Exploring the Effects of High National Debt on Household Consumption and Foreign Direct Investments

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Abstract

This paper aims to focus on the implications of high external debt for macroeconomic variables and find out the short-term and long-term effects using a quantitative approach. The researchers intend to find out if the household consumption expenditure is influenced by high national debt, tax revenues, total economic health, and foreign investments, or otherwise, finding out as well if high national debt, tax revenues, total economic health, and household consumption expenditure or not influence the foreign investments. While fiscal policies are strong indicators of government revenue raising and spending directions and actions, tax collection or revenues are necessarily integral as a key variable influencing a country's capacity to pay and can also limit the potential of incurring a high national debt level. Moreover, related hazards that impact general consumption behavior include the depreciation of the currency and price rises that lead to inflation, which could exacerbate the living conditions of the people. The research examines the relationship between tax income, state debt, household expenditure, and foreign direct investments. Its goal is to determine whether the country's growing debt affects household consumption and investments. The study utilizes the Autoregressive Distributed Lag (ARDL) cointegration technique to examine the links between GDP, tax collections, foreign investments, household consumption, and national debt. In conclusion, the analysis' result regarding

the influence of total national debt, overall economic health, and foreign investment on the household's final consumption expenditure (HCFE) is largely evident in both the short run and long run. The ARDL is a flexible model that allows analysis at the level and first differences. Different lag lengths may also be used in the model having different variables.

Keywords: high national debt, public debt, household consumption, consumer spending, tax revenues, foreign direct investment (FDI)

Background of the Study

The country is still suffering from the remnants of the COVID-19 pandemic in the past years; it unfolds five different variants that were very much present on the horizon, namely, Alpha, Beta, Gamma, Delta, and Omicron as variants of concern (VOCs) according to Migrino, Julius R. et al. (2023). Adding the issues of war, political tensions caused by midterm elections, global warming, and all, the assumption that the Philippines' high level of public debt could affect household consumption and investment mean that the government may need to consider adjusting tax rates to raise revenue, and increase borrowing for repayments. This follows the conventional wisdom that a lack of revenues leads to an increase in national debt. Because of this, there are growing concerns that this will affect the population's ability to spend, thus ultimately bearing the burdens of the situation.

When revenues cannot cover a country's expenditures, the resort is for that country to borrow or take on additional debt. While other sources of revenues may be identified by the government, such as pushing for better tax administration to step up compliance, privatizing government assets that can generate further revenues as opposed to the ones that are too costly to maintain, borrowing would be the most convenient manner. However, this will lead to higher financial pressure as the government balances meeting the needs of the population, while making sure that such debt obligations are paid, hence reducing the national debt. As a policy gap, it can be identified that government revenue-raising capabilities, the country's existing debt policy, and action plans must be carefully considered in terms of the households' consuming behavior and capacity. This is one area that needs careful consideration when taken as a whole, encompassing the United Nations Sustainable Development Goals (SDGs) of reduced inequalities and decent work and economic growth, leading to sustainable cities and communities. In addition, according to silverbullion.com.sg, Japan holds the largest total national debt, estimated at around 10 trillion US dollars in 2022; followed by the United States of America with a substantial debt of 31 trillion US dollars; and third, China forecasted 78 trillion US dollars by the year 2025; and then, Italy in fourth, while Brazil recorded 110 trillion US dollars in the year 2021.

Given the pressure to meet debt obligations, macroeconomic variables are generally expected to vary over a wider range. Fiscal policies and monetary policy controls would have to be commingled just to ensure that the economy would be able to keep up with the rising debt. Introducing

new tax rates or strengthening the tax administration as ways to increase revenues to achieve economic stability, are ways to ensure that there are funds to pay off debt. As changes in the tax rates are one of the factors that determine the increase or decrease in tax collections or revenues, its changes affect the consumer spending behavior of households. When consumption spending is tight,there would not be much revenue to affect, which can in turn affect a country's ability to pay off debt, and would in fact resort to more borrowings that can eat up a good portion of the country's gross domestic product (GDP). A low GDP and growth rate can sound off instability, which can discourage foreign investments from coming into the country, due to a lack of investor confidence. Without appropriate fiscal policies, monetary policies may go overdrive by also allowing interest rates to fluctuate, in this case, increase, thereby affecting inflation. Increasing interest rates coerces necessary fiscal maneuvers calling for tax hikes. Inflation and rising interest rates can affect how consumers behave, especially in meeting personal needs. It is more expensive to borrow, to cover basic household needs and other forms of financial needs, such as mortgages and other financial obligations. This could limit disposable income and reduce consumer spending. However, in the case of overseas investment, if the inflow of financial institutions is generally good, interest rates will fall.

A crowding-out effect may also occur, wherein increased government borrowing limits the availability of funds for private investments. This can obstruct businesses from securing financing for expansions and projects, slowing down economic growth, and job creation. Economic uncertainty is another issue, as concerns about the government's ability to manage its debt can lead to volatility in financial markets, making both consumers and businesses more cautious in their spending and investment decisions.

Furthermore, high national debt may constrain the government's fiscal policy options during economic downturns, limiting its ability to stimulate the economy. In addition, the associated risks, such as currency depreciation and price increases leading to inflation, can erode the purchasing power of households, affecting their overall consumption patterns. That's why, the impact of high national debt on households and investments highlights the importance of effective fiscal management and policy measures to mitigate potential adverse effects.

The perception that high national debt would "tragically" affect consumer spending and foreign direct investments in the country creates fear and worry over government efforts. Inter-relationships among these macroeconomic aggregates are considered to find out which influences the general worry of having high outstanding public debt, over time horizons in the short-run and long run.

Statement of the Problem

The study aims to understand the following key issues concerning the dynamics of macroeconomic aggregates of high national debt, household consumption, tax revenues, and foreign investments.

1. What is the performance trend of selected variables of the study?
2. How do the variables perform in the long run and in the short run and its relationship among each other?
3. How do national debt level, household consumption, and investment affect each other?

Statement of Specific Objectives

1. Exploring the trend analysis of the following selected variables to find out its performance over time:
   a. Gross Domestic Product
   b. National Government Debt
   c. Household Consumption Expenditures
   d. Foreign Investments (FDI)
   e. Tax revenues
2. Finding the dynamics among tax revenues, and public debt, and how it affects household spending and foreign direct investments
3. Find evidence if increasing the national debt level does affect household consumption and investments in the country to determine its implications to the economy.
4. Outcome of the *Autoregressive Distributed Lag (ARDL) cointegration technique* utilizing these selected variables:
   a. Gross Domestic Product
   b. National Government Debt
   c. Household Consumption Expenditures
   d. Foreign Investments
   e. Tax revenues
5. Policy recommendations from the findings

General Objectives of the Study:

1. To study the relationship of the higher level of debt on key macroeconomic aggregates: Gross Domestic Product, National Government Debt, Household Consumption Expenditures, Foreign Investments, and Tax revenues.
2. To analyze the impact of national debts on selected variables; Household Consumption Expenditures, Foreign Investments, and Tax revenues.
3. To offer policy insights for further studies

Review of Related Literature

This paper aims to focus on studies that have showcased the link between high national debt with consumption spending and FDIs. The paper also looks at literature surveys to find the link between tax revenues and economic health. Our review of the literature showed minimal empirical studies on the link between the variables our paper aims to look at.

