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Essays on Foreign Direct Investment, Free Trade Agreements, and the Digital Economy

Constance Vigilance
University of Southern Mississippi

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ESSAYS ON
FOREIGN DIRECT INVESTMENT, FREE TRADE AGREEMENTS, AND THE
DIGITAL ECONOMY

by

Constance Vigilance

A Dissertation
Submitted to the Graduate School,
the College of Arts and Sciences
and the School of Coastal Resilience
at The University of Southern Mississippi
in Partial Fulfillment of the Requirements
for the Degree of Doctor of Philosophy

Committee:

Dr. Edward Sayre, Committee Chair
Dr. Joseph St. Marie
Dr. Robert Pauly
Dr Tom Lansford

May 2024

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2024

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ABSTRACT

Economic globalization's key components include international trade, foreign direct investment (FDI), and the digital economy. FDI stimulates export growth, complementing international trade. The global economy is being transformed by digitalization, boosting international trade and GDP through speed, convenience, productivity, and transparency and driving shifts in FDI patterns through resource-efficient products and green technologies.

This dissertation investigates three prominent issues - the FDI inflows to fragile, least-developed countries (LDC), the proliferation of Free Trade Agreements (FTA,) and the digital economy. Using the Generalised Least Squares Random effects (GLS RE) and the Ordinary least squares (OLS) estimations with a sample size of 156 countries, the research found that market size (GNI), human development (HDI), the presence of liquified natural gas (LNG), the presence of precious stones and mineral resources, least developed country (LDC) classification, and trade openness positively determine FDI. At the same time, fragility, measured by the fragile states index and political instability, can reduce FDI. Also, the research into FTAs used the Kruskal-Wallis H test to study the 356 FTAs registered by the WTO at the end of 2022. The research found that FTAs differ based on the number of countries, economic regions, and goods and/or services coverage. The research on the digital economy used a case study methodology to analyze its features and how it has contributed to cross-border trade and investment. The research findings show that internet connections, the ubiquitous mobile phone, and the actions of digital MNEs have created an ecosystem that has changed how we work and play and boosted cross-border trade in goods and services. For example, digital platforms such as

Airbnb and social media platforms, including YouTube, have enabled trade in services across borders.

The research findings can contribute to national and multilateral discussions. Countries can implement policies and programs that promote FDI and advance the digital economy. At the same time, at the multilateral level, discussions can acknowledge the disparities and policy challenges of the digital economy and the erosion of free trade caused by FTAs and pursue multilateral solutions that would benefit the global economy.

ACKNOWLEDGMENTS

Thank you to Dr. Edward Sayre, my Ph.D. Dissertation supervisor for his invaluable support and guidance throughout preparing my dissertation. The meetings and conversations played a crucial role in completing my dissertation. Furthermore, I would like to express my gratitude for each dissertation committee member's valuable guidance on my dissertation. I am also grateful to the IDV Doctoral Program faculty members, namely Dr. St. Marie, Dr. Pauly, Dr. Naghshpour, and the Graduate Program Coordinator, Annette Copeland, for their valuable contributions during my Ph.D. program.

DEDICATION

Thank you, Jesus!

I dedicate my dissertation to my darling son Kieron I. A. Cox.

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LIST OF ABBREVIATIONS

<i>ACP</i>	African Caribbean and Pacific countries
<i>AfCFTA</i>	The African Free Trade Area
<i>AI</i>	Artificial Intelligence
<i>ASEAN</i>	Association of Southeast Asian Nations
<i>B2B</i>	Business-to-Business
<i>B2C</i>	Business-to-Consumer
<i>BIT</i>	Bilateral Investment Treaties
<i>BRICS</i>	Brazil Russia India China South Africa
<i>C2C</i>	Consumer-to-Consumer
<i>CGE</i>	Computable General Equilibrium model
<i>COMESA</i>	Common Market for Eastern and Southern Africa
<i>CPTPP</i>	Comprehensive and Progressive Agreement for Trans-Pacific Partnership
<i>CT</i>	Communication technology
<i>CU</i>	Customs Union
<i>EIA</i>	Economic Integration Agreements
<i>EU</i>	European Union
<i>FDI</i>	Foreign Direct Investment
<i>FSI</i>	Fragile States Index
<i>FTA</i>	Free Trade Agreements

<i>GATS</i>	General Agreement on Trade and Services
<i>GATT</i>	General Agreement on Tariffs and Trade
<i>GDP</i>	Gross Domestic Product
<i>GLS RE</i>	Generalized Least Squares Random Effects
<i>GNI</i>	Gross National Income
<i>GSTP</i>	The Global System of Trade Preferences
<i>GSP</i>	Generalized System of Preferences
<i>GTAP</i>	Global Trade Analysis Project
<i>HDI</i>	Human Development Index
<i>ICT</i>	Information and Communication Technologies
<i>IMF</i>	International Monetary Fund
<i>IT</i>	Information technology
<i>LDC</i>	Least Developed Countries
<i>LNG</i>	Liquefied petroleum gas
<i>MENA</i>	Middle East and North Africa
<i>MFN</i>	Most Favoured Nation
<i>MNE</i>	Multinational Enterprises/Transnational Corporation Multinational Corporations
<i>MOOCs</i>	Massive Online Open Courses
<i>MSME</i>	Micro-Small and Medium Enterprises

<i>OECD</i>	Organization for Economic Cooperation and Development
<i>OLS</i>	Ordinary Least Squares
<i>PSA</i>	Partial Scope Agreements
<i>PTN</i>	Protocol on Trade Negotiations
<i>RCEP</i>	Regional Comprehensive Economic Partnership
<i>SDT</i>	Special and Differential Treatment
<i>TPP</i>	Trans-Pacific Partnership
<i>TRIPS</i>	Trade-Related Aspects of Intellectual Property Rights
<i>UN</i>	United Nations
<i>UNCTAD</i>	The United Nations Conference on Trade and Development
<i>USMCA</i>	US Mexico Canada Free Trade Agreement
<i>WTO</i>	World Trade Organisation

CHAPTER I – INTRODUCTION

International trade, foreign direct investment (FDI), and the digital economy are essential to economic globalization. The OECD study by Fontagné (1999) indicates that empirical evidence until the mid-1980s showed that international trade generated foreign direct investment, but recently, the cause-and-effect relationship seems to have reversed. Foreign direct investment promotes export growth from originating countries and is complementary to trade. However, foreign investment generally increases imports in the short term, and exports increase after several years of FDI. The nature and extent of the relationship between FDI and international trade can differ between countries (Fontagné, 1999).

Into this mix, enter the digital economy. According to Satyanand (2021), the global economy is being transformed by digitalization, boosting trade and GDP through speed, convenience, productivity, and transparency. This Fourth Industrial Revolution drives shifts in FDI patterns through resource-efficient products and green technologies (Satyanand, 2021).

Both international trade and FDI determine a country's GNI. Whiteaker (2020) contended that greenfield FDI involves establishing businesses, subsidiaries, or facilities in another country and can contribute to job creation and goods and skills transfer. Whiteaker (2020) notes that mergers and acquisitions with active ownership changes are also an FDI component. FDI is typically divided into horizontal, vertical, and conglomerate investments. Horizontal FDI involves establishing the same type of business in a new market as in its home country, vertical FDI involves investing in a

particular sector's primary, secondary, and tertiary processes, and conglomerate FDI involves investing in unrelated business activities (Whiteaker, 2020).

Further, according to Whiteaker (2020), FDI stocks measure direct investments held by non-residents, while FDI flows relate to cross-border investment either into or out of a country. International trade involves purchasing and selling products and services on international markets, promoting consumer choice and competitiveness. It allows countries to trade primary, intermediate, or finished goods, capital, or services for necessary resources, reducing end prices and increasing quality (Whiteaker, 2020).

In recent years, Free Trade Agreements (FTAs) have proliferated and are a crucial feature of international trade and investment. According to Barone (2023), an FTA between two or more nations reduces import and export barriers, allowing cross-border purchase and sale of goods and services without government tariffs, quotas, subsidies, or prohibitions (Barone, 2023). Since the mid-1990s, there has been a significant increase in the number of FTAs, an expansion in the depth of FTAs, and an increase in FTAs between countries that are not geographically close (Barone, 2023).

According to (Urata, Globalization and the growth in free trade agreements, 2002), the expansion, intensification, and diversification of FTAs are driven by a complex mix of external and internal factors and economic, political, and security-related factors. The external barriers include securing markets and providing export opportunities for domestic companies by dismantling trade barriers. This barrier breakdown benefits companies from economies of scale, efficient production, market access, and increased exports. (Urata, Globalization and the growth in free trade agreements, 2002) notes that liberalization of multilateral trade can also be achieved

under the WTO, but there are several reasons why countries prefer FTAs. First, FTAs are faster, as FTA agreements require less time than WTO negotiations. Second, trade liberalization under the WTO is perceived by anti-globalization protestors as detrimental; therefore, FTAs are an alternative way to achieve trade liberalization. Thirdly, FTAs involve fewer participants, and it is easier to establish rules for new issues yet to be discussed in the WTO. Fourth, particularly for small countries wishing to participate in FTAs, strengthen their political and economic influence internationally (Urata, *Globalization and the growth in free trade agreements*, 2002).

Large FTAs exist in Asia and Europe. In Asia, the Association of South East Asian Nations (ASEAN) established an FTA in 1992 to attract FDI to their own countries, creating a large market and a free and competitive environment (Urata, *Globalization and the growth in free trade agreements*, 2002). The EU has the most significant number of FTAs. According to Access2Markets (2023), the benefits of FTAs for the EU include the elimination of tariffs and more comprehensive market access. Also, the FTAs aim to strengthen economic ties between the EU and Eastern European countries (Georgia, Moldova, and Ukraine) by aligning their regulatory frameworks with EU law, particularly in trade-related areas (Access2Markets, 2023).

Further, Access2Markets (2023) argues that the EU FTAs with countries in the African, Caribbean, and Pacific (ACP) region are focused on development. The ACP countries liberalize around 80 percent of trade, and the EU grants duty-free, quota-free access. Most agreements cover trade in goods and development cooperation, while the Economic Partnership Agreement with the Caribbean covers investment, services, and

other trade-related topics. The EU helps strengthen and build export competitiveness and economic infrastructure (Access2Markets, 2023).

Digitalization has significantly increased the scale, scope, and speed of trade, enabling firms to trade new goods and services globally over the Internet, according to OECD (2023). It also allows smaller firms to reach new markets, facilitate payments, avoid investment in fixed assets, and use alternative funding mechanisms like crowdfunding. OECD (2023) also argues that Digitalization is changing how goods are traded, with the growth of online platforms leading to a rise in small packages sold across international borders. New technologies and business models also change how services are produced and supplied, blurring the distinctions between goods and services and delivery mode. Rapid technological developments have also facilitated the rise of services in international cross-border trade, with information and communication technology services providing the necessary network infrastructure and underpinning the digitization of other services (OECD, 2023).

Brookings (2023) contended that globalization through the internet and cross-border data movement transforms international trade in five key areas. SMEs and developing countries can use digital platforms to export, with online payment mechanisms providing a global reach. Information technology, financial, professional, and education services can be traded online, with new digital services like cloud computing becoming necessary business inputs. According to Brookings (2023), Data collection and analysis allow value-added services to goods exports, underpinning global value chains. The growth of digital technologies like 3D printing and machine-to-

machine (M2M) communications complicates trade transactions, affecting regulatory cooperation and trade-related principles like rules of origin (Brookings, 2023).

This dissertation investigates foreign direct investment, free trade agreements, and the digital economy to identify their determinants, impact, and role within the global economy. These three issues are critical to the global economy to achieve economic growth and employment and promote business development. Economic theory on FDI notes that imperfect competition would lead monopolistic competition firms and oligopolies to seek FDI to increase profits and market share. However, in the past few decades since the end of the Cold War, FDI in fragile LDCs has been increasing despite these countries' poor economic, social, security, and governance situations. Economic theory on international trade includes the Ricardian theory, the Heckscher-Ohlin theory, and the gravity model. The most favored nation (MFN) principle in international trade through the first GATT and the WTO has been eroding with the establishment of FTAs, where only members of the agreements are afforded certain benefits. The scope of FTAs also extends beyond international trade. While there is no established theoretical model for the digital economy, one can place the digital economy within growth theory since technology and human capital development are critical components. The global spread of the digital economy has increased cross-border trade and investment. This dissertation will provide critical insights into these international trade and investment issues.

Chapter 2 analyses foreign direct investment determinants given the trend of increasing investment in the least developed fragile countries. The research starts with a review of the literature that explores the various FDI theories, including the product life cycle theory of FDI, followed by a review of the previous studies on FDI determinants,

definitions of least developed countries (LDC), and Fragile states, the proliferation of bilateral investment treaties, and studies on FDI in emerging market countries, developing countries, LDCs, and fragile states. The generalized least squares random effects and ordinary least squares models are used to estimate the determinants of FDI. The database for the study covers the years 1995 to 2021. It has data for 156 countries and nine independent variables – gross national income (GNI), human development index (HDI), fragile states index, LDC status, the presence or absence of mineral deposits, petroleum reserves, liquified natural gas production, political stability and the absence of violence/terrorism, and trade openness. The chapter ends with a discussion of the regression results and concludes by identifying the determinants of FDI in fragile LDCs.

