in table 4.26 below. The comparison was based on five firm-level variables and four domestic variables that are common to both domestic and multinational firms. Foremost, two firm-level variables (one-year lag of leverage LEV(-1) and profitability) were significantly related to leverage ratio over the period of study and across all model examined. The first observation is that leverage ratio in previous year affects leverage in current period by approximately same proportion (0.71) for both domestic and multinational firms. However, this effect drastically reduces when all firms are combined as shown in column four (0.28). Further, the relationship between profitability and leverage is positive for domestic firms and negative for multinational. This showed that multinational firms uses less debt as their profit rises while domestic debt uses more debt as their profit rises. The magnitude of the coefficients showed that domestic firms' leverage ratio respond more to profit than multinational firms' leverage ratio. In the combine analysis in column four, a positive relationship was observed between profitability and all firms. The remaining three firm-level variables (Tangibility, Size and

Age) do not produce a uniform result across board. Tangibility was significant and negatively related to leverage while size was also significant but positively related to leverage for multinational firms only. Age was significant and positively related to leverage for domestic firms and all firms. In summary, tangibility and size are not significant for domestic firms and all firms while age is not significant for multinational firms.

Further, out of the four macroeconomic variables, only interest rate is found to be statistically significant and also positively related to leverage ratio across board. It shows that interest rate is the only macroeconomic variable in the host economy that affects both domestic and multinational firms in approximately same proportion. Other macroeconomic variable that is significant for domestic firms is exchange rate and for multinational firms are inflation rate and exchange rate. For both domestic and multinational firms exchange rate is positively related to leverage. However, when both types of firms are combined, it is only interest rate that is significant.

Finally, the adjusted R^2 showed that multinational firm's model gives the best fit with a value of 95%, this is followed by domestic firms with a value of 51% and the least fit is the case of all firms with a value of 42%.

Table 4.26 Comparing Regression Results for Domestic, Multinational and All Firms

MODEL THREE	Domestic Firms		Multinational Firms		All Firms	
	Coefficient	t-Statistics	Coefficient	t-Statistics	Coefficient	t-Statistics
C	0.122478	1.585041	-0.101915	-1.129967	0.402105	2.629232***
LEV(-1)	0.711133	11.55468***	0.711775	17.82698***	0.28376	20.01377***
PRF	5.09E-05	28.23871***	-2.14E-01	-5.64585***	6.88E-05	18.44157***
TAN	0.010943	0.454166	-0.047482	-2.68982***	0.050875	1.480447
SIZ	-0.002074	-0.639634	0.018578	4.026775***	-0.011238	-1.256008
AGE	0.000669	1.673396*	-0.00044	-1.410566	0.002103	1.927231*
GDP	-0.001375	-0.35286	0.001809	0.825334	-0.003824	-0.876402
INR	0.007237	2.237752**	0.00444	2.338598**	0.006729	2.422397**
INF	0.002456	1.494276	0.001831	1.66945*	0.001598	0.706
EXR	-0.000225	-1.83842*	-0.000329	-4.76256***	0.000153	0.540656
Adjusted R-squared	0.507476		0.951087		0.419252	
F-statistic	69.80496***		301.3119***		30.71889***	
Durbin-Watson stat	2.211967		1.954824		1.994153	

Source: Author's computation using E-View (2023)

NB: *, ** and *** Indicate Significance at 10%, 5% and 1% Respectively

4.22 Comparing Regression Results of Consumer Goods Sector with Results from Domestic and Multinational Firms.

This section presents and discusses the consistency of results from consumer goods sector with other main results. Consumer goods sector was chosen because it is the only sector with comparatively adequate data for both multinational and domestic firms. The purpose of this is to further investigate some of the study objective by sector. The results presented in table 4.27 below presents side by side, results from consumer goods sector and others.

Foremost, the variable dum is significant at 1% and showed that the capital structure of domestic firms differs from that of multinational firms in the consumer goods sector. This is consistent with previously obtained results for ALL firms examined. Clearly, multinational

firms maintained capital structure that differs from domestic firms in this sector. Again, the interactive terms showed variables such as profitability, size and tangibility to be responsible for this difference. An additional variable (exchange rate) contributed to this difference in consumer goods sector.

Another important point is that firms in the consumer goods sector followed the theoretical prediction of pecking order theory of capital structure. This is consistent with result gotten from multinational firms and evident from negative relationship between leverage and variables such as profitability, tangibility and exchange rate. Perhaps, the major reason for this is the dominance of multinational firms in the consumer goods sector. Generally, the result from the consumer goods sector is more consistent with multinational firms than domestic firms. For instance, of the four included firm-specific factors only Age is not significant while GDP is not significant among the macroeconomic factors.

Table 4.27 Comparing Regression Results of Consumer Goods Sector with Results from Domestic and Multinational and Firms.

CONSUMER GOODS			ALL FIRMS		DOMESTIC FIRMS		MULTINATIONAL	
Variable	Coefficient	Prob.	Coefficient	Prob.	Coefficient	Prob.	Coefficient	Prob.
C	-0.153985	0.0513	0.402105	0.00920	0.122478	0.11350	-0.101915	0.26060
LEV(-1)	0.536898	0.0000	0.28376	0.00000	0.711133	0.00000	0.711775	0.00000
PRF	-0.932346	0.0000	6.88E-05	0.01490	5.09E-05	0.00000	-2.14E-01	0.00000
AGE	0.000123	0.9088	0.002103	0.11700	0.000669	0.09480	-0.00044	0.16080
SIZ	0.035602	0.0000	-0.011238	0.21320	-0.002074	0.52270	0.018578	0.00010
TAN	-0.247599	0.0000	0.050875	0.13840	0.010943	0.64990	-0.047482	0.00810
GDP	0.002205	0.4175	-0.003824	0.37850	-0.001375	0.72430	0.001809	0.41070
INR	0.012792	0.0000	0.006729	0.01650	0.007237	0.02560	0.00444	0.02090
INF	0.005296	0.0000	0.001598	0.49560	0.002456	0.13560	0.001831	0.09740
EXR	-0.000917	0.0000	0.000153	0.60220	-0.000225	0.06650	-0.000329	0.00000
DUM	1.343739	0.0000	-0.743512	0.00660				
DUM*(PRF)	0.877708	0.0000	-0.246153	0.00000				
DUM*(AGE)	-0.000849	0.4320	0.000278	0.88360				
DUM*(SIZ)	-0.106808	0.0000	0.054516	0.00050				
DUM*(TAN)	0.66038	0.0000	-0.140991	0.02330				
DUM*(GDP)	-0.000401	0.9223	0.005858	0.32900				
DUM*(INR)	0.000605	0.8669	-0.006565	0.08650				
DUM*(INF)	0.002384	0.2097	-0.000546	0.86700				
DUM*(EXR)	0.000758	0.0000	-0.000513	0.20410				
Adjusted R-Squared	0.956517		0.419252		0.507476		0.951087	
F-Statistics	205.0881	0.00000	30.71889	0.00000	69.80496	0.00000	301.3119	0.00000
Durbin-Watson Stat.	1.847083			2.23813	2.211967		1.954824	2.238125

Source: Author:s Computation Using Eviews (2023)

4.23 Discussion of Results

The second aspect of this chapter discussed the results presented above in order of the study specific objectives.

4.24 Comparing the capital structure of listed multinational firms and domestic firms in Nigeria

To achieve objective one of the study, model one was developed to accommodate a dummy variable (DUM) that takes the value of one when firm is multinational and value zero when domestic. Eight interaction variables were added to buttress this objective. In accordance to result presented in table 4.16, the study found that in both model with interaction and without interaction, capital structure or leverage is lower for multinational firms and significantly different from that of domestic firms in Nigeria. This finding establishes the fact that leverage for multinational firms in Nigeria is not the same with domestic firms in Nigeria. Further, the negative sign on the dummy variable shows that, leverage for multinational firms is generally lower than leverage for domestic firms. This is a major finding in this study and is consistent with most past studies reviewed (Lee & Kwok 1988, Todd 1996, Shumi & Barry 2009 and Shumi 2015). Although, the result is contrary to the expectation that multinational firms should be able to take more debt in their capital structure, when compare to domestic firms due to their multinationality and ability to diversify business risk across international economies. Some of the studies that support this expectation include Shumi (2015) for Malaysian firms, Mitto and Zhang (2008) for Canada firms and Mari, et al., (2011) for Baltic State (Estonia, Latvia and Lithuanian). The result of this study can be founded on the fact that

most multinational firms in Nigeria are relatively more profitable, larger in size and older in age than the domestic firms. For these reasons, Nigerian multinational firms, appear to follow the prediction of pecking order theory that states that more profitable firms will rely first on internal fund for business development before external fund.

The result further showed that four (DUM*PRF, DUM*TAN, DUM*SIZ and DUM INR) of the eight interactive variables are statistically significant. These four significant variables are able to explain the reasons why leverage ratio differs for multinational firms compare to domestic firms. The interactive variables for profitability (DUM*PRF), tangibility (DUM*TAN) and interest rate (DUM*INR) are significant with negative coefficients. It shows that profitability, tangibility and interest are factors that drive the reasons for the difference between leverage ratio for multinational firms and domestic firms. The negative sign suggest that the impact of these variables is less for multinational firms relative to domestic firms. The interactive variables for size (DUM*SIZ) is significant with positive sign. This also suggests that size is one of the factors that is responsible for the difference in leverage among multinational and domestic firms in Nigeria. However, the positive sign shows that size affects multinational firm's decision on leverage more than it affects domestic firms. The remaining four interaction variables are not significant and thus do not matter in determining the reason for the difference in leverage ratio among multinational and domestic firms in Nigeria.

4.25 Examining the influence of host-country macroeconomic factors on capital structure of multinational and domestic firms.

The discussion in this section will be based on the results presented in table 4.26 and table 4.24. Four macroeconomic factors were examined in order to achieve this objective. These factors have been shown to affect capital structure of firms in previous studies. The variables are GDP growth rate (GDP), Interest Rate (INR), Inflation Rate (INF) and Exchange Rate (EXR). The influence of these variables on capital structure of multinational and domestic firms will be discussed in turn as follows:

GDP growth rate (GDP)

The growth rate of GDP was used to measure the impact of GDP on the capital structure of listed firms in Nigeria. The result showed that GDP was not statistically significant with leverage for both domestic and multinational firms in Nigeria. Although the result showed a negative relationship between GDP and leverage for domestic firms on one hand and a positive relationship between GDP and multinational firms on the other hand. The insignificance of this variable for both multinational and domestic firms weakens the strength of the result. This outcome is contrary to theoretical expectation of the two major theory upon which this study rested. Some previous studies have documented positive and significant relationship between GDP and leverage (Rubi & Oyebola 2017; Osman 2018; Demis & Man 2018) while some others have shown a negative relationship between leverage and GDP (Monomita 2008; Sutanuka & Debdas 2021). However, when foreign macroeconomic factors were introduced into the model for multinational firms (see table 4.24), a positive and significant relationship was reported between GDP and leverage for multinational firms.

Revealing that omission of relevant variable could significantly affect results of regression analysis. This may be the case for the insignificance of GDP for domestic firms in this study.

Interest Rate (INR)

The result in table 26 showed that interest rate is the only macroeconomic variables that affects leverage ratio significantly across board. First, the result showed a positive relationship between interest rate and leverage for domestic firms. Similarly, the same type of relationship was reported between leverage and interest rate for multinational firms. This shows that both types of firms respond to interest rate in choosing their capital structure. This result is consistent with theoretical predictions of both pecking order theory and trade-off theory of capital structure. In trade-off theory, firms are expected to increase debt usage because interest expense is tax deductible and serves as one of the benefits of using more debt. Thus, the higher the interest rate, the higher the leverage ratio for both domestic and multinational firms. This result is consistent with studies on firms in India (Monomita 2008) and in twelve African countries (Demis & Man 2018). However, some studies are contrary to the outcome of this study (Muyiwa, et al., 2017; Dang, Garerett & Nguyen 2010).

Inflation Rate (INF)

By theory, inflation rate should produce a negative relationship with leverage for pecking order theory and a positive relationship for trade-off theory. The current study revealed a positive relationship between leverage and inflation rate for both domestic and multinational firms. However, this relationship is not significant for domestic firms but significant for multinational firms. Thus, by the result from this study, inflation rate does not determines leverage usage for domestic firms in Nigeria although some studies abroad have shown inflation rate to be significant determinant of leverage (Salehi & Manesh 2012; Sett & Sarkhel

2010). Aside, study by Rubi and Oyebola (2017) have shown a positive relationship between leverage and inflation rate while another study on Nigeria firms showed a negative relationship between leverage and inflation rate (Muyiwa, et al., 2017). This current study differs from these studies in that it separate domestic firms from multinational firms. The results for multinational firms showed that inflation is significant and positively related to leverage ratio. Thus, multinational firms in Nigeria follow the prediction of trade-off theory. That is the higher the inflation rate, the higher the debt usage. The intuition is that when inflation goes up, multinational firms by nature are internationally mobile with capacity to hedge against risk. So using more debt when inflation is rising may be a way of trading-off the risk.