Fiscal and monetary policies on public debt

After the sudden and severe COVID-19 pandemic economic shock hit, there was an obvious surge in the increase of government national debt in numerous countries (Kose, 2021). High debts, however, are already evident in recent decades without shocks, commonly linked to factors such as changes in fiscal policies, government expenditure priorities, and monetary policy approaches. A critical inquiry, however, emerges concerning the potential impact of this increasing national debt on the financial decisions and behavior of households. With the perception that the risks of high debt may take their toll on the general public, worry over interest rates and the country's fiscal deficits heightens the idea of defaults in payments, which may perceptively affect the consumption spending of the people and FDI.

Fiscal policy, encompassing tax revenue and government expenditures, is pivotal in determining a nation's economic health. According to Alesina and Perotti (1995), the impact of fiscal policies on public debt dynamics emphasizes the relationship between tax and spending decisions. On the other hand, according to Alessina and Ardagna (2013) research into the nuances of tax policy effects on public debt. The study assesses the role of different tax structures, including progressive and regressive taxation, in influencing the line of public debt. Insights from this research contribute to understanding the fiscal implications of diverse tax policies.

While public fear may drive some relationships among macroeconomic variables, the burden imposed by high national debt must be evaluated in terms of costs as well. Looking at taxation to raise revenues to pay off interest rates at existing levels may not be enough to argue that there is a cost concerning tax revenues raised (Weale, 2019), hence, interest rates play a role in debt dynamics as debt incurs interest payments, which are a proportion of GDP. Furthermore, in one IMF study on the costs, the analysis reveals that, over a period where interest rates were low, and expected to remain low, a permanent increase in debt from 60 to 120 percent of GDP can incur substantial costs. In the same study, it was mentioned that the negative differential between interest rates and growth allows experts in the field to argue that elevated levels of public debt may incur minimal fiscal and social costs (Cao, Gaspar, and Peralta-Alva, 2024).

On the investment side, when government borrowing increases, interest rates will also rise, causing a "crowding out" of investors. On the other hand, interest rates are a ready tool for the central bank to manipulate, stimulating the economy more, and even averting economic downturns (Oche, Mah, Mongale, 2016).

Contemporary Issues in Fiscal Policy

Mendoza et al. (2019) focus on contemporary issues in fiscal policy, considering factors such as globalization and technological advancements. This research explores how evolving economic landscapes influence the effectiveness of tax and spending policies in managing public debt.

The issue of high national debt has been a topic of concern for governments and economists worldwide. As countries accumulate substantial levels of debt, questions arise about the potential impact on various aspects of the economy, including household consumption and investments. This study aims to investigate the effects of high national debt on these two critical components of economic well-being.

Rising National Debt and GDP

The sudden increase of government national debt has been a notable trend in numerous countries in recent decades, commonly linked to factors like fiscal policies, government expenditure, and economic crises. A critical inquiry emerges concerning the potential impact of this increasing national debt on the financial decisions and behavior of households. As nations mitigate the challenges posed by increasing debt burdens, understanding the intricacies between macroeconomic indicators and individual financial

choices becomes necessary. Furthermore, researchers and policymakers alike seek to explore the nuanced ways in which rising national debt may influence household financial dynamics   (Viray and Bato 2023), considering the potential repercussions on savings, investments, and consumption patterns.

In one study that assessed the impact of government debt, expenditures, and taxes on investments, the findings suggested that high public debt adversely affects the investments and productivity growth of a country. (Salotti, Trecroci, 2015). Another study also showed that when gross external public and private debt reaches 60 percent of the GDP, there is a decline in the annual economic growth by about two percent. In addition, real GDP growth rate takes a slow pace in economies with debt-to-GDP ratios hitting roughly 90% and above, suggesting in the findings that growth and normal debt level have a weak relationship. Debt can also be exacerbated by unexpectedly high inflation as it lowers the cost of debt servicing. (Reinhart & Rogoff, 2010). High inflation is induced by higher levels of public debt, so when the debt level is high, inflation is harder to control (De Rugy and Salmon, 2022).

Household Consumption and Public Debt

A strong driver of economic growth is consumption spending, wherein an increase in household consumption expenditure may boost demand in the economy. More demand means more productivity in the business sector for higher profitability, leading to more employment and, hence, higher tax collection for the government. While consumer spending involves individual decisions, this can significantly contribute to a country's macroeconomic performance. (Mankiw, 2019). In addition to the household's trauma, was the continuous consumption with unstable income generation, especially during the COVID-19 pandemic, according to Quilon, A., and Kurniawan, Y. (2023). The sudden shift to digitalization without any preparations and training was unexpected, and now a carry-on burden to consumption decisions and patterns of the whole country.

Household consumption is a critical driver for economic growth, constituting a substantial portion of overall economic activity. Examining the influence of high national debt on household consumption patterns is imperative for policymakers and economists. The relationship between increasing national debt levels and household behaviors, such as consumer confidence, spending habits, and savings tendencies, requires thorough investigation. Several studies have explored the intricate dynamics between national debt and household consumption, shedding light on potential

consequences for individual financial decisions and overall economic stability (Smith et al., 2022). Moreover, the International Monetary Fund (IMF) provides insights into global trends and the broader impact of national debt on consumer behavior (IMF report, 2022). This crossing of macroeconomic factors and individual financial choices is a complex area that demands ongoing research to inform effective policy measures.

Foreign investments and tax revenues

Investments serve as a linchpin for economic development, job creation, and the accumulation of wealth. The influence of high national debt on investments is a multifaceted aspect that can shape economic landscapes in several ways. A comprehensive exploration is crucial to understanding the potential ramifications of national outstanding debt on foreign investment.

Empirical studies on the relationship of FDI on tax revenues are diverse. Some studies find a positive relationship on how FDI affects tax revenues , while other studies suggest the opposite. In some instances made in other studies, FDI has no significant effect on tax revenues (Camara, 2022).

One significant avenue through which high national debt can impact investments is the potential for higher or numerous tax rates and increased interest rates. As governments grapple with mounting debt, raising revenues through taxation and offering attractive interest rates to investors can significantly impact business decisions, see a make-or-break deal.   There is often pressure to attract investors through higher interest rates. This can have a current effect on businesses and individuals seeking capital for investments, leading to increased borrowing costs and potentially dampening investment activities.

