PressAcademia

JEFA

Journal of Economics, Finance & Accounting

PressAcademia publishes journals, books, case studies, conference proceedings and organizes international conferences.

jefa@pressacademia.org

ISSN 2148-6697

PressAcademia
www.pressacademia.org/journals/jefa

JEFA
ISSN 2148-6697

Journal of Economics, Finance and Accounting YEAR 2022 VOLUME 9 ISSUE 4

ABOUT THE JOURNAL

Journal of Economics, Finance and Accounting (JEFA) is a scientific, academic, peer-reviewed, quarterly and open-access online journal. The journal publishes four issues a year. The issuing months are March, June, September and December. The publication languages of the Journal are English and Turkish. JEFA aims to provide a research source for all practitioners, policy makers, professionals and researchers working in the area of economics, finance, accounting and auditing. The editor in chief of JEFA invites all manuscripts that cover theoretical and/or applied researches on topics related to the interest areas of the Journal.

JEFA is currently indexed/archived by

Ulrich's Directiroy, Copernicus, Scope, Open J-Gate, Princeton University Library, International Scientific Indexing (ISI), Directory of Research Journals Indexing (DRJI), International Society for Research Activity (ISRA), InfoBaseIndex, Scientific Indexing Services (SIS), Google Scholar, Root Indexing, Journal Factor Indexing, International Institute of Organized Research (I2OR), SOBIAD, EuroPub.

Ethics Policy

JEFA applies the standards of Committee on Publication Ethics (COPE). JEFA is committed to the academic community ensuring ethics and quality of manuscripts in publications. Plagiarism is strictly forbidden and the manuscripts found to be plagiarised will not be accepted or if published will be removed from the publication.

Author Guidelines

All manuscripts must use the journal format for submissions. Visit www.pressacademia.org/journals/jefa/guidelines for details.

CALL FOR PAPERS

The next issue of JEFA will be published in March, 2023.
Submit manuscripts to
jefa@pressacademia.org or
http://www.pressacademia.org/submit-manuscript/

PressAcademia
www.pressacademia.org/journals/jefa

JEFA
ISSN 2148-6697

Journal of Economics, Finance and Accounting YEAR 2022 VOLUME 9 ISSUE 4

EDITORIAL BOARD

PressAcademia
www.pressacademia.org/journals/jefa
JEFA
ISSN 2148-6697
Journal of Economics, Finance and Accounting YEAR 2022 VOLUME 9 ISSUE 4

CONTENT

PressAcademia
www.pressacademia.org/journals/jefa

JEFA
ISSN 2148-6697

Journal of Economics, Finance and Accounting YEAR 2022 VOLUME 9 ISSUE 4

ANALYZING THE NATIONAL DEBT OF SEVERAL SELECTED EAST AFRICAN COUNTRIES: AN APPLICATION OF A LONGITUDINAL PANEL DATA

DOI: 10.17261/Pressacademia.2022.1638
JEFA- V.9-ISS.4-2022(1)-p.152-165

Sadik Aden Dirir
University of Djibouti, Department of Law, Economics and Management, Djibouti city, Djibouti.
sadikaden1999@gmail.com , ORCID: 0000-0002-8159-5442

Date Received: September 11, 2022 **Date Accepted:** November 29, 2022

To cite this document
Dirir, S. A., (2022). Analyzing the national debt of several selected East African countries: an application of a longitudinal panel data. Journal of Economics, Finance and Accounting (JEFA), 9(4), 152-165.
Permanent link to this document: http://doi.org/10.17261/Pressacademia.2022.1638

ABSTRACT

Purpose- East African countries are the fastest-growing nations in the region. These countries have membership in several well-known regional agreements such as COMESA, IGAD, and EAC. Hence, because of their impressive growth in the course of the previous years, these countries are demanding an extensive analysis from many dimensions. Consequently, this paper has an objective to inspect the national debt of 9 selected East African countries from the period 2000 to 2021.

Methodology- The paper utilized longitudinal panel data in order to evaluate the impact that the GDP, inflation rate, government spending, and trade have on the national debt of east African countries.

Findings- The findings in our fixed effect model revealed that the variables GDP, inflation rate, government spending, importation, and exportation have a significant impact on the national debt of East African countries. we perceive that an increase of 1% in GDP increases 0.557% in the East African debt. Also, the inflation rate and government spending revealed that they expand by 0.002% and 0.413% respectively the national debt of East African debt. Finally, according to table 3, the trade components have revealed distinctive effects. To start with, exportation was revealed to increase the national debt by 0.122% while importation revealed an inverse impact in which it reduces the national debt by -0.368%.

Conclusion- Finally, the study will provide evidence to the African countries especially my country Djibouti how to adjust and limit their national debt in conformity with their gross domestic product and economic capacity. Additionally, it will provide economists with a better comprehension of the economic situation in East Africa.

Keywords: GDP, inflation rate, national debt, government spending, trade, panel data.
JEL Codes: B22, C22, H11

1. INTRODUCTION

The East African Community has achieved excellent accomplishments since the nineteen and is currently appraised across Africa to act as an illustration of fruitful local coordination. A large portion of these victories are established in the community's solid past that originates before any local legislative association on the planet by the nineteen-sixties, and in the political aim that has stirred specialized endeavors around territorial joining programs since the marking of the 1999 Treaty. Boss among these accomplishments includes organization building, financial advancement coming about because of the tradition's association and the normal market, and a typical voice in the continent (Bainomugisha, 2016).

The initial ten years of the 21st century realized major subjective changes in African nations, showing the immense potential and the formative prospects arising out of them. Individual nations in the locale kept the quickest economic development in the worldwide economy while a large portion of the advanced economies experienced the economic emergency and its outcomes (Mataen, 2012).

From one viewpoint, African nations have become more significant players in the global market and business sectors. Then again, they have transformed into an essential locale for the strong nations on the planet's framework (Cargill, 2010). The region's development rate reached the midpoint of 4.9% in 2018 and 5.3% in 2019, contrasted with 3.3% and 3.4% in Africa

generally. According to the African development bank, because of the covid-19 pandemic, the development of East Africa falls down to 0.7% in 2020. Nevertheless, the region's development remained above compared to other African countries. The reason behind this stable performance was due to the region's financial incentives, broadened administration in different sectors, and supported public spending on various projects and investments in agribusiness.

Previous to realizing a financial merger, several rules of macroeconomic criteria were stated to accomplish it. These criteria have encountered many difficulties, from the discrepancies among the member nations to institutional, social, and divergent economic systems. In such a manner the involved States established a council of central bank legislative heads of separate nations, the EAC Financial Undertakings Board (EACMAC) with the order to manage, coordinate and fit the full-scale monetary strategies in the area. The other crucial expectations that they were supposed to accomplish involved; adapting the tax values with the region standards upgrading the simplicity with which one money can be changed over completely to another, introducing contemporary and coordinated installment and settlement frameworks, smooth exchange practices and mandates to make the stock trade market in the region harmonized (Law, Tee, & Ooi, 2019).

Public Debt is essentially an obligation owed to holders of Government and institutions like Treasury Bills and Treasury Bonds. Nations generally get by securities, government bonds what's more, bills. Countries often take debt for two reasons. For instance, when the expected gains are less than the planned amount for the expenditure and payback maturing loans. "Logical" amounts of taking a debt by a developed nation are probably going to improve its financial development and economic, both through capital allocation and efficiency development. Nations at the beginning phases of improvement have little supplies of capital and are probably going to have venture open doors with paces of return higher than the advanced countries. In conditions, they utilize the acquired assets for useful ventures and they don't experience the ill effects of macroeconomic precariousness, arrangements that twist economic initiatives, or sizable diverse shocks, development ought to grow and permit ideal obligation reimbursements (Pattillo, Poirson, & Ricci, 2015).

Adequate utilization of debt could prompt improved economic development and consequently, better ways of life. To make obligation powerful, there is a need for expansive changes in the executives of the public area. Generally speaking, assets from debt have not been utilized as actually, for instance, projects funded by worldwide credits have, because of the absence of satisfactory or practical preparation, not succeeded to create appropriate assets to support the debt acquired. In this manner socio-economic expansion is compromised since the public authority spends tremendous aggregates on advance reimbursements, consequently diminishing the cash it spends on schooling, well-being, and other social conveniences, which mostly focus on poor people, who consist mostly of the populace (Kendren, 2009).

Africa is famous for taking huge amounts of debt to stabilize and balance its economy. Thus, the fundamental objective of this study is to scrutinize the effects of national debt on east African countries. It also evaluates the economic growth of East Africa during the past 21 years. Accordingly, the data consist of nine East African countries which are (Djibouti, Ethiopia, Sudan, Kenya, Rwanda, Eritrea, Uganda, Tanzania, and Burundi). Additionally, the information was gathered from multiple sources such as World Bank, Statista, and economy country from the period 2000 to 2020.

Moreover, the study exercised longitudinal panel data that consisted of pooled OLS, fixed effect, and random effect models. These models were employed so that the influence of the GDP, inflation rate, government spending, and trade on the national debt of East African countries will be investigated.

The paper contributes to the large empirical findings about the economic situation of Africa. In addition, it puts light on the rapid development of East Africa. Furthermore, it provides to East African government, policymakers, and economists with insightful practical evidence about the correlation between the national debt and macroeconomic factors. The study will also offer insights into how to regulate these factors in order to decrease the national debt.

The study will be composed as follow. Section 1 will involve reviewing past literature on the topic, then in section 2, we will explore the methodology and econometric model that are employed in this study. After identifying the methodology that will be utilized. In section 3 we will apply the model and interpret the results. Finally, in Section 4 we will discuss the results and conclude the study.

2. LITERATURE REVIEW

2.1. East African Nations

Numerous countries all over the world acquire investments to fulfill their necessities and limit the spending plan shortage. In any case, homegrown resources have regularly shown deficient and perhaps obliterating in their results private investments.

(Fajana, 2003). Countries will quite often borrow debt externally in light of the fact that such sources are significantly concessional and broken down into domestic assets. (Ajisafe & Gidado, 2006) concede that countries can adapt their debt by making cash, to dodge installment of premiums. This is the way state-run administrations use to lessen interest costs which and on the off chance that frequently utilized it can prompt excessive inflation. (Mutasa, 2003) points out that the customary view that high levels of domestic obligation could restrict the private area and constrain the degree of countercyclical money-related courses of action. Consequently, could engender higher insecurity and unfavorable results for financial execution. With the rising danger of instability emerging from resource restriction and poverty, the economic situation in Africa is suffering under the unstable of the weakening macroeconomic basics. Falling product costs are similarly affecting tremendously these nations. Financial backers are opting for more risky assets and avoiding less secure spots, incited by the chance of increasing interest costs in America (Lora & Olivera, 2006). The IMF is limiting its improvement aids further diminishing income for the countries, compelling them to get more and administrate their activities less regularly. The progressing public-obligation crisis in African countries, which have experienced every one of these patterns is an indicator of what might be on the horizon.

According to (Halima, 2015), several nations in East Africa are confronted with an escalating degree of debt volumes. For example, the public debt of Tanzania reached Tshs 28 trillion at the beginning of 2015. Another money-related guess by the UK-based Oxford Financial matters, Tanzania's GDP (Gross domestic product) remained at 52 trillion at current expenses as of November 2013 (Asogwa, 2014). Obligation to-Gross domestic product extent has outperformed by 50% beating the debt to Gross domestic product extent limit specified by the IMF. In the account of Rwanda in 2013 the public authority enlisted an obligation to Gross domestic product extent of 29.42% of the nation's Gross domestic product.

In an investigation conducted by (Mukui, 2013), he stated that external public debt and debt servicing that includes (interest, principles, and late payment fees) had a deteriorating impact on the economic development of Kenya. The author additionally mentioned that inflation levels and home-based investment funds had a negative influence on economic development. Paradoxically, capital arrangement and foreign direct ventures affected positively economic development. Previous studies, that involved the economic development of 19 developing countries revealed that outer public obligations which consist of a portion of GNI and GDP had a pessimistic impact on economic growth. In parallel, external debt had a negative impact on investment (Fatma & Zouhaier, 2014).

The government obligation in Rwanda which is the total amount of debt in proportion to the gross domestic product appeared at the midpoint of 65.78% from 1995 to 2013, appearing at a high of 119.50% in 1995 and a record low of 21.27% in 2008. Rwanda's new ascent in acquisition urged the policymakers to vocalize their concerns over the nation's ability to pay the debt (Ogwuma, 2013).

Foreign debt is seen to be a significant source of funds on which nations depend to accomplish public goals. External debt is considered the appropriate alternative for developing countries to finance their industrial activities and narrow the shortage between savings and investment (Rahman, Ismail, & Ridzuan, 2019). Moreover, authors such as (Sheng & Suka, 2021) declared that in the past years' debt borrowing fall down in proportion to GDP, which is probably because of the accessibility of different types of foreign debt and sectors diversification. In spite of that, for developing economies, especially external debt is regarded as a main source of financing.

2.2. The Growth of Domestic Product

Otherwise called economic development is characterized as an ascent in financial labor and product creation relative from one-time span to another and is typically estimated with regard to the GDP of an economy. The importance of economic improvement can't be under-evaluated. Since it is verification that an economy is growing efficiently in the usage of its restricted assets. (Bhagwati, 1988) acclaimed that economic advancement works on innovative progression and abilities arrangement. the "traditional assessment" of government obligation complements the positive interest effects of public commitment in the short period and amassing out influences hosing monetary activity over the long term. In this essence, an extension in the spending plan shortfall raises nonessential house income, especially when there is a high pace of spending plan deficiency in the economy. The related expansion in pay and abundance supports the total interest for labor and products. On the other hand, Keynesian believes that the reason for the fall of public reserve and forcing nations to borrow debt is because of the expansion in the fiscal deficit. In this sense, the private investment funds that countries possess cannot cover the deficit which as a result diminishes economic growth and calls for immediate measures (Elmendorf & Mankiw, 1999).

As indicated by (Ighodalo, Omankhanlen, Osagie, & Iwiyisi, 2020), external debt has no noticeable impact on economic development. Nonetheless, in their viewpoint, home-based debt has a considerable impact on economic development by 3.3% for each increment. Another paper by, (Kumar & Woo, 2010) contradicts this statement and mentions that a negative relationship subsides between the debt acquired by the government and the real GDP per capita. Notwithstanding, the previous authors appropriately stated that this link disregards possible endogeneity among growth and public debt: the public obligation to-Gross domestic product proportion and results of economic development might not be entirely set in stone by external factors.

(Jacobs, Ogawa, Sterken, & Tokutsu, 2020) expressed that national debt is a crucial source for the nations to fund public spending and narrow the disparity in the public spending plan. There are various resorts of public debts like treasury and depository bills, obsolete government securities, outer help, and short periods borrowings. These quantities of funds are acquired by the public authority to meet the required objective of its financial plan. Additionally, these funds can be utilized to perform developing and valuable projects in terms of social and economic. Along these lines, public debt increases investment speculations, business activities, employment, and the performance of all the different sectors. Accordingly, the expanded acquirement of public debt is an incredible instrument to achieve improvement in the real gross domestic rate.

The previous examination (Esteve & Tamarit, 2018) dissected how the development and execution of nations' approaches with respect to credits influence their financial plan and economic development in the worldwide market. This examination sets that when the public authority has an adaptable credit strategy and can get cash from the overall population whenever when required, it has the likelihood to prompt more productive economical activities and employment opportunities. All of these policies empower the country to accomplish higher Gross domestic product and accomplish a superior place in the global market.

(Wairimu & Gitundu, 2017) adopt another strategy to look at the effect of government obligation by observing the effect of outside obligation on Kenya's Gross domestic product from 1970 to 2010. Alongside this, several factors such as inflation, workforce, investment, interest rate, and financial services were employed. As a result, a pessimistic connection which is negative has been discovered.

2.3. Government Spending

The economic hypothesis doesn't consequently create solid decisions about the effect of a nation's spending on economic development. Without a doubt, many economic experts would agree that there are situations in which lower levels of government expenditure would improve economic growth and contrary various circumstances in which more significant levels of government spending would be appealing. In the case nation's spending is zero, likely there will be unremarkable economic development considering the way that approving agreements, getting property, and cultivating a structure would unquestionably be challenging. As such, some government spending is important for the effective activity of law and order (Mitchell, 2005).

Starting around 1959, when Richard Musgrave (1989) distributed The Theory of Public Finance, it has been considered a custom for economic specialists to organize administrative capacities in the three classes of allocations, stabilization, and redistribution as proposed by the author Musgrave. The quest for the other three capacities was accepted to naturally create a characteristic long-run pace of development. Anyway, in late many years, development has obtained extraordinary conspicuousness in numerous nations. As a result, different approaches that don't effortlessly fit into Musgrave's classes have been presented. The time has finally come to perceive economic development as an unequivocal, fourth goal to be added to Musgrave's triplet (Musgrave & Peggy, 1989).

For sure, if properly administrated and used, government spending has a noteworthy positive impact on real GDP development, particularly in underdeveloped nations also, immature infrastructural facilities, and where the private area isn't sufficiently mature to participate in the anticipated part of the economy. The government's activity in economic development might be useful and simultaneously be impeding. The advantageous side of government activity can bring about: The utilization of monetary arrangements like pay duties and move installments which can prompt more evenhanded reallocation of pay; The supply of unadulterated public merchandise which might comprise a sizeable part of total interest; Government frequently behave as a facilitator in the business sectors with awry and flawed data (Husnain et al., 2011).

Conviction of a complete government spending budget and it is framework is complicated and may incorporate a large number of factors, like monetary circumstances and political, social, demographic, and financial elements. Most nations have kept on depending on outside help to back a portion of their public uses. A more grounded relationship of help with higher government utilization instead of with public venture would recommend both a "flypaper impact" and fungibility. This might

infer that aid beneficiary governments consider aid and debt like any other wellspring of income and thusly use it for expanded utilization, charge decreases, or diminished monetary shortages (future expense commitments) (Hindriks, 2004).

2.4. Inflation Rate and Debt

Accomplishing reasonable economic development and improvement is a main pressing issue for all nations (Shabbir, 2009). Numerous world economies are described by low capital development and a deficiency of assets to meet expanding public uses (Aluko & Arowolo, 2010). With persistent expansions in open consumption and extending monetary shortages, the greater part is compelled to seek domestic and foreign debt to stop monetary deficiencies and asset advancement (Saheed & Idakwoji, 2015). Moreover, nations can raise finances through tax assessment, production, or internal obligation, with money least favored due to the apprehension about fueling inflation.

Outer debt involves the outside money-related obligation commitments, including ensuring responsibilities by the government to non-occupants in different monetary standards, ordinarily in US dollars. Adapted to outer commitment, external currency debt includes; public and openly ensured debt, short and long-haul (longer than one year) debt, for example, bilateral and multilateral debt as well as business advances and credits. It additionally involves transient obligation (short of one year) from institutional moneylenders, private non-ensured obligation, IMF obligation, and obligation commitment to foreign exchange currency.

As per Nelasco (2012), outer debt acquisition has become essential in the advanced world since it supplements homegrown investment funds and permits nations to do useful operations. (Ezeabasili, 2011) and Gana, (2002) also emphasize that external debt acquisition is alluring and can give supporting importance to speed up economic development if they are diverted to expand the useful limit of the economy and advance financial development and advancement. The countries need to intensely acquire debt from other nations to make up for the deficit in the balance of payments resulting from heavy imports.

In accordance with (Mulusew, 2012), inflation is a worldwide worry that constantly compromises all economies, whether advanced or emerging, because of its unfortunate impacts. Keynesian speculations show that inflation happens when requests surpass the capability of the economy (Gebru, 2015). There are different contentions on the impact of external debt on inflation. As indicated by (Choong, 2010), since a country gets to plug its spending plan deficiencies, external debt getting is ultimately adapted and thusly impacts inflation. A country with a huge obligation level is more probable to encounter exorbitant loan costs prompting the execution of financial strategies that diminish these rates. The aftereffect of such an expansionary strategy might diminish loan costs over a shorter period of time yet lead to higher financing costs and higher inflation or unaltered over the long haul.

2.5. Trade Liberalization

Trade liberalization is a significant variable that can further develop the debt-adjusting limit of an economy, as it might cause an expansion in wellsprings of foreign trades like net commodities and foreign direct ventures. Market promotion of non-industrial nations for their items is a fundamental instrument to pay off their foreign obligations by running an exchange excess. The limitations on abroad market access can hinder the obliged nations' endeavors to acquire vital foreign exchange to support their outer obligation and try not to turn to unreasonable loans. Because of these reasons, the interlinkages between exchange transparency and outside obligation in non-industrial nations must be underlined for the obtainment of supportable answers for external debt.

In 2003 world trade organization emphasized the importance of trade among nations. According to them, trade can be helpful in several ways such as the expansion of rivalry between domestic and foreign companies, more productivity, higher revenue, the inflow of foreign currency, and more opportunities for people. Furthermore, similar benefits among countries in terms of the capital market and the financial sector generates investment. and another one is taking advantage of the financial matters of scale that would build a level of revenue and proficiency in asset assignment.

The advantages of exchange receptiveness remember an increment for improvement, redistribution of work to new exercises that need more human resources, and upgrade of the information stream between nations. Be that as it may, exchange transparency can lead to a diminishing in government income in emerging nations (Stiglitz, 2007). Accordingly, strategies and measures pointed toward encouraging macroeconomic soundness and an ideal venture environment, should go with exchange transparency.

(Sakyi, 2011) analyzed the degree of the long period link between the exchange, foreign help, and economic improvement in Ghana from the years 1984 to 2007. The results found that the long and the short run have a positive effect on trade

liberalization and outer assistance on financial improvement are diminished by their association term, and both exchange transparency and foreign help have been helpful to monetary development in Ghana, since the reception of progression strategies in 1983. Moreover, an analysis conducted during the nineteenth by (Osuji & Olowolayemo, 1998) explored the effect that liberalizing trade has on outer debt procurement for African countries. In that survey, the outside obligation is used as a dependent variable, and the extent of items and imports to Gross domestic product, terms of trade, and change scale are shown as free variables. As per the outcomes, they showed that the degree of external debt will go up whenever trade is more liberalized. Experimental results likewise reveal that an increase in homegrown imports compared with GDP will expand the external debt.

Liberalizing trade has many negative outcomes, including the risk of deindustrialization, as various African countries have now experienced. However, liberalizing trade likewise bears the bet of upsetting the outer debt issue of African/ACP countries. Consequently, an end to trade receptiveness is of identical importance from the perspective of handling the astounding issue of African/ACP countries' external debt. Without an end to trade liberalization, the answer to the external debt issue will undoubtedly stay slipper (Custers, 2006).

(Hassan, Wajid, & Kalim, 2017) investigated the long-term link between the trade deficit and its components in countries such as Bangladesh, India, and Pakistan. The results revealed that a decrease in the exchange rate significantly diminished trade. In addition, the outcomes presented that the trade deficit could be resolved by promoting capita income, exchange rate, economic activities, and cash supply. Another study, (Zahir, 2018) explored the correlation that exists between the trade imbalance, foreign direct investment, economic growth, and the external debt of Pakistan. The findings outlined that FDI and trade deficit had a positive impact however irrelevant on the debt whereas GDP has a remarkable impact on the debt with a strong association.

3. DATA AND METHODOLOGY

3.1. Data Collection

The data used in the study were gathered and extracted from various sources such as the economy country website, world bank, and Statista from the year 2000 to 2020. Generally, the data extraction focused on 9 East African countries which are (Djibouti, Ethiopia, Sudan, Rwanda, Eretria, Tanzania, Kenya, Uganda, and Burundi).

The factors employed in the model are estimated as follows: Firstly, we selected the national debt (annually) of each country as the reliant variable. Then several independent variables such as the GDP, inflation rate, government spending (the total amount of expenditure on all the sectors), importation, and exportation were adopted.

3.2. Econometric Models

The study seeks to investigate the effect of several independent variables on the national debt during 21 years' time frame and measure any changes, trends, and correlations. Therefore, longitudinal panel data was utilized. For instance, let us observe a hypothetical data set of ***(x₁, x₂, x₃, x₄, x₅, y)***. Also, a hypothesis linear regression equation that combines both the cross-sectional and time specified for the panel.

$$Y_{it} = \beta_0 + \beta_1 x_{\text{it}} + \beta_2 x_{\text{it}} + \cdots + \beta_{\text{n}} x_{\text{it}} + u_{\text{it}} \quad (1)$$

$$\text{Debt}_{it} = \beta_0 + \beta_1 \text{GDP}_{it} + \beta_2 \text{Infla}_{it} + \beta_3 GovSp_{it} + \beta_4 \text{Import}_{it} + \beta_5 \text{Export}_{it} + \cdots + u_{\text{it}} \quad (2)$$

The equation above contains the various factors used in this paper. We have the GDP that represents the gross domestic products of East African countries, we also used Infla which is the inflation rate of each country. Then we selected GovSp which denotes the government expenditure. Finally, we have the trade balance of each country which consist of importation and exportation.

3.2.1. Fixed Effect Model

This model will help us to analyze the causes of changes within the countries. As well it alters the factors (variables) by using time as an average point. The formula is presented as the following.