Chapter 3 analyses the impact of free trade agreements. Since 1995 and the launch of the World Trade Organization (WTO), free trade agreements (FTA) have proliferated so that at the end of December 2022, were 356 FTAs registered in the WTO database. FTAs are usually signed between two countries or between a regional grouping like the EU and one or two countries. The review of the literature for this research starts with a discussion of trade theories, the concept of free trade, the difference between the most-favored-nation principle and special and differential treatment, the proliferation of FTAs, models studying FTAs, regionalism and multilateralism, and a review of various FTAs that are currently in force. The methodology for this research is the non-parametric Kruskal-Wallis H test that examines if there are differences in the agreements that would significantly impact world trade. The discussion of the results of the H test includes examining the impact of the FTAs on GDP, exports, and imports. Findings from the research indicate that countries that enter FTAs benefit from increased exports and higher

economic growth. Also, the largest trading partners in the world do not have FTAs with each other. The US, China, and the EU do not have FTAs with each other.

Chapter 4 analyses the role of the digital economy in international trade and investment. The literature review examines the definition and composition of the digital economy and its place in economic theory. The literature review also includes how the digital economy has contributed to economic growth and development, its impact on business operations, the digital economy benefits, and the policy and regulatory issues facing the digital economy. The research answers questions on the digital economy's impact on cross-border trade through a case study methodology. The research looks at the enabling environment of internet connections, devices, and shipping, as well as the role of the leading players in the digital economy, including Google/Alphabet, Facebook/Meta, Microsoft, and Apple. The technologies and platforms that power the digital economy cross-border trade are also analyzed in this chapter. Findings from the research indicate that by the end of 2022, 4.59 billion people will use social media globally. A survey of US professional YouTube content creators found that 81% reported that YouTube assists them in exporting content to international audiences.

CHAPTER II – THE DETERMINANTS OF FOREIGN DIRECT INVESTMENT IN FRAGILE LEAST DEVELOPED COUNTRIES

Introduction

This study delves into the subject of factors influencing foreign direct investment. The significance of this subject matter lies in its potential to inform policymakers about the determinants that influence foreign direct investment. By understanding these determinants comprehensively, policymakers can effectively strategize and implement measures to address the determinants, enhancing the country's appeal to foreign investors. According to the World Bank (2020), Foreign Direct Investment (FDI) encompasses the infusion of equity capital and reinvestment of earnings by a resident of one country who possesses and exercises control over 10 percent or more of an enterprise located in another country. Studies conducted by Duttaray, Dutt, and Mukhopadhyay (2008) have demonstrated FDI's positive impact on the host country. The advantages include substantial economic growth, employment opportunities, technology diffusion, and domestic companies' development (World Bank, 2023); (Duttaray, Dutt, & Mukhopadhyay, 2008).

According to Balasubramanyam (2001), FDI's inception and theoretical framework emerged during the 1950s, primarily within the Latin American region. However, by the 1980s, FDI had predominantly shifted its focus towards East Asia. FDI in sub-Saharan Africa primarily focuses on exploring natural resources, specifically petroleum, liquefied natural gas, and minerals (Balasubramanyam, 2001). According to Wako's (2021) scholarly investigations, there is a correlation between FDI in natural resources within the sub-Saharan African region and the subsequent occurrence of

deindustrialization. This phenomenon can be attributed to the predominant concentration of investment in natural resources, which often neglects manufacturing activities (Wako, 2021). FDI theory lies between trade theory and growth theory. FDI theory includes Vernon's product life cycle theory of FDI, market size hypothesis theory, eclectic paradigm theory of FDI, and Dunning's investment development theory.

The existing body of literature primarily examines FDI in a broad context or within specific geographic regions. However, a noticeable research gap exists on FDI in fragile least-developed countries. Based on the findings of the United Nations Conference on Trade and Development (2022), it was observed that the least developed countries experienced a notable surge in FDI in 2021. Specifically, these countries received US\$ 26 billion in FDI, reflecting a substantial 13 percent growth compared to the investment inflows recorded in 2020 (UNCTAD, 2022). Most of the least developed countries (LDCs) that exhibit high levels of fragility are in the sub-Saharan African region. These countries have faced conflict, political instability, and human development challenges despite their abundant natural resources. However, they have managed to attract foreign investment.

The primary objective of this research paper is to address the existing knowledge gap on factors that influence FDI in fragile and least-developed countries. The study encompasses a diverse range of economies, including both fragile least-developed countries and other categories of economies, in its sample size. The measure used to assess fragility in this study is the Fund for Peace Fragile States Index, which spans from 0.0 (indicating a sustainable state) to 120 (indicating a state of red alert). Fragile states encompass a range of definitions ascribed by diverse international development actors.

However, specific shared characteristics emerge, including conflict, humanitarian crises, inadequate governance, widespread poverty, and limited access to essential services.

Countries identified as fragile in this study are classified under the red alert score category according to the Fragile States Index. The United Nations General Assembly determines the measure used to assess the LDC. The categorization of countries as LDCs, according to UNCTAD (2023), is determined by examining indicators such as per capita income, human development, and economic and environmental vulnerabilities. Forty-six nations have been classified as least developed countries (UNCTAD, 2023).

This study encompasses a broader scope by analyzing data from 156 of 195 countries, representing approximately 80 percent of all countries. It does not solely focus on fragile, least-developed countries. The dependent variable in this study is the inflow of FDI. The independent variables consist of nine variables: gross national income, human development index, fragile states index, LDC status, political stability and absence of violence or terrorism, and the presence of natural resources such as petroleum, liquefied natural gas, and minerals. The null hypothesis for this research is a positive relationship between political stability, peacefulness, high gross national income (GNI), and FDI inflow into countries. The research methodology employed in this study consists of two regression models, namely the generalized least squares model utilizing random effects and the ordinary least squares model. The primary objective of this study is to identify the determinants of FDI in fragile, least-developed countries. The purpose is to provide policymakers in these nations with valuable information on the independent variables that affect FDI, enabling them to devise appropriate strategies to enhance foreign investment inflows.

The research begins with a comprehensive examination of the existing literature, encompassing various theories of FDI, the advantages associated with FDI, the factors influencing FDI identified by previous scholars, and empirical data about FDI inflow. This section examines the research methodology and data and then analyzes the data and the subsequent regression results. The study concludes with an analysis of the regression findings and the inferences that can be derived from the research.

Recent Trends in FDI

UNCTAD (2012) and Holden and Pagel (2012) indicate that the trends in FDI to fragile LDCs indicate that these countries perform better than expected in attracting FDI. For example, between 2000 and 2006, FDI to these countries quadrupled from US\$ 5 billion to US\$ 21 billion (UNCTAD, 2012); (Holden & Pagel, 2012). As shown in Table 1, the trend shows high FDI to fragile continues. Net FDI to LDCs amounted to US\$ 26 billion in 2021. This amount represents an increase of 13 percent over 2020 (UNCTAD 2022).

Table 1 *Inward FDI Inflows to selected Fragile Least Developed Countries, 2019-2021*

Country	2019	2020	2021	Growth rate 2020-2021 percent
	US\$ millions			
Angola	- 4,098	- 1,866	- 4,150	
Congo, Democratic Republic of the	1,488	1,647	1,870	14
Ethiopia	2,549	2,381	4,259	79
Mali	721	537	660	23
Mozambique	2,212	3,035	5,102	68
Zambia	860	- 173	- 457	
Bangladesh	2,874	2,564	2,896	13
Myanmar	2,509	1,907	2,067	8
Haiti	75	23	50	117
Solomon Islands	33	9	50	456

Source: UNCTAD, World Investment Report, 2022

Between 2011 and 2013, LDCs received, on average, US\$25 billion in FDI, approximately 2 percent of global FDI flows. FDI is important for LDCs because it accounts for 13 percent of their gross fixed capital formation (Sauvant K. P., 2015). UNCTAD's (2022) World Investment Report shows that FDI in LDCs increased by 13 percent to US\$26 billion in 2022 despite oil companies repatriating funds. The top five LDC recipients received 69 percent of the FDI total. FDI inflows to 33 African LDCs in 2022 were 17 percent higher than in 2021 at US\$16 billion, or two-thirds of all LDC FDI inflows. FDI inflows exceeded US\$1 billion in five African LDCs, and Mozambique experienced an increase in greenfield projects. FDI in the nine Asian LDCs increased by 6 percent to US\$9.8 billion, one-third of the total FDI in LDCs in 2022. In Cambodia, the largest LDC recipient, FDI decreased by 4 percent to US\$3.5 billion in 2022. In

Bangladesh, FDI inflows increased by 13 percent to US\$2.9 billion in 2022. China is the largest FDI investor in LDCs (UNCTAD, 2022).

The World Bank (2020) indicates that FDI flows as a percent of GDP have been on par or above the inflows received by countries with a higher income level. As shown in the table below, LDCs' FDI net inflows as a percent of GDP was 1.5 percent in 2022, higher than the FDI received by middle-income countries. The FDI flows to the low-income countries were highest among the income groups, at 3.13 percent of GDP.

African countries that are mainly fragile and low-income also received FDI on par with or above countries with more stable economies. In 2021, Countries in Eastern and Southern Africa received FDI net inflows of 4.91 percent of GNI, with only countries in Central Europe and the Baltics receiving a higher percentage of FDI net inflows at 6.09 percent of GDP (World Bank, 2023).

Table 2 *Foreign direct investment, net inflows (percent of GDP) 2017-2021, by region*

Region	2017	2018	2019	2020	2021
Africa Eastern and Southern	0.99	1.35	1.50	1.40	4.91
Africa Western and Central	2.58	2.02	1.51	1.37	2.06
Sub-Saharan Africa	1.63	1.64	1.51	1.38	3.65
Middle East & North Africa	1.62	1.73	1.78	2.05	2.18
Arab World	1.15	1.21	1.38	1.48	1.91
Central Europe and the Baltics	2.00	1.19	9.10	12.74	6.09
Europe & Central Asia	4.15	1.38	2.67	0.60	1.68
East Asia & Pacific	2.31	2.27	1.97	2.17	2.61
South Asia	1.35	1.38	1.55	1.98	1.23
Latin America & Caribbean	3.06	3.33	3.10	2.52	3.38
North America	1.92	1.16	1.58	0.74	2.20

Source: World Development Indicators <https://databank.worldbank.org/metadataglossary/jobs/series/BX.KLT.DINV.WD.GD.ZS>

Table 3 *Foreign direct investment, net inflows (percent of GDP), 2017-2022, by income group*

Income Group	2017	2018	2019	2020	2021	2022
Least developed countries	1.90	1.69	1.86	1.96	2.09	1.50
Low income	2.75	3.22	3.74	3.04	4.01	3.13
Lower middle income	1.89	1.81	1.78	1.82	1.60	1.44
Middle income	1.84	1.92	1.75	1.72	2.09	1.40
Upper middle income	1.82	1.95	1.74	1.69	2.23	1.39
High income	3.13	0.45	2.26	1.15	2.33	1.84

Source: World Development Indicators <https://databank.worldbank.org/metadataglossary/jobs/series/BX.KLT.DINV.WD.GD.ZS>

Review of the Literature

Mallampally and Sauvant (1999) posit that the approximately 54,000 transnational corporations (MNEs) have increased FDI outflows by approximately 13 percent annually since 1980. As MNEs seek to proliferate, they have expanded into developing countries since the 1980s. Mallampally and Sauvant (1999) contend that FDI outflows should be FDI inflows equal in principle as FDI moves from one country to another; however, in practice, FDI outflows and inflows differ. The increase in FDI led to an expansion in transnational corporations with an estimated investment of US\$3.4 trillion and approximately 450,000 foreign subsidiaries worldwide. Mallampally and Sauvant (1999) note that the host country's determinants of FDI include the host country's policy framework, such as economic, political, and social stability and tax policy, business facilitation, investment promotion, and economic determinants of FDI. Economic determinants can be considered as market seeking, which looks at consumer preferences and growth in the market; second, resource or asset-seeking FDI, which seeks to obtain raw materials, skilled labor, and technological innovation; and third, efficiency-seeking FDI, where companies invest abroad to reduce cost. Firms benefit from FDI

because of asset transfer from the parent transnational corporation to the domestic developing country firm. Developing countries are pursuing improvement in their national policies to track FDI. These include relaxing the requirements to establish companies in the host country. Policy frameworks include bilateral investment treaties and double taxation treaties, investment promotion, and investment incentives (Mallampally & Sauvant, 1999).

Duttaray, Dutt, and Mukhopadhyay (2008) conclude that the FDI affects growth mainly through capital accumulation, balance of payments components, technological changes, and industrial structures. In LDCs with low savings rates, FDI is a significant source of savings and investment. FDI improves the balance of payments, including through exports and capital inflows. Transnational corporations that engage in FDI bring new technology to the host country. FDI also improves competition because it breaks the monopoly of domestic firms. The study of 66 countries found that FDI impacts GNI only through exports, productivity, or both (Duttaray, Dutt, & Mukhopadhyay, 2008).