Another potential consequence is the phenomenon of crowding out in the private sector. When the government absorbs a substantial portion of available funds for borrowing, it can limit the pool of resources accessible to private businesses. The crowding-out effect may limit the private sector's investment initiatives, slowing down economic growth and job creation.

Furthermore, high national debt can influence investor sentiment. Investors, both domestic and foreign, closely monitor a country's fiscal health. Rising national debt levels may signal potential economic challenges, affecting investor confidence and influencing decisions regarding long-term investments.

Economic Growth and Stability Amid High National Debt in the Philippines

The intricate relationship between high national debt, household consumption, and investments holds significant implications for the economic growth and stability of the Philippines. Examining the impact of excessive debt on the nation's economic well-being requires an exploration of specific dynamics and relevant literature within the Philippine context.

According to the Philippine Economic Trends Institute (PETI, 2022), it provides insights into how high national debt levels may contribute to economic recessions in the Philippines. As the government manages increasing debt obligations, resource allocation constraints can influence public spending, potentially impeding overall economic activity.

Financial stability is a paramount concern, and studies by the Bangko Sentral ng Pilipinas Research Department (BSPRD, 2022) emphasize the importance of understanding the connection between national debt and financial stability in the Philippine context. High debt levels may introduce vulnerabilities within the financial system, demanding vigilant monitoring to mitigate potential crises affecting various sectors.

Moreover, inflationary pressures are a critical consideration for the Philippines. Economic analyses conducted by the National Economic and Development Authority (NEDA, 2022) explore the links between high national debt and inflation, shedding light on how monetary policy adjustments may impact inflation rates and, consequently, the purchasing power of Filipino households.

Assessing the causal relationship between high national debt and fluctuations in household consumption and investments is imperative. The work of the Philippine Institute for Development Studies (PIDS, 2022) contributes to this understanding, employing empirical analyses to uncover connections between national debt levels, consumer behavior, and investment trends within the Philippine economic landscape.

Theoretical Framework and Philosophical Underpinning
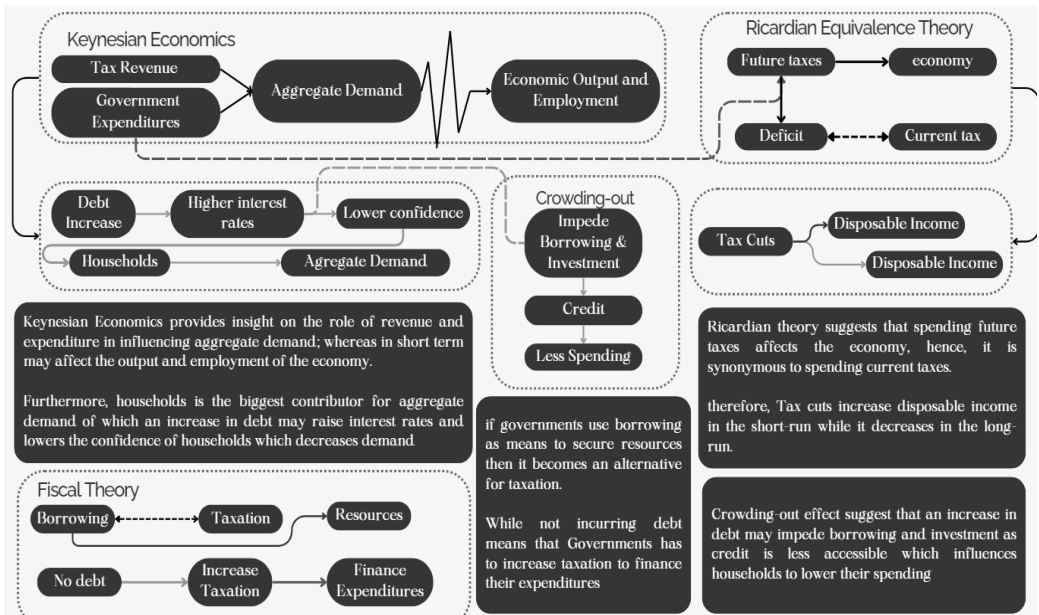
a. Keynesian Economic Theory

The Keynesian Economic Theory provides insights into the short-term impacts of fiscal policies. According to Keynes, changes in tax revenue and government expenditures directly influence aggregate demand, leading to short-term fluctuations in economic output and employment. The framework acknowledges the potential of fiscal policies to stimulate or contract economic activity.

According to Keynesian theory also, households play a big role in aggregate demand. When national debt increases, this will lead to higher interest rates, which can result in reduced consumer confidence, in turn leading to lower household spending. This is because higher national debt can signal the potential for future tax increases, leading to lower household disposable income. A high national debt level may also decrease government spending.

b. Ricardian equivalence theory

The theory of Ricardian equivalence states that financing government spending out of the current or future taxes will have equivalent effects on the overall economy. The theory maintains that government deficit is equivalent to spending out of current taxes. Therefore, tax cuts

increase disposable income in the short term but reduce it in the long term. The theory posits that changes in national debt will not have an impact on household spending because households will anticipate future taxes to service the debt and adjust their spending accordingly.

The idea is that consumers anticipate the future, so if they receive a tax cut financed by government borrowing, they anticipate future taxes will rise. Therefore, their lifetime income remains unchanged, and so consumer spending remains unchanged. Similarly, higher government spending, financed by borrowing, will imply lower spending in the future. In other words, households may decrease their spending in anticipation of future taxes.

c. Crowding out effect theory

The crowding-out effect theory suggests that increased national debt can lead to higher interest rates, which can impede borrowing and investment for both households and businesses. This can lead to reduced spending by households as they have less access to credit and face higher borrowing costs.

d. Fiscal Theory

Fiscal theory must always recognize the fundamental two-sidedness of the government's fiscal account. It is not methodologically possible to examine, for example, a change in the level of taxes, without examining, at the same time, the offsetting or compensating changes on the expenditure side, provided that the quality of money is held unchanged, according to Buchanan (1999).

Borrowing is only one of the means through which the government secures command over monetary resources, which, except in the case of anti-inflationary debt issues, the government uses to purchase real resources. Borrowing is therefore, an alternative to taxation. If a given public expenditure is to be financed, this can only be accomplished in three ways: taxes, loans, and currency inflation. The analysis of the effects of debt issues must, therefore, compare what will happen under the debt with what will happen under tax or inflation.