Exchange Rate (EXR)

The result showed that exchange rate relationship with leverage is negative for both domestic and multinational firms. This shows that both multinational and domestic firms increase debt usage when the value of naira appreciates against US dollar. This result is consistent with the study by Osman (2018) for listed firms in Turkey, Brazil, South Africa, India and Indonesia. Thus, exchange rate is an important macroeconomic factor that affects listed firms in Nigeria.

Generally, it is good to observe that most of these macroeconomic variables were not significant when all firms are combined. For instance in this study, inflation rate and exchange rate were not significant for all firms but became significant for multinational firms. Similarly, exchange rate was not significant for all firms but became significant for each of domestic and multinational firms. Also, it should be observed that the adjusted R^2 improve significantly when firms were separated compare to when they are not. For instance, the adjusted R^2 for

multinational firms and domestic firms are 95% and 51% respectively while for all firms is the lowest at 42%. This shows that separating the firms by country of origin improves the goodness of fit for the analysis.

4.26 Analysing the impact of firm-specific variables on multinational and domestic firms.

The discussion in this section shall be based on the result presented in table 4.26. From the table, out of five firm level variables examined, three are statistically significant for domestic firms, four for multinational firms and three for all firms. Following are detailed discussion on this result.

One-Period Lagged Leverage (LEV (-1))

The inclusion of one-period lagged value makes the model dynamic. One reason for this is to check if the firms have target leverage such that if there is deviation from target, the coefficient will help determine the speed of adjustment back to the target. First, the coefficient of lagged leverage value is discussed purely as a firm-level factor in the model. From the result presented, the lagged leverage is significant and positively related to leverage for both domestic and multinational firms. This same relationship is observed when all firms are combined. Thus, a unit increment in leverage will yield approximately 0.7units increment in leverage ratio for current period. The impact of this variable is approximately the same for both categories of firms. In essence, the past value of leverage ratio determines the application of debt in the current period. This result is very much consistent with most studies on capital structure of firms. For instance in the Middle East and North Africa (MENA) region

(Mohamed, et al., 2016) and for Malaysia, Singapore and Thailand (Jancinta, Malfuzer & Salvan 2017).

The second important information from the lagged dependent variable is that it helps in determining the speed of adjustment. The result in table 4.16 is the result for the first model to measure the speed of adjustment in this study. From the result without interaction model, the coefficient of lagged dependent variable is approximately 0.27. By this, 0.27 (i.e 1-.73) is the adjustment rate or adjustment coefficient. This shows that there is target leverage that all firms follow and that if there is any deviation, 27 percent of such deviation will be corrected every year. If this is the case, the speed of adjustment which is given as $1/\lambda$ is 3.70 ($1/0.27$) implying that it will take about 4 years for deviation from target leverage to be fully corrected. Further, in table 4.26, the coefficient for lagged dependent variable for domestic is approximately 0.71 and for multinational firm is also 0.71. This suggests that both categories of firms respond to deviation from target at the same rate. Even in the presence of foreign macroeconomic variables (table 4.24), the coefficient for multinational firm is approximately 0.73. With this the adjustment rate is 0.29 for each of domestic and multinational firm and the speed of adjustment is 3.4. Meaning deviation from target will be fully corrected in the fourth year. In summary, for both domestic and multinational firms the speed of adjustment is between 3.4 and 3.7. Both categories will fully return to target leverage in the fourth year of deviation.

Most studies have reported higher adjustment rate for foreign countries. For instance in India adjustment rate have been observed to be between 40% and 55% (Mukherjee & Mahakud 2012; Tiwani & Krishnankutty 2014; Sutanuka & Debdas 2021). For Asian, Europe and USA, 31%, 56% and 46% was respectively reported. For MENA region, Mohamed, et al., (2018) reported adjustment rate between 42% and 80%. For manufacturing firms in Nigeria,

Akinleye (2012) reported adjustment rate of 16.17 percent. Thus, rate of adjustment in Nigeria is generally lower than in other countries. The major reason posited for this in the literature is the cost of adjustment. Generally, the lower the cost of deviation from target compare to cost of adjustment, the longer the period it will take a firm to adjust for deviation in target leverage.

Profitability (PRF)

Profitability is another firm specific variable that is statistically significant across domestic, multinational and all firms. However the direction of relationship for domestic firms differs from multinational firms. Thus, as profit level rises, leverage ratio will also rise and vice versa. Further, this result revealed that Nigerian domestic firms follow the theoretical prediction of trade-off theory in determining the capital structure. On the other hand, the relationship between leverage and profitability is found to be negative for multinational firms. This suggests that as profit level rises, leverage ratio should be falling. Thus, multinational firms differ from domestic firm in that it follows the prediction of pecking order theory while domestic firms follow trade-off theory. Several studies have been able to document that profitability is an important firm-level variable that affect multinational and domestic firms differently (Shumi 2005; Shumi & Barry 2009). Some other studies that have shown leverage and profitability to be negatively related (Mukherjee & Mahakud 2011; Ogbulu & Emeni 2012; Sangeetha & Sivathaasan 2013; Rubi & Oyebola 2017; Sutomo, et al., 2020; Sutanuka & Debdas 2021). At the same time some have shown that the relationship between leverage and profitability is positive (Nunkoo & Boateng (2010); Kouki & Said (2012); Jorge & Antonio 2017). The summary is that multinational firms do not have similar behaviour

compare to domestic firm in terms of how profit level impact capital structure of each category of firm.

Tangibility (TAN)

Tangibility measures the proportion of fixed assets to total assets. It provides evidence to show the capacity of firms to borrow fund for business purpose. In the result presented in table 4.26, tangibility was significant and negatively related to leverage for multinational firms while it is positively related to leverage for domestic firms, however, not statistically significant. The direction of relationship for multinational firms revealed that, these firms do follow the prediction of pecking order theory when choosing leverage ratio. It shows that firms with more tangible asset compare to total asset should be more profitable and therefore will look inward for fund rather than debts from outside. Hence the relationship between leverage and tangibility is expected to be negative showing consistency with pecking order theory. Studies with similar results have been documented in the literature by Kouki and Said (2012) among French listed companies, Saadah and Prijadi (2012) for Indonesia firms, Ogbulu and Emeni (2012) and Yinusa, et al., (2018) for Nigerian firms and Ahmed and Amina (2019) for listed firms in Egypt. On the other hand, the result for domestic firms is not significant, although, the relationship between leverage and tangibility was found to be positive and consistent with the trade-off theory of capital structure.

Size (SIZ)

Size measures the bigness or largeness of a firm. By pecking order theory a large firm is expected to be highly profitable and thereby should look inward for funding business project or expansion. On the other, trade-off theory predicts otherwise. Under trade-off, firms with

large size are expected to use their size as collateral for debt securement and therefore to use more debt than smaller firms. Generally, multinational firms are expected to pattern their leverage decision in accordance to the prediction of trade-theory because of their size when compare to domestic counterpart. The result from this study confirms this expectation since the relationship between leverage and size is positive and significant for multinational firms in Nigeria. Thus, multinational firms are expected to use more debt compare to domestic firm in Nigeria. Several past studies have been able to establish this type of behavior among listed firms for different countries. (Faris 2010; Mukherjee & Mahakud 2011; Ahmed Mohammed 2015; Mumtaz & Atta 2017; Rubi & Oyebola 2017; Sutanuka & Debdas 2021). Further, the result from the study shows that domestic firms are consistent with the prediction of pecking order theory, although, it is not statistically significant.

Age (AGE)

Age measure the number of years a firm has been in existence since incorporation. Again, by pecking order theory a firm with more years of experience is expected to have much prosperity such that it will rely more on internally generated revenue form profits than debt. The result from the study shows that multinational firms are consistent with the prediction of pecking order theory, although not statistically significant. For domestic firms, the result showed a positive significant relationship between leverage ratio and age of firms. This is consistent with the prediction of trade-off theory of capital structure. By this, the more the age of domestic firms the more the debt in their leverage and vice versa. Some studies also found a positive relationship between leverage and age of firm (Ahmed Mohammed 2015; Jorge & Antonio 2017) while some established a negative relationship (Yinusa, et al., 2018; Sutanuka & Debdas 2021).

4.27 Examining the impact of parent-country macroeconomic variables on multinational firm in Nigeria.

The discussion in this section will be based on results presented in table 4.20 and table 4.24. The first table presents results for multinational firms with foreign macroeconomic variables while the second table presents multinational firms with both domestic and foreign macroeconomic variables. It is important to note that with the introduction of macroeconomic variables from respective parent-country, the explanatory power of included macro and firm specific-variables improve significantly. For instance, and as displayed in the two tables all the firm specific variables (including those that were not significant without the foreign macroeconomic variable in previous analysis) became statistically significant. This suggests the importance of macroeconomic conditions of countries where parent-firm of multinational firm in Nigeria is located. Thus, it is important to factor in these macroeconomic conditions when studying the determinants of capital structure of multinational firms.

Growth rate of GDP (GDP2), Interest rate (INR2), Inflation rate (INF2), and Exchange rate (EXR2) from respective parent-country were chosen to capture the macroeconomic conditions from parent-country. From the result in table 4.20, GDP, interest rate and exchange rate were found to be statistically significant and positively related to leverage of multinational firms in Nigeria. Thus, if GDP, interest rate and exchange rate of parent country rises, the leverage ratios of multinational firms in Nigeria will also rise and vice-versa. This shows that multinational firms are internationally mobile, can access external funds and hedge against risk. Further, Inflation rate was found to be significant and negatively related to leverage. This implies that higher inflation rate at country of origin/parent-country will lead to lower leverage ratio for affiliate firm in another host country. Several studies have established the possibility

of macroeconomic conditions of parent country affecting affiliate firm in another country (Lee & Kwok 1988; Shumi 2005; Mitto & Zhang 2008; Shumi & Barry 2009; Mari, et al., 2011; Shumi 2015).

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

This chapter presents the summary of major findings from the study and specific recommendations based on the empirical findings.

5.1: Summary of Study

This study investigated the determinants of capital structure of domestic and multinational firms in Nigeria. Fifty three non-financial firms, made up of ten multinational and forty three domestic firms were examined over the period 2005 to 2019. The intention is to find out if multinational and domestic firms' leverage ratio responds to firm-level variables and or macroeconomic variables differently or not. To achieve the study objectives, four firm-specific explanatory variables (profitability, tangibility, age and size) and four macroeconomic variables (GDP growth rate, Inflation rate, interest rate and exchange) were included in the model. Further, same four macroeconomic variables were sourced from parent country of multinational affiliate in Nigeria. The first effort was to establish if multinational firms and domestic firms differs in terms of leverage ratio. Thereafter, the study proceeds to check how firm-specific variable differs on their impact on leverage ratio. Further, impact of macroeconomic variables was examined in relation to how it affects multinational firm and domestic firm. In addition, impact of macroeconomic variables from parent-country of multinational firms was also examined in order to check how macroeconomic conditions from country of origin affect capital structure of affiliate firm. Finally, the study determines the speed of adjustment for both domestic and multinational firms listed on the Nigerian Stock Exchange (NSE).

Following are summary of major findings from the study:

- (i) One major finding from this study is that capital structure for domestic firms significantly differs from that of multinational firms. The result showed that the leverage ratio for multinational firm is significantly lower than the leverage ratio for domestic firm. This outcome is actually against the theoretical expectation for multinational firms because these firms are larger, more experience and are international mobile. These qualities put them in a vantage position to use more debt compare to domestic counterpart. Some variables like profitability, tangibility and interest rate were discovered to be part reasons why multinational firm would use lesser debt ratio than domestic firm while size would make them use more debt compare to domestic firm.
- (ii) Another finding from the study was the positive impact of one period lagged leverage ratio on firm current leverage ratio. Across all analysis conducted in this study, result revealed that lagged leverage ratio affect capital structure irrespective of whether the firms are separated into domestic and multinational or combined. Thus, firms listed on the stock exchange consider their past leverage level in determining the capital structure to pursue in the current period. Again, the result shows that the impact of lagged dependent variable on leverage for both categories of firm is same. Therefore, one other main findings from this study is that the relationship and magnitude of relationship between one period lagged leverage value and current leverage ratio is same for domestic and multinational firms.
- (iii) One more striking discovery from this study is that profitability was found to be significant across all models for both domestic and multinational firms. For

domestic firms, the relationship with leverage ratio was positive while for multinational firms it was negative. This shows that combining firms for the purpose of empirical investigation on capital structure may give a misleading result as shown in this study. From the study, it is clear that domestic firms follows the prediction of trade-off theory in determining capital structure when profitability is considered while multinational firms follows the theoretical expectation of pecking order theory.