Çeştepe and Avcı (2018) argued that the economic benefits of FDI include increased foreign exchange stock and reduced unemployment. Çeştepe and Avcı (2018) acknowledged that the phenomenon and concept of FDI started in the 1950s, mainly in Latin American countries that received investment from England, France, and Germany, mainly in portfolio investment. FDI in the 1970s came mainly from Western Europe, Japan, and transnational corporations in transnational corporations in the United States. However, because of the oil crisis of the 1970s, it declined. By the 1980s, FDI began to increase again but went mainly to Eastern Asian countries because of instabilities in Latin America. Many countries liberalized due to IMF and World Bank policies, leading to

favorable investment policies. Panel data analysis of 48 developing countries from 1996 to 2015 shows that liberal policies increased foreign direct investment due to institutional improvements of developing countries and their accession to the globalization process (Çeştepe & Avcı, 2018). Balasubramanyam (2001) notes that for FDI to be beneficial, countries must be able to absorb the new technology brought by foreign firms. FDI builds on the home country's capacity; therefore, human capital is essential for the benefits of FDI to be unleashed. FDI can be profitable for foreign firms, but due to the tax benefits provided to those foreign firms, FDI may not be socially beneficial for the host country (Balasubramanyam, 2001).

Foreign Direct Investment Theories

The theory of FDI theory has evolved, with various theories focusing on an international specialization of production and comparative advantage. The macroeconomic perspectives of these theories include market size, GDP, and factor prices, while the microeconomic perspectives are firm-specific and relate to ownership and internalization benefits (Agarwal, 1980) (Makoni, 2015). FDI can also be anchored in trade and endogenous growth theories (Balasubramanyam, 2001). These theories, which have several critiques, include:

- Hymer's 1960 thesis, the first to examine FDI, articulated FDI as an extension of industrial organization, where firms extend their production beyond national borders (Hymer, 1960); (Dunning & Rugman, 1985). Hymer's 1960 thesis laid the foundation for more plausible theories, arguing that FDI stems from firms wanting to reduce or eliminate international competition. Multinational corporations (MNEs) wish to increase their returns and unique advantages (Hymer, 1960); (Makoni, 2015). In addition,

multinational corporations will continue outsourcing production abroad because they are gaining from factor prices. Factor prices differ; transnational corporations will invest in different countries to obtain better factor prices (Çeştepe & Avcı, 2018). Furthermore, international firms compete with domestic firms, particularly in foreign exchange risk and consumer preference. The critique of this theory includes being a static theory that cannot explain the pattern of FDI and ignores the other factors that influence FDI (Marandu & Ditshweu, 2018).

- Vernon's product life cycle theory (1966) explained post-second World War investments in Western European countries between 1950 and 1970. Product life cycle theory is a simplified decision-making process that explains the FDI process. It is based on three integrative theories: the international capital market, firm theory, and international trade. The product life cycle theory has limitations, such as not being empirically tested and not considering all FDI determinants (Vernon, 1966); (Makoni, 2015). It is a dynamic theory that predicts that a product will start a market in a domestically developed country and then, through growth in demand, lead to low-cost production in developing countries (Marandu & Ditshweu, 2018).

- Foreign investment results from market imperfections (Makoni, 2015). posits that countries with weaker currencies tend to attract more FDI than countries with stronger currencies. Although this is true for developed countries, it does not work for developing countries (Marandu & Ditshweu, 2018). The portfolio hypothesis, which considers both the rate of return and the risk in portfolio selection, suggests that investors consider both the rate of return and the risk in selecting their portfolios. However, its

empirical evidence is weak, and its significance as an explanatory variable of FDI is questionable (Agarwal, 1980).

- The FDI location-based approach theories are influenced by firm behavior and economic geography (Makoni, 2015). FDI is close to raw materials, skilled labor, and the host country's political, economic, and infrastructure.

- Wilhems's (1998) institutional FDI fitness theory focuses on attracting, absorbing, and retaining FDI. The theory also focuses on four fundamental pillars: government, market, education, and sociocultural fitness. Government fitness refers to economic openness, trade, exchange rate, low corruption, and greater transparency. These pillars interact in unison, shaping markets, education, and sociocultural activities (Wilhelms, 1998); (Makoni, 2015).

- The Eclectic Paradigm of FDI theory posited by Dunning (1988) combines theories like international trade, imperfect markets, internalization, and location. It suggests that a firm must possess net ownership advantages and be profitable in exploiting these advantages through production. However, as Marandu and Ditshweu (2018) note, the theory has limitations, such as a lack of explanation for subsequent FDI increases. FDI benefits companies with assets such as a brand name and intellectual property. The internalization hypothesis suggests that the markets for essential intermediate products are imperfect, which encourages firms to internalize the markets across national boundaries. Internalization's benefits include avoiding time delays, bargaining, and the ability to use discriminatory prices. However, high transaction costs and longer delays often motivate companies to bypass the markets for FDI. The hypothesis of oligopolistic reactions suggests that FDI results from oligopolistic

reactions, but it is limited and only partially explained by the leading investor (Dunning J. H., 1988); (Makoni, 2015); (Agarwal, 1980); (Marandu & Ditshweu, 2018). Companies also avoid uncertainty and market imperfections through direct foreign investment. An advantage is that companies minimize government interventions when investing directly abroad (Çeştepe & Avcı, 2018).

- The market size hypothesis is the most popular explanation for a country's propensity to attract FDI (Makoni, 2015). The output and market size hypotheses are interconnected, as they both pertain to the relationship between a firm's foreign direct investment (FDI) and its output (sales) in the host country. The output hypothesis posits a positive correlation between a firm's FDI and its output in the host country. Both subjective and objective variables influence a firm's investment decision in a foreign country. The Hymer-Kindleberger hypothesis focuses on factors influencing a firm's investment decision in foreign markets (Agarwal, 1980).

- Dunning's (1988) investment development cycle or path theory aims to link a country's level of economic development and its investment positions. However, a firm's financial asset advantage is a byproduct of size, efficiency, and knowledge of MNEs. Dunning (1988) hypothesized that firms engage in FDI with access to competitively priced equity, cross-listing stocks in a larger, more liquid stock market, enjoying strong investment credit ratings, and negotiating reduced taxation or subsidies (Dunning J. H., 1988) (Makoni, 2015).

- Agarwal (1980) posited the differential rate-of-return hypothesis, which suggests that foreign direct investment (FDI) is driven by expected profits rather than actual profits. However, attempts to test this hypothesis have not produced conclusive

results. The relationship between market and intra-company prices has been limited, with national authorities and multinational corporations facing challenges in determining correct prices, particularly for new goods with high research and development costs. The rate-of-return hypothesis, which refers to profits during the entire investment period, is controversial and requires extensive statistical information (Agarwal, 1980).

Determinants of FDI

According to Balasubramanyam (2001), countries with large domestic markets, measured by gross national income, tend to attract large volumes of foreign direct investment. In addition, natural resources such as oil, gas, and minerals and a highly skilled workforce tend to many transnational corporations. Balasubramanyam (2001) also noted that foreign investors will be attracted to a country with good air, sea, and road transportation and a formidable Information and Communication Technologies (ICT) infrastructure. A country can also be a good destination for foreign investment if there is macroeconomic stability, such as low inflation rates and foreign exchange availability. Balasubramanyam (2001) concluded that political stability is also a significant determinant of foreign direct investment. Good governance mechanisms, including transparent institutions, are attractive to foreign investors. In addition, a conducive business environment, tax concessions, and other fiscal and monetary incentives can attract foreign investment. Countries in Free Trade Agreements (FTAs) tend to attract foreign investment more (Balasubramanyam, 2001).

Chanegriha, Stewart, and Tsoukis (2017) research examined 58 economic, geographical, and political variables used to determine FDI using extreme bound analysis on a panel data set of 168 economies from 1970 to 2006. Chanegriha, Stewart, and

Tsoukis (2017) found that the ten most robust geopolitical determinants of FDI inflows to countries include the locations of South Asia, East Asia, and the Pacific region, countries with more than three borders, and countries with democratic accountability and less conflict attract FDI. The determinants with a negative impact on FDI were natural resources in terms of oil and gas. Countries that were not landlocked, Spanish-speaking, or Arabic-speaking also attracted more FDI. The quality of economic institutions and government policies, including spending and taxation, education, and infrastructure, are also robust determinants of foreign direct investment. Government investment promotion is critical to attracting FDI (Chanegriha, Stewart, & Tsoukis, 2017). Further, Moosa and Cardak (2006) researched the cross-sectional data of 138 countries using extreme bound analysis, indicating that GDP determines FDI, exports (percent of GDP), telephone lines (per 1000 population), and country risk. The study showed that high-income countries and countries that are more open and with lower risk attract more FDI (Moosa & Cardak, 2006).

Data from 1975 to 2007 determined that the determinants of FDI in BRICS include market size, economic stability and growth prospects, labor cost, infrastructure, trade openness, exchange rate, and gross capital formation. (Vijayakumar, Sridharan, & Rao, 2010). Kumari and Sharma's (2017) study of FDI in developing countries from 1990-2012, which focused on 20 developing countries in South, East, and Southeast Asia, found that China and India were the largest recipients of FDI. The robust determinants of FDI in these countries were market size, trade openness, and human capital, all positively impacting FDI inflows. Their liberal trade policies exemplify the openness of trade between China and India. Bhutan and Cambodia, with political unrest and

underdeveloped markets, had the lowest amount of FDI in the sample (Kumari & Sharma, 2017).

The Wako (2021) study of FDI in sub-Saharan Africa found that countries with high growth rates attract FDI and that FDI contributes to economic growth. Furthermore, countries with higher scores for political stability, civil liberties, institutional qualities, rule of law, voice, and accountability received more FDI inflows. Wako (2021) also found that corrupt countries receive a lower flow of foreign direct investment. Further, FDI does not contribute to improving or deteriorating political stability and civil liberties. However, FDI can damage voice, accountability, corruption, and the rule of law. Wako (2021) concluded that although natural resources attract FDI, the contribution of FDI to developing natural resources needs to be clarified. Due to the focus of FDI on natural resources and the extractive industry, FDI in sub-Saharan Africa has directly and indirectly contributed to deindustrialization and under-development of manufacturing in sub-Saharan Africa (Wako, 2021).

Moosa (2009) used an extreme bound analysis to study the relationship between FDI and domestic investment in 18 MENA countries and found that the GDP growth rate, enrolment in higher education, research and development spending, good country risk rating, and domestic investment explain FDI. Therefore, countries that successfully grow their economies develop human capital and have high returns on investment attract FDI (Moosa I. A., 2009).

Jensen's (2020) study of 127 countries, mainly fragile and conflict-affected countries, using data from 1989 to 2018 found that most fragile and conflict-affected countries are low-income or lower-middle-income, and 2/3 depend on natural resources.

These countries represented 40 percent of countries and received about 20 percent of the FDI. Fragile, conflicted, and natural resource-dependent countries received the highest ratio of FDI to GDP, averaging 5.6 percent per year between 2006 and 2018, compared to non-resource-dependent conflict-affected countries, which only averaged 2 percent annually. The Jensen (2020) study also found that periods coinciding with UN peacekeeping operations have higher FDI-to-GDP ratios. Furthermore, fragility is not a significant deterrent to foreign direct investment looking for resources. Investment by resource-seeking FDI depends on global commodity prices, the size and accessibility of resource deposits, agreement terms with the government, the presence of the infrastructure to transport the resources, and the likelihood of being disrupted by conflict (Jensen, 2020).

Regression analysis done by Vadlamannati, Tamazian, and Irala (2009) on FDI determinants in 17 Southeast Asian economies using cross-sectional time series data from 1996 to 2005 found that socioeconomic conditions and labor market problems are the primary determinants. Therefore, labor reforms in India, Sri Lanka, and Pakistan can help these countries become more attractive destinations for foreign investment. Political stability and human capital attract FDI inflows, and their importance has become increasingly significant. Institutional factors, such as civil and political rights, corruption, and transition progress, are critical in explaining FDI inflows into transition economies during the 1990s. A transparent business environment is essential for attracting FDI from EU and US members, primarily in low-tech sectors. Further, Labour regulation reforms are needed to make countries more attractive investment destinations (Vadlamannati, Tamazian, & Irala, 2009)

The study done by Dimitrova and Triki (2018) of seven regions of the MENA states' fragility and FDI using data from 2006 to 2016 and panel data found that the countries' overall Fragile States Index score harmed FDI. The political or military state fragility score harmed FDI inflows, while economic and social fragility was insignificant. Investors are attracted to the stability of the government and a substantial investment profile. Dimitrova and Triki (2018) concluded that the MENA region experienced varying levels of foreign direct investment (FDI) due to the influence of political instability, which serves as a significant determinant. The impact of political instability on FDI differs across sectors within the region. A positive correlation exists between institutional indicators and foreign direct investment (FDI), indicating that nations should enhance their regulation of economic policies and adopt strategies to increase the appeal of FDI. The impact of trade openness on foreign direct investment (FDI) is generally positive. Additionally, it is worth noting that the relationship between corruption in the host country and FDI may be beneficial, as investors may be attracted to countries with higher levels of corruption (Dimitrova & Triki, 2018).