It is perhaps better to look at the problem in terms of the whole set of fiscal alternatives. Debt creation is an alternative to increased taxation, currency inflation, or expenditure reduction. If the debt is not to be issued, taxes must be increased. Currency inflation must take place, or the public expenditure cannot be financed. It is wholly improper to hold the tax level,

the money supply, and the government expenditure in *ceteris paribus* either explicitly, or implicitly, when debt is examined.
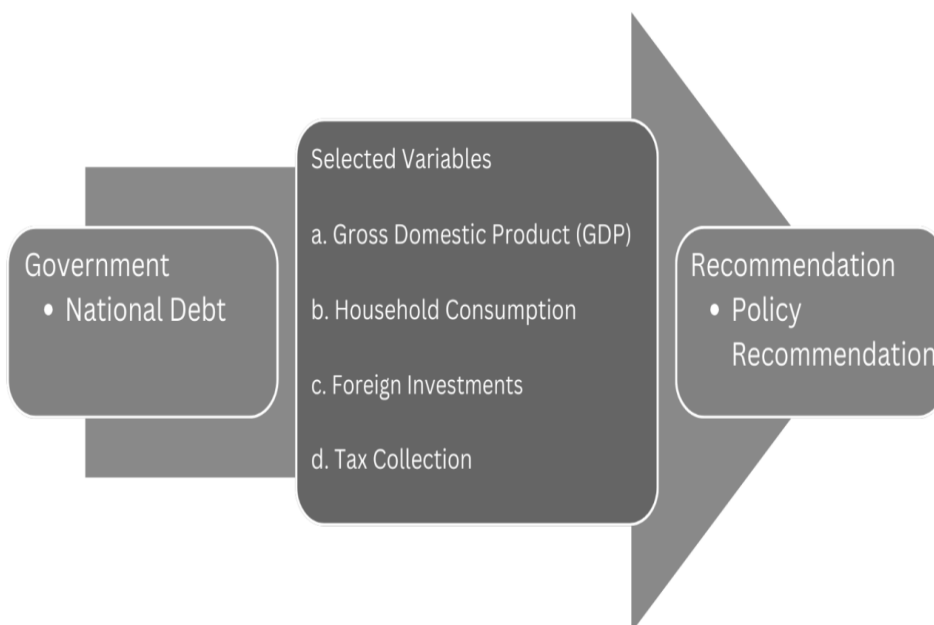
The national debt is the total amount of borrowing accumulated by the government that is still outstanding. It is the total amount that the government owes to individuals and institutions. The national debt is regarded as the level contained in the bulk of expenses. Each year, as the government borrows more, the amount it borrows is the current borrowing. However, at the same time, the government pays off some of its debt each year.

Conceptual/Operational Framework

Tax revenues comprise a large portion of revenues that the government needs to finance its operations. In a high public debt environment, it is important to look into the capacity to generate higher revenues, thus reflecting the capacity to finance its state obligations for the welfare of the people.

While revenues are being increased by introducing additional tax measures, as the usual go-to policy, this may have a toll on the people by affecting their household consumption and spending, and increases the likelihood of potential foreign investors to reconsider given changes in tax rates that can affect investment operations. As a matter of fiscal policy, exploring other modes of raising revenues, by strengthening revenue administration and looking at the use of the country's excess revenues in legal ways, can be studied. This concept is what the researchers would like to determine if the relationships of selected variables are evidenced by the set parameters mentioned in this paper. By finding this out, policy explorations on the abovementioned can be set under the premise of the obtained results.

Moreover, researchers recognize the concern about the public stress faced by increasing public debt. Before palliative economic policies can be identified, working on this particular conceptual framework that will help identify which variables provide the strongest influence, is one step ahead, ruling out and adding more appropriate macroaggregates and variables that will further help in the study.

Figure 1.

Conceptual Framework

Selected Variables

a. Gross Domestic Product (GDP)

b. Household Consumption

c. Foreign Investments

d. Tax Collection

Government
- National Debt

Recommendation
- Policy Recommendation

Hypotheses:

(1) **Ho**: *Household consumption expenditure is **not** influenced by high national debt, tax revenues, total economic health, and foreign investments; or otherwise;*

(2) **Ho**: *Foreign investments are **not** influenced by high national debt, tax revenues, total economic health, and household consumption expenditure; or otherwise.*

Methodology

Research Approaches

This study will use descriptive research to determine the characteristics and trends of both the dependent and independent variables. Descriptive research is useful in describing trends. Since the dependent variables (i.e.,) and independent variables (i.e.,) experienced fluctuations over the years, showing and describing them using summary statistics (i.e., mean, median, standard deviation) and graphs (e.g., bar chart, line chart,

scatterplot) would make it easier to understand the differences and similarities of the trends they underwent.

In addition, single-country data may give more reliable results than studies of cross-country or specific areas of the world. Due to a lack of individual country studies and problems with cross-sectional studies, time series analysis for a single country is more reliable than cross-section analyses (Sezgin, 1997). There is a need for case-by-case studies given each country's unique characteristics, given the stringent conditionalities for debt relief initiatives (Were, 2001).

Data generation

Annual time series data for the Philippines' foreign direct investments, total outstanding national debt, tax revenues, total economic health as represented by the GDP, and household consumption expenditure, from 2000 to 2022 are obtained. The most recent available data are set in this period to conform to the econometric approach of ARDL.

Sources of Data

Data gathering for this study will focus solely on secondary data. The government agencies needed in the research study are in charge of the country's economic data. International institutions such as the IMF and the WB are global economic data houses.

World Economic Forum (Weforum, www.weforum.org), Bloomberg Philippines (www.bloomberg.com, Asia Edition), Philippine Statistics Office (PSA, www.psa.com.ph), the Department of Budget and Management (DBM, www.dbm.com.ph), the National Economic Development Authority (NEDA, www.neda.com.ph), Department of Finance (DOF, www.dof.com.ph), Bureau of Treasury (BTr, www.btr.com.ph), Bangko Sentral ng Pilipinas (BSP – www.bsp.com.ph), United Nations (UN - www.un.org) and even Bureau of Customs (BOC – www.boc.com.ph), The WorldBank Group (www.worldbank.org) : International Monetary Fund (IMF - www.imf.org), and Bureau of Internal Revenue (BIR – www.bir.com.ph) when necessary.

Research ethics approaches

This research study doesn't need to utilize the primary data, as all the needed documents for the analysis must come from the government record. The researchers utilized this kind of approach to promote efficiency in gathering resources and effectiveness in creating an analysis. With the

use of secondary data, all government data are posted on their given websites, as long as researchers will properly recognize the respective government agencies in the research paper. The researchers further conclude that this research paper adheres to the ethical research standard.

Data Analysis and Analytical Tool

As mentioned, descriptive research through descriptive statistics will provide an overview of general economic performance and trends in public debt, foreign investments, and fiscal conditions in tax collections.

a. *Autoregressive Distributed Lag (ARDL) Model*

The use of econometric models has long been in place to see the dynamic relationship between the variables identified in this study, in the long run and the short term. The ARDL has emerged as a statistical model that has low minimum requirements in terms of sample sizes, making it ideal for research with small sizes, and yet can have model stability in the time series context. ARDL is also flexible, which allows analysis at level and first differences. Different lag lengths may also be used in the model having different variables. These features are basically the advantages of the ARDL.