- (iv) Tangibility and firm size were revealed not to be significant determinant of capital structure for domestic firms while these two firm-specific variables were significant determinant of capital structure for multinational firms. On the other hand, age was found to be a significant determinant of capital structure for domestic firms but not significant for multinational firms. This shows that multinational firms are relatively larger, stable and more experienced than domestic firms and thus their response to target leverage as a result of changes in firm level factors differs.
- (v) The growth rate of GDP was found not to be significant for both domestic and multinational firms. However, in the presence of foreign macroeconomic variable, it became significant for multinational firm. This shows foreign macroeconomic conditions of parent country of multinational firms have strong impact on capital structure of affiliate firm.
- (vi) Further, the result showed that certain macroeconomic variables affect leverage decision of both domestic and multinational firms. From the result, it was revealed that interest rate and exchange rate have similar impact on leverage decision for

both firm categories. For interest rate, the relationship with leverage was positive and the magnitude of relationship was same for both domestic and multinational firms. Also for exchange rate, the relationship with leverage was negative and the magnitude was same for both types of firms.

- (vii) Generally, the study found out that on average, domestic firms in Nigeria follows the prediction of trade-off theory in determining the capital structure while the multinational firms tend towards the theoretical expectation of pecking order theory. Thus merging all firms in a single analysis may not reveal the truth about how these firms choose their capital structure.
- (viii) Finally, the study finds that both domestic and multinational firm pursue target leverage. Also, both respond to deviation from target leverage at the same rate (0.29). Thus, the speed of adjustment is 3.4. Meaning both categories of firms will fully correct any deviation from target leverage in the fourth year, since 29 percent of total deviation will be corrected in the year of deviation.

5.2 Conclusion

The study concluded that profitability and lagged leverage ratio are most important firm-specific determinant of capital structure for domestic firms and multinational firms in Nigeria. Also, interest rate and exchange rate are most important macroeconomic variables that affect leverage decision for multinational and domestic firms.

Another important conclusion from the study is that, multinational firms' leverage ratio is relatively lower than that of domestic firms. That is multinational firms in Nigeria rely more on internal financing while domestic firms rely more on external financing. Although this may not be consistent with theoretical expectation of how international firms behave.

Also, macroeconomic conditions of parent-country affects leverage ratio of firms affiliate in Nigeria. In fact, with the presence of these macroeconomic variables, the explanatory power of both firm-specific variable and domestic macroeconomic variables in the model improves significantly. This is further evidenced by higher adjusted R^2 for the model reported in the model with foreign macroeconomic variables.

Firms examined in the study shows that domestic and multinational firms have target leverage that they pursue. The speed of adjustment for both firms is 3.4 meaning adjustment is completed in four years. This is relative due to cost of adjustment that is higher than cost of deviation from the target.

Also, the result from study showed that multinational firms followed the theoretical prediction of pecking-order theory while domestic firms followed the theoretical predictions of trade-off theory of capital structure.

Finally, the study concluded that, to understand the dynamic nature of capital structure of firms listed on the Nigeria Stock Exchange, it is important to separate domestic from the multinational firms because the multinational are internationally mobile and can decide to pursue capital structure of their parent firm or pursue capital structure that is similar to domestic firms in their host community or may choose to be independent in their behaviour towards choosing capital structure.

5.3 Recommendations

Based on the findings of this study, the following recommendations are proposed to ensure that managers of industries, appropriate government sector and stakeholders in the areas of

financial management understand how firm-specific and macroeconomic factors affect capital structure of listed domestic and multinational firms in Nigeria.

- (i) Multinational firms operate in international environment which exposes them to more risky situation on one hand and also to take available opportunities. This makes a great different between the multinational firms and their domestic counterparts. This study therefore recommends, on one hand, that managers of multinational firms should consider additional factors in determining target capital structure and, on the other hand, domestic firms should not assumed that factors respond to their target capital in similar way it affects multinational firms. For instance, this study has been able to establish that multinational firms relatively use lesser debt than domestic firms in their capital structure as a result of the complex interaction of both home and host country factors.
- (ii) Profitability appears to be a major firm-specific factor that affects both multinational firm and domestic firms. It is one of the variables that are responsible for relatively lower leverage for multinational firm. Again, the impact on leverage differs for both categories of firms. Since the relationship of profit level with leverage is positive for domestic firms, it therefore follows that, more profitable firms can use more debt in their capital structure while less profitable firms should use lesser debt. This is important because failure can raise the cost of bankruptcy for domestic firms. On the other hand, multinational firms appear safer since the result showed that more profitable firms use less debt. But there are other international factors that could be responsible for the observed relation between profitability and leverage ratio of multinational firms.

- (iii) Further, lagged leverage ratio was positively related to current leverage for both domestic and multinational firms. This shows that there is target leverage for both firms. It is therefore recommended that policy makers ensure they set their capital structure in accordance to the dictates of standard determinants of leverage ratio. In this study, both microeconomic variable and macroeconomic variables have been found to affect leverage ratio.
- (iv) In addition, the result has generally shown that multinational firms tend to behave in accordance to the prediction of Pecking-order theory while domestic firms respond to Trade-off theory prediction. It is therefore important that managers of firms know the implication of theory for achieving optimal target capital structure. This is important because, if firms deviate from optimal capital thereby reduces firm value. The implication will be adverse for the firm and the community at large.
- (v) Since multinationals have the capacity to access funds and other material from their home country, it is therefore important to consider the macroeconomic conditions at home when determining target leverage. In accordance to the result from this study, macroeconomic variables like GDP growth rate, inflation rate, interest rate and exchange are significant factor that contribute to the determination of capital structure. This should provide a policy direction for policy maker on the impact of parent-country macroeconomic variables on leverage ratio for multinational firm alone.
- (vi) Domestic country's interest rate and exchange rate are two key macroeconomic variables that affect capital structure of domestic and multinational firms in the

same proportion. These two variables are major tools of hedging against business risk. The result from the study confirms that both categories of firms respond to interest rate in accordance to trade-off theoretical predictions. One recommendation from this outcome is that firms should not rely only on firm specific variables when taking decisions about leverage ratio. In fact this study has been able to show that introducing macroeconomic factors into models that determine leverage ratio improves significantly, the explanatory power of the model.

- (vii) Finally the result shows that deviation from target leverage can only be fully corrected in the fourth year for both categories of firms. This confirms the fact that cost of deviation from target is lower than cost of returning back to target for domestic and multinational firms. The policy implication for managers of firms is that if this is allowed to continue for a very long time, it may raise the risk of bankruptcy which is not palatable to all stakeholders. Therefore, the policy makers should work toward keeping debt at a reasonable level because the higher the leverage ratio, the higher the bankruptcy cost and eventually business failure.

5.4 Contribution to Knowledge

This study has advanced the frontier of knowledge by modelling listed non-financial firms in Nigeria according to country of origin. This motivation is to establish for Nigeria if there is a significant difference in leverage ratio of multinational firm relative to their domestic counterpart as done in more developed countries. The purpose is to investigate and compare how firm-specific and macroeconomic variables affect capital structure of domestic firms and multinational firms' affiliates in Nigeria. Four firm specific variables like profitability,

tangibility, size of firm and firm age were examined. Similarly, four macroeconomic variables from host country were also examined. This exploration is to provide useful information for policy direction on determinants of capital structure of non-financial firms listed on the Nigerian Stock Exchange.

Further, based on the theoretical explanation that multinational firms are faced by international economic environment and forces not faced by their domestic counterparts, therefore, they are more likely to add international factors particularly from their home country to the regular standard determinant of capital structure from the host country. This study therefore, further the frontier of knowledge by adding factors that could represent the macroeconomic conditions from the parent-country of multinational firms. For this purpose, four foreign macroeconomic variables like GDP growth rate, interest rate, inflation rate and exchange rate were added to other variables to determine how these macroeconomic factors affect leverage ratio of multinational firm. Again, this will give a policy direction to managers of multinational firms in Nigeria on the impacts of macroeconomic conditions at home country on their capital structure.

5.5 Suggestions for Further Studies

This study has investigated and compares the determinant of capital structure of non-financial domestic and multinational firms in Nigeria. The study extensively examined how firm-specific variables (profitability, tangibility, age and size) and macroeconomic variables (GDP growth rate, interest rate, inflation rate and exchange rate) affect the capital structure of multinational firm relative to their domestic counterparts. Further research on this topic can consider some other variables which are currently not adequately available for this study. For instance, variables like bankruptcy cost and agency cost can be examined in future study.

Another area of recommendation emanating from this study is on how corporate governance factors (for instance board size, state ownership, concentrated ownership) will influence financial decision of MNCs differently from DCs.

Again, future researcher can consider how institutional factors like rule of law, ease of doing business, political conditions and so on affect the leverage decision of domestic and multinational firms in Nigeria. Finally, a cross-country examination of determinant of capital structure of MNCs and DCs is another area of recommendation emanating from the current study.

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APPENDIX

Appendix I: List of All Firms

SN	NAME OF FIRM	SECTOR	COUNTRY OF ORIGIN	STATUS
1	ELLAH LAKES PLC.	Agriculture	Nigeria	Domestic
2	LIVESTOCK FEEDS PLC.	Agriculture	Nigeria	Domestic
3	OKOMU OIL PALM PLC.	Agriculture	Nigeria	Domestic
4	CHELLARAMS PLC.	Conglomerates	Nigeria	Domestic
5	JOHN HOLT PLC.	Conglomerates	Nigeria	Domestic
6	S C O A NIG. PLC.	Conglomerates	United Kingdom	Multinational
7	U A C N PLC.	Conglomerates	Germany	Multinational
8	ARBICO PLC.	Construction/Real Estate	Nigeria	Domestic
9	JULIUS BERGER NIG. PLC.	Construction/Real Estate	Nigeria	Domestic
10	SMART PRODUCTS NIGERIA PLC	Construction/Real Estate	Nigeria	Domestic
11	UPDC PLC	Construction/Real Estate	Nigeria	Domestic
12	CADBURY NIGERIA PLC.	Consumer Goods	United Kingdom	Multinational
13	FLOUR MILLS NIG. PLC.	Consumer Goods	Nigeria	Domestic
14	GUINNESS NIG PLC	Consumer Goods	United Kingdom	Multinational
15	INTERNATIONAL BREWERIES PLC.	Consumer Goods	Nigeria	Domestic
16	N NIG. FLOUR MILLS PLC.	Consumer Goods	Nigeria	Domestic
17	NASCON ALLIED INDUSTRIES PLC	Consumer Goods	Nigeria	Domestic
18	NESTLE NIGERIA PLC.	Consumer Goods	Switzerland	Multinational
19	NIGERIAN BREW. PLC.	Consumer Goods	Nigeria	Domestic
20	NIGERIAN ENAMELWARE PLC.	Consumer Goods	Nigeria	Domestic
21	P Z CUSSONS NIGERIA PLC.	Consumer Goods	United Kingdom	Multinational
22	UNILEVER NIGERIA PLC.	Consumer Goods	United Kingdom	Multinational
23	VITAFOAM NIG PLC.	Consumer Goods	Nigeria	Domestic
24	GLAXO SMITHKLINE CONSUMER NIG. PLC.	Health Care	United Kingdom	Multinational
25	MAY & BAKER NIGERIA PLC.	Health Care	United	Multinational