The Lu, Kasimov, Karimov, and Abdullaev (2020) study of FDI inflows in the Commonwealth of Independent States using panel data from 1998 to 2017 showed that natural resources, access to the sea, and economic freedom are robust determinants of FDI inflows to these countries. Smaller government size, regulatory efficiency, rule of law, open markets, and lower tax burdens accompanied economic freedom. Furthermore, the petroleum and territorial coastline positively impacted the flow of FDI. Countries such as Azerbaijan, Kazakhstan, Georgia, Russia, Turkmenistan, and Ukraine, with direct access to the Black Sea and the Caspian Sea, have a geographic competitive advantage

for attracting FDI compared with other Commonwealth independent states (Lu, Kasimov, Karimov, & Abdullaev, 2020).

The Moussaa, Çahab, and Karagözc (2016) study of 156 countries from 1995-2013 found that imports, exports, and economic freedom determined FDI. Economic freedom is significant for European, sub-Saharan African, and Asia countries. Economic data such as inflation, interest rates, domestic trade, and exports are insignificant for the post-Soviet Commonwealth of Independent States but significant for Asian and North American countries. The economic freedom index is significant but low for Oceanian and fragile conflict-affected states seeking to attract FDI (Moussaa, Çahab, & Karagözc, 2016). The Wang, Xu, and Zhu (2011) study of 12,000 firms in 120 Chinese cities between 2002 and 2004 shows that sound economic fundamentals, government policies, good air quality, and bureaucratic efficiency positively impact FDI. However, significant financial market development, including the number of private firms with access to loans, reduces the flow of FDI. Furthermore, older government officials in Chinese cities positively impact FDI (Wang, Xu, & Zhu, 2011).

According to Sauvart (2015), the economic determinants that attract FDI include good infrastructure, market size, human capital, and information and communication technology. An enabling regulatory framework is also essential for FDI. One practical example is the appointment of an investment ombudsperson to resolve conflicts informally before they escalate. The third set of determinants for FDI, according to Sauvart (2015), is investment promotion since investment promotion agencies can target investors and follow them up so that they can establish companies in the host country. The investment promotion agency can also provide investment services to foreign

companies and encourage these companies to reinvest their earnings in the host country (Sauvant K. P., 2015). Data from 1970 and 1989 from developing countries show that FDI contributes to economic growth (Sylwester, 2005). Cheap labor and political stability influence FDI (Agarwal, 1980) (Makoni, 2015).

Least Developed Countries

UNCTAD (2022) notes that the UN's Committee for Development Policy reviews the list of LDCs every three years. The criteria used to establish the list are based on the income criterion, the human assets criterion, and the economic and environmental vulnerability index. The Committee for Development Policy then reports this information to the United Nations Economic and Social Council. A country's GNI per capita in US dollars for the previous three years must be US\$1,018 or below to be categorized as an LDC. The human assets index, the sub-indicators that cover health, education, and gender, should be at an index weighting of 60 or below. The economic and environmental vulnerability index has sub-indicators covering agriculture, export concentration, disasters, and the population's environment. The country should score an index of 36 or more using the established methodologies to be an LDC. In this methodology, 33 African countries, nine Asian countries, one Caribbean country, and three Pacific islands are considered LDCs (UNCTAD, 2022).

Fragile Countries

Although there is no academic definition of Fragile States, several organizations have created working definitions of what Fragile States are. Holden and Pagel (2012) argue that fragile states usually have some form of conflict. However, not all fragile states are conflict-afflicted states. States affected by conflict are defined based on the

number of battle deaths per year (Holden & Pagel, 2012). Regarding the working definition of fragile states, the International Monetary Fund (2018) notes the uniqueness of each fragile state. The characteristics of fragile states on the economic front are the need for more diversification and their susceptibility to economic shocks. On the political front, most fragile states are corrupt, politically unstable, and have weak institutions lacking inclusivity (International Monetary Fund, 2018).

Furthermore, many fragile states have low human development (International Monetary Fund, 2018). The Organisation for Economic Cooperation and Development (OECD) (ILO, 2016) sees fragile states as countries where governments cannot meet the population's needs regarding poverty reduction, security, and human rights. The World Bank (ILO, 2016) considers countries fragile if they receive International Development Association concessional financing and fall below 3.2 in the World Bank's Country Policy and Institutional Assessment. Furthermore, the Fund for Peace, an American non-profit, non-governmental research, and educational institution, also classifies what makes a country fragile according to social, political, economic, and cohesion factors (Fund for Peace, 2017). Finally, the concept of failed states, a subset of the fragile states index, is an amalgam of conflict-afflicted and fragile states (Holden & Pagel, 2012).

FDI in the fragile state is mainly related to resource seeking. Holden and Pagel (2012) conclude that fragile states have natural resources that have led to civil wars. However, civil wars have not deterred investors in recent years. The study by Holden and Pagel (2012) found that from 1990 to 2002, there were 15 recorded civil wars worldwide. Civil wars included countries like Angola, which had oil and diamonds, and the Democratic Republic of Congo, which had cobalt, copper, coltan, diamonds, and gold.

Despite the conflict, countries like Chad, Niger, and Uganda have seen increased foreign investment. On the contrary, other countries, such as Georgia and Djibouti, saw a decrease in FDI after the conflict (Holden & Pagel, 2012).

Challenges in fragile states are mainly due to economic opportunities rather than other grievances, particularly where there are significant commodity exports, low education, and many young men (Collier, 1999). However, despite these challenges, FDI flows into fragile LDCs. For example, in Uganda, the discovery of oil reserves in 2006 led to an FDI of US\$ 700 million by 2009, despite conflict with the Lord's Resistance Army (Ganson & Wennmann, 2015).

According to Holden and Pagel (2012), fragile states are low-income countries or territories that do not meet citizens' basic needs and expectations, such as security, the rule of law, justice, and providing essential services and economic opportunities. They are more likely to experience conflict, and conflict-affliction is challenging to measure objectively. Fragile states have significant variations in GDP per capita, with 62 percent of the labor force working in agriculture for fragile states and 56 percent for less fragile ones. The link between fragility and conflict is strong, and 46 percent of fragile countries experience conflict. The link between conflict and economic structure is related to the geographical spread of civil war, reducing private domestic investment by approximately 0.4 percent of GDP annually (Holden & Pagel, 2012).

Holden and Pagel (2012) posit that fragile states' economies have behaved in ways damaging to the long-term interests of most populations due to serving narrow constituencies. Wealth in natural resources has led to corruption, repression, and violent conflict. A strong correlation exists between resource dependence and the likelihood of a

state experiencing resource-based conflict or authoritarianism. Fragile nations are vulnerable to reduced foreign direct investment (FDI), foreign aid, and migrants' remittances (Holden & Pagel, 2012).

Jensen (2020) notes that post-conflict countries often face fragility, increased unemployment, and poverty, increasing the risk of relapse. However, investors' perception of the risk of post-conflict countries works against the need to attract funding. Peacekeeping operations are essential instruments to reduce and prevent conflict. The presence of peacekeepers in a country can be seen as a signal of elevated risk, as it is a criterion that the World Bank uses to label a country as fragile (Jensen, 2020).

The World Bank (2011) notes that individuals residing in fragile states and affected by conflict exhibit a diminished propensity to enroll their offspring in educational institutions. Furthermore, they face a significantly higher likelihood, exceeding twofold, of experiencing undernourishment, witnessing the premature demise of their children before reaching the age of five, and encountering a scarcity of clean water resources. The presence of elevated levels of organized criminal violence has a detrimental impact on economic development, as it hinders the progress and growth of the economy. Similarly, regions experiencing high levels of civil war reduce their Gross Domestic Product (GDP) growth over 30 years (World Bank, 2011).

Bilateral Investment Treaties

The World Bank (2023) reported that Bilateral Investment Treaties (BITs) are negotiated as a standalone treaty or as part of a FTA. It allows for settling disputes between investors from one country and the host country under the International Centre for the Settlement of Investor Disputes (World Bank, 2023). There are 2,828 BITs with

2,220 in force. Additionally, 442 treaties with investment provisions have been signed, and 366 are in force (UNCTAD, 2023).

The Office of the United States Trade Representative (2023) reports that the US government indicated that its BIT programs aim to protect US foreign investment, encourage market-orientated policies in host countries, and support the development of international law standards. BITs benefit US investors through, among other things, limiting the expropriation of investments, enabling investment funds to be transferred into and out of host countries, and restricting the imposition of requirements such as local content targets (Office of the United States Trade Representative, 2023).

Neumayer and Spess (2005) conclude that BITs allow for standardization of treatment between an investor and the host country dispute settlement outside of the jurisdiction of the investor's home country. Developing countries accept these BITs because they believe that it can lead to increased FDI. The study of the relationship between BITs and FDI shows that BITs are a significant determinant of FDI (Neumayer & Spess, 2005).

Ferrando (2014) notes that BITs have increased since the 1990s as a codification of an asymmetrical world began to take shape. BITs are usually negotiated without public consultation. China's BITs have been used to protect its investors in the global north and south, including standard provisions and investor access to arbitration. India has BITs with Asian and African countries. Brazil has signed BITs with South Asian countries. However, Brazilian investors actively seek investment in other countries (Ferrando, 2014).

Table 4 *Bilateral Investment Treaties Signed by the Least Developed Countries*

	Number of BITs signed	Advanced economy	Emerging and Developing Asia	Regions of BIT signatories			
				Emerging and Developing Europe	Latin America and the Caribbean	Middle East and North Africa	Sub-Saharan Africa
Africa							
Angola,	5	4					1
Benin	9	5				1	3
Burkina Faso,	9	5	1			1	2
Burundi,	5	4					1
Central African Republic,	4	2				2	
Chad,	8	3				3	2
Comoros,	4	1				2	1
Democratic Republic of the Congo,	9	6	1			1	1
Djibouti,	5	2	2				
Eritrea,	3	2				1	
Ethiopia,	29	14	3	2		7	3
Guinea,	5	3				2	
Guinea-Bissau,	13	4	1	1		4	3
Lesotho	3	3					
Liberia,	4	4					
Madagascar,	11	9					2
Malawi,	0						
Mali,	8	3	1			3	1
Mauritania,	12	6	1			3	2
Mozambique,	17	11	2			2	2
Niger,	5	2				3	
Rwanda,	6	4					2
Sao Tome and Principe	1	1					
Senegal	23	11	2	2	1	5	2
Sierra Leone	3	3					
, Somalia,	2	1				1	
Sudan,	24	5	3	2		12	2
Tanzania	16	12		1		1	2
Togo,	4	3				1	
Uganda,	11	8				1	2
Zambia	9	7				1	1
Asia							
Afghanistan,	3	1				2	
Bangladesh,	31	13	9	5		4	
Laos	26	12	12		1	1	
Myanmar,	7	1	6				
Nepal,	6	4	1				1
Timore Leste	2	2					
Yemen	0						
Caribbean							
Haiti	5	5					
Pacific							
Solomon Islands	0						
Yemen	35	9	4	6		13	3

Source: World Bank, <https://icsid.worldbank.org/node/20271>, accessed September 2023

FDI in Emerging Market Economies

Ali and Guo (2005) conclude that China is the primary recipient of foreign direct investment (FDI) among developing nations, boasting the highest influx of such investments. China's primary foreign direct investment (FDI) forms encompass contractual joint ventures, wholly foreign-owned enterprises, equity, and joint ventures. In recent times, there has been a growing preference among foreign investors to opt for wholly foreign-owned companies as their preferred mode of entry. This choice is motivated by the desire to circumvent the challenges commonly associated with equity joint ventures. Several obstacles and challenges characterize the Chinese investment environment. Ali and Guo (2005) note that these include an unsatisfactory foreign trade policy, lax implementation of regulations, banking system deficiencies, foreign capital restrictions, a complex application process, and low productivity levels. The foreign direct investment (FDI) allocation across industry sectors in China has notably focused on secondary industries. However, there has been a recent shift towards tertiary industries as the preferred recipient of FDI inflows into China. Export-oriented foreign direct investment (FDI) is driven by the desire to exploit low-cost foreign labor (Ali & Guo, 2005).

Ali and Guo (2005) state that market-oriented FDI is primarily motivated by gaining access to foreign markets. The market size holds significant economic significance with foreign direct investment (FDI) in China, as it is a primary determinant for attracting United States and Hong Kong firms. China's advantageous position is reinforced by the incentive policies implemented by its government and the comparatively lower labor costs it offers. This combination of factors makes China an

attractive destination for foreign investors who prioritize cost-effectiveness and benefit from the country's abundant supply of skilled labor and well-developed education system. According to Ali and Guo (2005), implementing incentive policies is essential, particularly in developing nations, as they are crucial to attracting foreign direct investment (FDI). Foreign investors consider high investment returns and global integration crucial when investing in China (Ali & Guo, 2005). China has been the primary beneficiary of foreign direct investment (FDI) inflows since 1990 (Kumari & Sharma, 2017).