The research will mainly use the ARDL cointegration technique as the prime analytical tool to help determine the longer-term effect of the variables and their relationship to one another. This is utilized to examine the interplay among the three chosen endogenous variables in the research. This involves the following stages: (1) performing a unit root test for all variables; (2) detailing the determination of lag order, model construction, and the robustness test; (3) assessing the ARDL cointegration technique among the specified variables.

While the structure of the ARDL cointegration technique model may seem intricate, estimating its parameters is not challenging. The ordinary least squares (OLS) method or maximum likelihoods can be readily utilized for this purpose. In alignment with the study's objectives, the econometric model can be articulated as:

The researchers intend to see the long-run and short-run relationship of regressor variables in household consumer spending and foreign direct investments. The intent is to show results in the long-run state through the use of the autoregressive distributed lag approach. The ARDL method

would also be suitable for small sample sizes as long as variables are cointegrated, hence the need to perform cointegration tests to see if variables share a common trend. In time series data, unit root testing must be ensured. The need to lag would confirm that errors are uncorrelated. With a set of non-stationary data variables, running them in the usual time series models would only generate spurious results.

After testing for stationarity, a cointegration analysis must be performed to find out if there is a long-run equilibrium relationship among variables. The need to do this would ensure that there is no misspecification.

General ARDL Model equation with lags of the dependent and independent variables:

$$y_t = \beta_0 + \beta_1 y_{t-1} + ...+ \beta p y_{t-p} + \alpha_0 x_t + \alpha_1 x_{t-1} + \alpha_2 x_{t-2} + ... + \alpha_q x_{t-q} + \varepsilon_t \quad \textbf{(1)}$$

The assumption is that all variables are (trend) stationary at first difference and cointegrated. Optimal lags should be conservative given the limited sample size.

$$HFCEt = a + b1\ (HFCE_{t-1)}) + b2(FDI_{t-1}) + b3(GDP_{t-1}) + b4(\ (Td_{t-1}) + b5(tr_{t-1}) + u \quad (2)$$

$$FDIt = a + b1(FDI_{t-1}) + b2(HFCE_{t-1}) + b3(GDP_{t-1}) + b3(\ (Td_{t-1}) + b4(tr_{t-1}) + u \quad (3)$$

where:
- *hfce - Household Final Consumption Expenditure*
- *td - Total Outstanding Debt*
- *Fdi - foreign direct investment*
- *eh - Economic Health represented by GDP*
- *tr - Tax Revenue*

b. Tests and operational process of the ARDL

a. Augmented Diceky Fuller (ADF) Test for Stationarity

Using time series in the ARDL model, the variables must be tested for stationarity by making the variance and mean equal in the event that they are non-stationary. Using the ADF unit root test would make the variables

stationary. The following must be determined to comprise the method of analysis to test for stationarity:

i. When variables are stationary at level, the mean and variance are equal as they are. When the findings are such without a need to cure the data, the regular Ordinary Least Squares (OLS) may be used to estimate the model, running valid results.

ii. On the other hand, when some variables are stationary at level I (0) and some data are stationary at first difference (I)(1), then the ARDL bounds test would be used to estimate the model.

The researchers were able to employ first differencing to ensure the validity of the ARDL model.

b. Johansen test for cointegration

In order to establish the correlation between time series in the long term, a cointegration test must be performed. This test would signify non-stationary time series are integrated such that there is deviation from equilibrium in the long run. The Johansen cointegration test is used to test the cointegrating relationship of non-stationary time series data. The Johansen test type used in the paper is the trace statistics, to determine if cointegration is present. A null hypothesis would suggest that there are no cointegrating equations, while the alternative hypothesis would suggest otherwise. This means that a number of cointegrating relationships is at least one linear combination.

A. General economic performance and trends in variables

a. Before going further with the time series with the use of ARDL, it is important to give an overview and describe the data statistics used in this study. Table 1 below shows the general performance of economic variables used in the research.

Table 1.

Total outstanding debt, FDI, economic health, household consumption, and tax revenues figures
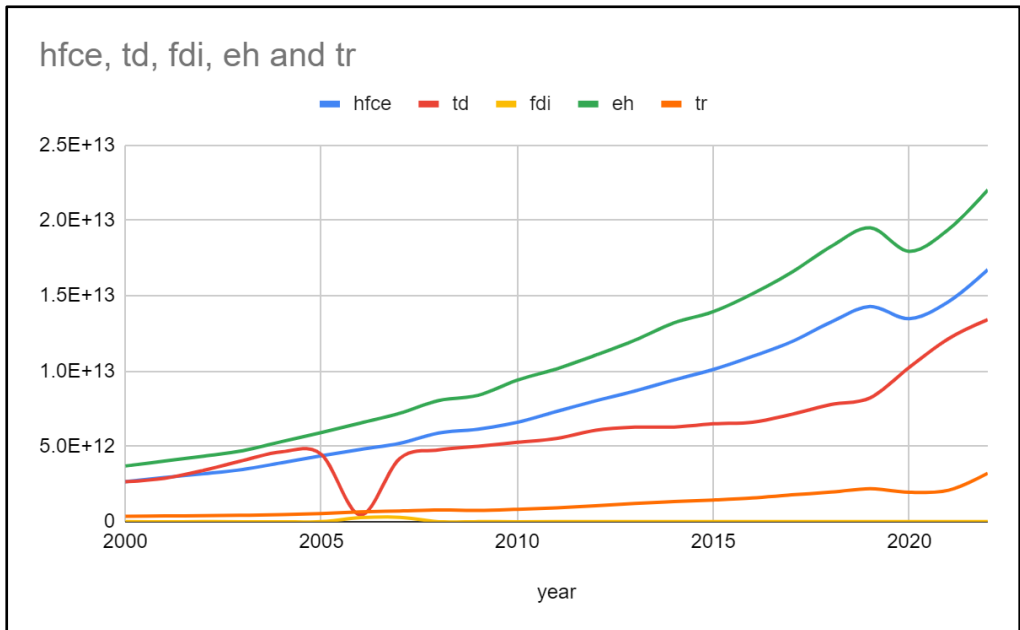
i. **Household consumption expenditure (hfce).** The graph depicts a steadily increasing trend in the consumption expenditure of households. Consumption indicators include expenses incurred by households on basic goods and services such as food and beverages, education, housing, and health. Increasing household final expenditures in the span of twenty years indicate an active economy grounded on relatively effective economic policies.