In this formula a_i ($_I$ =1, n) is the unknown intercept for each entity (*n* entity-specific intercepts). Y_{it} is our dependent variable

$$Y_{it} = \beta_1 x_{it} + a_i + u_{it} \quad (3)$$

which is national debt where *I* am the entity and *t* is the time. Additionally, x_{it} stands for a one independent variable. Whereas, β_1 is considered as the main coefficient of that independent variable. Finally, we have u_{it} which implies the errors term.

$$\text{Debt}_{it} = \alpha_i + \beta_1 \text{GDP}_{it} + \beta_2 \text{Infla}_{it} + \beta_3 GovSp_{it} + \beta_4 \text{Import}_{it} + \beta_5 \text{Export}_{it} + \cdots + u_{it} \quad (4)$$

3.2.2. Random Effect Model

The thinking that the arbitrary impact model which is the random effect express is that, differently the fixed effect model, the difference across substances is believed to be sporadic and uncorrelated with the pointer or free factors associated with the model. Inside the fixed effect model, these variables are absorbed by the intercept. The equation of the random effect is as the following.

$$Y_{it} = \beta_1 x_{it} + a_i + u_{it} + \varepsilon_{it} \quad (5)$$

In this equation a_i ($_I$ =1,…,n) is the unknown intercept for each entity (*n* entity-specific intercepts). Y_{it} is our dependent variable which is national debt where *I* is the entity and *t* is the time. Additionally, x_{it} stands for one independent variable. Whereas, β_1 is considered the main coefficient of that independent variable. Also u_{it} which implies the error term. Finally, ε_{it} indicates within the entity error.

$$\text{Debt}_{it} = \alpha_i + \beta_1 \text{GDP}_{it} + \beta_2 \text{Infla}_{it} + \beta_3 GovSp_{it} + \beta_4 \text{Import}_{it} + \beta_5 \text{Export}_{it} + \cdots + u_{it} + \varepsilon_{it} \quad (6)$$

4. FINDINGS

4.1. Statistical Results

The table below encompasses all the variables investigated in this paper. Additionally, it shows the time frame and the countries analyzed.

Table 1: Variables Definitions

Name	Description
Country	9 East African countries were used.
Years	The time frame of the data consists of 2000 to 2020 (20 years).
Debt	The total amount that every East African government has borrowed.
GDP	Gross domestic product. The total amount of goods and services produced in a country.
Inflation rate	The percentage of prices increases.
Government spending	The amount spent by the government in sectors such as education, healthcare, and social protection.
Export	The goods and services are exported to other countries.
Import	The goods and services are imported from other countries.

Figure 1 which is the national debt, illustrates that from 2000 to 2016 Sudan had the largest debt among the East African countries. However, starting in 2017 their debt declined. Countries such as Ethiopia and Kenya had also a high level of national debt estimated to be billion of USD. Finally, the rest of the East African countries including Djibouti had a constant level of national debt between 2000 to 2020.

The gross domestic product in the case of Kenya and Ethiopia demonstrated remarkable growth between 2000 and 2020 with an amount estimated to be 100 billion USD. Unfortunately, Sudan had steady growth until 2016 after that its GDP started to decline. Other countries such as Tanzania, Uganda, and Rwanda revealed a growth in their GDP as well over the years. Whereas countries such as Djibouti, Eritrea, and Burundi recorded the lowest GDP growth among the 9 East African countries over the years. See figure 2.

Figure 1: National debt

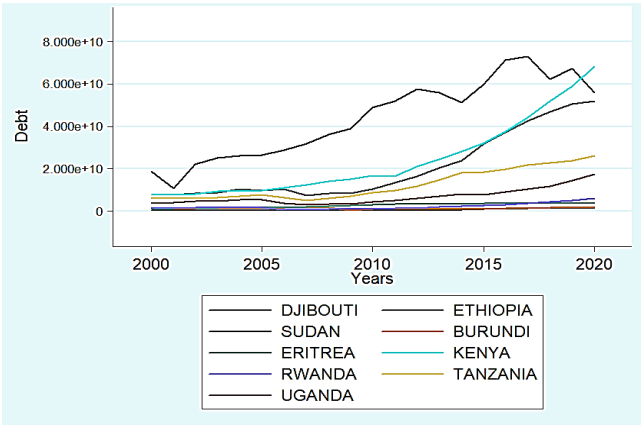
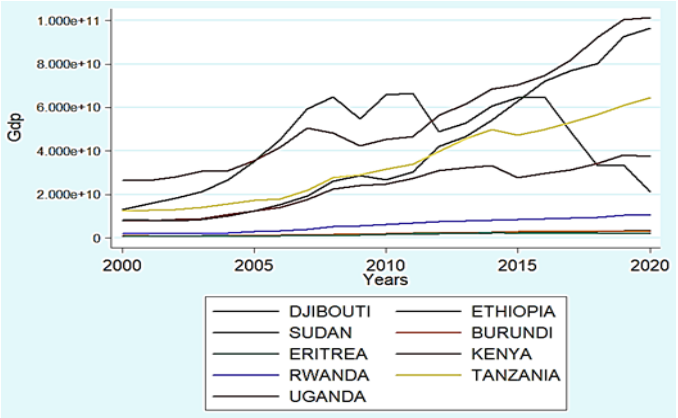


Figure 2: GDP



As expressed in figure 3 The overall inflation level is quite moderate among the East African countries. However, Sudan displayed a high rate of 150% of inflation in 2020. While Ethiopia was the second country in the 9 East African countries that showed inflation above 10%. Finally, there are Eritrea and Burundi which manifested a negative inflation rate. Whereas the inflation of Djibouti was not that significant.

The expenditure of the government is often considered as the total money injected into the different public sectors, such as health care, education, and social protection. In accordance with the figure, we can perceive that the Kenyan and Ethiopian governments spend the most among the 9 East African countries with an amount estimated at 15 billion and 25 billion USD consecutively. Simultaneously, Tanzania and Uganda spent a noteworthy budget on the public sector while Sudan's spending decreased over the years. Finally, we can discern that in 2020 Rwanda and Djibouti spent a similar amount of 5 billion USD on the public sector. See figure 4.

Figure 3: Inflation rate

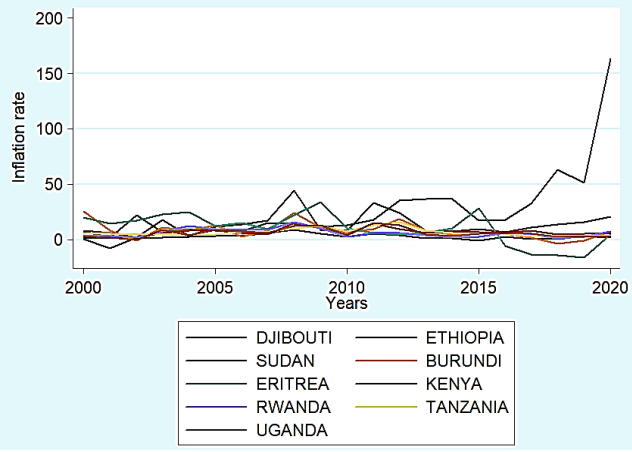
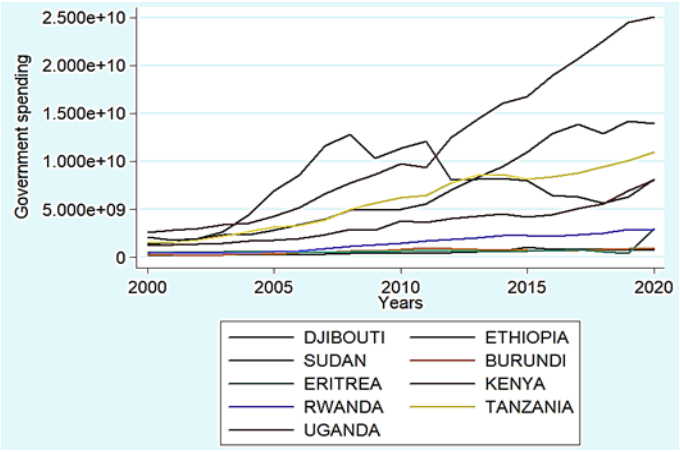


Figure 4: Government spending



In relevance to the exportation strangely Sudan had the highest level of exportation between the years 2000 to 2012 but the amount exported declined after that because the country was divided at that period of time. Interestingly, Djibouti demonstrated a high level of exportation between 2016 to 2020 ranking third place among the 9 African countries with an exporting amount reaching 5 billion USD. Overall, countries such as Kenya, Tanzania, Ethiopia, and Uganda expressed a similarly high level of exportation marking their positions in East Africa. See figure 5.

According to the importation figure, Kenya, Ethiopia, Tanzania, and Sudan displayed the highest rate of importation with an amount varied between 15 billion to 20 billion USD. Whereas, Uganda, Djibouti, and Rwanda presented a moderate level of importation with an amount of 5 billion USD. Finally, Eritrea and Burundi recorded the lowest level of importation among the East African countries. See figure 6.

Figure 5: Exportation

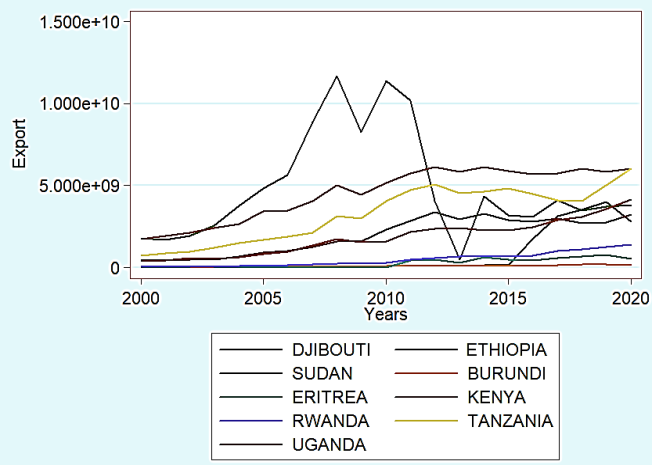
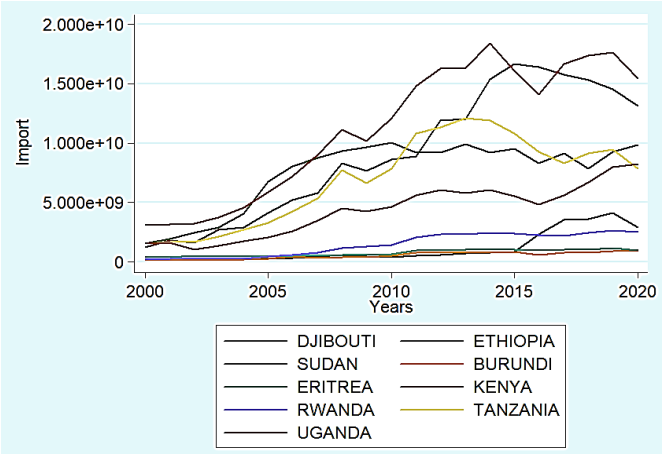


Figure 6: Importation



The table summarizes the descriptive statistics that are employed in this study. All the variables are expressed in million USD dollars but in order to facilitate the interpretation, we converted the numbers into percentages. The data are extracted from a handful of sources such as the country's economy, Statista, and the world bank from 2000 to 2020. In the table, we observe that the average national debt is 9.71 which varies between 8.50 to 10.86 million USD. The level of variability is exhibited by the standard deviation. The national debt diverges from it is normal mean value by .6209. Additionally, the GDP average is 9.97 with insignificant volatility of 0.6669. The average inflation rate stands at 9.74 and it presents a considerable amount of volatility since the standard deviation is at 14.97. Government spending displayed a mean value of 9.31 that range between 8.23 and 10.39. Finally, the trade balance which is composed of exportation and importation presented an average value of 8.84 and 9.36 respectively and inconsiderable volatility.

Table 2: Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max	Skew	Kurt
Debt	189	9.71	0.6209	8.50	10.86	0.024	2.059
GDP	189	9.97	0.6669	8.73	11.00	-0.209	1.644
Inflation rate	189	9.74	14.97	-16.37	163.26	6.24	60.858
Government spending	189	9.31	0.5535	8.23	10.39	-0.027	1.879
Export	189	8.84	0.8004	7.04	10.06	-0.577	2.144
Import	189	9.36	0.5901	8.11	10.26	-0.263	1.893

4.1.2. Regression Results

The table below exhibits a simple linear regression of pooled OLS. It is essential to observe the variables before opting for the fixed and random effects. As specified in the table, we can detect that GDP, inflation rate, and importation have a remarkable impact on the national debt. First, we perceive that an increase of 1% in GDP increases 0.316% the East African debt. Also, the inflation rate and government spending revealed that they expand by 0.006% and 0.825% gradually the national debt of East African debt. Finally, according to table 3, the trade components have revealed distinctive effects. To start with, exportation was revealed to increase the national debt by 0.119% while importation revealed an inverse impact in which it reduces the national debt by -0.356%.

Table 3: Pooled OLS Regression Test Result

Debt	Coef.	St. Err.	t-value	p-value	[95% Conf	Interval]	Sig
GDP	0.316	0.122	2.58	0.011	0.074	0.557	**
Inflation rate	0.006	0.001	4.90	0	0.004	0.009	***
Government spending	0.825	0.166	4.98	0	0.498	1.151	***
Export	0.118	0.07	1.69	0.092	-0.019	0.255	*
Import	-0.356	0.146	-2.44	0.016	-0.644	-0.068	**
Constant	1.111	0.366	3.04	0.003	0.39	1.833	***
Mean dependent var	9.717						
Prob > F	0.000						
R-squared	0.841						
Number of obs	189						
F-test	193.455						

**** p<.01, ** p<.05, * p<.1*

Table 4 demonstrates the fixed effect coefficient of the model evaluating the impact of our opted independent variables on the national debt using the panel. According to the table, the model demonstrates that GDP, government spending, exportation, and importation are significant at a 1% level in the fixed model estimation. Whereas, the inflation rate displayed a critical value of 0.05. These results indicate that all the factors are good explanatory and determinants to assess the national debt, due to the critical value they revealed. The coefficient is negative in importation in this model as well which implies that a 1% increase in importation diminishes -0.368% of the national debt of East African countries.

Table 4: Fixed Effect Test Results

Debt	Coef.	St. Err.	t-value	p-value	[95% Conf	Interval]	Sig
GDP	0.557	0.132	4.21	0	0.296	0.819	***
Inflation rate	0.002	0.001	2.09	0.038	0	0.004	**
Government spending	0.413	0.116	3.56	0	0.185	0.642	***
Export	0.122	0.047	2.60	0.01	0.03	0.215	***
Import	-0.368	0.121	-3.06	0.003	-0.606	-0.131	***
Constant	2.65	.504	5.26	0	1.656	3.644	***
Mean dependent var	9.717						
Prob > F	0.000						
Number of obs	189						
R-squared	0.596						
F-test	129.972						

**** p<.01, ** p<.05, * p<.1*

Table 5 is illustrating similar results in proportion to the fixed effect table. We can detect that all the variables have a significant value. However, the significance varies among the factors, for instance, for exportation the significance level is 5%. On the other hand, GDP, inflation rate, government spending, and importation presented a significant level of 1%. To sum up our random effect model indicate that all our variables have a noteworthy and remarkable impact on the national debt of each East African country. To conclude, the common thing between the three model is that importation presented a negative impact on the national debt of East African countries.

Table 5: Random Effect Test Results

Debt	Coef.	St. Err.	t-value	p-value	[95% Conf	Interval]	Sig
GDP	0.576	0.112	5.15	0	0.357	0.795	***
Inflation rate	0.003	0.001	3.23	0.001	0.001	0.005	***
Government spending	0.516	0.133	3.88	0	0.255	0.777	***
Export	0.124	0.054	2.29	0.022	0.018	0.231	**
Import	-0.409	0.126	-3.25	0.001	-0.655	-0.162	***
Constant	1.86	0.384	4.85	0	1.108	2.612	***

Mean dependent var	9.717
Prob > chi2	0.000
Number of obs	189
R-squared	0.591
Chi-square	614.799

**** p<.01, ** p<.05, * p<.1*

4.1.3. Specification Test and Stationarity

The decision of the model when it comes to panel data should be founded on data about the unique specific parts and the homogeneity of the factors. In accordance with the (Hausman, 1978) specification test if the P-value is less than 0.05 then we reject the null hypothesis and retain the alternative hypothesis and vice versa. In this table the P-value is clearly less than 0.05 then we select the fixed effect model as an initial and primary model for the variable's estimations (Chmelarova, 2007).

Table 6: Hausman's (1978) Specification Test

	Coef.
Chi-square test value	30.049
P-value	0

According to (Breusch, 1979), we fail to reject the alternative hypothesis since the test presents a p-value that is less than 0.05 which demonstrates the presence of heteroscedasticity. Consequently, in order to correct the heteroskedasticity, a residual variable was generated and the result revealed a value of 0.12 which is higher than the degree of freedom of 0.05.

Table 8: heteroskedasticity test

chi2(1)	Prob > chi2
2.38	0.1227

5. DISCUSSION

According to our model, several results were revealed. First of all, after running a pooled OLS regression test, we perceived that all the variables (GDP, inflation rate, government spending, exportation, and importation) have a positive impact on the national debt of East African countries. Because each one of them is demonstrating a significant p-value that ranges from 0.01% to 0.05%. Moreover, both the random and the fixed effect test displayed that all the variables have a noteworthy influence on the national debt. Therefore, since the Hausman test disclosed that the fixed effect model is our primary model for the variable's estimation we will interpret the findings based on it.

With that in mind, the variables demonstrated quite a crucial reaction to the national debt. First. Inflation has the capacity to alter the debt of a given country. This implies that a rise in inflation rise the degree of external debt. This is the case according to the fixed model. Because the 1% increase in the inflation rate rises 0.002% of the national debt. Additionally, high inflation rates influence money-related dependability which is a critical instrument in credit rating. mediocre or absence of money-related dependability prompts interest rates which eventually prompts high gathering of outer debt levels. The findings are

validated by Bhara et al (2009) who from his side revealed that there is a huge connection between a nation's loan fees, financial plan shortages, foreign and domestic debts to inflation and that outside obligation forces both inflation and interest costs higher (Aisen & Veiga, 2006).

Secondly, the findings of this paper infer that economic growth ordinarily needs aggregating total debt. In different words, economic growth is extremely challenging to accomplish when the amount of debt borrowed is diminished. At that point being, the East African countries are now intensely indebted and, thus, it appears to be possible that acquiring more debt is challenging. Subsequently, during a recession, the public sector ought to acquire in order to animate the economy and upgrade the reimbursement capacity of the private sector.

Thirdly, debt manageability has turned into an extremely dynamic issue in the ongoing scene situation with numerous industrialized nations surrendering to unreasonable spending plan deficiencies and obligation levels. Nonetheless, the approach toward execution of starkness measures is concentered on pay and expenditure cuts. Mainly public expenditure depends on the way the money is spent in accordance with the debt. For instance, the East African countries expenditure on activities that may generate revenue such as in the tourism and transportation sector may lead to a decrease in the amount of debt acquired.

Finally, liberalizing trade of the East African countries is a significant instrument that can further develop the obligation adjusting limit of their economy, as it might cause an expansion in the source of foreign trades like net commodities and foreign direct ventures. Market increase of East African nations for their goods and services is a fundamental instrument to pay off their foreign debt by running an exchange surplus.

6. CONCLUSION AND IMPLICATIONS

The paper highlighted the factors that affect the national debt of East African countries. In addition, the paper assessed the level of macroeconomic fluctuation. In order to gather the data 9 East African countries which are (Djibouti, Ethiopia, Sudan, Kenya, Rwanda, Eritrea, Uganda, Tanzania, and Burundi) between the period 2000 to 2020 were analyzed. Consequently, to analyze the relationship and the impact of the national debt several macroeconomic factors were selected such as GDP, inflation rate, government expenditure, and trade. Furthermore, longitudinal panel data that compromised Pooled Ordinary Least Square (OLS), Fixed Effects, and Random Effect tests were applied. On that account, the result illustrated all the variables have a significant impact on the East African national debt. Finally, this research contributes to the large empirical findings about the economic situation of Africa. In addition, it provides to East African government, policymakers, and economists with insightful practical evidence about the correlation between the national debt and macroeconomic factors. The study will also offer insights into how to regulate these factors in order to decrease the national debt.

REFERENCES

Abd Rahman, N. H., Ismail, S., &Ridzuan, A. R. (2019). How does public debt affect economic growth? A systematic review. Cogent Business and Management, 6(1), 1701339.

Annual report (2003). world Trade Organization publication, CH-1211 Geneva.

Aisen, A., & Veiga, F. J. (2006). Political Instability and Inflation Volatility. IMF Working Paper, (p. No. 06/212).

Ajisafe, R., Nassar, M., Fatokun, O., Soile, I., & Gidado, O. K. (2006). “External debt and Foreign Private Investment in Nigeria: A Test for Causality”. African Economics Business Review. 4(1): 48-63.

Funso, A., & Dare, A. (2010). Foreign Aid, the Third World’s Debt Crisis and the Implication for Economic Development: The Nigeria Experience. African Journal of Political Science and International Relations, 4(4),120-127.

Asogwa, R. C., & Ezema, C. C. (2014). Domestic Government Debt Structure, Risk Characteristics, and Monetary Policy Conduct, Evidence from Tanzania. Nairobi: ACME.

Aziz, O. G., & Mishra, A. V. (2016). Determinants of FDI inflows to Arab economies. The Journal of International Trade & Economic Development, 25(3), 325–356.

Bainomugisha, A. (2016). The Promise and Efficacy. ACODE Policy Briefing Paper, Series No. 41.

Bhagwati, J. (1988). Protectionism. USA: The MIT Press, Cambridge, MA.

Cargill, T. (2010). Our Common Strategic Interests. Africa’s Role in the Post-G8 World. A Chatham House Report.

Chmelarova, V. (2007). "The Hausman test, and some alternatives, with heteroskedastic data". LSU Doctoral Dissertations. 936.

Chee-Keong, C., Evan, L., Venus, K. S. L., & Chin-Hong, P. (2010). Does debt foster economic growth? The experience of Malaysia. African Journal of Business Management, 4(8), 1564-1575.

Custers, P. (2006). Trade Liberalization under EPAs and African External Debts. Trade Liberalization under EPAs and African External Debts The Need To Look AT Interlinkages, Polycentric World Social Forum. Bamako, Mali.

East Africa Regional Overview (2020) A report by African Development Bank Group, Nairobi, Kenya.

Elmendorf, D. W., & Mankiw, N. G. (1999). Government debt. Handbook of Macroeconomics, 1(3), 1615-1669.

Esteve, V., & Tamarit, C. (2018). Public debt and economic growth in Spain. Cliometrica, 12(2), 219-249.

Ezeabasili, V. N., Isu, H. O., & Mojekwu, J. N. (2011). External Debt and Economic Growth An Error Correction Approach. International Journal of Business Management, 6(5), 156-170.

Fajana. (2003). "Nigeria debt crisis" United National Economic Commission for African socio. Economic Research and Planning Division, Addis-Ababa, Ethiopia, 5(2): 54-57.

Fatma, M., & Zouhaier, H. (2014). Debt and economic growth. International Journal of Economics and Financial Issues, 4(2), 440-447.

Gebru, T. (2015). The determinants of economic growth in Ethiopia: A time series analysis. Addis Ababa University.

Ibrahim, H. (2015). Effect of external public debt on economic growth: An empirical analysis of East African countries. MSc thesis in Economics, University of Nairobi.

Hausman, J. A., & Taylor, W. E. (1978). Specification tests in econometrics. Econometrica, 46, 1251–1271 doi: 10.2307/1913827.

Hassan, M. S., Wajid, A., & Kalim, R. (2017). Factors affecting trade deficit in Pakistan, India, and Bangladesh. Economia Politica, 34(2), 283-304.

Hindriks. (2004). Intermediate Public Economics. New York.

Husnain, M. I., Khan, M., Haq Padda, I., Akram, N. and Haider, A. (2011). Public Spending, Foreign Direct Investment, and Economic Growth: A Time Series Analysis for Pakistan (1975-2008). International Research Journal of Finance and Economics, Vol 61:21–27.

Ighodalo Ehikioya, B., Omankhanlen, A. E., Osagie Osuma, G., & Iwiyisi Inua, O. (2020). Dynamic Relations Between Public External Debt and Economic Growth in African Countries: A Curse or Blessing? Journal of Open Innovation: Technology, Market, and Complexity, 6(3), 88.

Jacobs, J., Ogawa, K., Sterken, E., & Tokutsu, I. (2020). Public Debt, Economic Growth, and the Real Interest Rate: A Panel VAR Approach to EU and OECD Countries. Applied Economics, 52(12), 1377-1394.

KENDREN (2009), Kenya's Public Debt Status, The Kenya Debt Relief Network, Nairobi.

Kumar, M. S., & Woo, J. (2010). Public debt and growth. IMF Working Paper, No. 10/174.

Law, C. H., Tee, C. L., & Ooi, S. K. (2019). Threshold Effect of Financial Integration on Linkages Between Monetary Independence and Foreign Exchange Reserves.Asian Academy of Management Journal of Accounting & Finance,15(1).

Lora, E., & Olivera, M. (2006). Public debt and social expenditure: Friends or foes? Technical Report 563, Inter-American Development Bank, Research Department.The USA.

Mataen, D. (2012). Africa - the Ultimate Frontier Market. s.l.: Harriman House Ltd. New African, 2014. East Africa Becomes a Petro-Dollar Region. New African, April, pp. 72- 74.