Further, Kumari and Sharma (2017) contended that south, east, and southeast Asian countries have collectively accounted for approximately two-thirds of the global FDI inflow. India is considered the second most appealing destination for foreign investment, following China. China and India, two prominent global markets characterized by open trade policies and extensive infrastructure, emerged as the primary beneficiaries of foreign direct investment (FDI) between 1990 and 2012. Bhutan and Cambodia experienced a decline in foreign direct investment (FDI) due to political instability (Kumari & Sharma, 2017).

The study by Akin (2019) of FDI in India, Indonesia, Brazil, South Africa, and Turkey, using panel data from 1996 to 2017, found that low labor costs, natural resources, and fiscal incentives were essential to attract foreign investment in electronic goods and appliance industry. In addition, FDI brought technology that benefited domestic companies, promoting economic growth. The study also found that political stability was the most critical factor determining FDI (Akin, 2019).

FDI from BRICS to Developing Countries

Ferrando (2014) states that BRICS investors have been actively involved in foreign land acquisition, particularly in Africa and Asia. Land matrix initiative data show that foreign investors have acquired through lease or purchase 7 billion hectares in Latin America, 56.2 billion hectares in Africa, and 17.7 billion in Asia. Indian investors have acquired land in Indonesia, Malaysia, and East Africa. Brazilian investors have acquired land only in East Africa, and South African investments have acquired land throughout Africa. China has acquired more than 5 million acres on various continents. BRICS are also actively assisting their national investors through national laws and diplomacy to engage in FDI (Ferrando, 2014). Holden and Pagel (2012) reported that the growing trend of land investment in Africa has seen foreign investors acquire approximately half of the agricultural land in the Democratic Republic of Congo and approximately one-third of the land in Mozambique. The buyers of the land include state-owned enterprises, sovereign wealth funds, and central government agencies. In addition to BRICS, investors come from the US, the UK, the European Union, Japan, Russia, and the Gulf states. Most of China's African investment is in natural resources (Holden & Pagel, 2012). China and India are also significant investors in LDCs, and China is strengthening investment and trade cooperation with African LDCs (UNCTAD, 2006).

FDI in LDCs

Akingube (2003) reported that low-income developing nations ought to prioritize policy factors, including their integration into the global trading system, fiscal and non-fiscal incentives, infrastructure enhancement, human resource development, and the cultivation of local entrepreneurship. These measures can enhance their prospects of

attracting foreign direct investment (FDI) inflows (Akingube, 2003). With investor-friendly policies, Africa has experienced a dramatic transformation in its mining sector. More than 40 African states have substantially changed their mining legislation to attract more foreign direct investment (Besada, 2013).

Diyamett and Mutambla (2014) state that FDIs are crucial in economic development, particularly in developing countries like Tanzania. Multinational corporations dominate the creation of technologies and are considered a key channel for the international diffusion of knowledge and technology. FDI contributes to local technological capabilities through knowledge exchange between local and foreign companies. Vertical and horizontal linkages are used to build local technological capabilities, with both channels contributing to the development of local firms and the industry's overall competitiveness. Diyamett and Mutambla's (2014) study of 200 manufacturing firms which were the second largest recipient of FDI in Tanzania, revealed that the degree of contribution of FDI to local product and process technological capabilities is small, with only 16 percent of local firms acquiring these capabilities from FDIs. In contrast, 84 percent acquired them from other sources (Diyamett & Mutambla , 2014).

Sauvant and Mallampally (2015) posited that local consumption, income, and employment benefit from FDI. In addition, domestic firms are strengthened, and human resources capacity is built. FDI has also improved labor and environmental standards, improved living standards, and alleviated poverty in LDCs. Although LDCs have a low GDP per capita and limited human development, they can enable market-seeking FDI in other manufacturing industries, such as electricity, gas, water, transport, storage,

communications, and financial services. More efficient investment in FDI can access low-cost and labor-intensive manufacturers for export (Sauvant & Mallampally , 2015).

Furthermore, Sauvant and Mallampally (2015) concluded that LDC's domestic firms can be strengthened and become internationally competitive if they engage in FDI outflows through better access to foreign markets and resources. LDCs that host FDIs are also more likely to sign BITs. FDI in LDCs impacts sustainable development through the activities in which investment is made and the extent to which foreign affiliates act as good corporate citizens (Sauvant & Mallampally , 2015). Research by UNCTAD (2011) found that FDI is a significant economic growth and development determinant, especially in the 49 LDCs. In Asia and Latin America, FDI accounts for 70 percent and 80 percent of net resource flows, respectively. Most FDI inflows to LDCs are through greenfield investments such as natural resources sector projects rather than cross-border mergers and acquisitions. LDC investment promotion agencies promote cooperation and facilitate the entry of foreign investors (UNCTAD, 2011).

FDI to the Fragile States

Holden and Pagel's (2012) research found that FDI flows to fragile states significantly reduced from 2006 to 2011, with countries such as Afghanistan and Somalia experiencing low FDI performance. UNCTAD's Inward FDI Attraction and Potential Index captures four critical economic determinants of an economy's attractiveness for investors: market attractiveness, low-cost labor and skills, natural resource presence, and FDI-enabling infrastructure (Holden & Pagel, 2012).

The Holden and Pagel (2012) study employed multiple regression analysis to investigate the association between economies characterized by fragility and foreign

direct investment (FDI). The research revealed statistically significant positive associations between foreign direct investment (FDI) and the abundance of natural resources in a given country. Countries with substantial oil reserves in the developing world attract an additional US\$11 billion in foreign investment compared to countries lacking such reserves. Countries with moderate and limited oil reserves exhibit relatively less significant yet positive associations with foreign direct investment (FDI) levels. (Holden & Pagel, 2012).

Holden and Pagel's (2012) research found that most of the inflows into Africa were greenfield mining, quarrying, and petroleum investments, totaling US\$36.9 billion in 2011, comparable to a peak of US\$37.3 billion in 2008. Most foreign direct investment (FDI) in Central Africa is directed towards three countries that possess abundant commodities. Democratic Republic of the Congo exports minerals, and the Congo and Equatorial Guinea are oil-exporting nations. Fragile states' economies are experiencing a shift toward diversification of natural resource-related activities, with projects in manufacturing and services relying on natural resources (Holden & Pagel, 2012).

The World Bank (2014) reported that the growth rate in foreign investment in fragile and conflict-affected economies from 2008 to 2012 has been nearly three times higher than the global flows despite initially starting from a low level. Due to untapped natural resources, reconstruction requirements, and unmet consumer demand, significant investment prospects exist for domestic and foreign investors. Common deficiencies in the investment climate within fragile and conflict-affected situations encompass insufficient infrastructure, underdeveloped human resources, disrupted distribution channels, challenges in acquiring inputs, and service providers (World Bank, 2014).

The OECD (2017) reports that the MENA region is one of the most fragile in the world, second only to sub-Saharan Africa. MENA has faced significant security challenges, including conflicts, displaced populations, and transnational terrorism. Fragility can have negative implications for FDI inflows and can encourage the concentration of FDI in heavily protected enclaves. Investment policy in fragile contexts is crucial to ensure resilience and sustainable development in low- and middle-income countries. Political risk can raise investor concerns, and higher political risk can increase business costs. Government policy and responses to fragility can help determine whether FDI exacerbates fragility risks or reinforces coping capacities (OECD, 2021).

Research Methodology

Research question: What are the key determinants of FDI in fragile, least-developed countries?

The hypotheses to be examined are as follows:

Null hypothesis: FDI occurs in politically stable and peaceful countries with high GNI;

Alternative hypothesis: Fragile LDCs are politically unstable with conflict and low GNI and do not attract FDI.

This research will use generalized least squares random effects (GLS RE) and ordinary least squares (OLS) regressions to estimate the causality of FDI. While the GLS RE produces robust results, diagnostic and robustness tests will be conducted for the OLS model results to ensure that the results are also the best linear unbiased estimators. The regression equation for this research is as follows.

$$\text{FDI (US\$ amount)} = \alpha_0 + \beta_1 \text{ GNI (US dollars millions)} + \beta_2 \text{ Trade openness} + \beta_3 \text{ Human Development Index} + \beta_4 \text{ Fragile States Index} + \beta_5 \text{ Least Developed Country category} - \beta_6 \text{ Political stability and absence of violence/terrorism} + \beta_7 \text{ Petroleum reserves} + \beta_8 \text{ Natural gas reserves} + \beta_9 \text{ Precious stones and minerals resources} + \beta_{10} \text{ FDI (US\$ amount)} + \mu$$

The findings of this equation will be used to determine the significant variables that determine the inflows of FDI into fragile and least-developed countries. The findings will also be analyzed using empirical evidence on the flows of FDI into fragile, least-developed countries. The data cover the period 1995 to 2021. All countries that are members of the WTO and/or are LDCs with a Fragile Index score are part of the database used for this model. The model included 4,158 observations from 156 countries. If a few years' data were missing, the years before and after data were averaged to create the missing number. The data types are macroeconomic observations in US\$ million - FDI and GNI, macroeconomic indicators – TradOpen, categorical variables – LDC and Minerals, production data – LNG and Oil, and composite indices – HDI, FSI, and PolStab. The list of variables, along with the acronym, expected relationship with the dependent variables, data source, and the literature on the inclusion of the variable in the model are shown in the table below:

Table 5 Regression Variable

	Data	Acronym	Relationship to FDI (+/-)	Data Source	Literature on the inclusion of the variable in the model
β_1	Gross national income (US\$ millions)	GNI	+	World Bank https://data.worldbank.org/indicator/NY.GNP.MKTP.CD	The size of the economy and the level of financial and technological development positively impacted FDI (Di Guardo, Marrocu, & Paci, 2016).
β_2	Trade Openness Index (percent)	TradOpen	+	World Bank https://data.worldbank.org/indicator/NE.TRD.GNFS.ZS	Trade openness positively affects FDI inflows (Kumari and Sharma, 2017).
β_3	Human Development Index (between 0 and 1)	HDI	+	UNDP https://data.worldbank.org/indicator/NE.TRD.GNFS.ZS	Human capital positively affects FDI inflows (Kumari and Sharma, 2017).

Table 5 (continued).

β ₄	Fragile States Index (between 0 and 120)	FSI	-	The Fund for Peace https://fragilestatesindex.org/global-data/	The trends in FDI to fragile LDCs indicate that these countries perform better than expected in attracting FDI.
B ₅	Least Developed Country Category (0 or 1)	LDC	+	UNDESA https://www.un.org/ohrlls/content/list-ldcs	(UNCTAD, 2012) (Holden & Pagel, 2012)
B ₆	Political Stability and Absence of Violence/Terrorism (between -2.5 and 2.5)	PolStab	-	World Bank https://databank.worldbank.org/source/worldwide-governance-indicators/Series/PV.EST	(Agarwal, 1980) argues that political instability discourages FDI inflow.

Table 5 (continued).

B 7	Petroleum reserves (billions of barrels)	Oil	+	https://www.theglobaleconomy.com/download-data.php	Resources-seeking investors usually seek cheap natural resources (Holden & Pagel, 2012). Natural resources positively attract FDI in sub-Saharan African countries (Wako, 2021).
B 8	Liquefied petroleum gas production measured in thousand barrels per day	LNG	+	https://www.theglobaleconomy.com/download-data.php	
B 9	Precious stones and mineral resources (0 or 1)	Minerals	+	https://www.theglobaleconomy.com/download-data.php	
B 9	Foreign Direct Investment (US\$ millions)	FDI	+	World Bank https://data.worldbank.org/indicator/BX.KLT.DINV.CD.WD	The change in FDI and the previous year's FDI would positively affect investment as investors continue to expand their investments to achieve profits.

Variables Description

Gross national income (GNI)

The GNI in this database is at current prices, meaning that inflation effects are considered. It is measured in US dollars to facilitate international comparison. The GNI comprises the GDP, total domestic production, taxes, less subsidies, and international transaction receipts and payments. The GNI is a good measure of a particular country's standard of living and well-being, meaning that the higher the GNI, the better the citizens in a particular country. The GNI is a flow number that measures production and international transactions for one particular year and is relevant only for that year.

Foreign Direct Investment (FDI)

The FDI in this database is measured in current US\$, which means that inflation effects are considered and represent the net inflows of FDI to a country as recorded in the country's balance of payments. According to (World Bank, 2023), FDI includes equity capital and reinvestment of earnings from a resident in one country who owns and controls 10 percent or more of an enterprise resident in another country.

Trade Openness Index (TradOpen)

According to (World Bank, 2023), trade is the sum of exports and imports of goods and services as a share of gross domestic product. According to the (OECD 2023), trade openness benefits the economy by providing access to goods and services and reducing poverty trade openness. Additionally, trade openness provides jobs; for example, in the United States, approximately 10 percent of the workforce produces goods and services for exports (OECD, 2023).

Human Development Index (HDI).