ii. **Total outstanding public debt (td)**. As can be seen in the graph above, there is an increasing trend in the country's total outstanding public debt. Using data from 2000 up to 2022 as the latest complete data available, the trend in debt is evidence of how the country has been financially borrowing from the year 2000 onward. It can be seen that in the early years prior to the COVID-19 health crisis, the debt of the country has maintained a single-digit level of about P2.7 trillion total debt in 2000. This gradually increased by a billion by 2002, slowly followed by the proportional

increase in 2003. Debt from 2004 until 2008 was almost constant at the level of four trillion pesos and even lowered, indicating effective payments from 2005 to 2007, but gradually increased again in 2009. The debt also grew gradually over the years from 2010 to 2018, which indicates growth and spending, attributed mainly to infrastructure. However, in 2020, at the surge of the COVID pandemic, the period of recovery cost the country 8.2 trillion pesos in debt, up to 13.4 trillion in 2022. Presently, the country is still managing its debt, hitting a level of 14 trillion pesos.

iii. **Foreign direct investments (FDI).** As evidenced in the graph, the country's FDIs are not significant enough to fare with our other macroeconomic variables. FDIs in the Philippines would need more pushing given the minimal FDI funds accumulated overtime. To stress, as of this writing, the goal of the economic managers is to attract more revenues while protecting the tax base that would redound to social and economic benefits.

iv. **Economic health is represented by the total output of the economy (eh).** From the graph above, it is evident that GDP is increasing from 2000 up until 2019, which is the onset of the pandemic. The US financial turmoil in 2008 didn't also hit as hard given strong monetary fundamentals for the country during this period, as our GDP was still increasing for the next few years. However, from 2019 to 2020, the GDP declined vastly but started to recover in 2021, financed mainly by huge government borrowings in order for the economy to get right back on track.

v. **Tax revenues.** From the years 2000 up until 2019, there was a steadily increasing trend in terms of tax collections. Even when the Tax Reform for Acceleration and Inclusion (TRAIN) law in 2018 was passed, which reduced the personal income tax rate, this did not change the trajectory of the increasing tax collection pattern, as the tax collection data still increased. This can be seen as evidence that tax changes may not be the only reasons that tax collection does not change, when in fact, it can still be increasing. The introduction of other ways to push for greater tax efforts, such as strong and strict tax administration, can have a direct impact on the way tax revenues can be collected.

B. Results   and   Discussion   (Autoregressive   Distributed   Lag (ARDL) Cointegration Technique)

Running an ARDL model follows a procedure to ensure its reliability. Tests conducted were the Augmented Dickery-Fuller Test for Unit Root for Time Series Data; differencing of non-stationary variables to first differences; a Johansen cointegration test is conducted and determining the optimal lag before running through the ARDL.

As to the coefficients in the ARDL model, estimating the long-term and short-term coefficients would require determining the lag order of the variables. The Akaike Information Criterion, or the AIC, is selected since the sample size is also small when finding out the optimal lag order of the selected variables. The maximum lag order is set to 4 using the Stata software.

Among macroeconomic aggregates, the two main dependent variables identified were household consumption expenditure and foreign investments, run in two equations both using ARDL, and how these economic variables are influenced by each other, along with other variables identified such as national debt, tax revenues, and economic health.

a.   Influence on HFCE and FDI

Testing for unit root, the Augmented Dickery-Fuller (ADF) Unit Root Test showed on each figure that all the variables are non-stationary after checking for stationarity of the variables. Stationarity is important in time-series data to ensure that statistical elements of the data are consistent over time. Hence, doing a first-order difference to obtain stationarity to be able to run more robust statistical models must be done. Identifying the stationarity of variables should be based on test statistics $< 5\%$ critical value as non-stationary and test statistics $> 5\%$ critical value to be stationary. At first difference, results showed data stationarity.

```
. dfuller hfce, trend lag(1)
```

Augmented Dickey-Fuller test for unit root   Number of obs   =   20

	Test Statistic	1% Critical Value	5% Critical Value	10% Critical Value
		Interpolated Dickey-Fuller		
Z(t)	-6.191	-4.380	-3.600	-3.240

MacKinnon approximate p-value for Z(t) = **0.0000**

➤ *ADF Test for HFCE result: 6.191 > 3.600 = stationary*

```
. dfuller td , trend lag(1)
```

Augmented Dickey-Fuller test for unit root   Number of obs   =   20

	Test Statistic	1% Critical Value	5% Critical Value	10% Critical Value
		Interpolated Dickey-Fuller		
Z(t)	-4.019	-4.380	-3.600	-3.240

MacKinnon approximate p-value for Z(t) = **0.0083**

➤ *ADF Test for TD result: 4.019 > 3.600 = stationary*

```
. dfuller fdi , trend lag(1)
```

Augmented Dickey-Fuller test for unit root   Number of obs   =   20

	Test Statistic	1% Critical Value	5% Critical Value	10% Critical Value
		Interpolated Dickey-Fuller		
Z(t)	-4.907	-4.380	-3.600	-3.240

MacKinnon approximate p-value for Z(t) = **0.0003**

> ***ADF Test for FDI result: 4.907 > 3.600 = stationary***

```
. dfuller eh , trend lag(1)

Augmented Dickey-Fuller test for unit root          Number of obs   =        20

                                    ——————— Interpolated Dickey-Fuller ———————
                    Test          1% Critical      5% Critical      10% Critical
                 Statistic           Value            Value            Value
 ——————————————————————————————————————————————————————————————————————————————
 Z(t)             -5.206            -4.380           -3.600           -3.240
 ——————————————————————————————————————————————————————————————————————————————
MacKinnon approximate p-value for Z(t) = 0.0001
```

> ***ADF Test for EH result: 5.206 > 3.600 = stationary***

```
. dfuller tr, trend lag(1)

Augmented Dickey-Fuller test for unit root          Number of obs   =        20

                                    ——————— Interpolated Dickey-Fuller ———————
                    Test          1% Critical      5% Critical      10% Critical
                 Statistic           Value            Value            Value
 ——————————————————————————————————————————————————————————————————————————————
 Z(t)             -4.918            -4.380           -3.600           -3.240
 ——————————————————————————————————————————————————————————————————————————————
MacKinnon approximate p-value for Z(t) = 0.0003
```

ADF Test for TR result: 4.918 > 3.600 = stationary

```
. varsoc hfce td fdi eh tr

  Selection-order criteria
  Sample:  2005 - 2022                        Number of obs    =        18

 ┌────┬──────────────────────────────────────────────────────────────────────────┐
 │lag │   LL       LR      df    p      FPE       AIC       HQIC       SBIC        │
 ├────┼──────────────────────────────────────────────────────────────────────────┤
 │ 0  │ -2471.69                       2.e+113   275.188   275.222    275.435      │
 │ 1  │ -2435.32  72.741  25  0.000    7.e+112   273.925   274.129    275.409      │
 │ 2  │ -2385.7   99.238  25  0.000    1.e+112   271.189   271.564    273.91       │
 │ 3  │ -1506.1   1759.2  25  0.000    4.6e+72*  176.233   176.779    180.19       │
 │ 4  │  313.487  3639.2* 25  0.000      .      -24.8319* -24.218*   -20.38*       │
 └────┴──────────────────────────────────────────────────────────────────────────┘

 Endogenous:  hfce td fdi eh tr
  Exogenous:  _cons
```

The optimal lag test showed a result of three lags. With the sample size of only 18 observations taken to test by Stata, this sample size is less than 30, or the expected number for time series data; hence, we look at the final prediction error (FPE) result, which arrived at lag 3 as the more accurate lag to be used in the statistical analysis for the ARDL Test. The AIC, however, is at lag 4.