Mitchell, J. (2005). The Impact of Government Spending on Economic Growth. Backgrounder, 1831.

Mulusew, A. (2012). Relationship between Inflation and Economic Growth in Ethiopia. MSc thesis in Economics, University of Gonder.

Musgrave, R. (1989). "Public finance in Theory and Practice". Singapore: McGraw-Hill International Editions.

Mutasa, C. (2003). Regional Integration and Debt in Africa: A Comparative Report of Africa's Regional Groupings. AFRODAD Research Series.

Ogwuma. (2013). "Revitalizing the manufacturing sector in Nigeria".Central Bank of Nigeria. A selection of Essays/Speeches by the Governor.

Osuji, L. O., & Olowolayemo, S. O. (1998). The Impact of Trade Liberalization Policy on Sub-Saharan AfricanCountries' Debt Burden. African Economic and Business Review, 1(22): 59-73.

Pattillo, C. A., Poirson, H., & Ricci, L. A. (2015). "What Are the Channels Through Which External Debt Affects Growth?". IMF Working Paper, No. 04/15.

Saheed, Z. S., Sani, I. E., & Idakwoji, B. O. (2015). Impact of Public External Debt on Exchange Rate in Nigeria. International Finance and Banking, 2(1), 15-26.

Daniel, S (2011). Trade Openness, Foreign Aid and Economic Growth in Post-Liberalisation Ghana: An Application of ARDL Bounds Test. Journal of Economics and International Finance, 3(3): 146-156.

Shabbir, S. (2009). Does External Debt Affect Economic Growth: Evidence from Developing Countries.

Stiglitz, J. E. (2007). Making Globalization Work for Developing Countries. New York: W.W Norton & Company, Inc.

Wairimu, M. M., & Gitundu, E. W. (2017). Macroeconomic determinants of nonperforming loans in Kenya. Research Journal of Finance and Accounting, 8(4), 97-105.

Zahir, S. (2018). Impact of trade deficit, foreign direct investment and external debt on the economic growth of Pakistan; a time series analysis University of Swabi Journal (USJ) Vol.2 Issue 1. January 2018, pp. 8-24.

PressAcademia
www.pressacademia.org/journals/jefa
JEFA
ISSN 2148-6697
Journal of Economics, Finance and Accounting YEAR 2022 VOLUME 9 ISSUE 4

THE IMPACT OF CORRUPTION ON THE PERFORMANCE OF ISLAMIC BANKING IN THE UNITED ARAB EMIRATES: EMPIRICAL EVIDENCE BY USING STATIC PANEL ANALYSIS

DOI: 10.17261/Pressacademia.2022.1639
JEFA- V.9-ISS.4-2022(2)-p.166-177

Omar Salim Ali
Istanbul Sabahattin Zaim University, Department of Islamic Economics and Finance, Istanbul, Turkey
salimzanzibar003@gmail.com, ORCID: 0000-0003-1135-9601

Date Received: October 24, 2022 **Date Accepted:** December 5, 2022

To cite this document
Ali, O.S., (2022). The impact of corruption on the performance of Islamic banking in the United Arab Emirates: empirical evidence by using static panel analysis. Journal of Economics, Finance, and Accounting (JEFA), 9(4), 166-177.
Permanent link to this document: http://doi.org/10.17261/Pressacademia.2022.1639

ABSTRACT

Purpose- The major objective of this paper was to scrutinize the impact of corruption control on Islamic banking performance in the United Arab Emirates. So the performance of Islamic banks was determined by the profitability as a specific objective of this study.
Methodology- Panel data was grounded on quantitative analysis applied. Also, the study collects data from secondary sources from 2000 up to 2019. The sample of this paper comprised a total of 18 banks that were selected in the UAE. Data were collected from the World Bank data set and annual financial reports for each selected bank. The study analyzed the data based on descriptive statistic, correlation matrix, and static models which includes pooled OLS model, random effect, and fixed effect to achieve the study objective. So, results were presented in the form of tables for descriptive analyses of the key variables applied, correlation as well as static models. The static model that was applied for this study provides the uniqueness of this paper because most of the previous corresponding studies did not employ a static model but used a dynamic model especially the Generalized Method of moment (GMM). So, the originality of this study firstly, it is the earliest study that used a static model, and secondly, this study may be the first to look at the impact of corruption control on Islamic bank's profitability. This is because most of the study is based on the impact of corruption and not corruption control like this study.
Findings – The findings have shown that corruption control and bank profitability have a statistical correlation relationship and its coefficient revealed a positive association which indicates that in the UAE control of corruption would increase the profitability of Islamic banks. The discussions of the findings show that some previous studies are consistence with the study while others are inconsistent. The results of this implied that the Islamic bank flourish and benefit from the corruption-controlling strategies that existed in UAE.
Conclusion – The study recommends that in UAE and other countries the zero-tolerance policy for corruption mitigation and eradication is a perfect way, efforts should take and should be achievable right now. So alternative way to expression at this is in terms of Islamic finance should not tolerate non-Shariah compliant elements and any element of the practice of corruption. So, the strong practice of corruption in the Muslim states and non-Muslim states hinders the progress of Islamic financial institutions (IFIs). From these results, Islamic finance should insist on the application of its principles for every Industry that offers Islamic finance products and services.

Keywords: Corruption, Islamic banks, Profitability, UAE, Static panel data analysis
JEL Codes: C30, C33

1. INTRODUCTION

Corruption combat becomes a major issue for most countries in developed and developing countries due to its consequences on the economy, political society, and so on. Currently, this problem has been affecting many countries in all sectors as a result it hinders the development of many things among them financial development as well as the economy. So there is a great demand to explore the impact of corruption in every sector of the country. Due to that all the nations, organizations, and individuals around the world have the consequence of corruption and anti-corruption measures. As a result, countries are suffering from corruption and have tried a variety of effective methods, initiatives, and ongoing improvements to counteract it

(Nguyen, 2012). So previous studies have shown that banks and other financial institutions have been affected either positively or negatively due to the corruption practiced in the countries. According to the findings Islamic banks highly and greatly benefited from the most corrupt nations. As a general rule, Islamic banks must be transparent and refrain from engaging in any unclear corrupt activities. It is a distinguishing feature of their edifice. However, as the data demonstrate, bank profitability and corruption in the nations are strong links that existed in the previous study. While a zero-tolerance policy for misbehavior is ideal, it is not currently practical. Another perspective is to consider the tolerance standard for non-Sharia-compliant functioning in Islamic banking. Scholars and jurists from Islam are responsible and required for the advancement of Islamic finance by accepting some existing non-Sharia compliant components (Saiful Azhar, 2005). Similarly, creating and promoting Islamic banking in places wherever it is badly required but inaccessible develops a modest value to recompense currently for the good of mankind tomorrow. Islamic financial Institutions would be pushed and conduct more in-depth investigations into their operations and refuse to tolerate illicit money flows. Likewise, In the course of their employment, bankers may derive through corrupt financial transactions should refrain from participating in them and denounce them as soon as feasible.

Furthermore, this phenomenon should be given more attention by existing governing bodies. They must ensure that all banks follow the same protocol, apart from that in terms of financial reporting as well as business practices. Similar bodies would be ready to intervene as well as assist in the resolution of such issues as they arise, allowing banks to concentrate on their core business. Corruption must be controlled and eradicated in all sectors and all countries because their negative effect has been justified in many studies but unfortunately, the graph of corruption practiced has increased moving upward in the developed and developing countries as well. So, UAE was a case study for this paper because Transparency international reports continue to show a bad direction for this Muslim country.

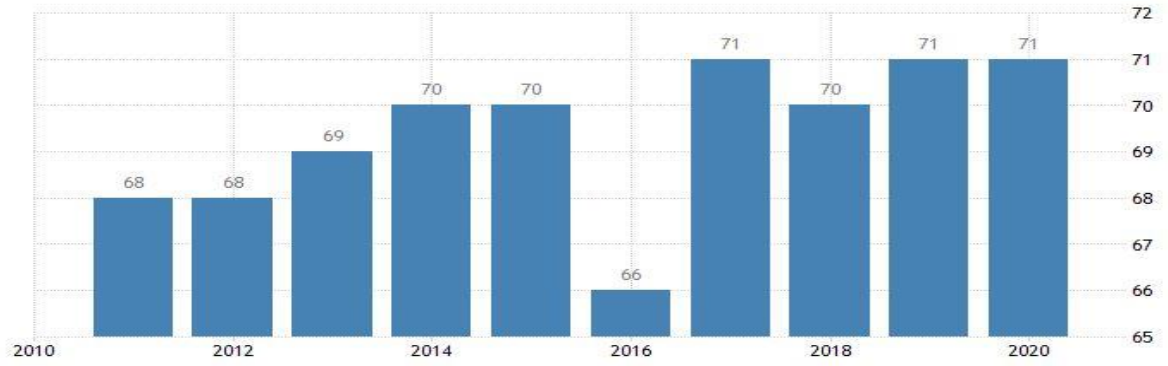
1.1. Trend of Corruption in the United Arab Emirates

Based on the reports provided annually for all nations using the " Corruption Perceptions Index"(CPI) which measures the performance of corruption in the public and private areas displayed 29 points in the UAE in 2020. The measure runs starting at 0 and ending at 100. The interpretation of their figure standing as the number approaching 100 means the higher corruption practiced in that region or country. The United Arab Emirates is classified 21st because of this result its performance is very higher than the normal situation when compared with the previous year or other nations.

In comparison to previous years in 2019, the level of corruption has remained unchanged. Despite this, it has been steadily declining in recent years in the long run. Previous research has given a variety of perspectives on corruption. Corruption can be described in a variety of ways, including through the angles of economics, religion, and politics. Some organizations and experts can also explain the corruption definition. UN Agreement against Corruption, in place of a global organization focused on corruption issues, does not provide a clear definition of its framework because its behavior varies from person to person, but Transparency International describes corruption defined as an abuse of public power for private gain or abuse of assigned power for private gain(Transparency International, 2018)

Ineffective law enforcement, in addition to explaining corruption caused by political and cultural causes, can intensify the situation. Notably, it is continuously lower in constitutionally governed countries (a system of régime in the UAE is the Federation of autonomous monarchies) So this system of government formed in the UAE could enable it to address the issue of corruption for every region in UAE. Consequently, corruption seems to be more prevalent in UAE. The average per capita income in the UAE is USD 43,470, which is quite high by global trends. The country's higher-than-average cost of living also indicates that it is relatively stable. These assessments were based on surveys performed by Transparency International, which compiles the Corruption Perceptions Index yearly. The actual ranking flips the data and gives higher weight to places with lower levels of corruption. As a result, the approved score for the United Arab Emirates in 2020 was 71 points, making it an anti-corruption statistic, with higher scores indicating lower corruption. For improved comprehension and visual acquisition of the graphs, some values have been reversed. Below are the graphs which show the trend of corruption in the United Arab Emirates over several years. IF observe in detail the corruption practice in UAE raise although some years diminish but in a general way it goes up.

Figure 1: Trend of Corruption in the United Arab Emirates from 2011 to 2020



Source: (Transparency International, 2021)

Moreover, TI reported that the UAE's rank upgraded from 37 nations out of 133 in 2003 to 21 nations out of 180 in 2019. Over the last sixteen years, the UAE has seen an increase in its CPI ranking. The UAE government's impressive attempts to fight graft are responsible for the rank changes. Following the latest global financial crisis, the federal law 4/2002 on anti-money laundering and other laws were enforced. The Abu Dhabi Accountability Authority (ADAA) was created in 2008 to fight monetary and managerial corruption. It was in charge of ensuring that public institutions handle money effectively, deliver accurate financial records, prosecute corruption allegations, and improve legal, accountable, and transparent values.

According to the central bank of the UAE, there are 22 regular and Islamic banks in the UAE in 2019, with whole assets of AED 2894.9 billion and gross credit of AED 1675.1 billion. Islamic banks have gained acceptance in the total monetary system by offering Sukuk products. According to the World Economic Forum (WEF), Islamic banks in the UAE account for 14.6% of global Islamic finance funds (WEF, 2015). In terms of anti-corruption activities, these developments encourage a concentration on the UAE's Islamic banks industry. The above report shows clearly that in UAE the Islamic Banks have had great development since it was initiated and their contribution to the economy either globally or in the UAE economy is very high.

1.2. Islamic Banking in UAE

The United Arab Emirates is one of the Muslim countries which have high development in Islamic finance, almost all Islamic financial industries including Islamic capital markets, Takaful, and Islamic banks, are well-operated in a good performance. Moreover, Islamic finance especially banks have been established for a long time and UAE is one of the countries which allowed it and provide positive significance for other countries to get advice and experience on how to operate. Mashreq Al Islamic Bank's concern with Islamic principles and most popular in the United Arab Emirates arranged the groundwork for the contemporary investment structure in the UAE also about the world in the arrangement of Islamic finance. The UAE is a principal and leading country with include Indonesia, Malaysia, and Saudi Arabia behind the advancement of contemporary Islamic finance, which adheres to Shari'ah-compliant financial practices. History shows that Dubai Islamic Bank (DIB) was the first commercial Islamic bank launched in the United Arab Emirates as well as the world in general and was established in 1975. The government of the UAE has established legislation controlling Islamic finance since the advent of Islamic banks. Currently, in UAE more than eight (8) Islamic banks are in existence, some of which are completely functional and others that serve as Islamic windows. According to the 2020 report of the Islamic Financial Service Board (IFSB), Islamic banking continues to lead the Islamic industry, followed by Islamic capital markets for banking assets of 1,765.8 and a share of 72.4% in global Islamic finance. In terms of region, the Gulf Cooperation Council (GCC) region also records 45.4% of global Islamic banking assets, followed by the Middle East and South Asia (MESA) region, which accounts for 25.9% of global Islamic Financial Service Industry assets.

Table 1: List of Islamic Banks in the United Arab Emirates by Year of Established

S/N	Name of Islamic banks	Year of Establishment
1	Dubai Islamic Bank	1975
2	Sharjah Islamic Bank	1976
3	Abu Dhabi Islamic Bank	1997
4	Dubai Bank	2002
5	Emirates Islamic Bank	2004
6	Noor Islamic Bank	2007
7	Al Hilal Islamic Bank	2008
8	Ajman Islamic Bank	2008

2. LITERATURE REVIEW

2.1. Theoretical review

Hypothetical contributions on the link between corruption and the performance of banks are conflicting. Many studies focus on the examine the correlation between corruption and banking performance but their findings still do not show consistency and the theories as well for instance the thought-led (Gerschenkron, 1952) argues that corruption can be positive to the economy. This is because it allows entrepreneurs to get loans without having to meet onerous collateral requirements for profitable projects, particularly in corrupt and underdeveloped nations (Luc, 2009). Likewise, the "grease wheel theory" proposed by (Charumilind et al., 2006) implies corruption allows businesses and prominent persons to obtain loans without meeting severe loan terms in high-corruption contexts. Furthermore, corruption has been found to boost bank loaning and therefore bank productivity in the short track, especially in finance organizations with a highly risky avoidance (Laurent, 2011).

Another school of thought contends that corruption reduces bank profitability. This means the available lending funds may be diverted to destructive activities in an economy with a extreme level of corruption, it is indicated (Bougatef, 2017). It happens because bank administrators could authorize risky credits solely intended for personal benefit through corruption and bribery, despite being conscious of their risk. Additionally, loans containing corruption are often connected with high default and creditworthiness in bank portfolios (Akins et al., 2016). So apart from these thoughts, the previous studies also were divided into two major groups whereby, others believed in the positive impact of corruption on banking performance, and others vice versa.

In addition to that,(Eisenhardt & Eisenhardt, 2018) define corruption as the result of an agency conflict, generally involving a bureaucrat who exploits his public position and thereby undermines the interests of his superiors for personal benefit. The most important assumption behind this theory is the presence of adverse selection, which prevents the primary from efficiently monitoring and regulating his agents' actions and inactions. The principal-agent theory has evolved into a strategic model to understand corruption and its consequences. As a result, the great majority of measures designed to combat corruption in the emerging economy followed the principle of agent foundations (Persson et al., 2013). Similarly, the principal-agent concept indicates that any anti-corruption initiatives should focus on structural adjustment rather than the presence of a non-corrupt leader.

2.2. Empirical Reviews

Several academics have explored the effects of corruption on bank profitability. There are several studies previously conducted based on Islamic banks and corruption from different samples of countries and banks or other organizations. This section provides a discussion of the previous studies on how carried out which includes their objectives, methods applied, findings obtained, and recommendations that they provided in their studies. Some of that studies like as follows;

(Kabir *et al.* 2022), This study focused on Islamic banks and observe the effect of corruption and money laundering on profitability and stability. It includes fifty-three conventional banks and Nineteen Islamic banks from Malaysia and Pakistan, and FE and random effect models were utilized in general. Commercial banks gain from corruption and money laundering, according to the research. While the effect of corruption and money laundering have been shown to encourage Islamic bank success and stability in less corrupt environments such as Malaysia, they have a detrimental impact in more corrupt environments such as Pakistan.

(Marwan & Haneef, 2019) study how corporate governance affects Islamic bank performance. In the analysis, they used a two-step technique of moment estimate methodology. From 2008 to 2017, the study examined data from 129 Islamic banks in 29 Muslim nations in Southeast Asia, South Asia, and with the Middle East. The outcomes displayed that all shariah supervisory boards (SSB) and committees especially audits have a beneficial influence on IB's profitability, according to the findings. However, the risk management committee and board size have a detrimental impact on IB performance.

Recent research conducted by (Mohammad, Ahmed Rufai Mohamad & Nor, 2019), explored how corruption impacts the stability of conventional and Islamic free-interest banks in the Middle East and North Africa (MENA). It focuses on the post-crisis time from 2008 to 2016. The generalized Method of Moments was the reliable method and was selected because the data was a panel and comprised many countries. So study revealed that better corruption control has a beneficial influence on the stability of Islamic banking. Also, according to the outcomes, it connected to fewer bank credit losses. Traditional banks, it continues, benefitted from corruption to reach their degree of stability. These results have been categorized and become different from Islamic banks and traditional banks.

In the same context, (Yunan, 2020), explained the way of corruption affects Islamic banks with the cases of OIC states. The study is based on a dynamic panel of a total of sixty-one Islamic banks of the member countries of the Organization of Islamic Countries. He looks at the effect of the corruption on reliability and profitability of Islamic banks. His study covers the time from 2016 to 2018. The findings show clearly that, corruption disturbs the concert of Islamic banks in OIC member countries.

(Sufian & Zulkhibri, 2015) conducted a more recent investigation. The study used a dynamic panel model to investigate the impact of economic freedom on the environment. Profitability of Islamic banks in the Middle East and North Africa (MENA) from 2000 to 2010. The study discovered that the profitability of Islamic banks has improved because of increased financial resource autonomy. The results moreover recommended that increasing profitability could be accomplished by reducing system intervention and increasing diversification Furthermore, this research used the anti-corruption index and empirical evidence, and it was discovered that corruption exists.

Correspondingly, (Bolarinwa & Soetan, 2019), between 2011 and 2017, looked at the impact of corruption on bank profitability using samples of banks from highly and least corrupt countries. In their research, they used GMM and panel co-integration, which included both systems and different GMM applied. Corruption has a substantial influence on commercial bank profitability in both emerging and developed nations, according to the study. Furthermore, in underdeveloped nations, corruption has been found to have a beneficial influence on profitability. These results concentrate and classified the countries into developed and underdeveloped in the end the results have become the same for both groups.

Moreover, (Aslam and Haron 2019), investigate the effect of corporate governance on the performance of Islamic banks (IBs). They utilized a two-step method GM of moment estimate methodology in the analysis. The study looked at data from 129 Islamic banks in 29 Islamic nations in Southeast Asia, South Asia, and the Middle East from 2008 to 2017. The findings show that both the audit committee (AUDC) and the Sharia board (SB) have a positive impact on IB's profitability. On the other hand, the risk management committee and board size have a negative influence on IB performance.

A similar study, (Mongid & Tahir, 2011), based on a cross-country sample from 475 banks working in 6 ASEAN states to analyze the influence of corruption on bank profitability. Their report revealed that there is a positive association between a high level of corruption and bank profitability. According to these results, Islamic banks have benefited as a result of the poor governance in these countries.

Moreover,(Asteriou et al., 2016) investigated the roles of corruption on bank profitability though the level of corruption is high among these countries in Europe. In the sample of 681 European banks from the period 2000 to 2012, the findings showed that corruption harms European banks' profitability. So the study concluded that European banks which almost are convectional have been affected by corruption.

In different special cases, (Tabash, 2019), the research examined the performance of the sector of Banking and Economic Growth in the UAE in the case study of Islamic Banks. So study objective was to explore the relationship between the corruption and performance of Islamic banks in the United Arab Emirates. Both full-fledged Islamic banks operating in the UAE make up the study.

(Rizvi and Arshad,2013), Using a multivariate regression model, they evaluated the influence of corruption on Islamic bank profitability in highly corrupt nations. As a result, ten countries have been chosen to participate in the investigation, The sample countries are Sudan, Bangladesh, Iran, Kenya, Indonesia, Tunisia, Iraq, Egypt, Algeria, and Pakistan. Using a panel dataset of

300 observations from ten different banks between 2000 and 2010, panel least squares regression consequences expose that corruption has a considerable positive influence on bank profitability.

Furthermore, (Khediri and Ben-Khedhiri, 2009) From 1999 to 2006, researchers examined the estimates imply of Islamic bank profitability for 40 Islamic banks in the MENA region. The study discovered that capitalization and management efficiency increase bank profitability by taking into account a variety of factors also including bank characteristics and market structure. Similarly, improved economic circumstances and legal structures assist Islamic banks to increase their profits. Nonetheless, the study discovered that Islamic bank profitability doesn't appear to be linked to the corruption rate.

Sufian and Habibullah (2009) used micro and macroeconomic statistics to investigate the causes of banking profitability in China. Data from the years 2000 to 2005 were used in the study. Employing regression analysis, it was discovered that all of the determining factors (variables) have a statistically significant impact on the profitability of Chinese banks. Nevertheless, the effects are not consistent among bank types. Liquidity, credit risk, and capitalization are bank-specific variables that have a beneficial impact on the profitability of state-owned commercial banks.

(Aburime, 2009) The purpose of this article was to use an econometric model to investigate the influence of corruption on bank profitability in Nigeria. The study used a panel data set that spanned the years 1996 to 2006 and included 358 observations from 48 different banks in Nigeria. The results reveal that corruption has a considerable positive impact on bank profitability in Nigeria when using backward stepwise regression.

On top of that, Research done by (Liao, 2009) found overseas banks from Asian states are extra lucrative in a corrupted atmosphere than domestic JFC banks in a cross-country comparison. Furthermore, (Mongid & Tahir, 2011) discovered that weak governance in six ASEAN nations analyzed gives advantages to banks. The research found that corruption had a negative stimulus on profits. Similarly, financial systems in Latin American countries are affected by significant levels of corruption(Pagano, 2008).

The above discussion has shown clearly that, there is a big gap in the themes of this study especially on the Islamic banks because the number of studies is very few and their results are inconsistence, although the Islamic banks based on Islamic ethics and principles and operated under the Shariah compliant still the corruption existing and some banks benefited from it. So this study could provide valuable information and additional pieces of literature on academics and all groups of decision-makers concerned about corruption.

2.3. Motivation of the Study

Promoting justice in society is one of Islam's most important goals. As a result, in a completely Islamic financial system, corruption should not exist. However, according to the available research, there is an observed link between corruption and the profitability of Islamic banks. UAE is also one of the few Muslim countries with a strong Islamic banking and Islamic finance sector. Also, though the UAE is among the Muslim governments with the most advanced Islamic banking and financial systems, TI studies reveal that their ranking on corruption is far worse, therefore these two factors, Islamic banking and corruption performance, do not drive together. As a result, the goal of this research is to clarify the link between Islamic banks and anti-corruption efforts in the United Arab Emirates.

3. METHODOLOGY OF THE STUDY

3.1. Sample and Sources of Data

The goal of this study is to see how anti-corruption measures affect Islamic bank profitability. This research includes 15 Islamic banks from the United Arab Emirates. It spans the years 2000 through 2019. Transparency International and the World Bank provide corruption indicators. The study is based on a quantitative approach which includes the numerical data of banks which were 15 selected from the UAE with each bank the data were collected. It was panel data based on static models. The data were collected from several sources for instance the data of specific banks collected from their annual financial reports while the macroeconomic variables data such as economic growth, trade openness, and corruption were collected from the World Bank.

3.2. Experimental Description

The dependent variable, Different methods can be used to determine a bank's profitability, but this study used the return on assets (ROA), This indicator is applied because of the extensive experience employed by former researchers. Also, it is the best

measurement and individuals in manipulative profitability ratios. Many researchers applied ROA to represent bank profitability measurement such as (Ahmad & Noor, 2010), (Hong, 2015), (Kingdom et al., 2015), (Mongid & Tahir, 2011), and (Bolarinwa & Soetan, 2019)A greater ROA ratio indicates that a bank their financial performance is more efficient and the ROA exhibits the bank's capacity to profitably employ financial and real investment resources. So, it is employed and recognized as a good predictor of profitability for any business entity.