The UNDP (2023) posits that the Human Development Index (HDI) is a composite measure that quantifies human well-being by considering health, education, and living standards indicators. It is calculated as the geometric mean of normalized indices representing these dimensions. The health dimension evaluates the average life expectancy at birth. The education dimension quantifies the years of schooling for individuals aged 25 and above and the anticipated years of schooling for children commencing their education. Lastly, the standard of living dimension gauges the logarithm of per capita income (UNDP, 2023).

Fragile States Index (FSI)

The Fragile States Index (FSI), according to the Fund for Peace (2023), ranks 179 countries using 12 critical political, social, and economic indicators and more than 100 sub-indicators as follows:

1. Security Apparatus indicator that assesses security threats to a state, such as rebel movements, coups, and terrorism;
2. Factionalized elite indicator that considers state institutions fragmentation along ethnic, class, racial, or religious lines
3. Group Grievance indicator that assesses divisions and schisms between different social groups, including compensation for victims, amnesty, and intertribal and interethnic relations;
4. Economic decline indicator, which assesses economic data such as per capita income, unemployment rates, inflation, productivity, debt, poverty, and business failures;

5. Uneven Development indicator, which considers economic inequality, focussing on structural and perception-based issues such as fair hiring practices and equal rights,
6. Human flight and brain drain indicator, which looks at the immigration of skilled workers and the reasons for the brain drain
7. The State Legitimacy Indicator evaluates the government's representativeness and openness, the integrity of elections, and political transitions.
8. The Public Services Indicator evaluates the state's ability to provide essential services and protect citizens;
9. The Human Rights and Rule of Law Indicator assesses the relationship between the state and its population, including civil rights, freedom of speech, freedom of movement, and religious freedom.
10. Demographic pressure indicators, including food security and pressures from high population growth
11. The Refugees and Internally Displaced Persons Indicator measures the forced displacement of large communities due to social, political, environmental, or other causes.
12. The external intervention indicator considers the impact of external actors on state security and economic matters (Fund for Peace, 2022).

Comparison of FSI with other fragility measures

The Fragile States Index of the Fund for Peace is considered the best measure of fragility, as it is specially designed to assess the fragility of a country in areas of development through a numerical value that can be included in the analysis. It includes

matters of war and conflict through its security apparatus indicator and corruption through its public service indicator. According to the ILO (2016), the World Bank measure for fragile states is the existing ranking under the Country Policy and Institutional Assessment (CPIA) of 3.2 or less. However, its fragility measures have additional criteria that must be measured numerically. The criteria is that for a country to be considered fragile, it must have had UN political peacebuilding missions over the previous three years. The other numerical measure is the Uppsala Conflict dataset, but it only measures conflict, which is only part of the issues regarding fragility (ILO, 2016).

Further, the ILO (2016) points out that the other international development actors that analyze country fragility include the African Development Bank, the German Federal Ministry of Economic Development for Economic Cooperation OECD, the European Union, G7, IMF, the Swiss Official Agency for Development Cooperation, and the United States Agency for International Development do not have numerical measures for fragility. The definitions of fragility by the United States Agency for International Development are based on security issues and essential services where states that fail or fail to provide security and essential services to their populations are fragile. The Swiss Official Agency for Development Cooperation fragile states are states where the population sees the state as having legitimate power, so the state cannot exercise state power within that territory, such as being unable to provide essential goods and services. The OECD looks at fragility from different dimensions, including violence justice institutions, economic foundations, and resilience, but does not provide a numerical measure that can be used in the analysis. The IMF looks at the characteristics of fragile states, including big governance, limited administrative capacity, chronic humanitarian

crisis, and the assistance of social tensions, conflict, and civil war, but does not provide a numeric variable through which these fragilities can be analyzed in this (ILO, 2016).

Least Developed Country Category (LDC)

UNCTAD (2023) reports that the UN General Assembly takes note of the Economic and Social Council Committee for Development Policy recommendation on countries that should be categorized as LDC. The Economic and Social Council Committee for Development Policy reviews the list of LDCs, which currently stands at 46 countries, every three years to make recommendations to the United Nations General Assembly. To be classified as an LDC, a country must meet specific criteria: income, human development, economy, and environment. Income criteria are based on a 3-year average per capita income estimate of US\$1,018 or less. Secondly, the country must meet the human assets index of 60 or below, comprising the health and education subindex. The health sub-index is based on infant mortality, maternal mortality, and stunting (UNCTAD, 2023).

UNCTAD (2023) notes that, in contrast, the education subindex is based on secondary school enrollment, adult literacy rate, and gender parity for secondary school enrollment. The third criterion is economic vulnerability, based on issues related to agriculture, remoteness, landlockedness, merchandise export concentration, and the instability of exports and goods and services. Environmental vulnerabilities are also part of the third criterion. They are based on the percentage of the population in low-elevated coastal zones and dry land, victims of disasters, and instability of agricultural production. To be included in the LDC category based on the third criterion, countries must score 36 or more (UNCTAD, 2023).

Political Stability and Absence of Violence/Terrorism (PolStab)

The World Bank (2023) indicates that the political stability and absence of violence/terrorism measure perceptions of the likelihood of political instability and/or politically motivated violence, including terrorism. This indicator uses data from various sources to form perceptions. These data include information on armed conflict, violent demonstrations, social unrest, protests and riots, civil war, terrorism, ethnic tensions, and government stability (World Bank, 2023). The political stability and absence of violence/terrorism index was chosen over the Polity 5 dataset due to data availability issues, including the fact that the World Bank Development indicators only have data for African countries from 1990, 2000, and 2003 to 2012. However, many issues covered in the Polity 5 dataset index calculation are covered by the FSI and the PolStab indices, including matters relating to democracy.

Petroleum Reserves (Oil)

This variable estimated proved reserves of crude oil and all liquids defined as crude oil, which geological and engineering data demonstrate can be recoverable in future years from reservoirs (GlobalEconomy.com, 2023).

Liquefied Petroleum Gas Production (LNG)

This variable is the production of liquefied petroleum gases, including ethane, ethylene, propane, propylene, normal butane, butylene, isobutane, and isobutylene, including liquefied petroleum gases sold directly from natural gas processing plants for fuel or chemical uses (GlobalEconomy.com, 2023).

Precious Stones and Mineral Resources

This variable includes the production of diamonds, gold, silver, platinum, iron, copper, lithium, zinc, cobalt, and bauxite (GlobalEconomy.com, 2023).

Data Analysis and Findings

Description of the data

As shown in Table 1, the database has 4,158 observations for the ten variables. Two variables, LDC and mineral resources, are categorical; a country is either an LDC or not an LDC, and a country has a variety of known mineral resources or does not. Some variables are observations of the countries' macroeconomic statistics of gross national income and foreign direct investment. The table shows that the mean FDI is US\$ 9.2 billion, with a standard deviation of US\$37.1 billion, and the mean GNI is US\$ 366 billion, with a standard deviation of US\$1.5 trillion. The fragility index has a mean of 68.4 and a standard deviation of 23.6, while the human development index shows a mean of 0.67 and a standard deviation of 0.18.

Furthermore, the political stability index shows a mean of -0.05 with a standard deviation of 0.96. The microeconomic sector production of oil and LNG measured by barrels produced per day shows a mean of 6.8 barrels per day for oil, a standard deviation of 31.1 barrels per day, and for LNG, a mean of 19.7 barrels per day with a standard deviation of 73.8. Trade openness is an indicator based on macroeconomic variables of exports, imports, and GNI, showing a mean of 85.2 percent and a standard deviation of 55.1 percent.

Table 6 *Description of the model variables*

Variable	Observations	Mean	Std. dev.	Min.	Max.
Foreign Direct Investment (FDI)	4,158	9.15E+09	3.71E+10	-3.30e+11	7.34E+11
Gross National Income (GNI)	4,158	3.66E+11	1.51E+12	1.92E+08	2.36E+13
Human Development Index (HDI)	4,158	0.6673	0.1750	0.1300	0.9620
Least Developed Countries (LDC)	4,158	0.2646	0.4411	-	1.0000
Fragile States Index (FSI)	4,158	68.4479	23.5929	14.6267	114.0000
Petroleum reserves (Oil)	4,158	6.7270	31.1142	-	303.8100
Liquefied petroleum gas production (LNG)	4,158	19.6855	73.7711	-	776.5200
Precious stones and mineral resources (Minerals)	4,158	0.7001	0.4583	-	1.0000
Trade Openness Index (TradOpen)	4,158	85.2334	55.1094	-9710	437.3300
Political Stability and Absence of Violence/Terrorism(PolStab)	4,158	-.0590	0.9557	-3.006	1.7587

Correlation of Variables in the Model

The correlation between the variables in the model is shown in Tables 1 and Graphs 1 to 3. This correlation analysis will focus on how each variable correlates with the dependent variable FDI and how the variables correlate. It is clear from Table 1 that the dependent variable - FDI, has a strong positive correlation with GNI at 0.7053 and a strong positive correlation with LNG at 0.5990. FDI and GNI are strongly associated and move in the same direction, as LNG and FDI are strongly associated and move in the same direction. The higher the HDI variable, the higher the human development in a country; that is, if the HDI of a country is closer to 1, that country has high human development. The results of the correlation matrix indicate that HDI is also positively correlated with FDI but in the middle range of 0.2470. The higher the country's human

development, the more likely the country will receive FDI. Oil, minerals, and political stability positively correlate with FDI but with a weaker association of 0.0801, 0.0623, and 0.1127, respectively.

On the other hand, the LDC status, the fragility of the country as measured by the FSI, and the openness of the economy as measured by Exports-Imports as a percent of GDP (TradOpen) are negatively correlated with FDI, but weakly at -0.1420, -0.2355, and -0.0258 respectively. These results indicate that the FDI is lower if a country is an LDC. Similarly, if a country is red alert fragile, that is, the FSI is high, the FDI to that country will be lower. Furthermore, the more open an economy is to trade, the lower the FDI.

Table 7 *Correlation of variables in the model*

Variables	FDI	GNI	HDI	LDC	FSI	Oil	LNG
FDI	1.0000						
GNI	0.7053	1.0000					
HDI	0.2470	0.2430	1.0000				
LDC	-0.1420	-0.1393	-0.7160	1.0000			
FSI	-0.2355	-0.2237	-0.8143	0.5412	1.0000		
Oil	0.0801	0.1055	0.1477	-0.1218	-0.0349	1.0000	
LNG	0.5990	0.7474	0.2016	-0.1577	-0.1476	0.1586	1.0000
Minerals	0.0623	0.1173	-0.0910	-0.1001	0.0620	0.0371	0.1273
TradOpen	-0.0258	-0.1490	0.2849	-0.1958	-0.2894	-0.0560	-0.1500
PolStab	0.1127	0.0847	0.6022	-0.3761	-0.7932	-0.0214	0.0222

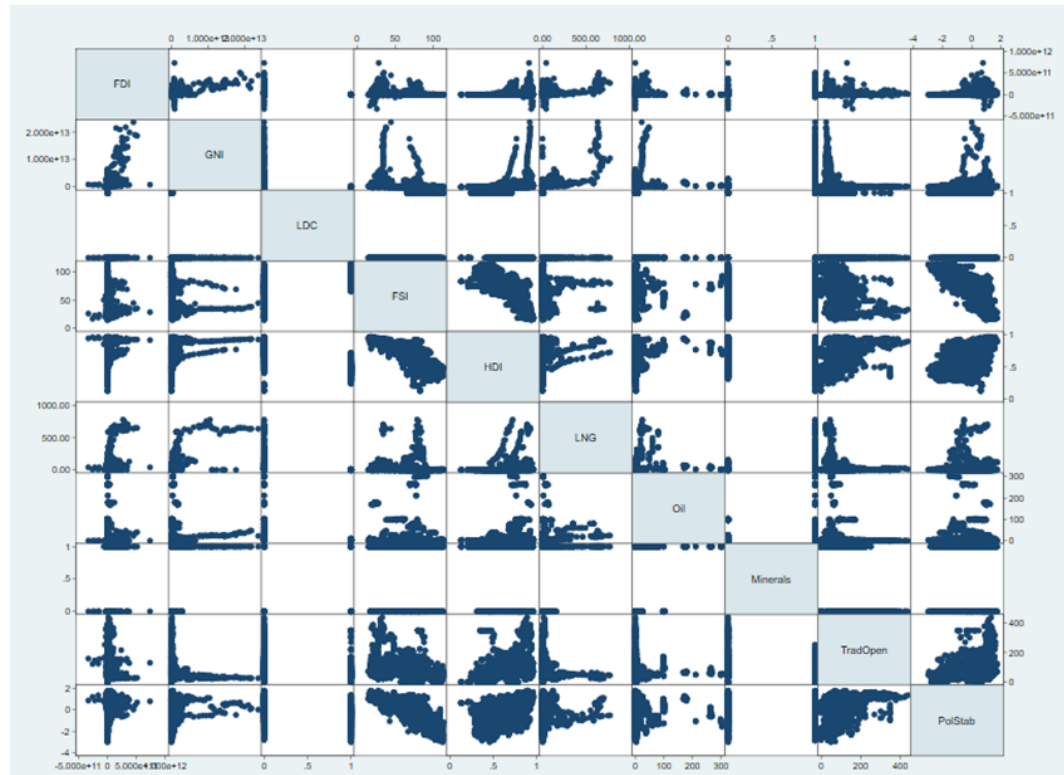
Variables	Minerals	TradOpen	PolStab
Minerals	1.0000		
TradOpen	-0.3159	1.0000	
PolStab	-0.1522	0.3554	1.0000

Regarding the association among dependent variables, starting with the relationship of GNI with the status of the LDC, the results show a negative association between GNI and the LDC of -0.1393; countries with higher GNI are not LDCs. The GNI

is also negatively correlated with the FSI, with a correlation coefficient of -0.2237, meaning that if a country scores more fragile on the FSI, it will have a lower GNI. The TradOpen variable also shows a weak negative association with GNI with a correlation coefficient of -0.1490. GNI is positively associated with HDI, LNG, oil, minerals, and PolStab, indicating that if a country has political stability and natural resources such as LNG, oil, and minerals, it is associated with a higher GNI.