			Kingdom	
26	MORISON INDUSTRIES PLC.	Health Care	Nigeria	Domestic
27	NEIMETH INTERNATIONAL PHARMACEUTICALS PLC	Health Care	Nigeria	Domestic
28	OMATEK VENTURES PLC	ICT	Nigeria	Domestic
29	AUSTIN LAZ & COMPANY PLC	Industrial Goods	Nigeria	Domestic
30	CAP PLC	Industrial Goods	Nigeria	Domestic
31	CUTIX PLC.	Industrial Goods	Nigeria	Domestic
32	LAFARGE AFRICA PLC.	Industrial Goods	Nigeria	Domestic
33	MEYER PLC.	Industrial Goods	Nigeria	Domestic
34	PREMIER PAINTS PLC.	Industrial Goods	Nigeria	Domestic
35	TRIPPLE GEE AND COMPANY PLC.	ICT	Nigeria	Domestic
36	INDUSTRIAL & MEDICAL GASES NIGERIA PLC (BOC Gases)	Natural Resources	Nigeria	Domestic
37	THOMAS WYATT NIG. PLC.	Natural Resources	Nigeria	Domestic
38	ARDOVA PLC	Oil and Gas	Nigeria	Domestic
39	CONOIL PLC	Oil and Gas	Nigeria	Domestic
40	ETERNA PLC.	Oil and Gas	Nigeria	Domestic
41	MRS OIL NIGERIA PLC.	Oil and Gas	Nigeria	Domestic
42	OANDO PLC	Oil and Gas	Nigeria	Domestic
43	TOTALENERGIES MARKETING NIGERIA PLC	Oil and Gas	France	Multinational
44	ACADEMY PRESS PLC.	Services	Nigeria	Domestic
45	CAPITAL HOTEL PLC	Services	Nigeria	Domestic
46	EUNISELL INTERLINKED PLC (Interlinked Tech)	Services	Nigeria	Domestic
47	JULI PLC.	Services	Nigeria	Domestic
48	LEARN AFRICA PLC	Services	Nigeria	Domestic
49	R T BRISCOE PLC.	Services	Nigeria	Domestic
50	TANTALIZERS PLC	Services	Nigeria	Domestic
51	TOURIST COMPANY OF NIGERIA PLC.	Services	Nigeria	Domestic
52	TRANS-NATIONWIDE EXPRESS PLC.	Services	Nigeria	Domestic
53	UNIVERSITY PRESS PLC.	Services	Nigeria	Domestic

Appendix II: Preliminary Analysis

1: Preliminary Analysis Based on Fixed Effect and Random Effect Model for All Firms

Random-effects GLS regression	Number of obs	=	742
Group variable: id	Number of groups	=	53
R-sq:	Obs per group:		
within = 0.0324	min =		14
between = 0.8334	avg =		14.0
overall = 0.0967	max =		14
corr(u_i, X) = 0 (assumed)	Wald chi2(18)	=	77.40
	Prob > chi2	=	0.0000

	lev	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]
lev		.2698142	.0363251	7.43	0.000	.1986183 .3410101
L1.						
prf		.0000698	.000054	1.29	0.196	-.000036 .0001756
age		.0004407	.0016031	0.27	0.783	-.0027013 .0035827
siz		-.004987	.0113737	-0.44	0.661	-.027279 .017305
tan		.0430596	.0746873	0.58	0.564	-.1033249 .1894441
gdp		.0125534	.021336	0.59	0.556	-.0292644 .0543712
inr		.010997	.0193036	0.57	0.569	-.0268373 .0488313
inf		.0089989	.0100402	0.90	0.370	-.0106794 .0286772
exr		.0009893	.0005925	1.67	0.095	-.0001719 .0021505
dum		-.1439837	1.130699	-0.13	0.899	-2.360113 2.072146
dumprf		-.3243976	.3061443	-1.06	0.289	-.9244293 .2756342
dumage		-.0001255	.0035651	-0.04	0.972	-.007113 .006862
dumsiz		.0390826	.039975	0.98	0.328	-.0392669 .1174322
dumtan		-.0144822	.2805173	-0.05	0.959	-.5642859 .5353216
dumgdp		-.014074	.0471136	-0.30	0.765	-.1064149 .078267
duminr		-.0105554	.0423984	-0.25	0.803	-.0936547 .072544
duminf		-.0072844	.0220905	-0.33	0.742	-.050581 .0360123
dumexr		-.0014408	.0012935	-1.11	0.265	-.0039761 .0010945
_cons		.0590856	.4331878	0.14	0.892	-.7899469 .9081181
sigma_u		0				
sigma_e		.53004795				
rho		0	(fraction of variance due to u_i)			

Fixed-effects (within) regression
 Group variable: **id**

Number of obs = **742**
 Number of groups = **53**

R-sq: within = **0.0949**
 between = **0.0074**
 overall = **0.0031**

Obs per group: min = **14**
 avg = **14.0**
 max = **14**

corr(u_i, Xb) = **-0.8442**

F(**18,671**) = **3.91**
 Prob > F = **0.0000**

lev	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
lev						
L1.	.0666911	.0381527	1.75	0.081	-.0082219 .141604	
prf	.0000323	.0000527	0.61	0.540	-.0000711 .0001357	
age	.0138898	.0162343	0.86	0.393	-.0179862 .0457659	
siz	-.27038	.0448237	-6.03	0.000	-.3583915 -.1823685	
tan	.0418681	.1118943	0.37	0.708	-.177837 .2615732	
gdp	.0166722	.0200666	0.83	0.406	-.0227286 .056073	
inr	.0222245	.0187048	1.19	0.235	-.0145025 .0589514	
inf	.0104503	.0095515	1.09	0.274	-.0083041 .0292048	
exr	.0014743	.0008627	1.71	0.088	-.0002197 .0031682	
dum	-2.437922	2.126554	-1.15	0.252	-6.613423 1.737578	
dumprf	-.2648013	.3660081	-0.72	0.470	-.9834603 .4538578	
dumage	-.0110358	.0382605	-0.29	0.773	-.0861604 .0640889	
dumsiz	.2428725	.1464241	1.66	0.098	-.0446321 .530377	
dumtan	-.0588244	.4222541	-0.14	0.889	-.8879226 .7702739	
dumgd	-.0219609	.0444348	-0.49	0.621	-.1092088 .065287	
p						
duminr	-.021712	.0410565	-0.53	0.597	-.1023267 .0589027	
duminf	-.0094506	.0210702	-0.45	0.654	-.0508222 .0319209	
dumexr	-.0018761	.0019373	-0.97	0.333	-.00568 .0019278	
_cons	3.424795	.7527853	4.55	0.000	1.946697 4.902894	
sigma_u	.56055601					
sigma_e	.53004795					
rho	.52795167	(fraction of variance due to u_i)				

F test that all u_i=0: F(52, 671) = **2.87**

Prob > F = **0.0000**

2: Hausman Test

Hausman fixed random

	(b)	(B)	(b-B)	sqrt(diag(V_b-V_B))fixed random
lev	.0666911	.2698142	-.2031231	.0116667
L1.				
prf	.0000323	.0000698	-.0000375	.
age	.0138898	.0004407	.0134491	.0161549
siz	-.27038	-.004987	-.265393	.0433567
tan	.0418681	.0430596	-.0011915	.0833195
gdp	.0166722	.0125534	.0041187	.
inr	.0222245	.010997	.0112275	.
inf	.0104503	.0089989	.0014514	.
exr	.0014743	.0009893	.000485	.0006271
dum	-2.437922	-.1439837	-2.293938	1.801042
dumprf	-.2648013	-.3243976	.0595963	.2005932
dumage	-.0110358	-.0001255	-.0109103	.038094
dumsiz	.2428725	.0390826	.2037898	.1408617
dumtan	-.0588244	-.0144822	-.0443422	.3156082
dumgdp	-.0219609	-.014074	-.0078869	.
duminr	-.021712	-.0105554	-.0111566	.
duminf	-.0094506	-.0072844	-.0021663	.
dumexr	-.0018761	-.0014408	-.0004353	.0014422

b = consistent under Ho and Ha; obtained from xtreg B = inconsistent under Ha, efficient under Ho; obtained from xtreg

Test:Ho:difference in coefficients not systematic

chi2(16) = (b-B)'[(V_b-V_B)^(-1)](b-B) = **378.69**

Prob>chi2 = **0.0000**

(V_b-V_B is not positive definite)

3: Test for Heteroskedasticity, Cross-Section Dependence and Autocorrelation for Fixed Effect Model

HETEROSKEDASTICITY TEST

Modified Wald test for groupwise heteroskedasticity in fixed effect regression model

H0: $\sigma(i)^2 = \sigma^2$ for all i

chi2 (53) = **4.4e+05**

Prob>chi2 = **0.0000**

CROSS- SECTION DEPENDECE TEST

Pesaran's test of cross sectional independence = **7.762**, Pr = **0.0000**

AUTOCORRELATION

Wooldridge test for autocorrelation in panel data

H0: no first-order autocorrelation

F(1, 52) = **0.430**

Prob > F = **0.5148**

Appendix III: Unit Roots Test

1: Unit Roots Test Based On AIC (Individual Intercept and Individual Intercept & Trend)

LEV

Panel unit root test: Summary

Series: LEV

Date: 01/02/23 Time: 15:08

Sample: 2005 2019

Exogenous variables: Individual effects

Automatic selection of maximum lags

Automatic lag length selection based on AIC: 0 to 2

Newey-West automatic bandwidth selection and Bartlett kernel

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-6.03504	0.0000	53	713
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-5.64397	0.0000	53	713
ADF - Fisher Chi-square	206.264	0.0000	53	713
PP - Fisher Chi-square	199.452	0.0000	53	742

** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

Panel unit root test: Summary

Series: LEV

Date: 01/02/23 Time: 15:10

Sample: 2005 2019

Exogenous variables: Individual effects, individual linear trends

Automatic selection of maximum lags

Automatic lag length selection based on AIC: 0 to 2

Newey-West automatic bandwidth selection and Bartlett kernel

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-9.15772	0.0000	53	702
Breitung t-stat	0.52949	0.7018	53	649
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-5.18028	0.0000	53	702
ADF - Fisher Chi-square	198.621	0.0000	53	702
PP - Fisher Chi-square	164.229	0.0002	53	742

** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

TAN

Panel unit root test: Summary

Series: TAN

Date: 01/02/23 Time: 15:11

Sample: 2005 2019

Exogenous variables: Individual effects

Automatic selection of maximum lags

Automatic lag length selection based on AIC: 0 to 2

Newey-West automatic bandwidth selection and Bartlett kernel

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-6.93354	0.0000	53	715
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-4.64446	0.0000	53	715
ADF - Fisher Chi-square	198.378	0.0000	53	715
PP - Fisher Chi-square	165.154	0.0002	53	742

** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

Panel unit root test: Summary

Series: TAN

Date: 01/02/23 Time: 15:12

Sample: 2005 2019

Exogenous variables: Individual effects, individual linear trends

Automatic selection of maximum lags

Automatic lag length selection based on AIC: 0 to 2

Newey-West automatic bandwidth selection and Bartlett kernel

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-6.99597	0.0000	53	715
Breitung t-stat	1.40926	0.9206	53	662
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-1.93496	0.0265	53	715
ADF - Fisher Chi-square	153.527	0.0018	53	715
PP - Fisher Chi-square	123.594	0.1165	53	742

** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

SIZ

Panel unit root test: Summary

Series: SIZ

Date: 01/02/23 Time: 15:13

Sample: 2005 2019

Exogenous variables: Individual effects

Automatic selection of maximum lags

Automatic lag length selection based on AIC: 0 to 2

Newey-West automatic bandwidth selection and Bartlett kernel

Method	Statistic	Prob.**	Cross-sections	Obs
<u>Null: Unit root (assumes common unit root process)</u>				
Levin, Lin & Chu t*	-14.1180	0.0000	53	707
<u>Null: Unit root (assumes individual unit root process)</u>				
Im, Pesaran and Shin W-stat	-7.21740	0.0000	53	707
ADF - Fisher Chi-square	246.312	0.0000	53	707
PP - Fisher Chi-square	270.550	0.0000	53	742

** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

Panel unit root test: Summary

Series: SIZ

Date: 01/02/23 Time: 15:14

Sample: 2005 2019

Exogenous variables: Individual effects, individual linear trends

Automatic selection of maximum lags

Automatic lag length selection based on AIC: 0 to 2

Newey-West automatic bandwidth selection and Bartlett kernel

Method	Statistic	Prob.**	Cross-sections	Obs
<u>Null: Unit root (assumes common unit root process)</u>				
Levin, Lin & Chu t*	-3.18309	0.0007	53	704
Breitung t-stat	-1.08055	0.1399	53	651
<u>Null: Unit root (assumes individual unit root process)</u>				
Im, Pesaran and Shin W-stat	0.13710	0.5545	53	704
ADF - Fisher Chi-square	113.630	0.2886	53	704
PP - Fisher Chi-square	164.679	0.0002	53	742

** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

PRF

Panel unit root test: Summary

Series: PRF

Date: 01/02/23 Time: 15:16

Sample: 2005 2019

Exogenous variables: Individual effects

Automatic selection of maximum lags

Automatic lag length selection based on AIC: 0 to 2

Newey-West automatic bandwidth selection and Bartlett kernel

Method	Statistic	Prob.**	Cross- sections	Obs
<hr/> Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-4.98025	0.0000	53	720
<hr/> Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-7.15181	0.0000	53	720
ADF - Fisher Chi-square	237.284	0.0000	53	720
PP - Fisher Chi-square	222.286	0.0000	53	742

** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

Panel unit root test: Summary

Series: PRF

Date: 01/02/23 Time: 15:18

Sample: 2005 2019

Exogenous variables: Individual effects, individual linear trends

Automatic selection of maximum lags

Automatic lag length selection based on AIC: 0 to 2

Newey-West automatic bandwidth selection and Bartlett kernel

Method	Statistic	Prob.**	Cross- sections	Obs
<hr/> Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	1.17741	0.8805	53	694
Breitung t-stat	3.51919	0.9998	53	641
<hr/> Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-5.83926	0.0000	53	694
ADF - Fisher Chi-square	216.924	0.0000	53	694
PP - Fisher Chi-square	227.521	0.0000	53	742

** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

GDP

Panel unit root test: Summary

Series: GDP

Date: 01/02/23 Time: 15:20

Sample: 2005 2019

Exogenous variables: Individual effects

Automatic selection of maximum lags

Automatic lag length selection based on AIC: 0

Newey-West automatic bandwidth selection and Bartlett kernel

Balanced observations for each test

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-5.99628	0.0000	53	742
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	2.21343	0.9866	53	742
ADF - Fisher Chi-square	47.9626	1.0000	53	742
PP - Fisher Chi-square	42.5673	1.0000	53	742

** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

Panel unit root test: Summary

Series: GDP

Date: 01/02/23 Time: 15:20

Sample: 2005 2019

Exogenous variables: Individual effects, individual linear trends

Automatic selection of maximum lags

Automatic lag length selection based on AIC: 1

Newey-West automatic bandwidth selection and Bartlett kernel

Balanced observations for each test

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-21.3692	0.0000	53	689
Breitung t-stat	-11.6527	0.0000	53	636
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-9.10735	0.0000	53	689
ADF - Fisher Chi-square	268.567	0.0000	53	689
PP - Fisher Chi-square	92.3348	0.8253	53	742

** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

INF

Panel unit root test: Summary

Series: INF

Date: 01/02/23 Time: 15:22

Sample: 2005 2019

Exogenous variables: Individual effects

Automatic selection of maximum lags

Automatic lag length selection based on AIC: 0

Newey-West automatic bandwidth selection and Bartlett kernel

Balanced observations for each test

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-17.9531	0.0000	53	742
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-9.77803	0.0000	53	742
ADF - Fisher Chi-square	267.459	0.0000	53	742
PP - Fisher Chi-square	249.875	0.0000	53	742

** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

Panel unit root test: Summary

Series: INF

Date: 01/02/23 Time: 15:23

Sample: 2005 2019

Exogenous variables: Individual effects, individual linear trends

Automatic selection of maximum lags

Automatic lag length selection based on AIC: 0

Newey-West automatic bandwidth selection and Bartlett kernel

Balanced observations for each test

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-17.3139	0.0000	53	742
Breitung t-stat	-15.5598	0.0000	53	689
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-6.55260	0.0000	53	742
ADF - Fisher Chi-square	195.018	0.0000	53	742
PP - Fisher Chi-square	190.639	0.0000	53	742

** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

INR

Panel unit root test: Summary

Series: INR

Date: 01/02/23 Time: 15:25

Sample: 2005 2019

Exogenous variables: Individual effects

Automatic selection of maximum lags

Automatic lag length selection based on AIC: 0

Newey-West automatic bandwidth selection and Bartlett kernel

Balanced observations for each test

Method	Statistic	Prob.**	Cross- sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-3.20464	0.0007	53	742
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-1.04839	0.1472	53	742
ADF - Fisher Chi-square	89.0156	0.8828	53	742
PP - Fisher Chi-square	89.0156	0.8828	53	742

** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

Panel unit root test: Summary

Series: INR

Date: 01/02/23 Time: 15:26

Sample: 2005 2019

Exogenous variables: Individual effects, individual linear trends

Automatic selection of maximum lags

Automatic lag length selection based on AIC: 1

Newey-West automatic bandwidth selection and Bartlett kernel

Balanced observations for each test

Method	Statistic	Prob.**	Cross- sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-12.5125	0.0000	53	689
Breitung t-stat	-8.98641	0.0000	53	636
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-3.33651	0.0004	53	689
ADF - Fisher Chi-square	141.584	0.0120	53	689
PP - Fisher Chi-square	533.133	0.0000	53	742

** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

EXR

Panel unit root test: Summary

Series: EXR

Date: 01/02/23 Time: 15:28

Sample: 2005 2019

Exogenous variables: Individual effects

Automatic selection of maximum lags

Automatic lag length selection based on AIC: 1

Newey-West automatic bandwidth selection and Bartlett kernel

Balanced observations for each test

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	2.07333	0.9809	53	689
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	5.65816	1.0000	53	689
ADF - Fisher Chi-square	21.1859	1.0000	53	689
PP - Fisher Chi-square	1.89133	1.0000	53	742

** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

Panel unit root test: Summary

Series: EXR

Date: 01/02/23 Time: 15:28

Sample: 2005 2019

Exogenous variables: Individual effects, individual linear trends

Automatic selection of maximum lags

Automatic lag length selection based on AIC: 1

Newey-West automatic bandwidth selection and Bartlett kernel

Balanced observations for each test

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-6.38574	0.0000	53	689
Breitung t-stat	-4.56258	0.0000	53	636
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-0.75041	0.2265	53	689
ADF - Fisher Chi-square	93.5657	0.8006	53	689
PP - Fisher Chi-square	30.6672	1.0000	53	742

** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

GDP2

Panel unit root test: Summary

Series: GDP2

Date: 01/02/23 Time: 15:40

Sample: 2005 2019

Exogenous variables: Individual effects

Automatic selection of maximum lags

Automatic lag length selection based on AIC: 0 to 2

Newey-West automatic bandwidth selection and Bartlett kernel

Method	Statistic	Prob.**	Cross- sections	Obs
<hr/> Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-7.62386	0.0000	10	137
<hr/> Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-4.79215	0.0000	10	137
ADF - Fisher Chi-square	56.7029	0.0000	10	137
PP - Fisher Chi-square	67.2659	0.0000	10	140

** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

Panel unit root test: Summary

Series: GDP2

Date: 01/02/23 Time: 15:42

Sample: 2005 2019

Exogenous variables: Individual effects, individual linear trends

Automatic selection of maximum lags

Automatic lag length selection based on AIC: 0 to 2

Newey-West automatic bandwidth selection and Bartlett kernel

Method	Statistic	Prob.**	Cross- sections	Obs
<hr/> Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-7.09580	0.0000	10	137
Breitung t-stat	-6.43753	0.0000	10	127
<hr/> Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-3.08987	0.0010	10	137
ADF - Fisher Chi-square	39.3986	0.0059	10	137
PP - Fisher Chi-square	46.5069	0.0007	10	140

** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

INF2

Panel unit root test: Summary

Series: INF2

Date: 01/02/23 Time: 15:43

Sample: 2005 2019

Exogenous variables: Individual effects

Automatic selection of maximum lags

Automatic lag length selection based on AIC: 0

Newey-West automatic bandwidth selection and Bartlett kernel

Balanced observations for each test

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-5.27714	0.0000	10	140
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-2.86904	0.0021	10	140
ADF - Fisher Chi-square	37.6001	0.0099	10	140
PP - Fisher Chi-square	36.1527	0.0148	10	140

** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

Panel unit root test: Summary

Series: INF2

Date: 01/02/23 Time: 15:44

Sample: 2005 2019

Exogenous variables: Individual effects, individual linear trends

Automatic selection of maximum lags

Automatic lag length selection based on AIC: 0 to 2

Newey-West automatic bandwidth selection and Bartlett kernel

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-4.57151	0.0000	10	138
Breitung t-stat	-3.35697	0.0004	10	128
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-1.39232	0.0819	10	138
ADF - Fisher Chi-square	25.0041	0.2013	10	138
PP - Fisher Chi-square	25.6934	0.1762	10	140

** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

INR2

Panel unit root test: Summary

Series: INR2

Date: 01/02/23 Time: 15:45

Sample: 2005 2019

Exogenous variables: Individual effects

Automatic selection of maximum lags

Automatic lag length selection based on AIC: 0 to 2

Newey-West automatic bandwidth selection and Bartlett kernel

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-0.97486	0.1648	10	126
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	2.42799	0.9924	10	126
ADF - Fisher Chi-square	3.90664	1.0000	10	126
PP - Fisher Chi-square	0.80244	1.0000	10	140

** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

Panel unit root test: Summary

Series: INR2

Date: 01/02/23 Time: 15:46

Sample: 2005 2019

Exogenous variables: Individual effects, individual linear trends

Automatic selection of maximum lags

Automatic lag length selection based on AIC: 0 to 1

Newey-West automatic bandwidth selection and Bartlett kernel

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-7.06767	0.0000	10	131
Breitung t-stat	-5.01021	0.0000	10	121
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-4.76114	0.0000	10	131
ADF - Fisher Chi-square	58.5109	0.0000	10	131
PP - Fisher Chi-square	37.1620	0.0112	10	140

** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

EXR2

Panel unit root test: Summary

Series: EXR2

Date: 01/02/23 Time: 15:48

Sample: 2005 2019

Exogenous variables: Individual effects

Automatic selection of maximum lags

Automatic lag length selection based on AIC: 0 to 2

Newey-West automatic bandwidth selection and Bartlett kernel

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	0.98414	0.8375	10	126
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	3.03120	0.9988	10	126
ADF - Fisher Chi-square	4.71756	0.9998	10	126
PP - Fisher Chi-square	6.77128	0.9974	10	140

** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

Panel unit root test: Summary

Series: EXR2

Date: 01/02/23 Time: 15:48

Sample: 2005 2019

Exogenous variables: Individual effects, individual linear trends

Automatic selection of maximum lags

Automatic lag length selection based on AIC: 0 to 1

Newey-West automatic bandwidth selection and Bartlett kernel

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-7.70702	0.0000	10	133
Breitung t-stat	-3.46447	0.0003	10	123
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-3.02782	0.0012	10	133
ADF - Fisher Chi-square	43.2044	0.0019	10	133
PP - Fisher Chi-square	20.6348	0.4189	10	140

** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

2: Unit Roots Test Based On SIC (Individual Intercept and Individual Intercept & Trend)

LEV

Panel unit root test: Summary

Series: LEV

Date: 01/02/23 Time: 14:31

Sample: 2005 2019

Exogenous variables: Individual effects

Automatic selection of maximum lags

Automatic lag length selection based on SIC: 0 to 2

Newey-West automatic bandwidth selection and Bartlett kernel

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-5.67672	0.0000	53	720
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-5.25152	0.0000	53	720
ADF - Fisher Chi-square	200.723	0.0000	53	720
PP - Fisher Chi-square	199.452	0.0000	53	742

** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

Panel unit root test: Summary

Series: LEV

Date: 01/02/23 Time: 14:36

Sample: 2005 2019

Exogenous variables: Individual effects, individual linear trends

Automatic selection of maximum lags

Automatic lag length selection based on SIC: 0 to 2

Newey-West automatic bandwidth selection and Bartlett kernel

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-9.26427	0.0000	53	708
Breitung t-stat	0.96967	0.8339	53	655
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-4.92889	0.0000	53	708
ADF - Fisher Chi-square	199.025	0.0000	53	708
PP - Fisher Chi-square	164.229	0.0002	53	742

** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

TAN

Panel unit root test: Summary

Series: TAN

Date: 01/02/23 Time: 14:39

Sample: 2005 2019

Exogenous variables: Individual effects

Automatic selection of maximum lags

Automatic lag length selection based on SIC: 0 to 2

Newey-West automatic bandwidth selection and Bartlett kernel

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-7.10788	0.0000	53	722
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-4.67407	0.0000	53	722
ADF - Fisher Chi-square	196.897	0.0000	53	722
PP - Fisher Chi-square	165.154	0.0002	53	742

** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

Panel unit root test: Summary

Series: TAN

Date: 01/02/23 Time: 14:41

Sample: 2005 2019

Exogenous variables: Individual effects, individual linear trends

Automatic selection of maximum lags

Automatic lag length selection based on SIC: 0 to 2

Newey-West automatic bandwidth selection and Bartlett kernel

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-7.14950	0.0000	53	723
Breitung t-stat	1.63567	0.9490	53	670
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-1.76189	0.0390	53	723
ADF - Fisher Chi-square	149.395	0.0035	53	723
PP - Fisher Chi-square	123.594	0.1165	53	742

** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

SIZ

Panel unit root test: Summary

Series: SIZ

Date: 01/02/23 Time: 14:51

Sample: 2005 2019

Exogenous variables: Individual effects

Automatic selection of maximum lags

Automatic lag length selection based on SIC: 0 to 2

Newey-West automatic bandwidth selection and Bartlett kernel

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-14.1423	0.0000	53	711
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-7.07155	0.0000	53	711
ADF - Fisher Chi-square	243.452	0.0000	53	711
PP - Fisher Chi-square	270.550	0.0000	53	742

** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

Panel unit root test: Summary

Series: SIZ

Date: 01/02/23 Time: 14:51

Sample: 2005 2019

Exogenous variables: Individual effects, individual linear trends

Automatic selection of maximum lags

Automatic lag length selection based on SIC: 0 to 2

Newey-West automatic bandwidth selection and Bartlett kernel

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-12.1061	0.0000	53	711
Breitung t-stat	-1.08127	0.1398	53	658
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-1.53187	0.0628	53	711
ADF - Fisher Chi-square	123.933	0.1125	53	711
PP - Fisher Chi-square	164.679	0.0002	53	742

** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

PRF

Panel unit root test: Summary

Series: PRF

Date: 01/02/23 Time: 14:54

Sample: 2005 2019

Exogenous variables: Individual effects

Automatic selection of maximum lags

Automatic lag length selection based on SIC: 0 to 2

Newey-West automatic bandwidth selection and Bartlett kernel

Method	Statistic	Prob.**	Cross-sections	Obs
<u>Null: Unit root (assumes common unit root process)</u>				
Levin, Lin & Chu t*	-5.03803	0.0000	53	725
<u>Null: Unit root (assumes individual unit root process)</u>				
Im, Pesaran and Shin W-stat	-7.01378	0.0000	53	725
ADF - Fisher Chi-square	234.666	0.0000	53	725
PP - Fisher Chi-square	222.286	0.0000	53	742

** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

Panel unit root test: Summary

Series: PRF

Date: 01/02/23 Time: 14:55

Sample: 2005 2019

Exogenous variables: Individual effects, individual linear trends

Automatic selection of maximum lags

Automatic lag length selection based on SIC: 0 to 2

Newey-West automatic bandwidth selection and Bartlett kernel

Method	Statistic	Prob.**	Cross-sections	Obs
<u>Null: Unit root (assumes common unit root process)</u>				
Levin, Lin & Chu t*	-0.29820	0.3828	53	706
Breitung t-stat	1.70659	0.9561	53	653
<u>Null: Unit root (assumes individual unit root process)</u>				
Im, Pesaran and Shin W-stat	-6.47484	0.0000	53	706
ADF - Fisher Chi-square	223.872	0.0000	53	706
PP - Fisher Chi-square	227.521	0.0000	53	742

** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

GDP

Panel unit root test: Summary

Series: GDP

Date: 01/02/23 Time: 14:56

Sample: 2005 2019

Exogenous variables: Individual effects

Automatic selection of maximum lags

Automatic lag length selection based on SIC: 0

Newey-West automatic bandwidth selection and Bartlett kernel

Balanced observations for each test

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-5.99628	0.0000	53	742
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	2.21343	0.9866	53	742
ADF - Fisher Chi-square	47.9626	1.0000	53	742
PP - Fisher Chi-square	42.5673	1.0000	53	742

** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

Panel unit root test: Summary

Series: GDP

Date: 01/02/23 Time: 14:57

Sample: 2005 2019

Exogenous variables: Individual effects, individual linear trends

Automatic selection of maximum lags

Automatic lag length selection based on SIC: 1

Newey-West automatic bandwidth selection and Bartlett kernel

Balanced observations for each test

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-21.3692	0.0000	53	689
Breitung t-stat	-11.6527	0.0000	53	636
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-9.10735	0.0000	53	689
ADF - Fisher Chi-square	268.567	0.0000	53	689
PP - Fisher Chi-square	92.3348	0.8253	53	742

** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

INF

Panel unit root test: Summary

Series: INF

Date: 01/02/23 Time: 14:59

Sample: 2005 2019

Exogenous variables: Individual effects

Automatic selection of maximum lags

Automatic lag length selection based on SIC: 0

Newey-West automatic bandwidth selection and Bartlett kernel

Balanced observations for each test

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-17.9531	0.0000	53	742
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-9.77803	0.0000	53	742
ADF - Fisher Chi-square	267.459	0.0000	53	742
PP - Fisher Chi-square	249.875	0.0000	53	742

** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

Panel unit root test: Summary

Series: INF

Date: 01/02/23 Time: 15:00

Sample: 2005 2019

Exogenous variables: Individual effects, individual linear trends

Automatic selection of maximum lags

Automatic lag length selection based on SIC: 0

Newey-West automatic bandwidth selection and Bartlett kernel

Balanced observations for each test

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-17.3139	0.0000	53	742
Breitung t-stat	-15.5598	0.0000	53	689
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-6.55260	0.0000	53	742
ADF - Fisher Chi-square	195.018	0.0000	53	742
PP - Fisher Chi-square	190.639	0.0000	53	742

** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

INR

Panel unit root test: Summary

Series: INR

Date: 01/02/23 Time: 15:04

Sample: 2005 2019

Exogenous variables: Individual effects

Automatic selection of maximum lags

Automatic lag length selection based on SIC: 0

Newey-West automatic bandwidth selection and Bartlett kernel

Balanced observations for each test

Method	Statistic	Prob.**	Cross-sections	Obs
<hr/> Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-3.20464	0.0007	53	742
<hr/> Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-1.04839	0.1472	53	742
ADF - Fisher Chi-square	89.0156	0.8828	53	742
PP - Fisher Chi-square	89.0156	0.8828	53	742

** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

Panel unit root test: Summary

Series: INR

Date: 01/02/23 Time: 15:04

Sample: 2005 2019

Exogenous variables: Individual effects, individual linear trends

Automatic selection of maximum lags

Automatic lag length selection based on SIC: 0

Newey-West automatic bandwidth selection and Bartlett kernel

Balanced observations for each test

Method	Statistic	Prob.**	Cross-sections	Obs
<hr/> Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-17.2021	0.0000	53	742
Breitung t-stat	-5.68691	0.0000	53	689
<hr/> Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-7.27489	0.0000	53	742
ADF - Fisher Chi-square	209.757	0.0000	53	742
PP - Fisher Chi-square	533.133	0.0000	53	742

** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

EXR

Panel unit root test: Summary

Series: EXR

Date: 01/02/23 Time: 15:05

Sample: 2005 2019

Exogenous variables: Individual effects

Automatic selection of maximum lags

Automatic lag length selection based on SIC: 1

Newey-West automatic bandwidth selection and Bartlett kernel

Balanced observations for each test

Method	Statistic	Prob.**	Cross-sections	Obs
<u>Null: Unit root (assumes common unit root process)</u>				
Levin, Lin & Chu t*	2.07333	0.9809	53	689
<u>Null: Unit root (assumes individual unit root process)</u>				
Im, Pesaran and Shin W-stat	5.65816	1.0000	53	689
ADF - Fisher Chi-square	21.1859	1.0000	53	689
PP - Fisher Chi-square	1.89133	1.0000	53	742

** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

Panel unit root test: Summary

Series: EXR

Date: 01/02/23 Time: 15:06

Sample: 2005 2019

Exogenous variables: Individual effects, individual linear trends

Automatic selection of maximum lags

Automatic lag length selection based on SIC: 1

Newey-West automatic bandwidth selection and Bartlett kernel

Balanced observations for each test

Method	Statistic	Prob.**	Cross-sections	Obs
<u>Null: Unit root (assumes common unit root process)</u>				
Levin, Lin & Chu t*	-6.38574	0.0000	53	689
Breitung t-stat	-4.56258	0.0000	53	636
<u>Null: Unit root (assumes individual unit root process)</u>				
Im, Pesaran and Shin W-stat	-0.75041	0.2265	53	689
ADF - Fisher Chi-square	93.5657	0.8006	53	689
PP - Fisher Chi-square	30.6672	1.0000	53	742

** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

GDP2

Panel unit root test: Summary

Series: GDP2

Date: 01/02/23 Time: 15:31

Sample: 2005 2019

Exogenous variables: Individual effects

Automatic selection of maximum lags

Automatic lag length selection based on SIC: 0 to 1

Newey-West automatic bandwidth selection and Bartlett kernel

Method	Statistic	Prob.**	Cross-sections	Obs
<hr/> Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-8.12266	0.0000	10	138
<hr/> Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-5.02185	0.0000	10	138
ADF - Fisher Chi-square	59.3782	0.0000	10	138
PP - Fisher Chi-square	67.2659	0.0000	10	140

** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

Panel unit root test: Summary

Series: GDP2

Date: 01/02/23 Time: 15:33

Sample: 2005 2019

Exogenous variables: Individual effects, individual linear trends

Automatic selection of maximum lags

Automatic lag length selection based on SIC: 0 to 2

Newey-West automatic bandwidth selection and Bartlett kernel

Method	Statistic	Prob.**	Cross-sections	Obs
<hr/> Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-7.09580	0.0000	10	137
Breitung t-stat	-6.43753	0.0000	10	127
<hr/> Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-3.08987	0.0010	10	137
ADF - Fisher Chi-square	39.3986	0.0059	10	137
PP - Fisher Chi-square	46.5069	0.0007	10	140

** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

INF2

Panel unit root test: Summary

Series: INF2

Date: 01/02/23 Time: 15:34

Sample: 2005 2019

Exogenous variables: Individual effects

Automatic selection of maximum lags

Automatic lag length selection based on SIC: 0

Newey-West automatic bandwidth selection and Bartlett kernel

Balanced observations for each test

Method	Statistic	Prob.**	Cross-sections	Obs
<hr/> Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-5.27714	0.0000	10	140
<hr/> Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-2.86904	0.0021	10	140
ADF - Fisher Chi-square	37.6001	0.0099	10	140
PP - Fisher Chi-square	36.1527	0.0148	10	140

** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

Panel unit root test: Summary

Series: INF2

Date: 01/02/23 Time: 15:35

Sample: 2005 2019

Exogenous variables: Individual effects, individual linear trends

Automatic selection of maximum lags

Automatic lag length selection based on SIC: 0 to 2

Newey-West automatic bandwidth selection and Bartlett kernel

Method	Statistic	Prob.**	Cross-sections	Obs
<hr/> Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-4.57151	0.0000	10	138
Breitung t-stat	-3.35697	0.0004	10	128
<hr/> Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-1.39232	0.0819	10	138
ADF - Fisher Chi-square	25.0041	0.2013	10	138
PP - Fisher Chi-square	25.6934	0.1762	10	140

** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

INR2

Panel unit root test: Summary

Series: INR2

Date: 01/02/23 Time: 15:36

Sample: 2005 2019

Exogenous variables: Individual effects

Automatic selection of maximum lags

Automatic lag length selection based on SIC: 0 to 2

Newey-West automatic bandwidth selection and Bartlett kernel

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-0.97486	0.1648	10	126
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	2.42799	0.9924	10	126
ADF - Fisher Chi-square	3.90664	1.0000	10	126
PP - Fisher Chi-square	0.80244	1.0000	10	140

** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

Panel unit root test: Summary

Series: INR2

Date: 01/02/23 Time: 15:36

Sample: 2005 2019

Exogenous variables: Individual effects, individual linear trends

Automatic selection of maximum lags

Automatic lag length selection based on SIC: 0 to 1

Newey-West automatic bandwidth selection and Bartlett kernel

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-7.06767	0.0000	10	131
Breitung t-stat	-5.01021	0.0000	10	121
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-4.76114	0.0000	10	131
ADF - Fisher Chi-square	58.5109	0.0000	10	131
PP - Fisher Chi-square	37.1620	0.0112	10	140

** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

EXR2

Panel unit root test: Summary

Series: EXR2

Date: 01/02/23 Time: 15:38

Sample: 2005 2019

Exogenous variables: Individual effects

Automatic selection of maximum lags

Automatic lag length selection based on SIC: 0 to 2

Newey-West automatic bandwidth selection and Bartlett kernel

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	0.98414	0.8375	10	126
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	3.03120	0.9988	10	126
ADF - Fisher Chi-square	4.71756	0.9998	10	126
PP - Fisher Chi-square	6.77128	0.9974	10	140

** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

Panel unit root test: Summary

Series: EXR2

Date: 01/02/23 Time: 15:39

Sample: 2005 2019

Exogenous variables: Individual effects, individual linear trends

Automatic selection of maximum lags

Automatic lag length selection based on SIC: 0 to 1

Newey-West automatic bandwidth selection and Bartlett kernel

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-7.70702	0.0000	10	133
Breitung t-stat	-3.46447	0.0003	10	123
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-3.02782	0.0012	10	133
ADF - Fisher Chi-square	43.2044	0.0019	10	133
PP - Fisher Chi-square	20.6348	0.4189	10	140

** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

Appendix IV: Main Regression Result for All Firms

1: With Interactive Terms

Dependent Variable: LEV

Method: Panel EGLS (Period SUR)

Date: 01/07/23 Time: 17:32

Sample (adjusted): 2006 2019

Periods included: 14

Cross-sections included: 53

Total panel (balanced) observations: 742

Linear estimation after one-step weighting matrix

White diagonal standard errors & covariance (d.f. corrected)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.402105	0.152936	2.629232	0.0087
LEV(-1)	0.283760	0.014178	20.01377	0.0000
PRF	6.88E-05	3.73E-06	18.44157	0.0000
TAN	0.050875	0.034365	1.480447	0.1392
AGE	0.002103	0.001091	1.927231	0.0543
SIZ	-0.011238	0.008947	-1.256008	0.2095
GDP	-0.003824	0.004363	-0.876402	0.3811
INR	0.006729	0.002778	2.422397	0.0157
INF	0.001598	0.002263	0.706000	0.4804
EXR	0.000153	0.000282	0.540656	0.5889
DUM	-0.743512	0.260761	-2.851323	0.0045
DUM*PRF	-0.246153	0.056128	-4.385536	0.0000
DUM*TAN	-0.140991	0.083159	-1.695434	0.0904
DUM*AGE	0.000278	0.001564	0.177632	0.8591
DUM*SIZ	0.054516	0.014665	3.717514	0.0002
DUM*GDP	0.005858	0.006129	0.955828	0.3395
DUM*INR	-0.006565	0.003935	-1.668230	0.0957
DUM*INF	-0.000546	0.003451	-0.158295	0.8743
DUM*EXR	-0.000513	0.000478	-1.073560	0.2834

Weighted Statistics

R-squared	0.433359	Mean dependent var	1.018374
Adjusted R-squared	0.419252	S.D. dependent var	1.547591
S.E. of regression	0.993176	Sum squared resid	713.1656
F-statistic	30.71889	Durbin-Watson stat	1.994153
Prob(F-statistic)	0.000000		

Unweighted Statistics

R-squared	0.088433	Mean dependent var	0.662148
Sum squared resid	232.4933	Durbin-Watson stat	2.238125

2: Without Interactive Terms

Dependent Variable: LEV

Method: Panel EGLS (Cross-section weights)

Date: 01/07/23 Time: 18:03

Sample (adjusted): 2006 2019

Periods included: 14

Cross-sections included: 53

Total panel (balanced) observations: 742

Linear estimation after one-step weighting matrix

White cross-section standard errors & covariance (d.f. corrected)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.143680	0.068730	2.090521	0.0369
LEV(-1)	0.732100	0.053206	13.75963	0.0000
PRF	5.02E-05	1.89E-06	26.58919	0.0000
TAN	0.007598	0.024521	0.309868	0.7567
AGE	0.000467	0.000205	2.277853	0.0230
SIZ	0.000321	0.002531	0.126766	0.8992
GDP	-0.002917	0.002817	-1.035687	0.3007
INR	0.003651	0.002629	1.388666	0.1654
INF	0.001428	0.001176	1.213695	0.2253
EXR	-0.000231	0.000101	-2.292680	0.0221
DUM	-0.025669	0.008522	-3.012132	0.0027

Weighted Statistics

R-squared	0.552991	Mean dependent var	1.965069
Adjusted R-squared	0.546876	S.D. dependent var	1.331557
S.E. of regression	0.440340	Sum squared resid	141.7401
F-statistic	90.43137	Durbin-Watson stat	2.176906
Prob(F-statistic)	0.000000		

Unweighted Statistics

R-squared	-0.112309	Mean dependent var	0.662148
Sum squared resid	283.6923	Durbin-Watson stat	3.029292

3: Cross-Section Dependence Test for Model with Interactive Terms

Residual Cross-Section Dependence Test

Null hypothesis: No cross-section dependence (correlation) in weighted

Residuals

Equation: Untitled

Periods included: 14

Cross-sections included: 53

Total panel observations: 742

Note: non-zero cross-section means detected in data

Cross-section means were removed during computation of correlations

Test	Statistic	d.f.	Prob.
Breusch-Pagan LM	1501.608	1378	0.0107
Pesaran scaled LM	2.354546		0.0185
Pesaran CD	-0.160743		0.8723

4: Cross-Section Dependence Test for Model without Interactive Terms

Residual Cross-Section Dependence Test

Null hypothesis: No cross-section dependence (correlation) in weighted Residuals

Equation: Untitled

Periods included: 14

Cross-sections included: 53

Total panel observations: 742

Note: non-zero cross-section means detected in data

Cross-section means were removed during computation of correlations

Test	Statistic	d.f.	Prob.
Breusch-Pagan LM	1660.866	1378	0.0000
Pesaran scaled LM	5.388174		0.0000
Pesaran CD	-0.181284		0.8561

Appendix V: Main Regression Result for Domestic Firms (WCSEC & WPSEC)

1: Based on WCSEC

Dependent Variable: LEV

Method: Panel EGLS (Cross-section weights)

Date: 12/30/22 Time: 10:50

Sample (adjusted): 2006 2019

Periods included: 14

Cross-sections included: 43

Total panel (balanced) observations: 602

Linear estimation after one-step weighting matrix

White cross-section standard errors & covariance (d.f. corrected)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.122478	0.077271	1.585041	0.1135
LEV(-1)	0.711330	0.061562	11.55468	0.0000
PRF	5.09E-05	1.80E-06	28.23871	0.0000
TAN	0.010943	0.024094	0.454166	0.6499
SIZ	-0.002074	0.003242	-0.639634	0.5227
AGE	0.000669	0.000400	1.673396	0.0948
GDP	-0.001375	0.003895	-0.352860	0.7243
INR	0.007237	0.003234	2.237752	0.0256
EXR	-0.000225	0.000122	-1.838420	0.0665
INF	0.002456	0.001644	1.494276	0.1356

Weighted Statistics

R-squared	0.514851	Mean dependent var	1.947985
Adjusted R-squared	0.507476	S.D. dependent var	1.382364

S.E. of regression	0.487112	Sum squared resid	140.4688
F-statistic	69.80496	Durbin-Watson stat	2.211967
Prob(F-statistic)	0.000000		

Unweighted Statistics

R-squared	-0.109725	Mean dependent var	0.678396
Sum squared resid	277.3154	Durbin-Watson stat	3.019342

2: Based on WPSEC

Dependent Variable: LEV
Method: Panel EGLS (Cross-section weights)
Date: 12/30/22 Time: 10:50
Sample (adjusted): 2006 2019
Periods included: 14
Cross-sections included: 43
Total panel (balanced) observations: 602
Linear estimation after one-step weighting matrix
White period standard errors & covariance (d.f. corrected)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.122478	0.088386	1.385723	0.1664
LEV(-1)	0.711330	0.042623	16.68892	0.0000
PRF	5.09E-05	1.63E-06	31.30520	0.0000
TAN	0.010943	0.019502	0.561100	0.5749
SIZ	-0.002074	0.003540	-0.585807	0.5582
AGE	0.000669	0.000329	2.034742	0.0423
GDP	-0.001375	0.003144	-0.437237	0.6621
INR	0.007237	0.003735	1.937607	0.0531
EXR	-0.000225	0.000116	-1.933421	0.0537
INF	0.002456	0.002103	1.167775	0.2434

Weighted Statistics

R-squared	0.514851	Mean dependent var	1.947985
Adjusted R-squared	0.507476	S.D. dependent var	1.382364
S.E. of regression	0.487112	Sum squared resid	140.4688
F-statistic	69.80496	Durbin-Watson stat	2.211967
Prob(F-statistic)	0.000000		

Unweighted Statistics

R-squared	-0.109725	Mean dependent var	0.678396
Sum squared resid	277.3154	Durbin-Watson stat	3.019342

3: Cross-Section Dependence Test (WCSEC)

Residual Cross-Section Dependence Test

Null hypothesis: No cross-section dependence (correlation) in weighted Residuals

Equation: Untitled

Periods included: 14

Cross-sections included: 43

Total panel observations: 602

Note: non-zero cross-section means detected in data

Cross-section means were removed during computation of correlations

Test	Statistic	d.f.	Prob.
Breusch-Pagan LM	1084.583	903	0.0000
Pesaran scaled LM	4.272847		0.0000
Pesaran CD	0.567045		0.5707

4: Cross-Section Dependence Test (WPSEC)

Residual Cross-Section Dependence Test

Null hypothesis: No cross-section dependence (correlation) in weighted Residuals

Equation: Untitled

Periods included: 14

Cross-sections included: 43

Total panel observations: 602

Note: non-zero cross-section means detected in data

Cross-section means were removed during computation of correlations

Test	Statistic	d.f.	Prob.
Breusch-Pagan LM	1084.583	903	0.0000
Pesaran scaled LM	4.272847		0.0000
Pesaran CD	0.567045		0.5707

Appendix VI: Main Regression Result for Multinational Firms (PWSEC & CWSEC)

1: Multinational with Foreign Macroeconomic Variables (PWSEC)

Dependent Variable: LEV

Method: Panel EGLS (Cross-section SUR)

Date: 12/30/22 Time: 11:11

Sample (adjusted): 2006 2019

Periods included: 14

Cross-sections included: 10

Total panel (balanced) observations: 140

Linear estimation after one-step weighting matrix

Period weights (PCSE) standard errors & covariance (d.f. corrected)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.036499	0.099393	-0.367221	0.7141
LEV(-1)	0.679629	0.044834	15.15895	0.0000
PRF	-0.241872	0.039879	-6.065197	0.0000
TAN	-0.026459	0.015784	-1.676365	0.0961
SIZ	0.010851	0.004548	2.385988	0.0185
AGE	-0.000617	0.000328	-1.878552	0.0625
GDP2	0.003713	0.001291	2.877175	0.0047
INR2	0.014718	0.002985	4.930097	0.0000
INF2	-0.019931	0.003414	-5.838008	0.0000
EXR2	0.139269	0.030967	4.497348	0.0000

Weighted Statistics

R-squared	0.903546	Mean dependent var	16.66547
Adjusted R-squared	0.896869	S.D. dependent var	18.61787
S.E. of regression	1.003189	Sum squared resid	130.8306
F-statistic	135.3104	Durbin-Watson stat	2.003623
Prob(F-statistic)	0.000000		

Unweighted Statistics

R-squared	0.593053	Mean dependent var	0.623404
Sum squared resid	1.627780	Durbin-Watson stat	1.878759

2: Multinational with Foreign Macroeconomic Variables (CWSEC)

Dependent Variable: LEV

Method: Panel EGLS (Cross-section SUR)

Date: 12/30/22 Time: 11:12

Sample (adjusted): 2006 2019

Periods included: 14

Cross-sections included: 10

Total panel (balanced) observations: 140

Linear estimation after one-step weighting matrix

Cross-section weights (PCSE) standard errors & covariance (d.f. corrected)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.036499	0.096992	-0.376314	0.7073
LEV(-1)	0.679629	0.043402	15.65886	0.0000
PRF	-0.241872	0.039180	-6.173387	0.0000
TAN	-0.026459	0.015312	-1.728055	0.0864
SIZ	0.010851	0.004416	2.457123	0.0153
AGE	-0.000617	0.000333	-1.853579	0.0661
GDP2	0.003713	0.001194	3.110055	0.0023
INR2	0.014718	0.002905	5.065675	0.0000
INF2	-0.019931	0.003480	-5.727959	0.0000
EXR2	0.139269	0.030369	4.585840	0.0000

Weighted Statistics

R-squared	0.903546	Mean dependent var	16.66547
Adjusted R-squared	0.896869	S.D. dependent var	18.61787
S.E. of regression	1.003189	Sum squared resid	130.8306
F-statistic	135.3104	Durbin-Watson stat	2.003623
Prob(F-statistic)	0.000000		

Unweighted Statistics

R-squared	0.593053	Mean dependent var	0.623404
Sum squared resid	1.627780	Durbin-Watson stat	1.878759