The focus variable was corruption, which was assessed by looking at the degree of corruption inside each country, with Transparency International's Corruption Perceptions Index being the major corruption utilized in this study. This index is the most frequent and widely utilized in many organizations, and it is simple to obtain data from it. The opinions of risk agencies are also included in this index.

Control variables such as bank size, management, capitalization, economic growth, and trade openness were also included in the study since these variables have a significant impact on and control the profitability of organizations, particularly banks. (Sufian & Habibullah, 2009) also utilized these factors.

The size of the bank is designed by the natural logarithm to total assets, while capitalization represents the total equity and management efficiency of the bank are reflected and more significant variables because larger banks spend less owing to the distribution of their fixed costs, they may acquire a bigger market share and enjoy a better profit margin (Kosmidou, 2008). This variable is also designed to be applied to show their effect and contribution to the bank's performance.

External macroeconomic factors, such as gross domestic product and trade openness, were also external macroeconomic factors in this study. These two macroeconomic factors also applied because of the previous studies taken into consideration and they justified having a great impact on the performance of financial institutions.

So, summarized, this study applied four control variables that are bank size, capitalization, an economic growth rate which is measured by the GDP growth rate, and trade openness. While the focus variable was one which corruption index and the dependent variable which measure profitability was the return on assets.

These factors have an impact on bank profitability depending on the country's economic situation.

Table 2: Name of the Variables Applied, Descriptions and Data Sources

Variables	**Measurement**	**Data sources**
Dependent variable		
ROA	Return on Asset = Profits / Total Assets	Financial report of respective bank
Independent Variables		
ECG	Economic growth rate	WB
TRO	Trade %	WB
K	Capitalization	Financial report of respective bank
B_SIZE	Bank Size (log total asset)	Financial report of respective bank
CI	Corruption Index	TI
MGT	Management Efficiency (inefficiency)	Financial report of respective bank

3.3. Estimating Model

To measure the profitability of Islamic banks on corruption control bases the static panel model was created. So due to the objective, the model was formulated as follows

$$Profitability = \beta_0 + \beta_1 B\_SIZE + \beta_2 ECG + \beta_3 TRO + \beta_4 MGT + \beta_5 CI + \beta_6 K + \varepsilon \quad (1)$$

The above econometric model of the static model represented by a dependent variable which is profitability, and its sign is Return on asset (ROA), focus variable is corruption control which shown by CI and the left are independent variable (Control variables) which includes an internal factor of the performance of Islamic bank and external factors as well. These are ECG: Economic growth rate, B_SIZE: Stands for bank size, MGT Stands for bank Management Efficiency (inefficiency), K stands for Capitalization and TRO stands for trade openness and the last sign is called error term which is shown as ε.

In the linear regression model, those variables were then transformed into logarithms as follows:

$$\log \mathrm{R\,OA_t} = \beta_0 + \beta_1 \log \mathrm{C\,I_t} + \beta_2 \log \mathrm{E\,CG_t} + \beta_3 \log \mathrm{B_{SIZE_t}} + \beta 4 \log \mathrm{T\,RO_t} + \beta 5 \log \mathrm{K} + \varepsilon_t \quad (2)$$

3.4. Econometric Methodology

Based on the pieces of evidence from most of the previous studies conducted with similar corruption and Islamic banking performance as well as the number of sample banks the study applied Panel data analysis. Moreover, the study is based on fifteen cross-section observations of 18 Islamic banks in the United Arab Emirates. So, the study included the years 2000 to 2019, and the estimation was based on panel data estimate, which was static panel data. Because the number of observations was little concerning the number of years the static models which include pool OLS, fixed effect, and random effect were more appropriate for the analysis of the data. Moreover, the panel analysis is also based on an estimate of the data which are time series and cross-sections. One of the benefits of panel data is that it allows for a greater number of data observations, which reduces or eliminates the risk of biased results (Baltagi & Kao, 2000), also it allows controlling for individual heterogeneity, to get richer information and has more degrees of freedom.

The pooled OLS technique, fixed effect method, and random effect technique are all used to estimate panel analysis. Pools all observations in the OLS estimate and overlooks the fact that time series and cross-sectional data. It is expected that the dependent variable's coefficients are constant cross-sections and time. The model is also known as the constant-coefficient model because of this. A pooled model combined groups without making any assumptions about individual differences (heterogeneity).

The fixed effect approach is acceptable in the situation of balanced panel data when all cross-sectional data variables are constant and there are no missing values, but it is not acceptable if the data is imbalanced. It also adjusts for omitted variables that change across N but are constant across T (i.e., unobserved heterogeneity). It is expected that the error term would fluctuate over time and between nations. In the pooled OLS regression, the nations' heterogeneity is not taken into consideration. While pooling all of the data, the fixed effects least squares dummy variables (LSDV) model allows each observation to have its intercept dummy.

Random Effects (RE) is employed if you feel that certain omitted variables may be constant over time but the change between cases and others may be fixed between cases but fluctuate over time, then you may include both types by applying a random model.

4. FINDINGS AND DISCUSSION

The findings of the data analysis are detailed and explained in this section. In line with earlier research (Bolarinwa & Soetan, 2019),(Arshad & Rizvi, 2013), and (Bougatef, 2017). The descriptive statistics of the selected variables are included in the analysis, followed by the correlation matrix, and, finally, the fixed effects results, the pooled OLS results, and random effects results are displayed and discussed.

4.1. Descriptive Statistics

The descriptive statistics are shown in Table 3 for Corruption Index, Bank Size, management effectiveness, profitability, capitalization, Trade Openness, and GDP growth for the entire sample. The mean for the profitability presented by ROA is 2.21 while its maximum is 13.1 percent, and its minimum was -9.08. On the side of the focus variable which is corruption control, its average is 46.38 and the maximum and minimum were 58.33 and 33.33 respectively. In addition to that, the GDP growth and bank size mean were 37057.89 and 28776.69 respectively while the maximum GDP growth was 44498.93 and the minimum value was -0.053. Furthermore, the average rate of management efficiency was noted at 36.43 percent as their mean. Where the maximum and minimum are 96.40 and 9.7 percent respectively. On the general overview, the economic growth represented by GDP has the highest mean level, and maximum unit as well. For the standard deviation, the bank size has the highest value than economic growth. The number of observations of the data ranges from 346 to 360. So data was very sufficient and meet all criteria of panel data analysis. The description of the other variables employed in this section is displayed in the same table below.

Table 3: Represent Descriptive Statistics

	ROA	TRO	MGT	K	ECG	CI	B_SIZE
Mean	2.2122	83.164	36.439	16.915	37057.8	46.388	28776.69
Maximum	13.150	176.80	96.400	39.760	44498.9	58.333	420713.5
Minimum	-9.0800	0.6666	9.770	5.330	-0.0538	33.333	13.04913
Std. Dev.	1.598	66.023	11.367	6.029	8607.3	12.096	67290.62
Observations	353	346	353	353	360	360	353

4.2. Correlation Matrix

The correlation among the most reliable components of ROA is presented in table 4, which displays the findings of correlation among the studied variables, with most of these variables showing a positive and others a negative relationship with ROA.

The goal of the study which intends to find out the impact of corruption control on Islamic banking profitability. The results of the correlation matrix are depicted in table 4 below. With regards to Islamic bank profitability, the table reveals that there is a strong linear association between bank profitability and corruption control although that was a negative association, it is not new because even this association also reflects the regression results of OLS in the next section. As corruption control increases the bank's profitability will decrease. This justifies that the UAE experiences among the countries which have the bad condition for corruption activities even though several measures are taken to address this problem but remained at the same level for three previous years as TI reported.

Moreover, trade openness and GDP growth referred to be as the fundamental inputs to the rise of banking profitability, they have shown to have a linear association with economic growth. Both variables are crucial inputs of the growth of Islamic banks' performance and the results revealed on positive linear relation. When the UAE's trade openness and economic growth rise it clearly will motivate the better performance of the Islamic bank. Apart from that the left variables which are bank management Efficiency (inefficiency), capitalization, and bank size also have a linear correlation with bank profitability but it depicted a negative sign.

Table 4: Correlation Matrix between Explanatory Variables

	ROA	TRD	MGT	B_SIZE	ECG	K	CI
ROA	1	0.232	-0.467	-0.285	0.019	0.486	-0.357
TRO	0.232	1	-0.115	-0.922	-0.137	0.088	-0.482
MGT	-0.467	-0.115	1	0.072	0.146	-0.184	0.056
B_SIZE	-0.285	-0.922	0.072	1	0.151	-0.191	0.709
GDPC	0.019	-0.137	0.146	0.151	1	0.106	0.113
K	0.486	0.088	-0.184	-0.191	0.106	1	-0.160
CI	-0.357	-0.482	0.056	0.709	0.113	-0.160	1

4.3. The Results for Panel Regressions

This section contains the panel regression results and interpretation of the outcomes. The results of this study will be shown in Table 5, the analysis of the data was based on panel analysis which could be estimated in the three stages which appeared in the table below. That table shows clearly the three steps which started from estimating pooled OLS then fixed effect and random effect. The table includes a Hausman test, B_LM test, and Chi-square to determine which of the three models is the best estimator. The study applied the test of B_LM to choose either pooled OLS or a random-effect model, the null hypothesis (H0) states that the variance of the unobserved fixed effects is zero, implying that POLS should be used. If p-value >5%, then use POLS while If p-value <5%, then use RE. On the side of the rule of thumb, after verifying to choose a random effect, the study tests the Hausman to choose either a random effect or a fixed effect. In the null hypothesis, individual-specific effects are not correlated with independent variables so the null state that if the p-value > 0.05 the RE is more appropriate, and if the p-value < 0.05 the fixed effect is the best.

The result revealed that the probability was 0.0004 so the fixed become the best. So, because there is a conflict between the Pool OLS and the Fixed effect model, due to the Chi-square is applied. The Null hypothesis is that if the P-value is greater than 0.05 the pool OLS is applicable and if less than 0.05 the fixed effect model is applicable. Based on the result the p-value was 0.0000 so the fixed effect model was used for the interpretation of the result compared to other models.

Table 5 displays the regression findings; the profitability of Islamic banks is destroyed by corruption. In all three models, the corruption index is statistically significant with a negative coefficient. It is the corruption index in UAE based on their measures of eradicating and mitigating could affect the performance of their banks, the situation is claimed that Islamic banks in highly corrupt states have low profitability. The corruption index, which is negative and substantial at 5%, is an unexpected outcome. It simplifies our understanding considerably.

The findings support our prediction that banks operating in a corrupt environment may have surplus pricing capacity in terms of lending and deposit rates. So Islamic banks in UAE get disadvantages from the corruption activities which continue to practice in UAE while this is not good information and behavior because Islamic banks must base on Islamic ethical issues which have already been explained in the Quran and Hadith as well as other sources of Islamic laws. Islamic banking and Islamic financial must rely on Shariah-compliant and no other fake methods. These results are supported by (Bolarinwa & Soetan, 2019), and (Mongid & Tahir, 2011) while it was opposite by also from the outcomes of Arshad and Rizvi (2013) as well as Asteriou et al. (2016).

In the case of other variables such as Management Efficiency (inefficiency), capitalization, and economic growth, both the fixed effect and random effect models become statistically significant. The Capital and economic growth were positively significant while the Management Efficiency (inefficiency) was a negative coefficient. The rest variables trade openness and bank size were insignificant in the fixed-effect model.

Table 5: Static Model's Results of POL OLS, FE, and RE Dependent Variable: LNROA

Variables	Pooled OLS	Random effects	Fixed effects
LNTRO	0.0099* (0.0034)	0.0057** (0.0031)	0.0037 (0.0030)
LNMGT	-0.0515* (0.0059)	-0.0705* (0.0060)	-0.0788* (0.0071)
LNK	0.1071* (0.0117)	0.1276* (0.0122)	0.1400* (0.0131)
LNECG	0.0404 (0.0273)	0.0594** (0.0328)	0.0766* (0.0213)
LNCI	-0.0573* (0.0099)	-0.0462* (0.0089)	-0.0406* (0.0086)
LB_SIZE	0.1997* (0.0726)	0.1131** (0.0661)	0.0710 (0.0600)
C	2.5844	3.0555	3.1250
Observation	338	338	338
R-squared	0.578	0.47	0.767
Pagan LM	0.0000		
P-Hausman test		0.0004	
Chi-square			0.0000

*,** denote significance at 5% and 10%, respectively; In parentheses, standard errors are listed.

5. CONCLUSION AND RECOMMENDATION

According to the findings of the observed investigation, Islamic banks in corrupt nations benefit significantly. Islamic banks are required to avoid any ambiguous corrupt practices by their nature. But in Islamic banks entirely Corruption should not exist since one of Islam's main goals is to promote justice in human society. Therefore, in a list of sample banks, there are correlations

between anti-corruption efforts and bank productivity. It is a lesson for UAE and all other Muslim and non- countries should be understanding that a zero-tolerance policy for corruption mitigation and eradication is a perfect way and achievable method for increasing revenue and profits for financial institutions like banks. So alternative way to expression at this is in terms of Islamic finance's Shariah-compliant elements and other principles should be applied because most of them give benefits to the Islamic finance industry. So, the strong practice of corruption in Muslim states the first time would hinder the growth of Islamic financial institutions.

Moreover, the study provides policy recommendation for all banks and Islamic banks especially because this study focus on Islamic banks must make sure their transactions comply with Sharia to keep the Islamic banks very safe from the impact of all illegal practices like corruption and Islamic banks due to their principles and ethical conduct should relax collateral requirements for productive enterprises and investments to minimize corruption in the banking industry. This will diminish the bribes and dishonest activities that these companies use to get loans. As such ventures assist both banks and businesses, the end will be a win-win situation. This also has the potential to cut the cost of financing, resulting in cheaper pricing for products and services in the economy. Similarly, banks are encouraged to have a better corporate governance structure to prevent and combat corruption, particularly in extremely corrupt situations, as this may have a detrimental impact on bank profitability.

REFERENCES

Aburime, (2009). Impact of corruption on bank profitability in Nigeria. Euro Economica, 2(23), 50-57.

Ahmad, N. H., & Noor, M. A. N. M. (2010). The determinants efficiency and profitability of World Islamic Banks. International Conference on E-Business, Management, and Economics, 3, 228–233.

Akins, B., Li, L., Ng, J., & Rusticus, T. O. (2016). Bank competition and financial stability: evidence from the financial crisis. Journal of Financial and Quantitative Analysis, 51(1), 1–28. https://doi.org/10.1017/S0022109016000090

Arshad, S., & Rizvi, S. A. R. (2013). Impact of corruption on bank profitability: An analysis of Islamic banks. International Journal of Business Governance and Ethics, 8(3), 195–209. https://doi.org/10.1504/IJBGE.2013.057375

Aslam and Haron (2019), Does corporate governance affect the performance of Islamic banks? New insight into Islamic countries, Corporate Governance International Journal of Business in Society ahead-of-print(ahead-of-print), DOI: 10.1108/CG-11-2019-0350

Asteriou, D., Pilbeam, K., & Tomuleasa, I. (2016). The Impact of Economic Freedom, Business Regulation and Corruption on Bank Profitability and Bank Stability: Evidence from Europe. City Research Online, 37(9), 1591–1601.

Baltagi, B. H., & Kao, C. (2000). Nonstationary panels, cointegration in panels and dynamic panels: A survey. Advances in Econometrics, 15, 7–51. https://doi.org/10.1016/S0731-9053(00)15002-9

Bolarinwa, S. T., & Soetan, F. (2019). The effect of corruption on bank profitability. Journal of Financial Crime, 26(3), 753–773. https://doi.org/10.1108/JFC-09-2018-0102

Bougatef, K. (2017). Determinants of bank profitability in Tunisia: does corruption matter? Journal of Money Laundering Control, 20(1), 70–78. https://doi.org/10.1108/JMLC-10-2015-0044

Charumilind, C., Kali, R., & Wiwattanakantang, Y. (2006). Connected lending: Thailand before the financial crisis. Journal of Business, 79(1), 181–217. https://doi.org/10.1086/497410

Eisenhardt, K. M., & Eisenhardt, K. M. (2018). Agency Theory : An Assessment and Review. Academy of Management, 14(1), 57–74.

Gerschenkron, A. (1952). Economic Backwardness in Historical Perspective - Lecture Three - Other Industrialized Countries than Britain.

Hong, S. C. (2015). The impact of nominal GDP and inflation on the financial performance of Islamic Banks in Malaysia. Journal of Islamic Economics, Banking and Finance, 11(1), 157–180.

Kabir, M., (2022). impact of corruption and money laundering (ML) on the profitability and stability of Islamic banks. Journal of Money Laundering Control, 25(4), 909-929. https://doi.org/10.1108/JMLC-09-2021-0094

Khediri, K.B. and Ben-Khedhiri, H. (2009). Determinants of Islamic bank profitability in the MENA region. International Journal of Monetary Economics and Finance, 2 (3/4), 409-426.

Kingdom, U., Simiyu, C. N., & Ngile, L. (2015). Effect of macroeconomic variables on profitability of commercial banks listed in the Nairobi Securities Exchange. International Journal of Economics, Commerce and Management, 3(4), 1–16.

Kosmidou, K. (2008). The determinants of banks' profits in Greece during the period of EU financial integration. Managerial Finance, 34(3), 146–159. https://doi.org/10.1108/03074350810848036

Laurent, W. (2011). How corruption affects bank lending in Russia. Journal of Economic Literature Is Currently Edited by Steven Durlauf, 35(2), 230–243.

Liao, C. S. (2009). Efficiency and productivity change in the banking industry in Taiwan: Domestic versus foreign banks. Banks and Bank Systems, 4(4), 84–93.

Luc, L. (2009). Bank governance, regulation and risk taking. Journal of Financial Economics, 93(2), 259–275.

Marwan, S., & Haneef, M. A. (2019). Does doing good pay off? Social impact bonds and lessons for Islamic finance to serve the real economy. Islamic Economic Studies, 27(1), 23–37. https://doi.org/10.1108/IES-05-2019-0001

Mohammad, Ahmed Rufai Mohamad, H. B. H., & Nor, A. B. M. (2019). Impact of corruption on banking sector stability: evidence from Middle East and North African Countries. Cademic Journal of Economic Studies 5(2) (Accessed August 3, 2022). Https://Link.Gale.Com/Apps/Doc/A593546343/AONE?, 5.

Rizvi and Arshad, (2013), Impact of corruption on bank profitability: An analysis of Islamic banks. International Journal of Business Governance and Ethics. DOI: 10.1504/IJBGE.2013.057375.

Sufian, F. and Habibullah, M.S. (2009). Bank specific and macroeconomic determinants of bank profitability: empirical evidence from the China banking sector. Journal Frontiers of Economics in China, 4 (2), 274-291.

Yunan (2020), Does corruption affect Islamic banking? Empirical evidence from the OIC countries. Journal of Financial Crime https://www.emerald.com/insight/content/doi/10.1108/JFC-06-2020-0101/full/html

PressAcademia
www.pressacademia.org/journals/jefa
JEFA
ISSN 2148-6697
Journal of Economics, Finance and Accounting YEAR 2022 VOLUME 9 ISSUE 4

UNCHANGING PROTECTIONISM IN THE POST-ATC ERA: NON-TARIFF MEASURES

DOI: 10.17261/Pressacademia.2022.1640
JEFA- V.9-ISS.4-2022(3)-p.178-186

Omer Tarik Gencosmanoglu
Ministry of Trade, DG of Trade Research and Risk Management, Ankara, Türkiye.
ottomanus@yahoo.com , ORCID: 0000-0003-3979-6387

Date Received: October 24, 2022 **Date Accepted:** December 5, 2022

To cite this document
Gencosmanoglu, O.T., (2022). Unchanging protectionism in the post-ATC Era: Non-tariff measures. Journal of Economics, Finance and Accounting (JEFA), 9(4), 178-186.
Permanent link to this document: http://doi.org/10.17261/Pressacademia.2022.1640

ABSTRACT

Purpose- This study explores the importance of non-tariff measures (NTMs) in the global textile and clothing trade. For this purpose, we consider the trade effects of other NTMs implemented instead of the quotas that expired in 2005 with the WTO Textile and Clothing Agreement (ATC). These results indicate that the textile and clothing trade continues to be protected by other non-tariff measures during the quota-free period.

Methodology- Based on the example of Turkey, the study examines the effects of anti-dumping measures (ADP) on imports in the quota-free period compared to customs duties by using OLS and PPML methods for the period 2000-2020.

Findings- The estimations indicate that the ADP measure of NTMs is much more effective than the tariff rates. The import value of textile and clothing might decline by 2,7%-4,1% due to a percentage point increase in the tariff rates compared to a decrease of 22,6%-78,6% following an ADP measure. This effect would be 5,2%-5,8% with one percentage point increase of tariffs, whereas 29,2%-78,2% after an ADP for the import volume.

Conclusion- The results reveal that the anti-dumping measures, which replace quotas, could restrict imports more than customs duties. Thus, the protectionism in the global trade of textile and clothing industry continues with other NTMs instead of quotas.

Keywords: WTO Textile and Clothing Agreement (ATC), non-tariff measures, quotas, anti-dumping, protectionism
JEL Codes: F13, F14, F53

1. INTRODUCTION

The importance of textile and clothing sector in the industrialization of countries is indisputable. Today, the sector continues to be the main source of foreign exchange income and employment in most countries, especially those on the development path. For this reason, decision-makers were deeply worried about the adverse economic effects of opening the sector to global competition starting from 2005. Accordingly, they had to maintain protectionism by using other non-tariff measures (NTMs) after the elimination of import quotas. Therefore, it is essential to understand the function of NTMs that support countries to cope with the transition to free trade.

1.1. Pre-ATC Period

Exposed to protectionism for many years, the sector was able to achieve international trade liberalization only ten years after the establishment of the World Trade Organization (WTO). From 1974 to the end of the Uruguay Round negotiations, the quotas imposed on the amount of clothing and textile were determined through bilateral negotiations within the framework of the Multifiber Agreement (MFA). The agreement was transformed into the Textile and Clothing Agreement (ATC) of the WTO from the beginning of 1995, which envisaged abolishing quotas within ten years and to bring the industry fully in line with the basic principles of the GATT. Considering that the textile and clothing industry accounted for some 7% of the global goods trade, the GATT Secretariat estimated before the ATC period that the international trade would increase by 18% for textiles and 69% for clothing (WTO, 2017). Such an increase was to be believed the driving force behind the expected 14%-37% growth in the exports of developing countries as a result of the Uruguay Round negotiations.

On the other hand, the WTO estimations pointed to just the tip of the iceberg, as countries were to be affected not in the same ways by a quota-free trade environment. For this reason, they were generally considered into three groups. The first group was developed countries such as the United States of America (USA), the European Union (EU), and Canada, which

constituted the main export markets in terms of the sector. As a result of the liberalization of trade, the consumers would benefit from low prices of the products (Appelbaum, 2004), while domestic producers and employment would suffer due to the increase in imports and competition (Martin, 2007).

Unlike the developed countries, the developing nations that made up the second group were not homogeneous. Because these countries had quite different advantages and disadvantages in the competitive environment after the ATC. For example, China with cheap labor, infrastructure, and product diversity could ensure efficiency and effectiveness in production, while not benefiting from the privileges such as the Generalized Preferences System (GSP) (Shah, Syed, & Shaikh, 2013). The other major player of India stood out with its availability of inputs such as cotton, design skills, cheap labor, large and expanding domestic market, and ethnic products, but the high cost of doing business and unsuitable conditions for foreign direct investment were the shortcomings of the country.

The factors such as low-cost labor and working conditions, the scale of firms, product quality, the existence of foreign ownership, availability of inputs, ability to develop new products, and access to preferential markets would obviously determine the export performance of developing countries in the post-ATC period (Alam, Selvanathan, Selvanathan, & Hossain, 2019). However, many developing countries had to consider domestic producers as well as their export performance. For example, a middle-income country of South Africa with a larger local market had to take measures to protect the domestic industry besides its share in the global market (Morris & Barnes, 2008).

1.2. Transition to the Quota-Free Trade Environment

The concerns of both developed and developing countries revealed that the transition to a quota-free environment would not be an easy matter. First of all, new restrictions were imposed on imports of the sector by the USA until 2008 and by the EU until 2007, as a result of lobbying efforts of local producers and other developing countries following the dramatic increase in China's exports to the USA in the 2001-2005 period (Brambilla, Khandelwal, & Schott, 2010). Besides, countries such as Republic of Korea, Brazil, South Africa, and Mexico initiated efforts to protect domestic producers from importers and to cope with the other difficulties brought by the liberalization process (Francois, 2010).

In this context, policy options that could be put into practice by the industry and the governments to improve competitiveness came to the fore. For instance, the sector could enhance the production of efficiency via skill training and additional technology investments that would provide product diversity (Appelbaum, 2004). It was also recommended the states build an effective logistics infrastructure with suitable ports, create export processing zones, provide financial aid (e.g. grants, loans, and tax reliefs), implement legislative reforms increasing their labor standards, and establish preferential trade arrangements such as GSP and regional trade agreements for market access. Importance was given to the efforts to support these national initiatives with international policy instruments such as “Aid-for-Trade” (Adhikari & Yamamoto, 2007). Moreover, the value of government initiatives was emphasized to implement innovations including production process, marketing, and organization that facilitate foreign direct investments and technology transfer in Sri Lanka after ATC (Wijayasiri & Dissanayake, 2009).