Cointegration is used to test the long-term relationship between variables. In the Johansen cointegration test, on the other hand, this means that the difference between the series changes with time. Using the trace statistics, where inferences are a little different from the eigenvalue, the decision criteria for the Johansen test is that if the value of the trace statistics is bigger than the 5% critical value, the null is rejected. The null hypothesis provides that there is no cointegration, and the alternative hypothesis is otherwise. Results show that the trace statistics are greater than the 5% critical value, so the null hypothesis is rejected, meaning there is enough evidence of cointegration among the variables.

```
. vecrank hfce fdi eh tr td, trend(constant) lags(3) max
```

```
                          Johansen tests for cointegration
Trend: constant                                        Number of obs =      19
Sample:  2004 - 2022                                          Lags =        3
```

					5%
maximum				trace	critical
rank	parms	LL	eigenvalue	statistic	value
0	55	-2524.5025	.	1209.2041	68.52
1	64	-2224.237	1.00000	608.6729	47.21
2	71	-1961.5147	1.00000	83.2284	29.68
3	76	-1933.3528	0.94841	26.9045	15.41
4	79	-1920.9259	0.72966	2.0509*	3.76
5	80	-1919.9005	0.10232		

					5%
maximum				max	critical
rank	parms	LL	eigenvalue	statistic	value
0	55	-2524.5025	.	600.5311	33.46
1	64	-2224.237	1.00000	525.4445	27.07
2	71	-1961.5147	1.00000	56.3239	20.97
3	76	-1933.3528	0.94841	24.8536	14.07
4	79	-1920.9259	0.72966	2.0509	3.76
5	80	-1919.9005	0.10232		

Given the data has a low number of observations, it would be better to choose a smaller maximum lag. With four explanatory variables, which

would be quite a number in the model, there is a need to choose a smaller maximum lag order. By default in the ARDL run, the lag is automatically chosen optimally by the command, which is 2, obtaining the following results:

ARDL Results

For the overall test of significance, the F-statistic test would indicate whether or not variables altogether have a long-run effect on the dependent variable. Individually, variables may not contribute significantly. This notes that at least one of the coefficients in the model is significantly different from zero. Since the results in the study are stationary at the first difference, the method of least squares results were obtained by using the first difference.

The F significance of 0.000 for the HFCE indicates that the model is statistically significant at the conventional significance level of 0.05, indicating that the model as a whole is useful in explaining the variation in the dependent variable. The significant variables are total debt (p=0.001), GDP (p=0.000) and tax revenues (p=0.012). On the other hand, the overall significance for the FDI independent variables in the ARDL mode, however, yielded a probability F-statistic to be least significant at 0.067. Only the debt variable at 0.007 is statistically significant.

Source	SS	df	MS		Number of obs	=	23
					F(4, 18)	=	7895.52
Model	4.0358e+26	4	1.0090e+26		Prob > F	=	0.0000
Residual	2.3002e+23	18	1.2779e+22		R-squared	=	0.9994
					Adj R-squared	=	0.9993
Total	4.0381e+26	22	1.8355e+25		Root MSE	=	1.1e+11

hfcel	Coef.	Std. Err.	t	P>|t|	[95% Conf. Interval]	
tdl	.0877782	.0224782	3.91	0.001	.0405533	.135003
fdil	.6200199	.3511346	1.77	0.094	-.1176866	1.357726
ehl	.6501433	.0188267	34.53	0.000	.61059	.6896967
trl	.4462654	.160806	2.78	0.012	.1084245	.7841063
_cons	-1.58e+11	8.04e+10	-1.96	0.065	-3.27e+11	1.11e+10

Source	SS	df	MS		Number of obs	=	23
					F(4, 18)	=	2.65
Model	5.2028e+22	4	1.3007e+22		Prob > F	=	0.0672
Residual	8.8342e+22	18	4.9079e+21		R-squared	=	0.3706
					Adj R-squared	=	0.2308
Total	1.4037e+23	22	6.3804e+21		Root MSE	=	7.0e+10

fdil	Coef.	Std. Err.	t	P>|t|	[95% Conf. Interval]	
hfcel	.2381262	.1348576	1.77	0.094	-.045199	.5214515
tdl	-.0468131	.0153853	-3.04	0.007	-.0791363	-.0144898
ehl	-.1592323	.088013	-1.81	0.087	-.3441408	.0256762
trl	.0051947	.119076	0.04	0.966	-.2449746	.255364
_cons	1.36e+11	4.46e+10	3.04	0.007	4.21e+10	2.29e+11

a. Running the ARDL for the HCFE, the results of the ARDL analysis show that the Independent variables of Foreign Direct Investment (LR p=0.017; SR p=0.04), Total Outstanding Debt (p=0.06 SR p=0.02), and Economic Health (LR p=0.06; SR p=0.004)) affect both short-run and long-run since their p-value is less than 0.05 significance level, providing strong evidence against the null hypotheses. However, as seen in the ARDL result, Tax Revenue in the short - run resulted in 0.08, and in the long - run it resulted in 0.121, a value greater than 0.05, which makes it statistically insignificant. Hence, Tax Revenue does not affect the short-run and long-run, as the null hypothesis is not rejected.

```
. ardl hfce tr td fdi eh, lag(2) ec

ARDL(2,2,2,2,2) regression

Sample: 2003 - 2022                          Number of obs   =         20
                                             R-squared       =     0.9985
                                             Adj R-squared   =     0.9942
Log likelihood = -507.74973                  Root MSE        =  5.134e+10
```