3: Cross-Section Dependence Test (PWSEC)

Residual Cross-Section Dependence Test

Null hypothesis: No cross-section dependence (correlation) in weighted Residuals

Equation: Untitled

Periods included: 14

Cross-sections included: 10

Total panel observations: 140

Note: non-zero cross-section means detected in data

Cross-section means were removed during computation of correlations

Test	Statistic	d.f.	Prob.
Breusch-Pagan LM	11.69382	45	1.0000
Pesaran scaled LM	-3.510779		0.0004
Pesaran CD	0.310309		0.7563

4: Cross-Section Dependence Test (CWSEC)

Residual Cross-Section Dependence Test

Null hypothesis: No cross-section dependence (correlation) in weighted

Residuals
Equation: Untitled
Periods included: 14
Cross-sections included: 10
Total panel observations: 140
Note: non-zero cross-section means detected in data
Cross-section means were removed during computation of correlations

Test	Statistic	d.f.	Prob.
Breusch-Pagan LM	11.69382	45	1.0000
Pesaran scaled LM	-3.510779		0.0004
Pesaran CD	0.310309		0.7563

5: Multinational with Domestic Macroeconomic Variables (PWSEC)

Dependent Variable: LEV
Method: Panel EGLS (Cross-section SUR)
Date: 01/02/23 Time: 11:16
Sample (adjusted): 2006 2019
Periods included: 14
Cross-sections included: 10
Total panel (balanced) observations: 140
Linear estimation after one-step weighting matrix
Period weights (PCSE) standard errors & covariance (d.f. corrected)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.101915	0.090193	-1.129967	0.2606
LEV(-1)	0.711775	0.039927	17.82698	0.0000
PRF	-0.214353	0.037966	-5.645853	0.0000
TAN	-0.047482	0.017652	-2.689821	0.0081
SIZ	0.018578	0.004614	4.026775	0.0001
AGE	-0.000440	0.000312	-1.410566	0.1608
GDP	0.001809	0.002191	0.825334	0.4107
INF	0.001831	0.001097	1.669450	0.0974
INR	0.004440	0.001899	2.338598	0.0209
EXR	-0.000329	6.92E-05	-4.762560	0.0000

Weighted Statistics

R-squared	0.954254	Mean dependent var	19.19988
Adjusted R-squared	0.951087	S.D. dependent var	14.75388
S.E. of regression	1.025485	Sum squared resid	136.7106
F-statistic	301.3119	Durbin-Watson stat	1.954824
Prob(F-statistic)	0.000000		

Unweighted Statistics

R-squared	0.582565	Mean dependent var	0.623404
Sum squared resid	1.669734	Durbin-Watson stat	1.843755

6: Multinational with Domestic Macroeconomic Variables (CWSEC)

Dependent Variable: LEV

Method: Panel EGLS (Cross-section SUR)

Date: 01/02/23 Time: 11:17

Sample (adjusted): 2006 2019

Periods included: 14

Cross-sections included: 10

Total panel (balanced) observations: 140

Linear estimation after one-step weighting matrix

Cross-section weights (PCSE) standard errors & covariance (d.f. corrected)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.101915	0.086666	-1.175954	0.2418
LEV(-1)	0.711775	0.038531	18.47301	0.0000
PRF	-0.214353	0.034829	-6.154478	0.0000
TAN	-0.047482	0.017034	-2.787465	0.0061
SIZ	0.018578	0.004484	4.142721	0.0001
AGE	-0.000440	0.000294	-1.497004	0.1368
GDP	0.001809	0.002167	0.834517	0.4055
INF	0.001831	0.001021	1.793859	0.0752
INR	0.004440	0.001975	2.248059	0.0263
EXR	-0.000329	6.27E-05	-5.251990	0.0000

Weighted Statistics

R-squared	0.954254	Mean dependent var	19.19988
Adjusted R-squared	0.951087	S.D. dependent var	14.75388
S.E. of regression	1.025485	Sum squared resid	136.7106
F-statistic	301.3119	Durbin-Watson stat	1.954824
Prob(F-statistic)	0.000000		

Unweighted Statistics

R-squared	0.582565	Mean dependent var	0.623404
Sum squared resid	1.669734	Durbin-Watson stat	1.843755

7: Cross-Section Dependence Test (PWSEC)

Residual Cross-Section Dependence Test

Null hypothesis: No cross-section dependence (correlation) in weighted Residuals

Equation: Untitled

Periods included: 14

Cross-sections included: 10

Total panel observations: 140

Note: non-zero cross-section means detected in data

Cross-section means were removed during computation of correlations

Test	Statistic	d.f.	Prob.
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Breusch-Pagan LM	10.19677	45	1.0000
Pesaran scaled LM	-3.668582		0.0002
Pesaran CD	0.138155		0.8901

8: Cross-Section Dependence Test (CWSEC)

Residual Cross-Section Dependence Test

Null hypothesis: No cross-section dependence (correlation) in weighted Residuals

Equation: Untitled

Periods included: 14

Cross-sections included: 10

Total panel observations: 140

Note: non-zero cross-section means detected in data

Cross-section means were removed during computation of correlations

Test	Statistic	d.f.	Prob.
Breusch-Pagan LM	10.19677	45	1.0000
Pesaran scaled LM	-3.668582		0.0002
Pesaran CD	0.138155		0.8901

9: Multinational with All Macroeconomic Variables (PWSEC)

Dependent Variable: LEV

Method: Panel EGLS (Cross-section SUR)

Date: 01/02/23 Time: 11:05

Sample (adjusted): 2006 2019

Periods included: 14

Cross-sections included: 10

Total panel (balanced) observations: 140

Linear estimation after one-step weighting matrix

Period weights (PCSE) standard errors & covariance (d.f. corrected)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.079169	0.100617	-0.786831	0.4329
LEV(-1)	0.726726	0.040568	17.91372	0.0000
PRF	-0.234187	0.034883	-6.713493	0.0000
TAN	-0.035923	0.017487	-2.054309	0.0420
SIZ	0.008764	0.004773	1.836123	0.0687
AGE	-0.000631	0.000313	-2.017553	0.0458
GDP2	0.002435	0.000854	2.849755	0.0051
EXR2	0.123308	0.038394	3.211626	0.0017
INF2	-0.021885	0.003541	-6.180029	0.0000
INR2	0.001996	0.004407	0.452894	0.6514
GDP	0.006931	0.001306	5.306949	0.0000
INF	0.004194	0.000593	7.070521	0.0000
INR	0.009566	0.001282	7.462561	0.0000
EXR	-0.000451	4.64E-05	-9.729145	0.0000

Weighted Statistics

R-squared	0.933453	Mean dependent var	30.78731
Adjusted R-squared	0.926587	S.D. dependent var	34.02704
S.E. of regression	1.016175	Sum squared resid	130.1092
F-statistic	135.9535	Durbin-Watson stat	2.077380
Prob(F-statistic)	0.000000		

Unweighted Statistics

R-squared	0.605019	Mean dependent var	0.623404
Sum squared resid	1.579916	Durbin-Watson stat	1.963949

10: Multinational with All (CWSEC)

Dependent Variable: LEV

Method: Panel EGLS (Cross-section SUR)

Date: 01/02/23 Time: 11:07

Sample (adjusted): 2006 2019

Periods included: 14

Cross-sections included: 10

Total panel (balanced) observations: 140

Linear estimation after one-step weighting matrix

Cross-section weights (PCSE) standard errors & covariance (d.f. corrected)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.079169	0.098559	-0.803262	0.4233
LEV(-1)	0.726726	0.036638	19.83541	0.0000
PRF	-0.234187	0.031572	-7.417512	0.0000
TAN	-0.035923	0.016534	-2.172654	0.0317
SIZ	0.008764	0.004679	1.873091	0.0634
AGE	-0.000631	0.000306	-2.064078	0.0411
GDP2	0.002435	0.000871	2.795474	0.0060
EXR2	0.123308	0.036982	3.334250	0.0011
INF2	-0.021885	0.003315	-6.601440	0.0000
INR2	0.001996	0.004154	0.480464	0.6317
GDP	0.006931	0.001236	5.606170	0.0000
INF	0.004194	0.000556	7.543955	0.0000
INR	0.009566	0.001270	7.534339	0.0000
EXR	-0.000451	4.02E-05	-11.23223	0.0000

Weighted Statistics

R-squared	0.933453	Mean dependent var	30.78731
Adjusted R-squared	0.926587	S.D. dependent var	34.02704
S.E. of regression	1.016175	Sum squared resid	130.1092
F-statistic	135.9535	Durbin-Watson stat	2.077380
Prob(F-statistic)	0.000000		

Unweighted Statistics

R-squared	0.605019	Mean dependent var	0.623404
Sum squared resid	1.579916	Durbin-Watson stat	1.963949

11: Cross-Section Dependence Test (PWSEC)

Residual Cross-Section Dependence Test

Null hypothesis: No cross-section dependence (correlation) in weighted Residuals

Equation: Untitled

Periods included: 14

Cross-sections included: 10

Total panel observations: 140

Note: non-zero cross-section means detected in data

Cross-section means were removed during computation of correlations

Test	Statistic	d.f.	Prob.
Breusch-Pagan LM	13.68057	45	1.0000
Pesaran scaled LM	-3.301358		0.0010
Pesaran CD	-0.340024		0.7338

12: Cross-Section Dependence Test (CWSEC)

Residual Cross-Section Dependence Test

Null hypothesis: No cross-section dependence (correlation) in weighted Residuals

Equation: Untitled

Periods included: 14

Cross-sections included: 10

Total panel observations: 140

Note: non-zero cross-section means detected in data

Cross-section means were removed during computation of correlations

Test	Statistic	d.f.	Prob.
Breusch-Pagan LM	13.68057	45	1.0000
Pesaran scaled LM	-3.301358		0.0010
Pesaran CD	-0.340024		0.7338

13: Regression Results from Consumer Goods Sector

Dependent Variable: LEV

Method: Panel EGLS (Cross-section SUR)

Date: 07/06/23 Time: 11:17

Sample (adjusted): 2006 2019

Periods included: 14

Cross-sections included: 12

Total panel (balanced) observations: 168

Linear estimation after one-step weighting matrix

Cross-section SUR (PCSE) standard errors & covariance (d.f. corrected)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.153985	0.078382	-1.964559	0.0513
LEV(-1)	0.536898	0.028546	18.80809	0.0000
PRF	-0.932346	0.047286	-19.71704	0.0000
AGE	0.000123	0.001068	0.114750	0.9088

SIZ	0.035602	0.005574	6.386900	0.0000
TAN	-0.247599	0.047228	-5.242603	0.0000
GDP	0.002205	0.002712	0.813048	0.4175
INR	0.012792	0.002319	5.516840	0.0000
INF	0.005296	0.001223	4.329178	0.0000
EXR	-0.000917	0.000101	-9.031759	0.0000
DUM	1.343739	0.220856	6.084222	0.0000
DUM*(PRF)	0.877708	0.068164	12.87642	0.0000
DUM*(AGE)	-0.000849	0.001078	-0.787830	0.4320
DUM*(SIZ)	-0.106808	0.013207	-8.087110	0.0000
DUM*(TAN)	0.660380	0.063930	10.32978	0.0000
DUM*(GDP)	-0.000401	0.004099	-0.097705	0.9223
DUM*(INR)	0.000605	0.003607	0.167828	0.8669
DUM*(INF)	0.002384	0.001893	1.259695	0.2097
DUM*(EXR)	0.000758	0.000153	4.948043	0.0000

Weighted Statistics

R-squared	0.961204	Mean dependent var	18.68995
Adjusted R-squared	0.956517	S.D. dependent var	31.13207
S.E. of regression	0.999600	Sum squared resid	148.8807
F-statistic	205.0881	Durbin-Watson stat	1.875364
Prob(F-statistic)	0.000000		

Unweighted Statistics

R-squared	0.675703	Mean dependent var	0.673004
Sum squared resid	5.960393	Durbin-Watson stat	1.847083

14: Cross-Section Dependence Test for Results from Consumer Goods Sector

Residual Cross-Section Dependence Test

Null hypothesis: No cross-section dependence (correlation) in weighted Residuals

Equation: Untitled

Periods included: 14

Cross-sections included: 12

Total panel observations: 168

Note: non-zero cross-section means detected in data

Cross-section means were removed during computation of correlations

Test	Statistic	d.f.	Prob.
Breusch-Pagan LM	24.50474	66	1.0000
Pesaran scaled LM	-3.611698		0.0003
Pesaran CD	0.143690		0.8857