1.3. Post-ATC Era

WTO data indicate that the liberalization of the textile and clothing trade have affected the exports and imports of countries differently. The shares of developed countries in the global imports of some 788 billion dollars have decreased since 2005 (Table 1). In the 2005-2020 period, the shares decreased from 33,8% to 30,0% for the EU, from 20,8% to 15,0% for the USA, from 5,7% to 4,5% for Japan, and from 2,1% to 2,0% for Canada.

Table 1: Shares of Textile and Clothing in Global Trade (%)

	Exports					Imports				
Countries	**2000**	**2005**	**2010**	**2015**	**2020**	**2000**	**2005**	**2010**	**2015**	**2020**
China	14,7	23,9	34,0	38,2	38,1	3,8	3,5	3,2	3,2	2,8
EU	29,5	30,6	26,2	22,3	24,4	31,3	33,8	31,8	26,8	30,0
Viet Nam	0,6	1,1	2,2	3,7	4,9	0,5	0,8	1,2	1,7	1,9
Bangladesh	1,5	1,6	2,7	3,8	3,8	0,4	0,5	0,7	1,2	1,1
India	3,3	3,5	4,0	4,8	3,6	0,2	0,4	0,5	0,6	0,5
Turkey	2,9	3,9	3,6	3,6	3,5	0,6	1,1	1,5	1,1	0,8
USA	5,5	3,6	2,8	2,7	2,1	22,6	20,8	16,5	16,0	15,0
Pakistan	1,9	2,2	1,9	1,8	1,7	0,0	0,1	0,2	0,2	0,1
Mexico	3,2	2,0	1,0	0,9	0,8	2,6	1,7	1,2	1,3	1,0
Japan	2,1	1,5	1,3	0,9	0,8	6,7	5,7	5,3	4,7	4,5
Canada	1,2	0,9	0,5	0,4	0,4	2,1	2,1	2,0	1,8	2,0
Brazil	0,3	0,4	0,2	0,1	0,1	0,3	0,3	0,8	0,8	0,6

South Africa	0,1	0,1	0,1	0,1	0,1	0,2	0,3	0,4	0,4	0,4
Others	33,1	24,6	19,5	16,6	15,8	28,6	28,9	34,8	40,2	39,3

Source: https://stats.wto.org

Major producers have showed quite dissimilar performances in terms of exports. In line with the expectations, China alone made 38,1% of the global sector exports or nearly 777 billion dollars of trade in 2020. On the other hand, China's share in total exports, which was 23,9% in 2005, stabilized after reaching 38,2% in 2015. In the relevant period, the shares increased from 1,1% to 4,9% for Viet Nam, from 1,6% to 3,8% for Bangladesh, from 0,8% to 1,5% for Malaysia, and from 0,5% to 1,0% for Cambodia. On the other hand, the countries whose market shares decreased during the quota-free period were Pakistan (from 2,2% to 1,7%), Mexico (from 2,0% to % 0,8), and Brazil (from 0,4% to 0,1%). The shares of countries such as Turkey, India, Indonesia, Sri Lanka, and South Africa either remained the same or changed little.

Like the exports, the developments in the imports of countries differ from each other. For instance, the shares of Viet Nam, Bangladesh, Indonesia, Egypt, Cambodia, and Brazil in total world imports enlarged between 2005 and 2020. However, the share of few countries such as Turkey and Mexico declined. India, Pakistan, Malaysia, Sri Lanka, and South Africa were among the countries whose shares remained almost unchanged.

1.4. Alternative Measures to the Quotas

Based on WTO figures, some countries gained in exports, while others lost in the post-ATC period, though not at the level of expectations. A similar outcome was realized for imports as a result of better managing the transition period of liberalization by some countries that were able to limit the adverse effects of global competition. This may be an apparent consequence of implementation of different policies discussed in the previous section. Another view is that customs duties have become the most important foreign trade policy to provide protectionism after the quotas (Öngüt, 2007).

On the other hand, WTO data reveal that trade-weighted average customs duties, calculated as MFN (the Most Favored Nation), for the sector did not increase significantly after 2005 and even declined in many export markets (Table 2). For example, significant reductions happened in MFN customs duties imposed by Australia, Japan, Mexico, Pakistan, Tunisia, and Viet Nam in the 2005-2020 period. Countries that increased customs duties the most were limited to Thailand, Indonesia, and India. The changes in the MFN rates applied by other countries are negligible.

Table 2: Trade Weighted Average Duties (MFN, %)

Countries	2005	2010	2015	2020
Australia	6,5	5,2	4,0	2,6
Brazil	8,2	10,2	10,4	10
Cambodia		9,5	9,2	9,1
Canada	3,6	3,1	3,1	3,3
China	4,7	4,6	4,4	3,2
EU	3,4	2,8	3,0	3,2
India		7,2	7,6	12,6
Indonesia	4,0	4,1	6,8	5,6
Japan	4,5	2,1	2,1	2,4
Mexico	11,9	5,8	4,5	4,1
Pakistan	13,1	10,1	10,7	9,6
South Africa	6,1	5,9	6,3	6,3
Sri Lanka	8,0	9,3	7,0	6,4
Turkey	3,8	4,9	5,9	4,6
USA	2,5	2,1	2,4	2,3
Viet Nam	12,7	5,9	5,6	5,3

Source: https://stats.wto.org

The most prominent development was the boost in the number of NTMs implemented after 2005 for textile and apparel products. While their total number increased by 13,1% in 2000-2004 compared to 1995-1999, this growth rate was 48,8% for the industry. In the 2005-2009 period, the said increase rates were 33,0% and 44,6%, respectively, compared to the previous 5-year period. Although interrupted from 2010-2014, this trend continued from 2015-2019.

Table 3: Number of NTMs notified by WTO members

	1995-1999		2000-2004		2005-2009		2010-2014		2015-2019	
NTMs (HS 50-63)	**Total**	**Sector**	**Total**	**Sector**	**Total**	**Sector**	**Total**	**Sector**	**Total**	**Sector**
Sanitary and Phytosanitary (SPS)	1.406	3	2.937	21	4.118	21	5.056	21	5.951	53
Technical Barriers to Trade (TBT)	2.940	20	3.162	30	5.440	146	7.563	119	9.335	254
Anti-dumping (ADP)	683	92	1.448	202	1.164	216	1.277	107	1.438	143
Quantitative Restrictions (QR)	695	68	592	57	540	56	788	77	458	18
Tariff-rate quotas (TRQ)	1.263	14	2		3		6			
Others	781	14	648	4	428	15	453	25	347	15

Source: https://i-tip.wto.org

The sector is distinguished from the others in terms of the types of NTMs applied. While Technical Barriers in Trade (TBT) and Sanitary and Phytosanitary (SPS) are the leading NTMs in general, Anti-Dumping (ADP) measure in the textile and apparel sector has always been in the first two places. It is safe to say that protectionism in the textile and clothing sector was replaced by another non-tariff measure (i.e. ADP) after the quotas.

1.5. Tariffs and NTMs in Turkey After the ATC

Turkey followed a similar path with other developing countries against the ATC process, except for China which could benefit from quota-free trade. For example, Turkey applied temporary protection measures against its rivals to prevent market losses caused by global competition and to limit its negative effects on the current account deficit (Atılgan & Şen, 2006). Still, in line with the general trend in the world, Turkey preferred most ADP measures to shelter its textile and apparel industry. The number of ADP measures applied by Turkish authorities was 39 in 2005-2009, 20 in 2010-2014, and 23 in 2015-2019. Their product coverage by years are available at the Ministry of Trade website (Ministry of Trade, 2022).

However, customs duties were used by Turkey only to a limited extent in this regard, considering the limitations arising from being a part of several regional trade agreements and its WTO membership. The applied MFN average increased from 3,8% in 2005 to 4,9% in 2010, then decreased from 5,9% in 2015 to 4,6% in 2020.

Despite tariffs and ADP measures applied by Turkey, its imports jumped from $5,2 billion dollars to $9,4 billion dollars in the 5-year period after ATC, which means an increase of over 70%. However, this rate of increase returned to a reasonable level of 32,1% in the 2005-2020 period. The expansion of world trade makes this import increase more insignificant, as Turkey's share in global imports decreased from 1,1% in 2005 to 0,8% in 2020. Therefore, we may conclude that Turkey has achieved a smooth adaptation to the quota-free competitive environment.

2. LITERATURE REVIEW

Empirical studies on how the applied tariffs and NTMs affect the trade and production of the textile and clothing industry are very inadequate in the literature. Further, the research carried out after ATC is limited to how the general trend of world trade has changed relating to the main actors. One study suggests that the sector trade expanded from 2005 to 2006, but contrary to expectations, the production did not shift sharply from other countries to China (Martin, 2007). The study also reveals that the imports into the USA continued to grow, though no evidence confirms the adverse effect of the ATC process on imports or employment. Similarly, another research points out that rising wages reduced China's advantage compared to the countries such as Viet Nam, Cambodia, and Bangladesh (Brambilla, Khandelwal, & Schott, 2010). It provides examples of Viet Nam's exports to the USA increasing by 240% in 2001 and the share of textiles and clothing in the US imports decreasing from 26% to 11% as China started to export more capital-intensive products.

Previous studies point out various consequences for countries after the termination of the import quotas. Fugazza & Conway (2010) mention that the shares of countries that do not have a comparative advantage in the textile and clothing sector diminished in the US and the EU markets, while they increased and diversified their exports to smaller markets in the post-quota period. Abraham & Sasikumar (2011) give the example of India which performed better in the international market due to its lower labor cost. Van Biesebroeck & Zaurino (2019) show that the exports of countries in the sub-Saharan African region increased as a result of the reduction of tariffs by high-income countries after the ATC period, and more importantly, this increase of the sector was 2-3 times higher than the other products. Datta & Kouliavtsev (2020) reveals that countries with low labor force significantly increased their exports to large markets during the quota-free period based on the example of the USA.

On the other hand, Lu (2013) states that the performance of exporters after the abolition of the quotas was not the same and depended on the levels of their economic development. Natsuda, Goto & Thoburn (2010) determine that the Cambodian

sector became fragile and lost interest from international buyers due to national socio-economic issues in the face of strong Chinese competition after ATC. Frederick & Staritz (2012) argue that the production infrastructure of countries reacted differently to the quota-free period and the countries with proactive policies by their governments successfully adapted themselves to the new conditions of international competition. Gebreeyesus (2013) find that the countries exposed to the quota in the post-ATC period showed different performances and only half of them were able to increase their exports to the EU and USA markets. Joarder, Hossain & Hakim (2010) consider that there are winners and losers among the main exporters of the sector in the post-ATC period and provide examples of Mexico and Turkey which suffered losses in their major destination markets. Farag, Moustafa & Mandour (2012) also give the example of Egypt which lost shares in its quasi-guaranteed markets namely, the EU and the USA.

Research on Turkey is not much either regarding the effects of tariffs and NTMs (i.e. ADP and safety controls for human health) on imports and production. The previous studies elaborate on Turkey's competitiveness in comparison with the major players (especially China and India) by using the techniques of field research, competitive indexes, and product mapping (Şencan, 2006; Yücel, 2010; Atış, 2014; Özözen, 2021; Elitaş & Şeker, 2017). One study follows a different method by examining the restrictive effect of NTMs on Turkey's imports (Elitaş & Şeker, 2017). Using the gravity model with a panel data set that includes 20 trading partners, the study concludes that Turkey's imports would decrease in case of a quota application.

In this context, the study aims to investigate the influence of the ADP measures applied by Turkey during the quota-free period (i.e. safety controls for human health) on textile and clothing imports *vis-a-vis* the effects of customs duties. The results will certainly help understand whether NTMs implemented by other countries have affected the sector.

3. DATA AND METHODOLOGY

3.1. Data

The study compiles trade data from the Turkish Statistical Institute (TUIK). The trade data sample is established for ATC products at the 6-digit level of the Harmonized System (HS6) and the period of 2000-2020. The countries in the dataset are grouped based on Turkey's preferential trade agreements since customs duties are applied separately. Accordingly, there are 21 countries (the EU countries, the EFTA countries, Albania, Bosnia and Herzegovina, Chile, Faroe Islands, Georgia, Palestine, Iran, Israel, the Republic of Korea, Malaysia, Mauritius, the Republic of Moldova, Montenegro, Morocco, Serbia, Singapore, Tunisia, Macedonia, Egypt and Kosovo) in the dataset, whereas others are considered MFN countries. The applied ad valorem equivalent duty rates are collected from WTO for 2000-2006 and from TradeMap for 2007-2020. For the coverage of the ADP measures, we extract the list of products from the Ministry of Trade website (Ministry of Trade, 2022).

Table 4 presents the descriptive statistics of the variables included in the sample. Accordingly, the average import value increased from 136 to 285 thousand dollars while its amount increased from 37 to 88 thousand kg. In addition, their standard deviations are high and enlarged over the years. In other words, the imports differ considerably in terms of value and quantity by countries and HS6 product groups.

Table 4: Descriptive Statistics

	Import Value (US dollars)		Import Volume (kg)		Ad Valorem Duties		No of
Countries	**Mean**	**Std. Dev.**	**Mean**	**Std. Dev.**	**Mean**	**Std. Dev.**	**Observations**
2000	136.303	1.646.818	37.369	706.268	7,9	4,2	17.503
2005	288.910	3.717.596	66.235	1.216.058	6,1	4,0	17.503
2010	463.914	6.232.836	81.579	1.912.744	3,2	4,2	17.503
2015	460.040	7.025.693	95.243	2.926.744	2,6	4,3	17.503
2020	285.187	4.337.792	88.390	2.736.567	1,1	3,0	17.503
Sample	358.545	5.466.378	76.829	2.164.099	3,8	4,5	367.563

Source: Author's calculations from the sample.

The average ad valorem duties decreased significantly from 7,9% to 1.1% between 2000 and 2020. Their standard deviations also dropped from 4,2% to only 3,0%, which means that the differences in customs duties by countries and HS6 sectors have gradually narrowed over the years.

The MFN countries account for 62,1% of Turkey's ATC imports Table 5. The EU has a share of 23,7% in their imports, which is followed by Egypt with a share of 5.5%. The share of other countries (8,7%) is quite low. However, the changes in imports performed differently according to the trading partners from 2000 through 2020. While the imports from MFN countries increased by 107%, the rates of changes in imports depend on various preferential trade agreements. Imports of textile and clothing products from Egypt, Malaysia, Morocco, Georgia, Macedonia, Bosnia, and Tunisia improved by more than 100%. In

contrast, their imports decreased by 5% from the Republic of Korea and 142% from EFTA countries. Imports from other FTA countries increased by 76%. These findings are similar to the figures for import volume in kg.

Table 5: ATC Trade by Importing Countries (2000 and 2020)

	Import Value (thousands of US dollars)				Import Volume (thousands of kg)			
Countries	**2000**	**2020**	**Share (%)**	**Log Change (%)**	**2000**	**2020**	**Share (%)**	**Log Change (%)**
MFN	1.068.479	3.101.722	62,1	1,07	378.909	1.119.245	72,3	1,08
EU	1.084.619	1.183.936	23,7	0,09	204.255	215.334	13,9	0,05
Egypt	8.028	273.754	5,5	3,53	1.779	59.652	3,9	3,51
R. of Korea	141.296	134.381	2,7	-0,05	41.651	58.512	3,8	0,34
Malaysia	13.272	111.686	2,2	2,13	5.405	74.451	4,8	2,62
Morocco	426	44.380	0,9	4,65	15	2.235	0,1	5,01
Georgia	129	42.560	0,9	5,80	4	2.341	0,2	6,27
Macedonia	579	19.131	0,4	3,50	234	3.888	0,3	2,81
Bosnia	46	17.718	0,4	5,95	1	1.423	0,1	7,60
Tunisia	4.848	13.981	0,3	1,06	502	1.265	0,1	0,92
EFTA	46.675	11.228	0,2	-1,42	16.130	744	0,0	-3,08
Others	17.321	37.144	0,7	0,76	5.184	8.009	0,5	0,44
Sample	2.385.718	4.991.622	100,0	0,74	654.070	1.547.099	100,0	0,86

Source: Author's calculations from the sample.

Table 6 shows the changes in the simple average of customs duties for ATC products according to the trading partners before and after the ATC Agreement. The exemption of customs duties continued within the framework of the agreements signed with the EU, EFTA, and Israel before the ATC agreement. Considering that approximately 68% of imports are from MFN, the Republic of Korea, and Albania, Turkey hasn't substantially lowered the customs duties for ATC products between 2000 and 2020.

Table 6: Average Ad Valorem Duties (simple average, %)

Countries	**2000**	**2020**
MFN, the Republic of Korea and Albania	9,1	8,1
Malaysia	9,1	1,1
Singapore	9,1	0,3
Faroe, Chile, Iran and Mauritius	9,1	0,1
Moldova, Bosnia, Egypt, Georgia, Kosovo, Macedonia, Montenegro, Morocco, Palestine, Serbia and Tunisia	9,1	0,0
EU, EFTA and Israel	0,0	0,0
Sample	7,9	1,1

Source: Author's calculations from the sample.

In the post-ATC period, the number of ADP measures increased rapidly and targeted specific importing countries (Table 7). For example, 117 measures were applied to MFN countries, 48 to Malaysia, and 29 to the Republic of Korea. In the pre-ATC period, for example, in 2000, the total of ADP measures applied to all countries was only 11. In other words, the ADP measures are applied to major importing countries after the end of import quotas.

Table 7: No of ADP Measures

Countries	**2000**	**2020**
MFN	6	117
Malaysia	0	48
the Republic of Korea	5	29
Sample	11	194

Source: Author's calculations from the sample.

3.2. Method

In order to explore the effects of tariff and non-tariff measures (ADP) applied in the textile and clothing industry on Turkish imports, we estimate the following specification;

$$imp_{hct} = \beta_0 + \beta_1 ave_{hct} + \beta_2 adp_{hct} + \rho_{ct} + \mu_{ch} + \epsilon_{hct} \quad (1)$$

where imp_{hct} is the value (US dollars) or volume (kg) of sector imports into Turkey in HS6-sector h from country c in year t, ave_{hct} is the ad valorem equivalent custom duties in percentages applied for country c in year t by HS6-sector h, and adp_{hct} is the dummy variable taking the value "1" if ADP is implemented for country c in year t by HS6-sector h or "0" otherwise. The model contains country-year fixed effects (ρ_{hct}) that absorbs all external shocks such as gross domestic product and exchange rate as well as country-sector (i.e. country-HS6) fixed effects (μ_{hc}) that control for supply and demand shocks in general. The error term ϵ_{hct} is also added to the specification.

However, we need to diagnose the existence of endogeneity before estimating of the specification (1). For this purpose, the following linear model is used;

$$adp_h = \beta_0 + \beta_1 \Delta imp_h + \epsilon_h \quad (2)$$

where Δimp_h is the difference between the log of the value (US dollars) or the volume (kg) of textile and clothing imports in 2005 and 2009 in HS6-sector h, adp_h is the dummy variable taking the value "1" if ADP measure is implemented by HS6-sector h or "0" otherwise, and ϵ_h is the error term.

OLS and PPML estimation methods are preferred to explain zero-values and to manage the probable deviation as a result of heteroskedasticity in the error terms (Silva & Tenreyro, 2006). Based on estimates carried out for more than 5.000 products at the HS6-digit level using a panel for 2001-2015 with NTM data notified by more than 150 members of the WTO, empirical findings show a large dispersion of volume effects across both the positive and the negative range, depending on the types of NTMs and income level of exporters (Dolabella, 2020). Therefore, the coefficients of the independent variables are estimated as either positive or negative, even if it is expected that they are smaller than zero.

4. FINDINGS AND DISCUSSIONS

4.1. Testing Endogeneity

The OLS and PPML estimation results from Equation (2) for checking the existence of endogeneity are given in Table 8. Our aim here is to determine whether the ADP measures applied are specifically for the HS6 product groups whose imports have increased the most during the relevant period. On the left side of Table 8 are the OLS and PPML results estimating the link between the increase in ATC import value and ADP measures over the 2000-2020 period. On the right side, the same estimations are calculated for the volume of imports.

Table 8: Estimation Results for Endogeneity

	Δimp_h change in import value (US dollar)		**Δimp_h change in import volume (kg)**	
Dependent Variable	**OLS**	**PPML**	**OLS**	**PPML**
adp_h	-0,0034	-0,0171	-0,0060	-0,0293
	(0,0042)	(0,0186)	(0,0050)	(0,0215)
R^2 / pseudo - R^2	0,0008	0,0006	0,0018	0,0013
N	761	761	761	761

*Notes: The significance levels are ***%1, **%5 and *%10.*

According to Table 8, the OLS and PPML methods produce the same results of estimated coefficients which are statistically insignificant. We can conclude that no relationship is found between the non-tariff measure (ADP) and the rate of change in the sector imports. Therefore, we can proceed with estimating the trade and production specifications of Equation (1), as there is no endogeneity problem for the dataset.

4.2. Effects on the Imports

This section presents the results for the effects of tariffs and ADP measures on the imports of Turkish textile and clothing sector. Table 9 provides the summary results obtained from both OLS and PPML estimations by using "reghdfe" and "ppmlhdfe" packages (Correia, Guimarães, & Zylkin, 2020).

Table 9: Estimation Results for Effects on Imports

	import value (US dollars)		import volume (kg)	
	OLS	**PPML**	**OLS**	**PPML**
ave_{hct}	-0,0411***	-0,0270**	-0,0583***	-0,0523**
	(0,0104)	(0,0121)	(0,0117)	(0,0266)
adp_{hct}	-0,7861***	-0,2257***	-0,7817***	-0,2920***
	(0,0901)	(0,0642)	(0,1054)	(0,0704)
Country-Year FE	Yes	Yes	Yes	Yes
Country-HS6 FE	Yes	Yes	Yes	Yes
R^2 / pseudo - R^2	0,8124	0,9397	0,8372	0,9559
N	60.756	147.331	60.755	147.331

*Notes: The significance levels are ***%1, **%5 and *%10.*

They reveal that the estimated coefficients for the tariffs and ADP variables are statistically significant. Their effects on both import value and volume are negative, as expected and in line with the literature. However, their magnitudes are greater in the OLS than in the PPML. In the case of ADP, these estimated differences are much higher. For instance, one percentage point increase in tariffs reduces import value in US dollars by 4,1% and by 2,7% according to OLS and PPML methods, respectively. For the NTM, this trade-shrinking effect of import value is 78,6% for the OLS while 22,6% for the PPLM. Similarly, the import volume in kg would decline by 5,8% in the OLS and 5,2% in the PPML as a result of a one percentage point increase in the tariff rates. The rates of decrease would be 78,2% and 29,2%, respectively, after applying an ADP for the sector.

As mentioned in the previous section, the earlier studies provide findings indicating that ATC exporting countries have been affected in different ways in the quota-free environment. It is also argued that apart from the share of exporting countries in the main destinations, their markets could be adversely affected in the post-ATC period. In this context, the importance of the measures implemented by the governments for a successful transition to the quota-free period was underlined. The above estimation results indicate that Turkey successfully carried out the transition to the post-ATC era through non-tariff measures. It has been also revealed that non-tariff measures implemented in this context affect imports more than customs duties.

5. CONCLUSION AND IMPLICATIONS

This study examines the effects of tariffs and NTMs both on the import value and the import volume by taking the example of Turkey. The research estimates the influence of the measures enforced by Turkey on the sectoral imports for 2000-2020 using OLS and PPML methods. The results confirmed the effects of customs duties and NTMs on reducing imports following the literature. However, we find that the ADP measure of NTMs is much more effective than the tariff rates. The import value would decline by 2,7%-4,1% due to a percentage point increase in the tariff rates compared to a decrease of 22,6%-78,6% following an ADP application. The level of effect on import volume would be 5,2%-5,8% with one percentage point increase of tariffs, whereas 29,2%-78,2% after an ADP. The results show that Turkey tried to rein in expansion of its sectoral imports through ADP measures in the post-quota period. This study of example indicates that protectionism in the global trade of textile and clothing industry continues with other NTMs instead of quotas.

REFERENCES

Abraham, V., & Sasikumar, S. K. (2011). Labor cost and export behavior of firms in Indian Textile and Clothing Industry. Economics, Management & Financial Markets, 6(1). 125-136.

Adhikari, R. & Yamamoto, Y. (2007). The textiles and clothing industry: Adjusting to a post quota world. In *Industrial Development for the 21st Century: Sustainable Development Perspectives,* 183-234. New York: United Nations, U.N. Department of Economic and Social Affairs.

Alam, S. M., Selvanathan, E. A., Selvanathan, S. & Hossain, M. (2019). The apparel industry in the post-multifiber arrangement environment: A review. Review of Development Economics, 23(1), 454-474.

Appelbaum, R. P. (2004). Assessing the impact of the phasing-out of the Agreement on Textiles and Clothing on apparel exports on the Least Developed and Developing Countries, https://escholarship.org/uc/item/2z94r6z1.

Atılgan, T. & Şen, A. (2006). The protective measures that started being applied in textile and apparel sector in 01 January 2005 and Turkey. Tekstil ve Konfeksiyon. 16(3), 148-151.

Atış, A. G. (2014). Türkiye'nin tekstil ve konfeksiyon sektörünün karşılaştırmalı rekabet analizi. Ege Akademik Bakış, 14(2), 315-334.