LDCs are positively associated with fragility, showing a correlation coefficient of 0.5412. This correlation means that if a country is an LDC, it is more likely to have an FSI score indicating a high degree of fragility. The LDC status is negatively correlated with all other independent variables in the model. The table shows a strong negative correlation between LDC and HDI, with a correlation coefficient of -0.7160, indicating that LDC status would mean lower HDI levels. The correlation coefficient for LDC and political stability also indicates a negative correlation of -0.3761, indicating that countries with LDC status have political instability and the presence of violence/terrorism. The correlation between the state of LDCs and natural resources indicates that LDC countries have a weak negative association with natural resources – petroleum, LNG, and minerals.

Figure 1. Correlation graph matrix of variables in the model



Fragility is positively associated with minerals but weakly with a correlation coefficient of 0.0620. Fragility is negatively associated with human development, political stability, trade openness, and oil and LNG, indicating that the more fragile a country is, the less likely it is to perform well in these indicators. The correlation coefficient between fragility and political stability is -0.7932, indicating that the more fragile a country is, the less likely it is to be politically stable.

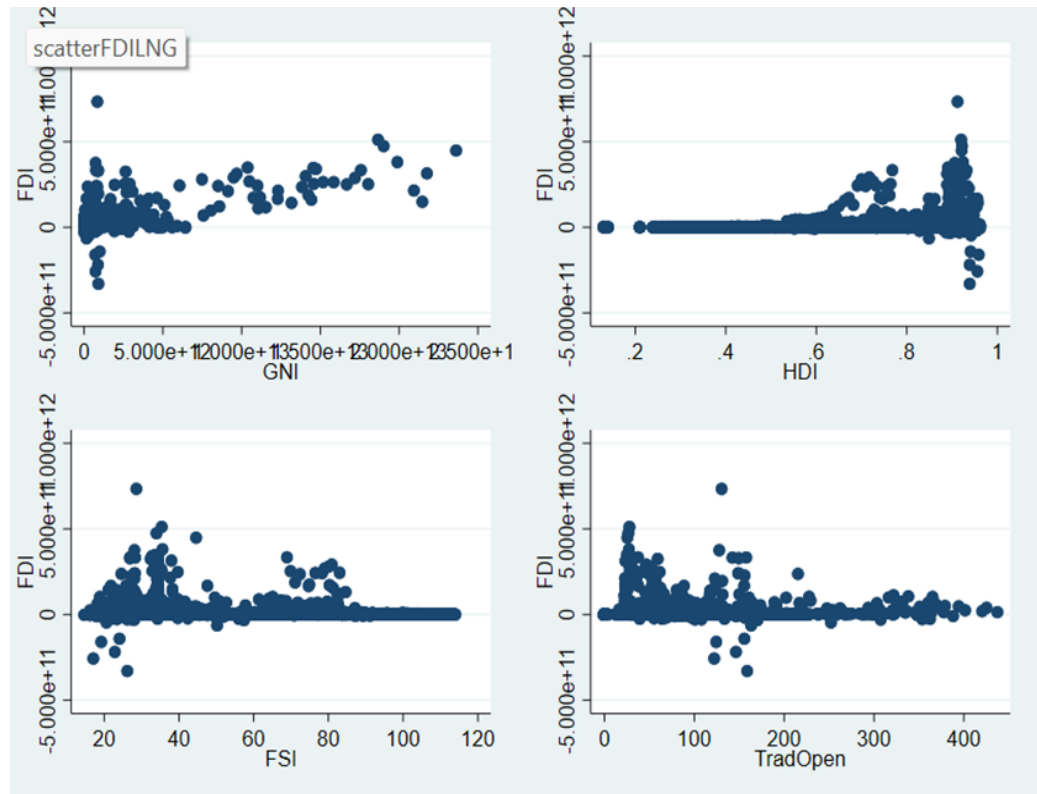
Human development has a weak negative correlation with minerals at a correlation coefficient of -0.0910, indicating that if a country has minerals, it likely has lower human development. Human development has a strong positive correlation with political stability of 0.6022, indicating that a country with high human development is more politically stable. Trade openness, LNG, and oil are also positively associated with

human development. Furthermore, trade openness is positively associated with political stability, showing a correlation coefficient of 0.3554.

Natural resources such as LNG, oil, and minerals correlate positively, indicating that countries often have all three resources. The three natural resources are negatively correlated with trade openness, indicating a negative relationship between exports and imports as a percentage of GDP in countries with natural resources. LNG has a weak positive association with political stability with a correlation coefficient of 0.0222, indicating that countries with LNG have some political stability. However, countries with oil and natural resources have a negative relationship with political stability, indicating that countries with these resources are more likely to have political instability.

The relationships between the variables in the model are also represented graphically in graphs 1 to 3. Graph 1, like Table 1, shows all the variables in the model and graphically shows how these variables are associated. For example, the relationship between FDI and GNI, as shown in column 1, row 2 of the correlation graph matrix, represents the positive relationship between FDI and GNI.

Figure 2. Correlation graph of the GNI, HDI, FSI, and trade openness logs with the dependent variable FDI

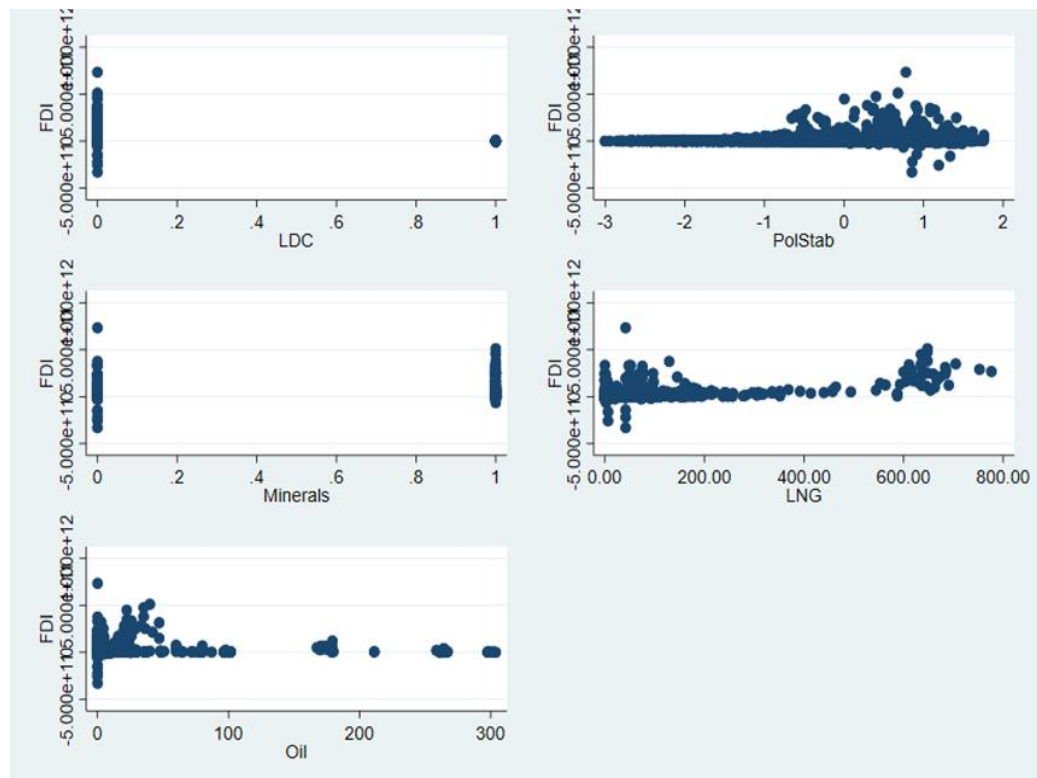


Figures 2 and 3 focus on the relationships between the FDI and the dependent variables. In Figure 2, the top left depiction indicates that the stronger positive correlation is at the lower end of the GNI; the lower a country's GNI, the more positively related to FDI the country's GNI is. The top-right depiction in Figure 2 shows that the observations on the higher end of HDI have a stronger positive relationship with FDI. The bottom left depiction indicates that countries on the lower end of FSI, countries that are not fragile (score closer to 0), have higher FDI. As shown in the lower-right depiction, countries on the lower end of the trade openness index tend to have higher FDI.

Figure 3 indicates the relationship between FDI and the categorical variables of LDC and Minerals in the first row left and the second row left, respectively. The graphs

indicate that the countries fall into category 0 or 1. For both variables, most countries fall into category 0. The political stability graph in the first row on the right indicates that countries with positive political stability scores, that is, politically stable countries, have more FDI. The graphs on the second row right and the third row left are for LNG and oil, respectively. These graphs indicate that countries with LNG and oil have higher levels of FDI.

Figure 3. Correlation graph of LDC, Minerals, and Logs of LNG, Oil, and Minerals with the dependent variable FDI



Distribution and normality of the data in the model

Skewness and kurtosis of the variables are examined with statistics, the chi-square test, and histograms shown in Tables 8 to 10 and Figures 4 to 6 to examine the normality of the variables before regression. Table 8 indicates that FDI, GNI, LDC, Oil LNG, and TradOpen have a skewness greater than 1. Therefore, these distributions are left-skewed.

Furthermore, these variables have kurtosis indicators greater than 3, indicating that the distributions for each variable are leptokurtic, which means that these distributions have heavier tails and are more likely to have extreme values in the right or left tails. Also, the skewness statistics for FDI, GNI, Oil, LNG, and TradOpen are more than 2, indicating nonnormality. Variables FSI, HDI, Minerals, PolStab, logFDI, logFSI, logGNI, logHDI, logLNG, logTradOpen, and logOil have skewness indicators between -1 and +1, indicating normality. Furthermore, the variables PolStab, logFDI, logGNI, and logLNG have kurtosis close to 3, making them mesokurtosis similar to a normal distribution.

Table 8 *Skewness and Kurtosis of the variables in the model*

Variable	Skewness	Kurtosis
Foreign Direct Investment (FDI)	7.2091	88.1830
Gross National Income (GNI)	9.0153	100.4185
Least Developed Countries (LDC)	1.0676	2.1397
Fragile States Index (FSI)	-.4893	2.3855
Human Development Index (HDI)	-.3260	2.1236
Petroleum reserves (Oil)	6.7722	53.4534
Liquefied petroleum gas production (LNG)	6.7295	53.7273
Precious stones and mineral resources (Minerals)	-.8734	1.7628
Trade Openness Index (TradOpen)	2.2144	10.6861
Political Stability and Absence of Violence/Terrorism(PolStab)	-.4700	2.6073
log Foreign Direct Investment (logFDI)	-.2525	3.2355
log Gross National Income (logGNI)	0.3182	2.5190
log Fragile States Index (logFSI)	-1.2372	3.7576
log Human Development Index (logHDI)	-.9505	3.9288
log Petroleum reserves (logOil)	0.3709	2.3161
log Liquefied petroleum gas production (logLNG)	-.4145	3.0271
log Trade Openness Index (logTradOpen)	-.4958	7.5281
log Political Stability and Absence of Violence/Terrorism(logPolStab)	-2.0057	8.7207

Table 9 *Skewness and kurtosis tests for normality for variables*

Variables	Observations	Pr(skewness)	Pr(kurtosis)	Joint Adj chi2(2)	test Prob>chi2
Foreign Direct Investment (FDI)	4,158	0	0	.	.
Gross National Income (GNI)	4,158	0	0	.	.
Least Developed Countries (LDC)	4,158	0	0	805.88	0
Fragile States Index (FSI)	4,158	0	0	239.04	0
Human Development Index (HDI)	4,158	0	0	461.32	0
Petroleum reserves (Oil)	4,158	0	0	.	.
Liquefied petroleum gas production (LNG)	4,158	0	0	.	.
Precious stones and mineral resources (Minerals)	4,158	0	0	.	.
Trade Openness Index (TradOpen)	4,158	0	0	.	.
Political Stability and Absence of Violence/Terrorism(PolStab)	4,158	0	0	149.35	0

The normality of the variables is confirmed by the chi-square statistic in Tables 9 and 4 and the histograms in Figures 4, 5, and 6. Table 9 shows that the variables LDC, FSI, HDI, and PolStab have normal distributions. In Table 10, it shows that the variables logFDI, logGNI, logFSI, logHDI, logOil, logLNG, logTradOpen, and logPolStab are normal. Figures 4, 5, and 6 also confirm that these eight variables have a normal distribution.