D.hfce	Coef.	Std. Err.	t	P>|t|	[95% Conf. Interval]	
ADJ						
hfce						
L1.	-1.779303	.3099064	-5.74	0.002	-2.575942	-.9826628
LR						
tr	-2.229853	1.193589	-1.87	0.121	-5.298071	.838366
td	.2317197	.0498215	4.65	0.006	.1036495	.35979
fdi	3.83595	1.083176	3.54	0.017	1.051558	6.620342
eh	1.252805	.2753863	4.55	0.006	.5449017	1.960707
SR						
hfce						
LD.	.4231485	.1795143	2.36	0.065	-.0383077	.8846046
tr						
D1.	2.341017	1.108308	2.11	0.088	-.50798	5.190014
LD.	-.3083071	.6284559	-0.49	0.644	-1.923804	1.30719
td						
D1.	-.2752672	.0822415	-3.35	0.020	-.4866757	-.0638586
LD.	-.0759677	.0648741	-1.17	0.294	-.2427319	.0907966
fdi						
D1.	-3.658912	1.357246	-2.70	0.043	-7.147824	-.1700004
LD.	-1.726983	.4721182	-3.66	0.015	-2.940602	-.5133647
eh						
D1.	-1.247658	.2531532	-4.93	0.004	-1.898409	-.5969067
LD.	-.3321175	.1231418	-2.70	0.043	-.6486634	-.0155715
_cons	-3.98e+11	1.31e+11	-3.03	0.029	-7.36e+11	-6.03e+10

b. Running the ARDL for the FDI, the results of the ARDL analysis show that the independent variables of Household Final Consumption Expenditures (LR p=0.022; SR p=0.04) and Economic Health (LR p=0.000; SR p=0.018) affect both the short-run and long-run, while Tax Revenue (p=0.019) and Total Debt only have an effect on the long-run (p=0.001) and have no effect in the short run, with p values at 0.19 and 0.16, respectively, as statistically least significant.

```
ARDL(2,2,2,2,2) regression

Sample: 2003 - 2022                        Number of obs    =         20
                                           R-squared        =     0.9970
                                           Adj R-squared    =     0.9885
Log likelihood = -481.47816               Root MSE          =   1.380e+10
```

D.fdi	Coef.	Std. Err.	t	P>|t|	[95% Conf. Interval]	
ADJ						
fdi						
L1.	-1.716767	.4732285	-3.63	0.015	-2.93324	-.5002948
LR						
hfce	.2575334	.0781557	3.30	0.022	.0566278	.4584389
td	-.0557247	.0074222	-7.51	0.001	-.074804	-.0366455
tr	.5797063	.1687051	3.44	0.019	.1460361	1.013376
eh	-.3239895	.0296662	-10.92	0.000	-.4002489	-.24773
SR						
fdi						
LD.	.397553	.1661891	2.39	0.062	-.0296496	.8247556
hfce						
D1.	-.2132457	.081408	-2.62	0.047	-.4225118	-.0039797
LD.	-.1173992	.0464909	-2.53	0.053	-.2369077	.0021094
td						
D1.	.0527646	.0320546	1.65	0.161	-.0296344	.1351636
LD.	.0042087	.0195986	0.21	0.838	-.0461712	.0545885
tr						
D1.	-.5129907	.3396846	-1.51	0.191	-1.386178	.3601964
LD.	.1707024	.1552263	1.10	0.322	-.2283196	.5697245
eh						
D1.	.3087971	.0898073	3.44	0.018	.07794	.5396541
LD.	.0665965	.0424699	1.57	0.178	-.0425757	.1757688
_cons	9.89e+10	3.98e+10	2.48	0.056	-3.47e+09	2.01e+11

Conclusion and Policy Implications

The results obtained provide a distinction on the dynamics of the short-term and long-term relationships of the variables that the researchers intended to show.

The result of the analysis in terms of the influence of total national debt, the overall economic health, and the foreign investment on the household final consumption expenditure (HCFE) is strongly evident in both the short run and long run. The results suggest that the high public debt pushes government efforts further to sustain economic recovery by ensuring stability in total output and productivity. Attending to the fiscal and monetary needs of the country would strike a balance between national spending, FDIs, and a nation's economic health due to their significant dependency in the short period, eventually more evident in the longer time horizon.

The research also validates that growing economic conditions and the presence of investments in the country can either discourage or encourage consumption expenditure, depending on the economic state of the country, and holds in favor of literature surveys presented in this research on the relationships of these variables to one another. The causal relationship between the HCFE economic health and investments has been apparent through several studies, establishing reinforcing effects between consumption and investment affecting the growth and general health of the economy.

On the other hand, the insignificant results obtained on the effect of tax revenues on household consumption expenditures in this study, both in the long run and the short run, may be attributed to the fact that changes in the tax rates would not automatically increase or decrease tax collection. For instance, the passage of TRAIN law in 2018, which reduced personal income tax rates, still ensured an increasing or growing tax collection in the succeeding years after its passage due to the multiplier and second round effect. This may mean that changes in tax rates or new tax schemes would render consumer spending indifferent to tax revenues. While tax policies may alter consumer spending as taxes can create more or less disposable income, these tax changes should be strongly complemented by other variables to make results more pronounced. One potential analysis the researchers want to present is that while tax revenues, i.e., a collection from tax on income and profits, come from different tax types, a change in the rate of one tax type does not automatically conclude that the change in tax revenues can be entirely attributed to such, directly or immediately affecting

the consumer's behavior patterns. On the other hand, the results may have a semblance in the Ricardian Equivalence, citing that consumers anticipate the future, a case of rational expectations as well, making their incomes unchanged, so is the spending pattern remaining as it is.

The researchers also do not discount the fact that results may be more consistent in this aspect, had more observations been added, or a better representation of tax revenues, such as its growth rate, may be explored. Due to data limitations, the constraints in the method contribute to a contradiction in the literature, which can be further looked into for further study. Adding another macroeconomic component of savings may also be studied.

As to the effects on the FDI, the results of the research analysis show that the independent variables of household final consumption expenditures and economic health affect both the short run and the long run. As previously discussed, the mutual dependency among these variables that strongly reinforce each other signifies the appropriate relationship among them. However, for the tax revenue and total debt variables' influence on FDI, results reveal that these variables only have an effect on the long run and have no influence in the short run. It is important to note, however, that the government has amended the Foreign Investment Act and the Public Service Act in order to attract more investments in the country. This is viewed by the researchers as complementary offsetting factors that can compensate for what is lacking in the short term when strict implementation is observed.

Reiterating what is aforementioned, the results conform to the causal relationship among HCFE, economic health, and investments. The long-run effect of tax revenues and national debt on foreign investments would confirm that good tax revenue collection, as the majority of government funds are derived from taxes, signals a country's growth standing as it can finance government expenditures and borrowings. This sends the message of conducive investment conditions that foreign investors are willing to put their trust in. The national debt effect on foreign investments is also evident in the outcome, confirming that debt, when not managed well, can impact investment inflows due to stagnating debt that can disrupt the economic plans of the country, leading to loss of investor confidence.

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