Brambilla, I., Khandelwal, A. K. & Schott, P. K. (2010). China's experience under the Multi-Fiber Arrangement (MFA) and the Agreement on Textiles and Clothing (ATC). R. C. Feenstra & S.-J. Wei (Ed.). *China's growing role in world trade.* (345-387). University of Chicago Press.

Chen, W., Lau, C. K. M., Boansi, D., & Bilgin, M. H. (2017). Effects of trade cost on the textile and apparel market: evidence from Asian countries. The Journal of The Textile Institute, 108(6), 971-986.

Correia, S., Guimarães, P. & Zylkin, T. (2020). Fast Poisson estimation with high-dimensional fixed effects. The Stata Journal, 20(1), 95-115.

Datta, A., & Kouliavtsev, M. (2020). The end of the Multi Fiber Arrangement and the pattern of US apparel trade: A gravity model analysis. Journal of Economic Studies, 5(2), 112-124.

Dolabella, M. (2020). Bilateral effects of non-tariff measures on international trade: volume-based. Santiago: United Nations Economic Commission for Latin America and the Caribbean (ECLAC).

Elitaş, L. & Şeker, A. (2017). Uluslararası ticarette tarife dışı önlemlerin rolü: Türkiye tekstil sektörü üzerine bir araştırma. Muhasebe ve Finansman Dergisi, 74, 51-74.

Farag, H. A., Moustafa, E. S., & Mandour, A. (2012). The impact of phasing-out textile quota on the Egyptian textile and clothing sector. Mediterranean Journal of Social Sciences, 3(11), 273-273.

Francois, J. (2010). Comment on "China's experience under the Multi-Fiber Arrangement (MFA) and the Agreement on Textiles and Clothing (ATC)". In R. C. Feenstra & S.-J. Wei (Ed.). In *China's growing role in world trade* (387-395). University of Chicago Press.

Frederick, S., & Staritz, C. (2012). Developments in the global apparel industry after the MFA phaseout. elibrary.worldbank.org

Fugazza, M., & Conway, P. (2010). The impact of removal of ATC quotas on international trade in textiles and apparel. UN.

Gebreeyesus, M. (2013). The end of the multifibre arrangement (MFA) and the heterogeneous performance of quota-constrained countries.

Joarder, M. A. M., Hossain, A. K. M., & Hakim, M. M. (2010). Post-MFA performance of Bangladesh apparel sector. International Review of Business Research Papers, 6(4), 134-144.

Lu, S. (2013). Impacts of quota elimination on world textile trade: a reality check from 2000 to 2010. Journal of the Textile Institute, 104(3), 239-250.

Martin, M. F. (2007). U.S. clothing and textile trade with china and the world: Trends since the end of quotas (Report No: RL34106). Washington, DC: Congressional Research Service.

Ministry of Trade (2022). Trade Policy Instruments, https://ticaret.gov.tr/ithalat/ticaret-politikasi-savunma-araclari.

Morris, M., Barnes, J. (2008). Globalization, the changed global dynamics of the clothing and textile value chains and the impact on Sub-Saharan Africa (Working Paper: 10/2008). Vienna: United Nations Industrial Development Organization, Research and Statistics Branch.

Natsuda, K., Goto, K., & Thoburn, J. (2010). Challenges to the Cambodian garment industry in the global garment value chain. The European Journal of Development Research, 22(4), 469-493.

Öngüt, E. Ç. (2007). Türk tekstil ve hazır giyim sanayinin değişen dünya rekabet şartlarına uyumu (DPT Uzmanlık Tezleri). DPT İktisadi Sektörler ve Koordinasyon Genel Müdürlüğü, Ankara.

Özözen, S. (2021). The competitiveness of the Turkish clothing sector in the EU-15 market post the World Trade Organization Agreement on Textiles and Clothing. Doctorate, Uludağ Üniversitesi Sosyal Bilimler Enstitüsü İktisat Anabilim Dalı, Bursa.

Şencan, G. (2006). Çin Halk Cumhuriyeti tekstil ve konfeksiyon ihracatının Türkiye'nin ihracatına etkileri ve bir saha araştırması: Zorlu Linen A.Ş. örneği. Master's degree, Marmara Üniversitesi, İstanbul.

Shah, S. A., Syed, A. A. & Shaikh, F. M. (2013). Effects of WTO on the textile industry on develeoping countries. Romanian Statistical Review, (61), 60-77.

Silva, J. M. & Tenreyro, S. (2006). The log of gravity. The Review of Economics and Statistics, 88(4), 641-658.

Van Biesebroeck, J., & Zaurino, E. (2019). Effects of trade liberalization on textile and apparel exports from Sub-Sahara Africa. World Bank Policy Research Working Paper, (8936).

Wijayasiri, J. & Dissanayake, J. (2009). The ending of the Multi-Fibre Agreement and innovation in the Sri Lankan textile and clothing industry. OECD Journal: General Papers, 2008(4), 157-188.

WTO, (2017). Press Brief on Textiles, https://www.wto.org/english/thewto_e/minist_e/min96_e/textiles.htm.

Yücel, Y. (2010). Uluslararası ticaretin serbestleştirilmesi sürecinde Türk tekstil ve hazır giyim sektörünün rekabet gücü ve Çin tehdidi. Marmara Üniversitesi İ.İ.B.F. Dergisi, XXIX(II), 227-250.

PressAcademia
www.pressacademia.org/journals/jefa
JEFA
ISSN 2148-6697
Journal of Economics, Finance and Accounting YEAR 2022 VOLUME 9 ISSUE 4

IMPACT OF CLIMATE CHANGE ON BIST 30 INDEX USING VAR MODEL

DOI: 10.17261/Pressacademia.2022.1641
JEFA- V.9-ISS.4-2022(4)-p.187-196

Muhammad Muddasir
Anadolu University, Department of Finance, Eskisehir, Turkey
muhammadmuddasir@anadolu.edu.tr, ORCID: 0000-0003-1116-4329

Date Received: September 27, 2022 **Date Accepted:** December 20, 2022

To cite this document
Muddasir, M., (2022). Impact of climate change on BIST 30 index using VAR model. Journal of Economics, Finance, and Accounting (JEFA), 9(4), 187-196.
Permanent link to this document: http://doi.org/10.17261/Pressacademia.2022.1641

ABSTRACT

Purpose- Global warming has caused an increase in the frequency and severity of extreme weather events in many parts of the world, including Turkey, over the past several decades. This study examines the effects of weather disasters on the Borsa Istanbul stock market from 2009 to 2019 using the BIST 30 Index.
Methodology- In the study, the short–term relationship between the Borsa Istanbul Stock Exchange (BIST30) index and climate change for the period January 2009 – December 2019 was analyzed using the VAR model, and Granger causality test, effect-response test and variance Decoupling tests were applied, respectively. In climate change we take 2 variable which are temperature and precipitation.
Findings – The impact of weather-related calamities on stock market volatility and returns has been found to be insignificant. BIST30 index has no effect of climate change and vice versa. A one-way relationship found between Temperature and the precipitation, and a short-term positive effect-response was found between these variables.
Conclusion – In conclusion we can say that climate change is one of the harsh reality which starts in recent years, and we can't ignore it. It has been determined that the BIST 30 index has not been impacted by climate change in Turkey. which mean 30 best performance companies but maybe it affects small companies and big stock exchanges like Nasdaq, FTSE, and others.

Keywords: Climate change, BIST-30, VAR model, precipitation, extreme weather temperatures
JEL Codes: Q5, Q54, G1

1. INTRODUCTION

Climate change poses significant difficulties and opportunities for industry. In terms of expenses, proposed legislation will increase regulatory costs. The Congressional Budget Office, for example, estimated that a newly proposed climate package would cost businesses more than $100 billion per year. On the plus side, "green" markets may open up new earning opportunities. The magnitudes of firms' climate-related net gains, and also which companies' profit, and which ones lose, are mostly unclear. This research adds to the debate by estimating the impact of climate change on stock prices. The impact of such knowledge should be reflected in short-run stock price adjustments if markets are generally efficient.

Investors are taking high interest in learning how the transition for a greener economy affects businesses, such as, He & Liu (2018), Li et al. (2020), Alsaifi et al. (2020), Teng & He (2020), Qian et al. (2020), Sarkodie et al. (2020). Furthermore, Alsaifi et al. (2020) used an event research technique to investigate how optional carbon disclosure affects businesses in UK. The researcher discovered that companies in carbon-intensive sector have a stronger unfavorable response to voluntary carbon disclosure.

These research display the current emphasis on climate risk, which is a systematic risk, according to Nordhaus and Yang (1996), affecting the entire economy rather than simply a single enterprise. Climate risks can also be divided into two categories: transition and physical risk (Clapp et al. 2017). The first is concerned with harsh weather and its repercussions, The alternative

however, is focused on the characteristics of the shift to a low-carbon economy., such as technology transitions, policy and regulation implementation, production-level changes, and purchasing behaviors. As a result, the market must account for transition risk in the upcoming days.

The research's importance is the presentation of early evidence on the association between financial markets and climate-related environmental behavior. Because there will likely be more market uncertainty over climate change, this study is very important. Compared to earlier empirical studies linking environmental success with financial success, our research has a number of important features.

Our Hypothesis we made for the study, is that the stock market could respond negatively, positively which is our alternative hypothesis, and null have no effect. Climate change has little effect on stocks if there is no reaction. This could indicate that meteorological variables such as temperature and precipitation are irrelevant to the company or market in question, or that they do not provide fresh information that should be factored in. A price change caused by climate change, on the other hand, is considerable but may have a significant effect on price development.

2. LITERATURE REVIEW

Pahuja (2009), in his study on large-scale manufacturing enterprises in India, investigated the relationship between environmental disclosures of firms and firm characteristics. For this purpose, the environmental disclosure index was created, and the activity reports of the enterprises were examined in a three-year period environmental disclosure scores were determined. Based on the analysis's findings, business size, and activities. The sector, profitability, and environmental performance have been found to significantly interact.

Chithambo and Tauringana (2014), took 210 from 2011 manufacturing businesses listed on the London Stock Exchange Measurement of greenhouse gas disclosures in sustainability reports, annual reports and websites between business-specific factors and GHG disclosures by developing a disclosure index for examined the relationship. In the study, greenhouse gas notifications and firm size, debt level and Profitability, liquidity, and investment expenditures, with which the sector is significantly related, it has been determined that there is no effect on greenhouse gas notifications.

Luo et. al (2012) found that 291 businesses in the Global 500 volunteered to the CDP (Carbon Disclosure Project) in 2009. In their study, they examined the factors affecting the participation of voluntarily submit to CDP reporting of large-scale enterprises operating in sectors were found to be more inclined to participate. Also, in this study, climate change is the main stakeholders demanding disclosures to the public and government rather than shareholders and lenders.

Kolk et. al (2008), business statement on climate change level and the significance of these disclosures for investors, the CDP survey although they observed a significant increase in the response rates given each year, this They concluded that the disclosures have a non-significant effect on the decision-making processes of investors.

According to İlgüz, B. (2022), the temperature increases experienced and the uncontrolled fluctuations in precipitation are affected by the climate change reveals the various effects of the change on the economy. Afore mentioned natural disasters such as floods, landslides, or on the contrary, it can cause extreme drought; economically can cause adverse situations.

Dlugolecki, A., & Lafeld, S. (2005) observed that economically developed countries take intensive measures against climate change While developing countries can take these measures instead of spending It is seen that they give priority to other areas. Developing countries being poor and lack in measures to address climate change behavior can reveal their situation.

Environmental monitoring event studies, the second strand of empirical research, is weaker but generates stronger results. The majority of studies related to stock market show that stock prices fall because of negative environmental news, and it reflects inverse relation of stock prices when news are positive (Hamilton 1995; Klassen & McLaughlin 1996; Konar & Cohen 1997; Khanna et al. 1998). Although the event study method used in this research helps to reduce inverse causation and neglected variable biases, various authors, especially Konar & Cohen (2001); McWilliams et al. (2006) have observed that studies in this field often encounter empirical obstacles. Most of the time environmental data is biased, so data of firm-level may suffer from measurement error or strategic misreporting, which is one of the issues driving this study.

Climate change is influencing our time's sociological, geopolitical, and financial dynamics. Shifts in long-term weather variable patterns may have a significant impact on sociocultural issues, including food shortages and relocation, particularly in poor nations (Dell et al., 2012).

Physical and transitional dangers arise as a result of climate change (Carney, 2015). Author finds out physical risks are the mostly negative consequences of weather and climate catastrophes on society, business operations and supply chain (Tankov & Tantet, 2019). Acute and persistent bodily dangers exist. Floods, excessive drought, wildfires, storms, and heat waves all pose acute bodily dangers. Sea-level rise, temperature rise and increase in precipitation are examples of chronic climate concerns that are steadily emerging.

Transitional hazards are the other possible scenarios that are consistent with a less carbon emission and their consequences for carbon fuels on dependent industries (Curtin et al., 2019). Other transitory hazards include firm reputation and technological changes (Semieniuk et al., 2021). I explore how the dynamics of both forms of climate change threats affect asset pricing in this paper. Extreme weather events are becoming more often and severe due to global warming and climate change, particularly within last three decades (Bourdeau & Kryzanowski 2017; Francis & Vavrus 2012).

The stock market's performance is beneficial to a country's overall economic performance. Every year, a lot of policies and research studies are undertaken around the world to investigate various elements of stock market development on economic growth. This is consistent with prior studies that looked at the effect of meteorological disasters on stock returns and local economic performance. Since the weather is regarded as a critical factor in economic performance and a determining factor in day-to-day living, several research and academic studies have been done to evaluate the influence of severe weather events on the industrial and financial market returns (Feltmate et al. 2020; Worthington & Valadkhani 2004; Wang & Kutan 2013). The majority of the research looked at how weather disasters affect the economy, and a few looked at how they affect stock market performance.

Over time, the weather impact study methodology improved and was applied on data from different markets. Some studies look at how weather disasters affect the country's economic indices, while others are primarily concerned with financial markets (Cavallo & Noy 2011; Lanfear et al. 2019; Wang & Kutan 2013).

Lanfear et al. (2019) estimate the impact on stock returns by landfall hurricanes in the America from 1990-2017. Researchers employed t-stats to determine the relationship between returns during in the event time frame and normal stock returns after calculating different accounting ratios for event window durations. Short-term returns were found to be particularly susceptible to hurricanes, but long-term returns were found to be unaffected. Equities with high momentum had a substantial negative effect than other stocks. Another oddity of catastrophic weather events was abnormal illiquidity.

Our main finding that climate change is having a significant economic impact on financial market returns is consistent with a large part of theoretical literature investigating the mechanisms that link environmental and financial performance. The most basic connection is that investors have "green" preferences. According to the literature, for good environmental performance (Arora and Gangopadhyay, 1995) to distinguish attract new customers with environmentally friendly products, (Maxwell and Decker, 2006) reduced monitoring and surveillance application, in the face of future regulation. The opposite is also true: those who perform poorly in the environment may see their profits suffer. Finally, poor performance can be directly lost as a result of high compliance costs in the face of new or stricter regulations that may reduce projected profitability. Stock prices reflect expectations for the predicted profitability.

In summary of previous studies, we can conclude that climate change is one of the hot topic now a days, not much researches are done on climate change but there are various studies related to environmental changes and its effect on firms profitability, stock returns and others key variables. We may say that this is the first study in which directly test the relationship between climate change and BIST 30 index prices. According to many researches climate change affected the firms and some of them found no significant result. We are going to test the same hypothesis on Turkish stock market that do they have any affects or not?

3. METHODOLOGY OF THE STUDY

3.1. Sample and Sources of Data

In this research, it is aimed to find the interaction between Climate change and BIST 30 Price Index using data on monthly frequency. Climate Change have 2 important variable which are Temperature and Precipitation and BIST30 index closing prices between January 2009 – December 2019, a total of 11 years dataset. In the studies in the literature on the subject, it has been observed that Granger causality tests and cointegration test are generally preferred and that causality tests give better results. For this reason, the VAR model was preferred in the analysis of the relationship between Climate change variables and BIST 30 in the study with the help of the VAR regression model, the correlation between the two variables shows the effects of climate

change on the BIST 30 index were observed. In addition, the effect occurred in the market during the selected data set time interval on the relationship between these variables was also included in the analysis.

The main aim of the research is to check the effect of climate change on BIST30 stock prices and the relationship between these two variables. For this purpose, Temperature, Precipitation and BIST30 data for the period 1.1.2009 – 29.12.2019 were used. Due to the fact that the data obtained from the Thomson Reuters DataStream and climateknowledgeportal.worldbank.org were used in the study. Within the scope of the study, Vector Autoregressive (VAR) model was created and EViews 10 program was used for the analysis. The main hypotheses of the study are as follows.

H0: Climate change have no effect on the BIST30 index.

H1: Climate change have an impact on the BIST30 index.

3.2. Econometric Modelling and Estimation

In the study, the stationarity of the Temperature, Precipitation and BIST30 variables was first examined. To examine if the series was stationary, the Augmented Dickey-Fuller (ADF) unit root test was applied.

$$\Delta Yt = \mu + \beta t + \delta Yt - 1 + \sum kj = 1 \alpha t \Delta Yt - 1 + \varepsilon t \quad (1)$$

ΔYt : The coefficients, the stationarity of which determines the time series to be tested

μ and ßt: The existence of a consistent trend in the time series under consideration

εt: Indicate an accidental error

Equation (1) refers to the equality of the ADF test. When the null hypothesis (H0) is rejected in the ADF test, it is concluded that there is no unit root for the ADF test, in other words, the time series in question is stationary (Elmastaş et. al 2016). Stationarity in general; It is described as the circumstance in which a time series' mean and variance remain constant across time and the covariance value between two points solely depends on the separation or time elapsed between the two points, not on actual time (Gujarati and Porter, 2010, p. 381).

$$\Delta Yt = A1 + A2t + A3Yt - 1 + \mu t \quad (2)$$

If the unit root test applied to determine the stationarity is expressed as in equation (2); the hypothesis H0 is that the coefficient of A3 is zero, and this indicates that the time series is not stationary. In this study, Augmented Dickey-Fuller (ADF) unit root test was applied to test that A3 is zero. If the value of the calculated A3 is greater than the critical value of the 10% selected for this study, the unit root hypothesis is rejected. In other words, the time series is considered to be stationary (Gujarati and Porter, 2010, p. 382). In order to find the number of delays in the ADF test, the Akaike information criterion was used in the study (AIC).

The VAR model was established with time series that were determined to be stationary by ADF test. However, the VAR model was subjected to autocorrelation, variable variance, normality, and root graph/table tests, respectively, and was tested for stability conditions, and the effect of Temperature and Precipitation on BIST30 was examined with the VAR model, which provides all four stages. In the next step, causality, effect-response, and variance decomposition analyses were applied respectively. With the effect-response analysis, it was measured what the reactions of the variables would be if one-unit shocks were applied to the variables in question. The variance decomposition was used to test at which percentage the change in the variance of each variable in question was covered by its delay or at which percentage it was covered by the other variable.

4. FINDINGS AND DISCUSSION

Whether a time series have a unit root depends on the stationarity of the series it is decided by looking at it. In other words, the time series changes over time the fact that it does not stop shows that the series is stationary, as well as the unit root of the series it also shows that it contains (Koyuncu, 2018, p. 621).

$$Xt = pXt - 1 + Ut \quad (3)$$

In the study, the stationarity of climate change and BIST 30 variables is determined by the ADF unit root in Table 1.

Table 1: Unit Root Test for BIST30 and Climate Change

D_BIST30	-10.35419***
D_Temperature	-3.996860***
D_Precipitation	-9.965391***

MacKinnon critical values for the 1%, 5% and 10% levels, respectively ***-3.5713, **-2.9225, * -2.5992

According to the applied ADF unit root test, with the current state of these series it has been determined that it is not stationary. There is a prerequisite for the analysis, which will be included in the model this is because the series is stationary. Therefore, the differences of the considered series are taken and the ADF test was repeated. As can be seen from Table the differences imported series do not contain a unit root. Here D represents the difference, for making stationary our variables.

4.1. VAR Model Stability Conditions

In order to ensure the stability conditions of the VAR model, respectively VAR (1,2,3,4,5,6,7,8,9) models have been tried. There is VAR (9) autocorrelation for the model. The results are shown in Table 2.

Table 2: Autocorrelation Test for the VAR (9) Model

Lags	P-value
Lag 1	0.0001
Lag 2	0.0131
Lag 3	0.0742
Lag 4	0.1048
Lag 5	0.0020
Lag 6	0.1484
Lag 7	0.5010
Lag 8	0.0658
Lag 9	0.1261

As can be seen from Table 2, there is no autocorrelation problem for the VAR (9) model, where the probability value of 9th Lag is more than 10%. A variable variance test was performed at a later stage for the VAR (9) model in which there was no autocorrelation problem. The probability value for the VAR (9) model subjected to the variable variance test is given in Table 3.

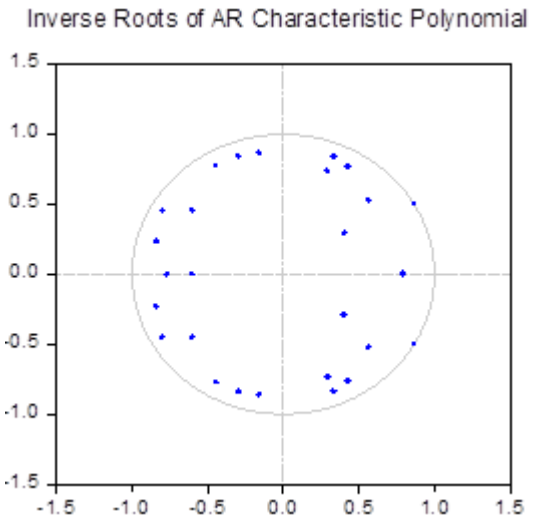
Table 3: VAR Residual Heteroskedasticity Tests Results

Chi-square	Probability
356.4932	0.1035

According to the VAR (9) model covering the BIST30 and Climate change time series, there are no problems with both autocorrelation and variable variance. For this reason, the analysis was continued with the VAR (9) model and the normality test was performed for the specified model. According to the normality test, the normality for the VAR model in question was greater than the specified confidence interval, that is 10%, and there is no normality problem.

In the VAR (9) model, there are 9*2=18 roots for this analysis, i.e., multiplying the model and the number of variables for bivariate analysis. These 18 roots must be located in the unit circle. The graph obtained for the VAR (9) model is given in Figure 1.

Figure 1: Unit Root Graph



4.2. Causality Test

In the causality test, the existence of a cause effect relationship between variables is tested and if there is a cause-and-effect relationship, the direction of this relationship is determined. The Granger causality test results applied in the study are as follows in Table 4.

Table 4: The Granger Causality Test Result

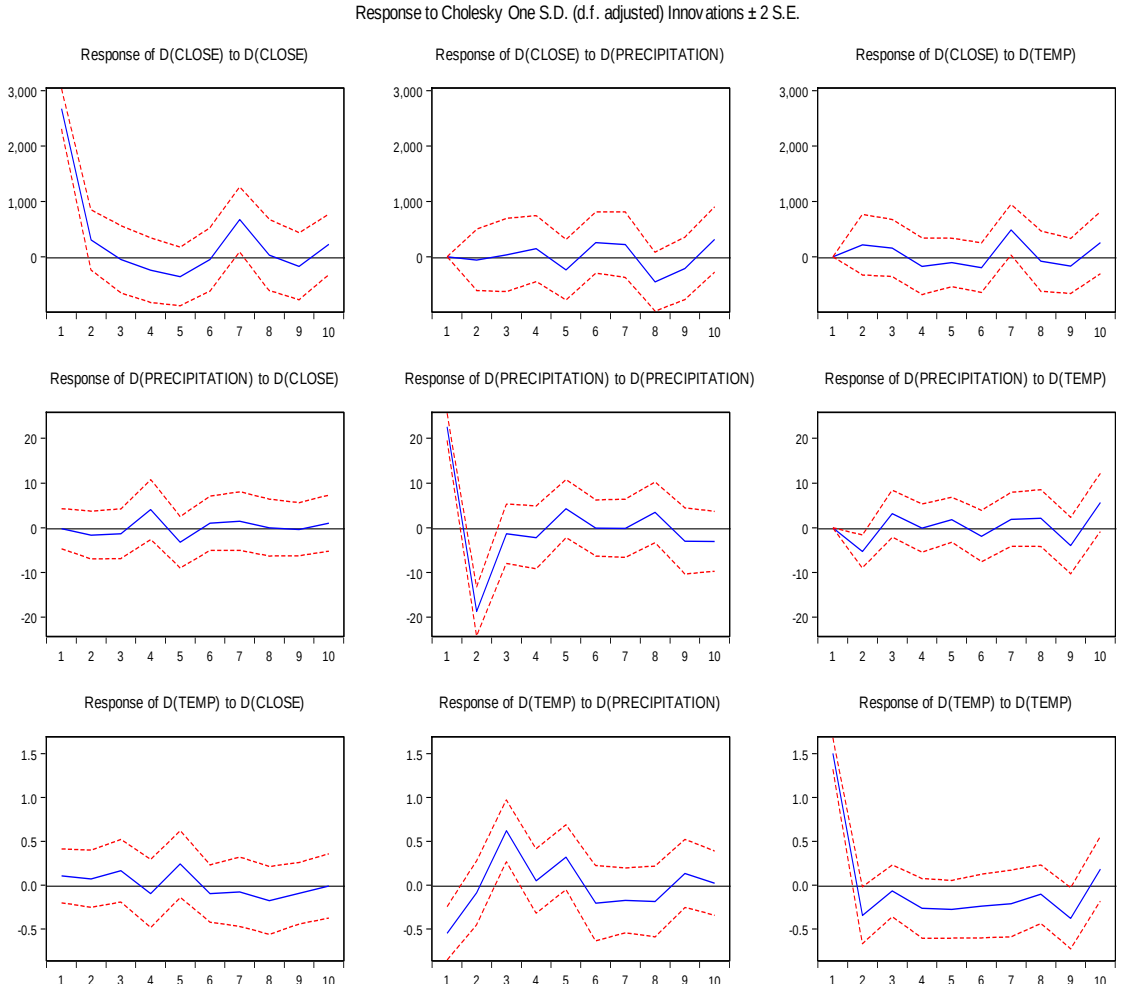
D_Temperature≠ > D_BIST30	0.3770
D_Precipitation ≠ > D_BIST30	0.2234
D_BIST30 ≠ > D_Temperature	0.5194
D_Precipitation ≠ > D_Temperature	0.0172
D_BIST30 ≠ > D_Precipitation	0.7715
D_Temperature≠ > D_Precipitation	0.0000

According to the results of the Granger causality test, Precipitation and Temperature have effect on each other. However, as can be seen from Table 4, BIST30 is not the reason for climate change and vice versa. In summary, there is no mutual causality relationship between the variables.

4.3. Effect-Response Test Results

Effect-response tests measure how a one-unit shock to a selected variable will affect the other variable or how the other variable will respond. In the study, the effect-response test was performed with the" Monte Carlo Standard Error and Generalized Effect" options. The generalized effect was chosen so that the results do not differ according to the order of variable selection.

Figure 2: Effect-Response Test Results



The first graph shows how a shock that will occur in the BIST30 will react in the BIST30. The second chart shows the reaction of Precipitation to a shock that will occur in BIST30, third chart shows the reaction of Temperature to a shock that will occur in BIST30. The fourth graph shows how a shock that will occur in the BIST30 will react in the Precipitation. The fifth chart shows the reaction of Precipitation to a shock that will occur in Precipitation, sixth chart shows the reaction of Temperature to a shock that will occur in Precipitation. The seventh graph shows how a shock that will occur in the BIST30 will react in the Temperature. The fifth chart shows the reaction of Precipitation to a shock that will occur in Temperature and the last chart shows his reaction to the shock caused by Temperature. The second, third, fourth, sixth, seventh and eight graphs are considered when interpreting these graphs. Because the first, fifth and ninth graphs measure the effect response of the variables themselves. The second, third, fourth, sixth, seventh and eight graphs are included in the interpretation since the important thing for analysis is the inter-variable effect-response.

When the effect-response graphs for BIST30 and temperature & precipitation are examined, it is seen that the other variable temperature and precipitation did not react to a shock occurring in BIST30 for a short period of time. But Precipitation and Temperatures variable have positive reaction to a shock.

4.4. Results of the Variance Decomposition Test

It measures the percentage of the change that occurs in one variable in the variance decomposition and how much other variables are affected by this change. The results of variance decomposition for an average of 10 periods are shown in Table 5.

Table 5: Variance Decomposition for BIST30 (%)

D_BIST30		
D_BIST30	D_Precipitation	D_Temperature
90.134	5.060	4.804
D_Precipitation		
D_BIST30	D_Precipitation	D_Temperature
3.455	89.692	6.8523
D_Temperature		
D_BIST30	D_Precipitation	D_Temperature
4.284	23.848	71.867

It measures the percentage of the change that occurs in one variable in the variance decomposition and how much other variables are affected by this change. The results of variance decomposition for an average of 10 periods are shown in Table 5.

As can be seen from Table 5, about 10% of the changes in the BIST30 index for an average of 9 periods are due to Temperature and Precipitation, and 90% are due to it. And almost 10% of the changes in the Precipitation for an average of 09 periods are due to Temperature and BIST30, and 90% are due to it. However, about 28% of the changes in Temperature are due to the BIST30 index and precipitation, and 72% are due to it. The results are limited by precipitation on temperature and but there is no effect of BIST30 on climate change and vice versa.

5. CONCLUSION AND RECOMMENDATION

Share prices and index values are affected by many macroeconomic variables such as inflation, interest rates, exchange rates, industrial production index, GDP, as well as precious metals such as oil and gold. In the scope of the research, it is aimed to find the interactions between the BIST30 index and climate change, which is the input of all sectors.

In the study, the short–term relationship between the BIST30 index and climate change for the period January 2009 – December 2019 was analyzed using the VAR model, and Granger causality test, effect-response test and variance Decoupling tests were applied, respectively.

The results of the causality test were obtained are that the BIST30 index is not the reason of climate change also climate change is not affected BIST30. A one-way relationship found between temperature and the precipitation, and a short-term positive effect-response was found.

When making investment decisions, carbon risk should be considered because programs to combat climate change aim to minimize carbon emissions. According to recent studies (Krueger, Sautner, and Starks 2020), investors are aware of the climate risk and seek better returns from businesses with higher emissions levels (Bolton & Kacperczyk 2021). Furthermore, the cost of borrowing is cheaper for businesses that care about the environment as compared to those that don't report their carbon footprint (Jung et al. 2018).

These findings demonstrate the need for investors to receive payment for owning climate-risky stocks. We contend that risk premiums and adjustments to expectations can account for how the sectors responded to the events. It is essential for

policymakers to comprehend how different businesses and the stock exchange as a whole respond to climate related policy in order to develop the best solution for the entire economy.

In conclusion we can say that climate change is one of the harsh reality which starts in recent years, and we can't ignore it. Our results for BIST30 are not significant but for other big index and big stock exchanges may have effects of climate change.

REFERENCES

Alsaifi, K., Elnahass, M., & Salama, A. (2020). Market responses to firms' voluntary carbon disclosure: Empirical evidence from the United Kingdom. Journal of Cleaner Production, 262, 121377.

Arora, S., & Gangopadhyay, S. (1995). Toward a theoretical model of voluntary overcompliance. Journal of economic behavior & organization, 28(3), 289-309.

Bolton, P., & Kacperczyk, M. (2021). Do investors care about carbon risk?. Journal of Financial Economics, 142(2), 517-549.

Bourdeau-Brien, M., & Kryzanowski, L. (2017). The impact of natural disasters on the stock returns and volatilities of local firms. The Quarterly Review of Economics and Finance, 63, 259-270.

Canham, C. D., Papaik, M. J., Uriarte, M., McWilliams, W. H., Jenkins, J. C., & Twery, M. J. (2006). Neighborhood analyses of canopy tree competition along environmental gradients in New England forests. Ecological applications, 16(2), 540-554.

Carney, M. (2015). Breaking the tragedy of the horizon–climate change and financial stability. Speech given at Lloyd's of London, 29, 220-230.

Cavallo, E., & Noy, I. (2011). Natural disasters and the economy—a survey. International Review of Environmental and Resource Economics, 5(1), 63-102.

Chithambo, L., & Tauringana, V. (2014). Company specific determinants of greenhouse gases disclosures. Journal of Applied Accounting Research.

Clapp, C., Lund, H. F., Aamaas, B., & Lannoo, E. (2017). Shades of Climate Risk. Categorizing climate risk for investors. CICERO Report.

Curtin, L., D'Andrea, W. J., Balascio, N., Pugsley, G., de Wet, G., & Bradley, R. (2019). Holocene and Last Interglacial climate of the Faroe Islands from sedimentary plant wax hydrogen and carbon isotopes. Quaternary Science Reviews, 223, 105930.

Dell, M., Jones, B. F., & Olken, B. A. (2012). Temperature shocks and economic growth: Evidence from the last half century. American Economic Journal: Macroeconomics, 4(3), 66-95.

Dlugolecki, A., & Lafeld, S. (2005). Climate change and the financial sector. an agenda for action.

Feltmate, B., Moudrak, N., Bakos, K., & Schofield, B. (2020). Factoring Climate Risk into Financial Valuation . Intact Center on Climate Adaptation.

Francis, J. A., & Vavrus, S. J. (2012). Evidence linking Arctic amplification to extreme weather in mid-latitudes. Geophysical research letters, 39(6).

Gujarati, Damodar N, and Dawn C Porter. Essentials of Econometrics. New York, Mcgraw-Hill/Irwin, 2010.

GÜLTEKİN, Ö. E., & HAYAT, E. A. (2016). Analysis of Factors Affecting The Gold Prices Through VAR Model: 2005-2015 Period. Ege Academic Review, 16(4), 611-625.

Hamilton, J. T. (1995). Pollution as news: Media and stock market reactions to the toxics release inventory data. Journal of environmental economics and management, 28(1), 98-113.

He, X., & Liu, Y. (2018). The public environmental awareness and the air pollution effect in Chinese stock market. Journal of Cleaner Production, 185, 446-454.

İlgüz, B. (2022). İklim değişikliğinin finansal piyasalara etkisi: Türkiye örneği (Master's thesis, Trakya Üniversitesi Sosyal Bilimler Enstitüsü).

Jung, J., Herbohn, K., & Clarkson, P. (2018). Carbon risk, carbon risk awareness and the cost of debt financing. Journal of Business Ethics, 150(4), 1151-1171.

Khanna, M. (2001). Non-mandatory approaches to environmental protection. Journal of economic surveys, 15(3), 291-324.

Klassen, R. D., & McLaughlin, C. P. (1996). The impact of environmental management on firm performance. Management science, 42(8), 1199-1214

Kolk, A., Levy, D., & Pinkse, J. (2008). Corporate responses in an emerging climate regime: The institutionalization and commensuration of carbon disclosure. European accounting review, 17(4), 719-745.

Konar, S., & Cohen, M. A. (1997). Information as regulation: The effect of community right to know laws on toxic emissions. Journal of environmental Economics and Management, 32(1), 109-124.

Konar, S., & Cohen, M. A. (2001). Does the market value environmental performance?. Review of economics and statistics, 83(2), 281-289.

Krueger, P., Sautner, Z., & Starks, L. T. (2020). The importance of climate risks for institutional investors. The Review of Financial Studies, 33(3), 1067-1111.

Lanfear, M. G., Lioui, A., & Siebert, M. G. (2019). Market anomalies and disaster risk: Evidence from extreme weather events. Journal of Financial Markets, 46, 100477.

Li, M., Dong, L., Luan, J., & Wang, P. (2020). Do environmental regulations affect investors? Evidence from China's action plan for air pollution prevention. Journal of Cleaner Production, 244, 118817.

Luo, L., Lan, Y. C., & Tang, Q. (2012). Corporate incentives to disclose carbon information: Evidence from the CDP Global 500 report. Journal of International Financial Management & Accounting, 23(2), 93-120.

Maxwell, J. W., & Decker, C. S. (2006). Voluntary environmental investment and responsive regulation. Environmental and Resource Economics, 33(4), 425-439.

Maxwell, J. W., Lyon, T. P., & Hackett, S. C. (2000). Self-regulation and social welfare: The political economy of corporate environmentalism. The Journal of Law and Economics, 43(2), 583-618.

Nordhaus, W. D., & Yang, Z. (1996). A regional dynamic general-equilibrium model of alternative climate-change strategies. The American Economic Review, 741-765.

Pahuja, S. (2009). Relationship between environmental disclosures and corporate characteristics: a study of large manufacturing companies in India. Social Responsibility Journal.

Porter, M. E., & Van der Linde, C. (1995). Toward a new conception of the environment-competitiveness relationship. Journal of economic perspectives, 9(4), 97-118.

Qian, W., Suryani, A. W., & Xing, K. (2020). Does carbon performance matter to market returns during climate policy changes? Evidence from Australia. Journal of Cleaner Production, 259, 121040.

Sarkodie, S. A., Adams, S., & Leirvik, T. (2020). Foreign direct investment and renewable energy in climate change mitigation: does governance matter?. Journal of Cleaner Production, 263, 121262.

Segerson, K., & Miceli, T. J. (1998). Voluntary environmental agreements: good or bad news for environmental protection?. Journal of environmental economics and management, 36(2), 109-130.

Semieniuk, G., Campiglio, E., Mercure, J. F., Volz, U., & Edwards, N. R. (2021). Low-carbon transition risks for finance. Wiley Interdisciplinary Reviews: Climate Change, 12(1), e678.

Tankov, P., & Tantet, A. (2019). Climate data for physical risk assessment in finance. Available at SSRN 3480156.

Teng, M., & He, X. (2020). Air quality levels, environmental awareness and investor trading behavior: Evidence from stock market in China. Journal of Cleaner Production, 244, 118663.

Tietenberg, T. (1998). Disclosure strategies for pollution control. Environmental and resource Economics, 11(3), 587-602.

Wang, L., & Kutan, A. M. (2013). The impact of natural disasters on stock markets: Evidence from Japan and the US. Comparative Economic Studies, 55(4), 672-686.

Wang, L., & Kutan, A. M. (2013). The impact of natural disasters on stock markets: Evidence from Japan and the US. Comparative Economic Studies, 55(4), 672-686.

Worthington*, A., & Valadkhani, A. (2004). Measuring the impact of natural disasters on capital markets: an empirical application using intervention analysis. Applied Economics, 36(19), 2177-2186.

PressAcademia
www.pressacademia.org/journals/jefa

JEFA
ISSN 2148-6697

Journal of Economics, Finance and Accounting YEAR 2022 VOLUME 9 ISSUE 4

A WAGE-LED OR PROFIT-LED DEMAND REGIME: THE CASE OF JORDAN (1990 – 2020)

DOI: 10.17261/Pressacademia.2022.
JEFA- V.9-ISS.4-2022(5)-p.197-207

Farah Omet[1], Ahmet Ozcam[2]
[1]Yeditepe University, Department of Economics, Kadikoy, Istanbul, Turkey.
farahomet@hotmail.com , ORCID:0000-0003-1302-5613
[2]Yeditepe University, Department of Economics, Kadikoy, Istanbul, Turkey.
aozcam@yeditepe.edu.tr, ORCID: 0000-0002-4145-6296

Date Received: October 11, 2022 **Date Accepted:** December 19, 2022

To cite this document
Omet, F., Ozcam, A., (2022). A wage-led or profit-ledge demand regime: the case of Jordan (1990-20220). Journal of Economics, Finance and Accounting (JEFA), 9(4), 197-207.
Permanent link to this document: http://doi.org/10.17261/Pressacademia.2022.1642

ABSTRACT

Purpose- Recently, the Jordanian economy has been finding it increasingly challenging to create sufficient job opportunities and absorb the new labor market entrants and hence, reduce unemployment. The economy must achieve healthy and persistent economic growth. Within this context, this paper looks at the relationship between income distribution of labor and capital on economic growth. In other words, the overall purpose of this paper is to examine whether the Jordanian economy is profit-led or wage-led.

Methodology- To examine the functional distribution of income in Jordan, the paper uses the period 1990-2020 (annual data) and time series techniques including stationarity test, lag length selection criteria, and augmented autoregressive distributed lag (ARDL) bounds test for cointegration.

Findings- Based on the period 1990 –2020, the results indicate that the demand regime in Jordan is wage-led and not profit-led. In more specific terms, a one-percentage-point increase in the profit share decreases output by 0.08 percent.

Conclusion- To rise-up to the growth and unemployment challenges that face the Jordanian economy, the government would be well-advised if it ensures that nominal wages increase in line with inflation as well as productivity. In addition, the government should adopt a wage-led strategy that rests on labour market policies whose aims are to pre-distribute income (such as minimum wage and better education and health policies) and redistribute income through progressive taxes.

Keywords: Jordan, demand-led growth, wage-led, profit-led, investment, ARDL, net exports.
JEL Codes: B50, E11, E12

1. INTRODUCTION

Jordan is classified by the World Bank as an upper middle-income country. Relatively speaking, the size of the Jordanian economy is small. In 2021, for example, nominal Gross Domestic Product (GDP) was worth 45.2 billion US dollars. GDP per capita is equal to 4,406 dollars. When converted to international dollars using Purchasing power parity (PPP) rates, Jordan's GDP per capita is equal to 10,952 US dollars.

Following any look at the recent performance of the Jordanian economy, one can conclude that the economy has been suffering from several socio-economic challenges. The national economy could only achieve modest if not weak real economic growth rates, and as a result, unemployment has been increasing to unprecedented levels. In addition, the status of public finance has been poor.

During the decade 2010–2019, real GDP increased by annual average of 2.4 percent. As a result of COVID-19, the economy shrank by -1.6 percent in 2020 and then grew by 2.2 percent in 2021. The overall unemployment rate, which stood at 12.5 percent in 2010, increased to 19.1 percent in 2019, and to 24.1 percent in 2021 (Department of Statistics). In addition, these two challenges (growth and unemployment) are underlined by persistent budget deficits and rising public debt. For example, public debt to GDP ratio, which was equal to 65.4 percent in 2010, increased to 90.8 percent in 2015, 95.2 percent in 2019, and to more than 106.0 percent in 2021 (Ministry of Finance, General Government Finance Bulletin).

Based on the above-mentioned brief account of the challenges that face the Jordanian economy, one can argue that the only way to significantly reduce unemployment and improve the status of public finance, is to realize strong and sustainable economic growth in future years to come. Within this context, one can also ask one basic, though important, question: What type of stimulus is necessary to produce the much-needed economic growth to redress the dangerous rise in unemployment?

To answer this question, one should remember that any long-term growth strategy should consider a myriad of factors including the overall economic regime of the economy. The functional income distribution of the economy should be understood. In other words, the fact that national income is the sum of all income available to the residents of a given country in a year, the division of income between labor and capital becomes important. For example, if an increase in the profit share has a positive and expansionary impact on the economy, the economy is profit-led. If an increase in the wage share, on the other hand, that creates the expansionary impact, the economy is wage-led.

The overall objective of this paper is to examine whether the Jordanian economy is wage-led or profit-led. The rest of the paper is organized as follows. In section 2, we briefly review the relevant literature about wage-led and profit-led regimes. In section 3, the data and methodology are discussed. In section 4, we present and discuss the estimated results. Finally, section 5 summarizes and concludes the paper.

2. WAGE-LED VERSUS PROFIT-LED REGIMES: LITERETURE REVIEW

It is probably accurate to state that the distribution of income in any economy is the result of complex social and economic processes. However, it is also fair to argue that governments can use tax policy, spending programs, and labour policies to affect the distribution of income. In other words, governments can adopt pro-capital policies to reduce the wage share in national income. Governments can also adopt pro-labour policies to increase the wage share in national income.

Pro-capital policies promote flexibility in the labour market. These policies include, for example, weakening the collective bargaining of unions, lowering minimum wages, adoption of capital gain tax exemption, and a reduction in the overall corporate tax rate. The end-result of such policies (pro-capital) is to moderate wage increases in national income.

Table 1: Pro-Labour and Pro-Capital Distributional Policies

Policy	Policies	Results / Impact
Pro-Capital	Abolish minimum wages, weaken collective bargaining, and impose wage moderation.	Weak increase in wages, higher wage dispersion, and falling wage share in national income.
Pro-Labour	Strengthen collective bargaining, increase minimum wages, lower corporate taxes.	Increasing real wages, lower wage dispersion, and stable or increasing wage share in national income.
Other Factors	Trade policy, changes in technology, globalization, financial development, and others.	

Source: Lavoie and Stockhammer (2013).

Pro-labour policies strengthen labour unions and their collective bargaining position. In addition, pro-labour policies tend to have more unemployment benefits, higher minimum wages relative to the median wage (Lavoie and Stockhammer, 2013). The end-result of such policies (pro-labour) is to maintain the wage share in national income or increase it in the long run, especially when real wages increase in tandem with labour productivity or even exceed productivity.

The impact of public policy on income distribution notwithstanding, the issue that must be settled is the impact of any shift in income distribution on economic growth. In other words, will income shift in favour of profit recipients have a favourable consequence on aggregate demand in the short term and / or long term? Indeed, if a shift towards profits has favourable repercussions on the economy, then it is said to be a profit-led economic regime. If, however, such a shift has negative repercussions on the economy, then it is said to be one of a wage-led regime. In other words, one can argue that a shift in income in favour of wages increases consumption when the marginal propensity to consume (MPC) of employees (wages) is higher than that of profits. However, the higher cost of labour might diminish competitiveness and as a result, net exports. In addition, such a shift might diminish private investment as well. Based on this, one can state that demand is wage-led if the positive impact of a shift in income in favour of wages on consumption is greater than on net exports and private investment. Naturally, if the opposite case prevails, then the economy if profit-led (Blecker 2002, Lavoie and Stockhammer 2013, and Hein 2014).

The works of Rowthorn (1981), Dutt (1984), Blecker (1989,2011) and Bhaduri and Marglin (1990) have all extended the post-Keynesian/ Kaleckian model. The total effect of wage share decrease on aggregate demand depends on the relative size of the interactions of consumption, investment, and net exports to changes in income distribution. Therefore, to assess which type of regime that any economy is in, one needs to consider all four components of GDP or all four components of aggregate demand (AD). These are private consumption (C), private investment (I), government expenditure (G), and net exports (NX / exports minus imports).

$$AD = C + I + G + NX \quad (1)$$

Based on the above expression, one can state that the economy is a wage-led demand regime if an increase in the wage share, or a decrease in the profit share, leads to an increase in the sum of the four components of aggregate demand. On the other hand, the economy is a profit-led demand regime if an increase in the profit share, or a decrease in the wage share, leads to an increase in the sum of the four components of aggregate demand.

Table 2: Features of Economic Structures: Wage-Led and Demand-Led Regimes

	Demand Regime	
	Profit-led	**Wage-led**
Economic Structure	Small differentials in propensities to consume. Investment is highly sensitive to profits. The effect of accelerator is low. Very open economy. High export price elasticity. High import price elasticity. High import income elasticity. Low excess capacity. Low rates of profits.	Propensity to consume out of wages is considerably higher than that of propensity to consume out of profits. Investment is non-sensitive to profits. The accelerator effect is high. Relatively closed economy. Low export price elasticity. Low import price elasticity. Low import income elasticity. High excess capacity. High rates of profits.
Other Factors	Fiscal and monetary policies. Financial development. Changes in world demand, exchange rates and commodity prices.	

Source: constructed *by the author* using discussions in Lavoie and Stockhammer (2013).

Since the publication of the seminal article by Bhaduri and Marglin's (1990), many economists have investigated many economies in terms of the wage-led and profit-led arguments. This literature uses two approaches.

The first approach analyzes consumption, investment, exports, and imports (or net exports) separately using single equations. The paper by Bowles and Boyer (1995) was the first to apply this methodology on developed counties. Hein and Vogel (2008) conclude that France, Germany, the UK, the USA, and the Netherlands (without including external trade) are profit-led, while Austria changes from a wage-led economy to a profit-led one when the impact of distribution on external trade is included in the analysis. Within the same spirit, Naastepad and Storm (2006) and Stockhammer et al. (2009) analyzed eight member countries of the Organization for Economic Cooperation and Development (OECD) and the euro area respectively.

The second approach considers the interactions amongst the various variables and use vector autoregressive modelling (VAR). Stockhammer and Onaran (2004) applied this approach on the French, American, and the British economies. Onaran and Stckhammer (2005) used a similar approach for South Korea and Turkey.

On average, the empirical literature shows that most economies are wage-led (Onaran 2013). Within this context, Galanis and Onaran's (2012) looked at the impact of a change in the wage share on economic growth in several countries from 1960 to 2007. Their results show that a decrease in the wage share leads to lower growth in the Eurozone countries and ihigher growth in Canada, Australia, Argentina, Mexico, China, India, and South Africa.

In a comprehensive analysis of cross-country panel data which is composed of 41 economies, Oyvat et al. (2020), show that countries with a higher level of openness to trade are more likely to be profit-led, and countries with lower wage inequality are mostly wage-led. In addition, Oyvat et al. (2020) show that countries with higher private credit GDP ratio are more likely to be profit-led. In a more recent paper, Ntshwant (2022) examines the South African economy. Based on the period 1975-2019, a Keynesian aggregate demand model, and the ARDL approach, the results indicate that the economy is profit-led.

3. THE DATA, METHODOLOGY, AND EMPIRICAL RESULTS

To assess the impact of the functional income distribution on economic growth in Jordan, this paper relies on the relevant data from the World Bank, Department of Statistics – Jordan, and the Central Bank of Jordan. The data set covers the period 1990 - 2020. The definitions of the data are as follows.

Y: Real GDP. GDP is the sum of the gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products. It is calculated without making deductions for depreciation of fabricated assets or for depletion and degradation of natural resources. The data are in constant local currency (Jordanian Dinar). The source of this variable is the World Bank.

Y^f : Real World GDP in 2015 constant prices in billion US Dollars. The source of this variable is the World bank.

Y_n: Nominal GDP in local currency (Jordanian Dinar) calculated by the expenditure approach. The source of this variable is the Department of Statistics – Jordan.

C: Nominal consumption expressed in local currency (Jordanian Dinar). Final consumption expenditure (formerly total consumption) is the sum of household final consumption expenditure (formerly private consumption) and general government final consumption expenditure (formerly general government consumption). The source of this variable is the World Bank.

I: Nominal gross fixed capital formation in local currency (Jordanian Dinar). Formerly gross domestic fixed investment, which includes land improvements (fences, ditches, drains, and so on), plant, machinery, and equipment purchase, and the construction of roads, railways, and the like, including schools, offices, hospitals, private residential dwellings, and commercial and industrial buildings. The source of this variable is the World Bank.

NX: Nominal net export volume, in thousands of local currency (Jordanian Dinar). The source of this variable is the World Bank.

Π: Operating surplus in constant local currency (Jordanian Dinar in thousands). The source of this variable is the Department of Statistics – Jordan.

W: Compensation of employees in constant local currency (Jordanian Dinar in thousands). The source of this variable is the Department of Statistics – Jordan.

w: Wage share. This is calculated by the ratio of compensation of employees to Gross Domestic Product (both nominal in local currency).

h: profit share. This is calculated by 1- wage share at local market price.

GDP Deflator: The GDP implicit deflator is the ratio of GDP in current local currency to GDP in constant local currency (base year is 2016). Source: World Bank database.

The Theoretical Model - The estimation model follows that of Hein and Vogel (2007), which is based on the seminal work of Bhaduri and Marglin (1990) and that of Bowles and Boyer (1995). Theoretically, capital utilization is defined as the main indicator of economic growth. However, domestic gross product (GDP) is used as a proxy measure for capital utilization due to insufficient data. All variables are defined in real terms, deflated by the Consumer Price Index (CPI), the base year being 2010. The period covers the years 1990-2020.

The total direct partial effect of change in the profit share on GDP components; consumption, investment and net exports is evaluated. Then, the partial effects are added up in order to obtain the total effect of change in the profit share on the components of GDP.

$$\frac{\frac{\partial Y}{Y}}{\partial h} = \frac{\frac{\partial C}{Y}}{\partial h} + \frac{\frac{\partial I}{Y}}{\partial h} + \frac{\frac{\partial NX}{Y}}{\partial h} \quad (2)$$

The Consumption Function - The effect of change in distribution on aggregate consumption (C) is estimated according to the expression:

$$C = f(\Pi, W) \quad (3)$$

where W and (Π) are compensation of employees and gross operating surplus respectively. All three variables are in their logarithmic forms.

The Investment Function

The investment function is defined by the below expression:

$$I = f(Y, h) \quad (4)$$

where, capacity utilization (u) and profit share (h) are the main variables affecting capital accumulation. Here, we use Y as a proxy for capacity utilization. All three variables are in their logarithmic forms.

The Net Export Function

The net export function is defined by the below expression:

$$\frac{NX_n}{Y_n} = f\left(h, Y, \mathrm{Y}^{\mathrm{foreign}}\right) \quad (5)$$

where, net exports is a function of the profit share, income, and income of main trading partners ($Y^{foreign}$).

To estimate the above-mentioned functions, we first test all the variables for stationarity using both the standard Augmented Dickey – Fuller (ADF) and the Phillips-Perron unit root tests. We then determine the optimal lag for each of the three equations using the Akaike information criterion or Schwartz's criterion. We then proceed by estimating the long-run relationships using the Bounds test of Pesaran et al. (2001). The main advantages of using the Bounds test methodology, compared to multiple equation methodologies, is that it does not require that the variables entering the estimation have the same order of integration (although at most they must be of integrated of order one). Another advantage is that it works for a limited number of annual observations. In other words, it yields unbiased estimates of the long-run coefficients even when some of the regressors are endogenous, Pesaran and Shin (1998), a condition which affects all macro series. The long-run and short-run errors can also be estimated in single stage (including their natural logarithms).

First, we look into the autoregressive distributed lag (ARDL) model as Pesaran et al. (2001) suggest. The general Error Correction Model is written below, as an example for the first part of the analysis (the consumption function):

$$\Delta C_t = \sum_{j=1}^{n=2} a_j \Delta C_{t-j} + \sum_{j=0}^{n=2} b_{\prod,j} \Delta \prod_{t-j} + \sum_{j=0}^{n=3} b_{W,j} \Delta W_{t-j} + \sigma C_{t-1} + d_{\prod} \prod_{t-1} d_W W_{t-1} + e_t \quad (6)$$

Second, Pesaran at al. (2001) suggest that one should compare the results of the t-test (which tests the significance of the speed of adjustment coefficient), and the F-test. If the t or F- statistic fall above the upper critical value (for a given significance level), then the null of no long run relationship can be rejected (i.e., cointegration is present). If, however, the statistics lie below the lower bounds, then the null cannot be rejected. It is also worth mentioning that the statistics lie between the upper and lower bounds, then the results are said to be inconclusive. Third, the lag structure of the equation above is simplified by eliminating the longest insignificant lags. In other words, the over- parameterised model is a 'parsimonious' model.

Before we present and discuss the estimated results, it is useful, at this stage, to note that Jordan's wage share in national income (Figure 1) has been fluctuating around 37 percent (Department of Statistics). In addition, this share (Table 1) is relatively low (World Bank Database). On average, it is the oil exporting Arab countries that have equally low wage shares. Naturally, this is the result of their oil exports which positively impact the size of their economies, and at the expense of their wages. In other words, this oil producing sector generates economic output without having to employ large numbers of individuals.

Figure 1: Jordan's Wage Share of National Income

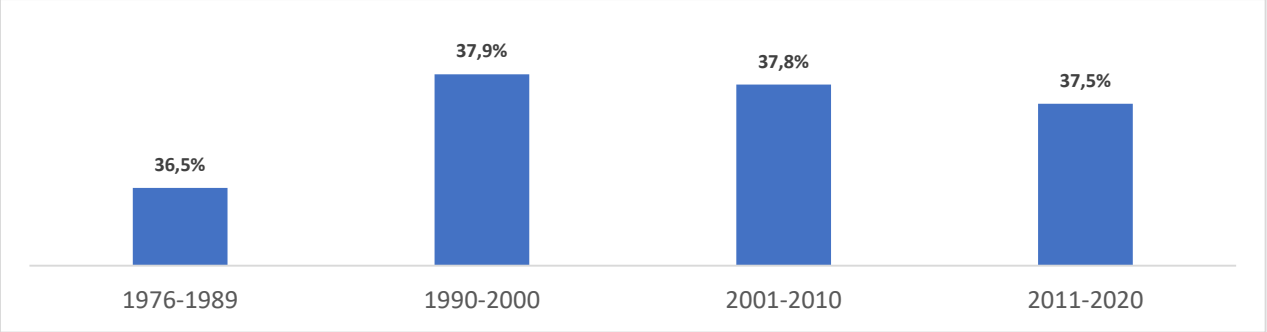


Table 1: Wage Share of National Income: Regional and International (2016 – 2019)

Economy	Wage Share	Economy	Wage Share
Qatar	27.5%	China	51.6%
Saudi Arabia	30.6%	Finland	54.6%
Jordan	37.5%	Sweden	54.8%
Turkey	39.3%	Great Britain	56.8%
Kuwait	39.5%	Denmark	56.9%
Egypt	42.6%	United States	58.3%
Morocco	44.5%	Australia	59.7%
Tunisia	47.7%	France	60.3%
Singapore	49.6%	Canada	60.6%

The consumption equation estimations regression results are presented in Table 2 below.

Table 2: Consumption Equation Estimations (1990 – 2022)

Estimated equation: $\Delta lnC = \alpha_1 \Delta ln\prod + \alpha_2 \Delta lnW$		
Regressors	**Coefficient**	**t-ratio**
$\Delta ln\prod$	0.363***	5.035
ΔlnW	0.841***	9.692
D_{2008}	-0.266***	-7.980
Diagnostics		
R^2	0.998	
Adjusted R^2	0.997	
DW statistics	1.938	
Breusch-Pagan-Godfrey heteroskedasticity test[a]	0.158	
Normality test[a]	0.729	
F-test[a]	0.000	
RESET test (with squares) [a]	0.000	

Source: Author's own calculations. ***, ** and * represent 1, 5 and 10% significance levels, respectively. *a* Probability values of the corresponding tests.

It should be noted that a dummy variable was employed to control for the sharp rise, as a result of the change in the Department of Statistics' methodology, in operating surplus ($\prod$) in 2007. Prior to year 2006, the expenditure approach of measuring GDP did not include "mixed income".

The coefficients of lnΠ(0.363) and lnW (0.841) are found to be statistically significant at the 1% significance level.

The bounds test is carried forward to test statistically the significance of the coefficient of the error correction term (σ). As expected, the sign of the speed of error term coefficient is negative (-1.088) and is found to be statistically significant at 1 %.

It can be confirmed that long term coefficients are confirmed by calculating:

$$a_{\Pi} = -\frac{d_{\Pi}}{\sigma} = -\frac{0.395}{(-1.088)} = 0.363$$

$$a_{\mathrm{W}} = -\frac{d_{\mathrm{W}}}{\sigma} = -\frac{0.915}{(-1.088)} = 0.841$$

Estimates of the elasticity of consumption with respect to wages were significantly higher than those with respect to profits. To calculate the direct partial effects of a change in the profit share on the GDP growth contribution of consumption, the elasticities were converted according to equation (6) below, using average values over the whole period for (C/ π) and (C/W) as derived from the equations below.

$$c = f(\Pi, W)$$

$$\frac{\partial c}{\partial h} = \frac{\partial c}{\partial \Pi} \cdot \frac{\partial \Pi}{\partial h} + \frac{\partial c}{\partial W} \cdot \frac{\partial W}{\partial h}$$

$$= \frac{\partial c}{\partial \Pi}(y) + \frac{\partial c}{dW}(-y)$$

$$\frac{\frac{\partial c}{y}}{\partial h} = \frac{\partial c}{\partial \Pi} - \frac{\partial c}{\partial W}$$

$$= \frac{\frac{\partial c}{c}}{\frac{\partial \Pi}{\Pi}} \cdot \frac{c}{\Pi} - \frac{\frac{\partial c}{c}}{\frac{\partial W}{W}} \cdot \frac{c}{W}$$

$$= \quad a_{\Pi} \frac{C}{\Pi} - a_{\mathrm{W}} \frac{C}{W}$$

(7)

$$\frac{\frac{\partial C}{Y}}{\partial h} = a_{\Pi} \frac{C}{\Pi} - a_W \frac{C}{W} = (0.3631) \frac{186.75}{82.45} - (0.8410) \frac{186.75}{71.551}$$

$$\frac{\frac{\partial C}{Y}}{\partial h} = 0.8224 \quad - 2.1950 = \mathbf{-1.37}$$

Table 3: Estimation Result of a Change in the Profit Share on the Growth Contribution of Consumption in ECM Form

	a_{Π}	a_W	C/π	C/W	$(\delta C/Y)/\delta h$
Jordan	0.3631	0.8410	2.265	2.610	-1.37

The long -term elasticities must be converted into marginal effect of a change in profit (h) share on the consumption. Using Eq. (6) and the mean values of the variables C,Π,W from the data set. The overall impact of profit share on consumption is negative (-1.37).

The Investment Function - In theory, capacity utilization (u) and the profit share (h) are the main variables that affect capital accumulation. Following this and using GDP (Y) as a proxy for capacity utilization, the investment function is defined as below.

$$I = f(Y, h)$$

The stationarity of both variables (Y and h) are tested by the Augmented Dickey – Fuller (ADF) and Phillips-Perron unit root tests. The results confirm that all the variables are integrated of order one, I (1) at the 1% significance level. Therefore, the bounds testing approach by Pesaran et al (2001) is applied to find out whether there is a long term cointegration between the variables in an error correction model. The bounds testing results do in fact confirm a long-term relationship between the variables. Consequently, we estimate the following error correction model:

$$d[log(I_t)] = c + a_1 \log(I_{t-1}) + a_2 log(Y_{t-1}) + a_3 h_{t-1} + \sum_{i=0}^{n=3} b_i \;\; d[\log(Y_{t-i})] + \sum_{i=0}^{n=3} c_i d(h_{t-i}) +$$

$$\sum_{i=1}^{n=3} d_i d[\log(I_{t-i})]$$

(8)

Table 4: Investment Equation Estimations (1990 – 2022)

Partial effect of the profit share on growth contribution of investment from equation (8)

a_1	a_2	a_3	Adj.R^2	D-W Statistic	Wald test (F statistic) [a]	Q statistics (P for lag =1)	Breusch-Pagan-Godfrey heteroskedasticity test (P)
-2.584*** (0.465)	8.935*** (1.638)	1.279 (3.144)	0.787	2.518	10.340	0.141	0.359

Note: (***) Significant at the 1% level, (**) significant at the 5% level, (*) significant at the 10% level. Standard errors are in parentheses, t statistics in square parentheses. [a]Bounds testing for H_0: $a_1 = a_2 = a_3 = 0$ to test for the existence of a long-run relationship between the variables.

To obtain the partial effect of a change in distribution on the growth contribution of investment, the estimates of the long-run elasticity of investment with respect to the profit share were multiplied by the average investment share in GDP over the whole period.

$$a_{\mathrm{I}} = \left(\frac{a_3}{-a_1}\right)\left(\frac{I}{Y}\right)$$

(9)

$$= \left(\frac{1.278934}{-(-2.584639)}\right)\left(\frac{17.50435}{23.58338}\right)$$

$$(\mathbf{0.49482})(\mathbf{0.7422}) = \mathbf{0.36727}$$

Table 5: Partial effect of the Profit Share on the Growth Contribution of Investment from Equation (9)

	a_3/ -a_1	I/Y	(ΔI/Y)/δh
Jordan	0.4948	0.7422	0.3672

Thus, the impact of profit share on investment is positive (0.3672).

The Net Export Function - Net exports in the model (Hein 1990) are positively affected by real exchange rate as a proxy measure of international competitiveness, and negatively affected by domestic activity. IN other words, the real exchange rate will have a positive effect on net exports. But net exports also depend on the relative developments of foreign and domestic demand. If domestic demand grows at a faster rate than foreign demand, net exports will decline. If domestic demand grows at a faster rate than foreign demand, net exports will decline, ceteris peritus. With foreign demand given, the domestic rate of capacity utilization moving in step with domestic demand will have a negative impact on net exports. As described earlier, this effect is ambiguous and dependent upon the cause of change in profit share. Therefore, the sign of effect of change in the profit share on net exports is not clear in prior. For the estimation of the nominal share of effects of distribution on the net exports in nominal GDP of the main trading partners ($Y^{foreign}$), as indicators of domestic and foreign demand, as exogenous variables.

$$\frac{NX_n}{Y_n} = f\left(h, Y, \mathrm{Y}^{\mathrm{foreign}}\right)$$

(10)

The sign of the effect of change in profit share on net exports is not clear in prior, we expect domestic GDP to have a negative influence on net exports, since higher domestic demand will result in higher imports and decrease in net exports. In contrast, a higher GDP in trading partner countries will cause an increase of exports and will thus increase net exports. Domestic and foreign GDP are portraited in logarithm form for simplicity reasons and foreign GDP is generally assumed to be that of the rest of the world. All the variables in the time series are integrated in order of one I (1) at the 5% significance level.

Using profit share (h) as one of the variables, the bounds test reflected statistically insignificant coefficients. Thus, the gross operating share (Π) as a proxy for profit share (h) has been replaced and the bounds test of Pesaran et al. (2001) upper critical values are sustained.

The long- term elasticities are converted into marginal effect of a change in profit share (in this case gross operating surplus, (Π) on the net exports (NX) component of gross domestic product (Y).

$$a_{NX} = -\frac{d_i}{\sigma} = -\frac{(-0.7940)}{(-2.0083)} = -0.3953$$

$$\frac{\frac{\partial NX}{Y}}{\partial h} = a_{NX}\left(\frac{NX}{\Pi}\right)$$

$$= (-0.3953)\left(\frac{-0.2477}{18.0915}\right) = \mathbf{0.0540}$$

The Total Effect - The total effect of a change in the profit share on aggregate demand and therefore on the growth of output can be calculated by adding up the direct partial effects of the growth contributions of consumption, investment, and net exports according to equation. The results of the total effect are shown in Table (6) below. In Jordan's wage-led regime a one-percentage-point increase in the profit share will decrease output by 0.08 percent. The Jordanian economy is wage-led and not profit led.

Table 6: Total effect of a change in the profit share on the percentage of real GDP

	$\frac{\frac{\delta C}{Y}}{\delta h}$	$\frac{\frac{\delta I}{Y}}{\delta h}$	$\frac{\frac{\delta NX}{Y}}{\delta h}$	$\frac{\frac{\delta Y}{Y}}{\delta h}$
Jordan (1990 -2021)	**-1.37**	**0.367**	**0.054**	**-0.94**

The Multiplier - The total effect presented above, is again said to be the summation of the components of demand (C,I and NX) with respect to changes in profit share (h), is also called 'private excess demand'.
In respect to the analysis conducted above, it is also worth investigating the economic multiplier with the aid of the paper by Onaran and Galanis (2012).

Thus, taking into consideration the multiplier mechanism in regards to equation (2), we derive the following equation:

$$\frac{\frac{\partial Y}{Y}}{\partial h} = \frac{\frac{\frac{\partial C}{Y}}{\partial h} + \frac{\frac{\partial I}{Y}}{\partial h} + \frac{\frac{\partial NX}{Y}}{\partial h}}{1 - \left(\frac{\frac{\partial C}{Y}}{\partial Y} + \frac{\frac{\partial I}{Y}}{\partial Y} + \frac{\frac{\partial NX}{Y}}{\partial Y}\right)} \qquad (11)$$

$$m = \frac{\frac{\partial C}{Y}}{\partial Y} + \frac{\frac{\partial I}{Y}}{\partial Y} + \frac{\frac{\partial NX}{Y}}{\partial Y}$$

$$= a_{Cy}\frac{C}{Y} + a_{Iy}\frac{I}{Y} + a_{NXy}\frac{NX}{Y} \qquad (12)$$

Where the elasticity of consumption with respect to output (a_{Cy}) is calculated as the weighted average of the consumption elasticities of profit and wages, a_{Π} and a_W respectively.

$$a_{Cy} = a_{\Pi}\ h\ + a_W\ (1-h) \qquad (13)$$

Table 7: Results of Multiplier Calculation	
Elasticities	
Elasticity of consumption with respect to profit, a_{Π}	0.3625
Elasticity of consumption with respect to wages, a_W	0.8413
Weighted elasticity of consumption with respect to output, a_{Cy}	0.8392
Elasticity of investment with respect to output, a_{Iy}	0.4948
Elasticity of net export with respect to output, a_{NXy}	-0.3954
Sample means	
Output,Y	18964
Consumption, C	186.75
Investment, I	42.731
Net Exports, NX	-0.247
Profit share, $h = \frac{\Pi}{Y}$	0.0043
$1/(1-m)$	0.9906
$\frac{\partial Y}{\partial h} = \frac{\frac{\partial C}{\partial h} + \frac{\partial I}{\partial h} + \frac{\partial NX}{\partial h}}{1 - \left(\frac{\partial C}{\partial Y} + \frac{\partial I}{\partial Y} + \frac{\partial NX}{\partial Y}\right)} =$	-0.95

The multiplier effect has a significant effect on the overall change in gross domestic product, giving more precise calculations. It can be deduced that the multiplier carries private excess demand from -0.94 to a -0.95. The strong consumption elasticities carry the overall Jordanian economy even further as a wage led regime.

4. SUMMARY AND CONCLUSIONS

For more than a decade, the Jordanian economy could not create sufficient job opportunities and reduce unemployment. Indeed, the onslaught of COVID-19 and the resultant closures have made this challenge even more compelling. The Jordanian government, together with the private sector, should work tirelessly and achieve strong and persistent economic growth. This is the only way to reduce unemployment.

Within the context of Jordan's growth and employment challenges, this paper looked at the relationship between income inequality and economic growth. In more specific terms, this paper used the Keynesian aggregate demand model, conducted an autoregressive distributed lag (ARDL) approach to examine the presence, if any, of a long-run relationship between changes in income distribution and aggregate demand.

Based on the period 1990–2020, the results indicate that the demand regime in Jordan is wage-led and not profit-led. Based on this conclusion and given that the wage share in Jordan has been around the 37 percent of the national economy, one can argue that the government would be well-advised if it ensures that nominal wages increase in line with inflation as well as productivity. In addition, the government should adopt a wage-led strategy that rests on labour market policies whose aims are to pre-distribute income (such as minimum wage and better education and health policies) and redistribute income through progressive taxes.

REFERENCES

Bhaduri, A., and Marglin, S. (1990). Unemployment and the real wage: the economic basis for contesting political ideologies. Cambridge Journal of Economics, 14(4), 375-393.

Blecker, R. (1989). International competition, income distribution and economic growth. Cambridge Journal of Economics, 13, 395-412.

Blecker, R. (2002). Demand, distribution, and growth in neo-Kaleckian macro models, in M. Setterfield (ed.), The Economics of Demand-Led Growth: Challenging the Supply-Side Vision of the Long Run, Cheltenham, UK and Northampton, MA: Edward Elgar, 129–152

Blecker, R. (2011). Open economy models of distribution and growth, in E. Hein and E. Stockhammer (eds), A Modern Guide to Keynesian Macroeconomics and Economic Policies, Cheltenham, UK and Northampton, MA: Edward Elgar, 215-293.

Stockhammer (eds), A Modern guide to Keynesian Macroeconomics and Economic Policies, Cheltenham, UK and Northampton, MA, USA: Edward Elgar Publishing.

Blecker, A. (2016). Wage-led versus profit-led demand regimes: the long and the short of it. Review of Keynesian Economics, 4(4), 373-390.

Bowles, S. and Boyer, R. (1995). Wages, aggregate demand and employment in an open economy: An empirical investigation, in G. Epstein and Gintis, H. (eds), Macroeconomic Policy after the Conservative Era, Cambridge, UK: Cambridge University Press.

Dutt, A. (1984). Stagnation, income distribution and monopoly power. Cambridge Journal of Economics, 8(1), 25-40.

Hein, E., and Vogel, L. (2008). Distribution and growth reconsidered: empirical results for six OECD countries. Cambridge Journal of Economics, 32(3), 479-511.

Hein, E. (2014). Distribution and Growth After Keynes: A Post-Keynesian Guide, Cheltenham, UK and Northampton, MA: Edward Elgar.

Kalecki, M. (1954), Theory of economic Dynamics, London, UK: Unwin, reprinted New York, NY, USA: Monthly Review Press, 1968.

Kurt, Ekin Ozan. (2017). Functional income distribution and growth in South Korea: A post-Keynesian econometric analysis. Marmara Üniversitesi İktisadi ve İdari Bilimler Dergisi, 39(2), 553-576.

Kurt, Ekin Ozan. (2020),. Functional income distribution, capacity utilization, capital accumulation and productivity growth in Turkey. Metroeconomica, 71, 734-766.

Lavoie, M. and Stockhammer, E. (2013). Wage-led Growth: An Equitable Strategy for Economic Recovery, Basingstoke, UK: Palgrave Macmilla.

Keynes, J. M. (1936). The General Theory of Employment, Interest and Money, London: MacMillan

Naastepad, C. and Storm, M. (2006). OECD demand regimes, 1960-2000. Journal of Post Keynesian Economics, 29(2), 213-48.

Ntshwant, M. (2022). Is growth in the South African economy profit-led or wage-led? Journal of Economic and Financial Sciences, 15 (1), 1-12.

Onaran, Ö. and Stockhammer, E. (2004). Do profits affect investments? Am empirical test based on the Bhaduri-Marglin model, in E. Hein, A. Heise and A. Truger (eds), Wages, Employment, Distribution and Growth: International Perspectives, Basingstoke, UK: Palgrave Macmillan.

Onaran, Ö. and Stockhammer, E. (2005). Two different export-oriented growth strategies: Accumulation and distribution in Turkey and South Korea. Emerging Finance and Trade, 41, 65-89.

Onaran, Ö. and Galanis, G. (2012). Is aggregate demand wage-led or profit-led? National and global effects. Condition of Work and Employment Series No.40, Geneva: International Labour Office.

Onaran, Ö. and Obst, T. (2016). Wage-led growth in the EU15 member states: the effects of income distribution on growth, investment, trade balance and inflation', Cambridge Journal of Economics, 40(6), 1517-51.

Oyvat, C., Oztunah, O. and Elgin, C. (2020). Wage-led versus profit-led demand: A comprehensive empirical analysis. Metroeconomica, 71(3), 458-486.

Pesaran, M., Shin, Y., Smith, R. (2001). Bounds testing approaches the analysis of level relationships. Journal of Applied Econometrics 16,289–326.

Rowthorn, R. (1981). Demand, Real Wages and Economic Growth. Thames Polytechnic, Northeast London Polytechnic.

Stockhammer, E. and Onaran, Ö. (2004). Accumulation, distribution, and employment: A structural VAR approach to a Kaleckian macro model. Structural Change and Economic Dynamics, 15, 421-447.

Stockhammer, E., Onaran, Ö. and Ederer, S. (2009). Functional income distribution and aggregate demand in the Euro area. Cambridge Journal of Economics, 33(1), 139-59.

Stockhammer, E. and Onaran, Ö. (2013). Wage-led growth: Theory, evidence policy. Review of Keynesian Economics, 1, 61-78.

Stockhammer, E. and Stehrer, R. (2011). Goodwin or Kalecki in demand? Functional income distribution and aggregate demand in the short run. Review of Radical Political Economics, 43(4), 506-522.