Table 10 *Skewness and kurtosis tests for normality for variables*

Variables	Observations	Pr(skewness)	Pr(kurtosis)	Joint Adj chi2(2)	test Prob>chi2
log Foreign Direct Investment (logFDI)	3,883	0	0.0059	41.81	0
log Gross National Income (logGNI)	4,158	0	0	115.02	0
log Least Developed Countries (logLDC)	1,100	.	.	.	.
log Fragile States Index (logFSI)	4,158	0	0	582.8	0
log Human Development Index (logHDI)	4,158	0	0	428.04	0
log Petroleum reserves (logOil)	2,089	0	0	117.89	0
log Liquefied petroleum gas production (logLNG)	2,286	0	0.7353	51.63	0
log Precious stones and mineral resources (logMinerals)	2,911	.	.	.	.
log Trade Openness Index (logTradOpen)	4,076	0	0	458.32	0
log Political Stability and Absence of Violence/Terrorism(logPolStab)	2,121	0	0	700.75	0

Figure 4. Histograms for $\log\text{FDI}$, $\log\text{GNI}$, and TradOpen to determine the normality of the variables

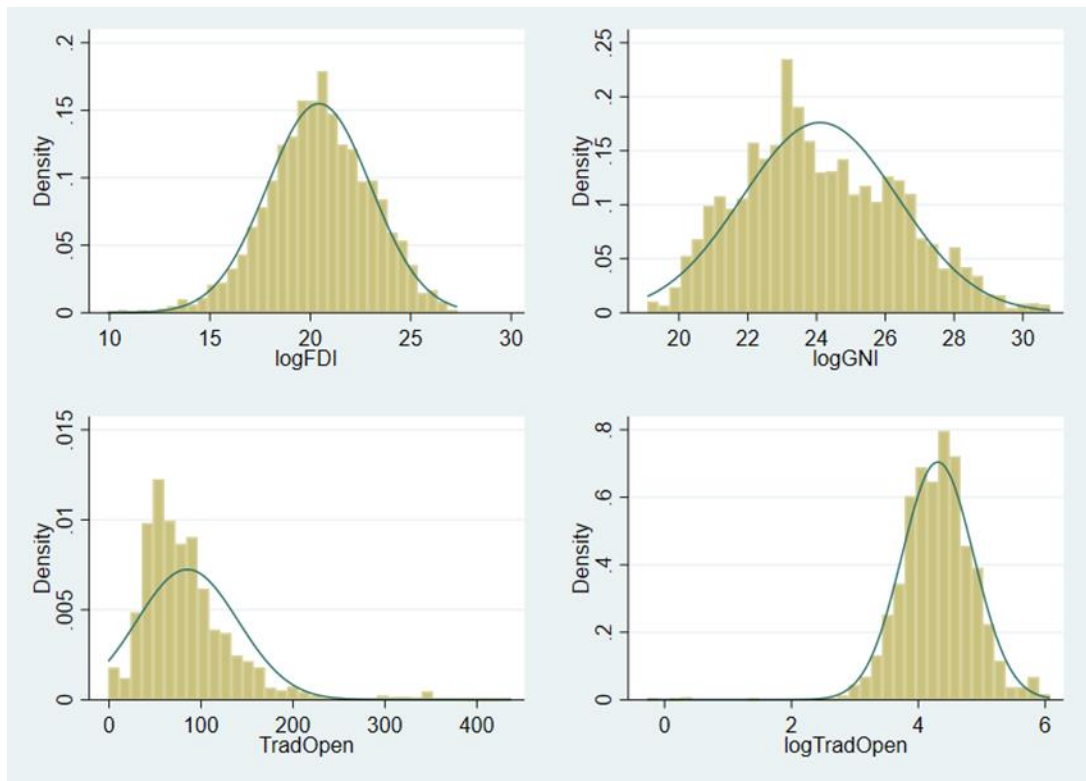


Figure 5. Histograms for $\log\text{PolStab}$, FSI , LDC , and HDI to determine normality

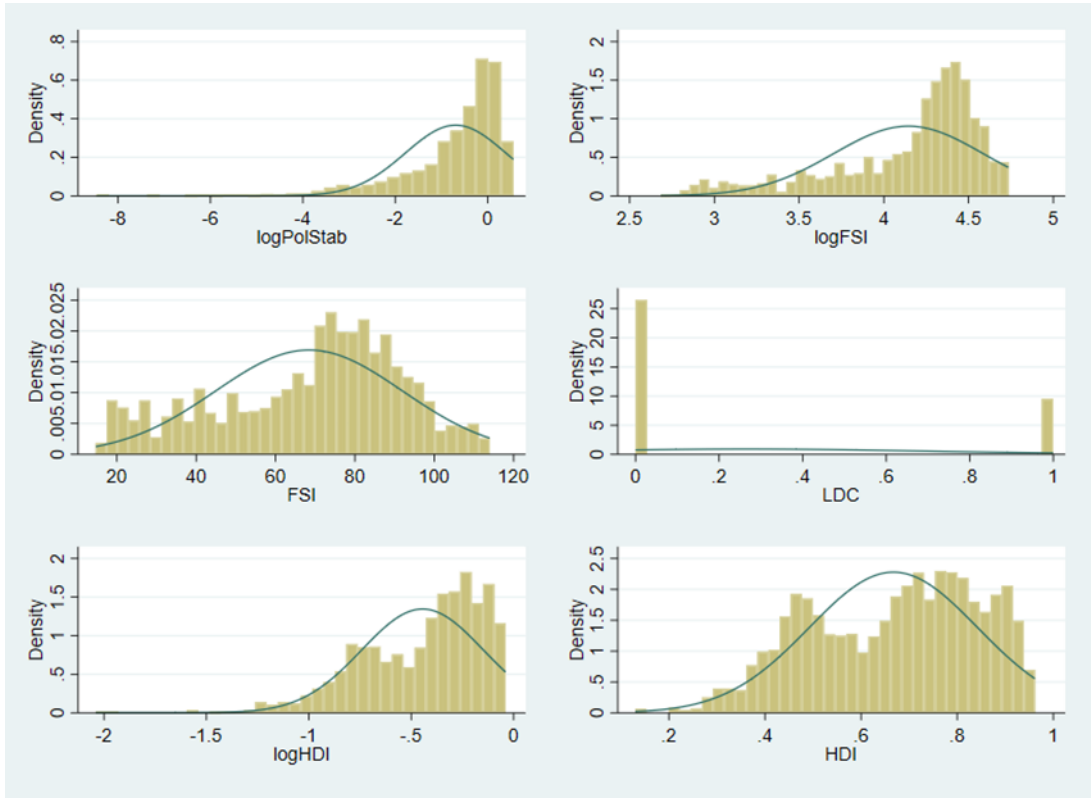
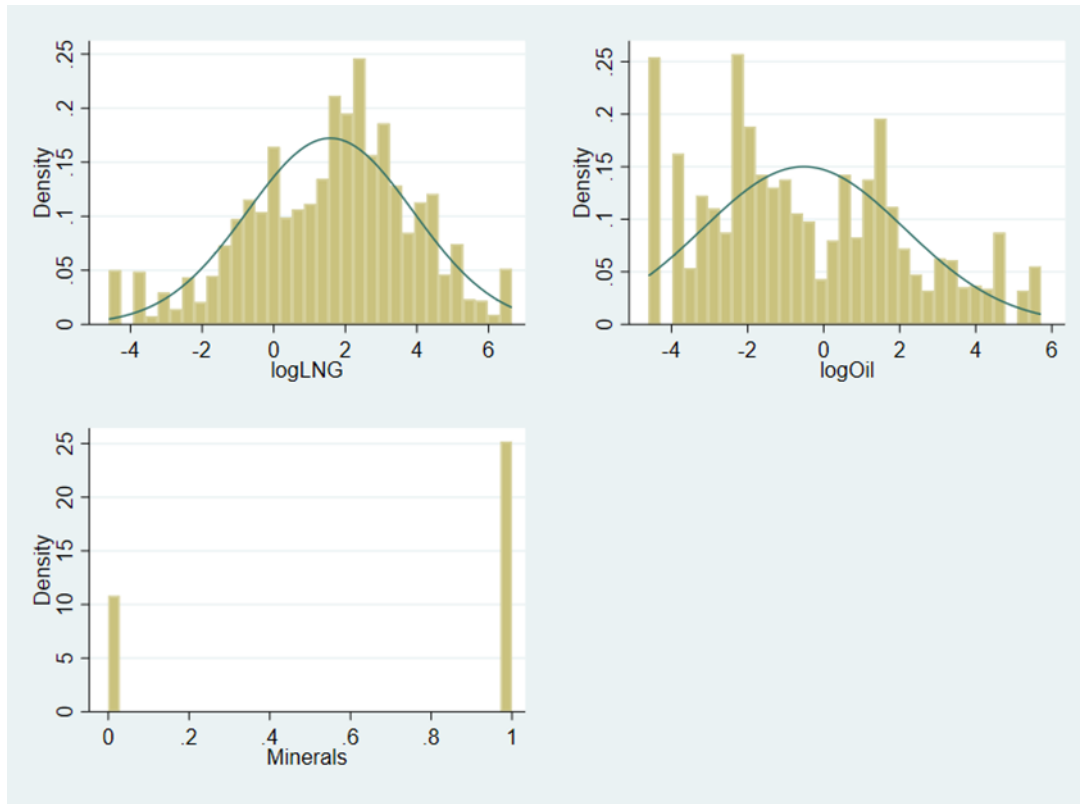


Figure 6. Histograms for oil, LNG, and minerals to determine normality



Regression results

The determinants of FDI as revealed by the regression analyses - Generalised Least Squares Random effects (GLS RE) and Ordinary least squares (OLS) are least developed country status, precious minerals, fragility, human development, liquified natural gas, political stability index, gross national income, and trade openness. As shown in the distribution and normality analysis of the variables chosen for this study, only some had normal distributions. The logs of variables were taken to normalize the variables. Four equations, two log-log models and two log-linear models, were found with high R-squares and significant variables. In all four equations, the logs of the macroeconomic variables FDI and GNI were used.

It should be noted that only the fragility changes are significant in three of the models. In the GLS RE log-log model, the log of fragility has a negative causal effect on FDI; As fragility increases, FDI decreases. The fragility index ranges between 0.0 (blue sustainable) and 120 (red alert); therefore, the higher the fragility index, the more fragile a country is. So if the fragility index increases by 1 percent, Foreign direct investment reduces by 0.71 percent, holding other variables constant. At $\alpha = 0.05$, we reject the null hypothesis and conclude that the regression coefficient for FSI is statistically different from zero, given that GNI, HDI, and LNG are in the model. The OLS log-log model indicates that if fragility increases by 1 percent, foreign investment declines by 0.38 percent, keeping other variables constant. This result means that investors will flee the country if it becomes fragile. At $\alpha = 0.05$, we reject the null hypothesis and conclude that the regression coefficient for FSI is statistically different from zero, given that PolStab, GNI, and TradOpen are in the model. In the GLS RE log-linear model, if the fragility index increases by one, FDI decreases by 0.008, keeping other variables constant. At $\alpha = 0.05$, we reject the null hypothesis and conclude that the regression coefficient for FSI is statistically different from zero, given that LDC status, HDI, Minerals, PolStab, GNI, and LNG are in the model. The three models confirm that fragility harms foreign direct investment.

The log-linear GLS RE model shows that if a country is an LDC (categorical variable one), FDI will increase by 0.7531 while other variables are kept constant. At $\alpha = 0.05$, we reject the null hypothesis and conclude that the regression coefficient for LDC is statistically different from zero, given that FSI, HDI, Minerals, PolStab, GNI, and

LNG are in the model. This finding confirms the empirical evidence that LDCs receive a high level of FDI.

The log-log GLS RE model indicates that changes in human development significantly determine foreign direct investment. The positive causal effect of human development on investment means that if the country's human development increases, foreign direct investment will increase. HDI ranges from 0 to 1, with 1 being high human development. The model results indicate that if human development increases by 1 percent, the population is more educated and healthier, more investment will be made in the country, and foreign direct investment will increase by 1.82 percent, keeping other variables constant. At $\alpha = 0.05$, we reject the null hypothesis and conclude that the regression coefficient for HDI is statistically different from zero, given that GNI, FSI, and LNG are in the model. The regression results for the log-linear GLS RE model show that HDI is significant; a one-unit change in HDI will increase FDI by 5.791, holding other variables constant. At $\alpha = 0.05$, we reject the null hypothesis and conclude that the regression coefficient for HDI is statistically different from zero, given that LDC status, FSI, Minerals, PolStab, GNI, and LNG are in the model. The regression results for the log-linear OLS model show that HDI is significant; a one-unit change in HDI will increase FDI by 1.355, holding other variables constant. At $\alpha = 0.05$, we reject the null hypothesis and conclude that the regression coefficient for HDI is statistically different from zero, given that GNI and trade openness are in the model. Three models confirm the positive effect of human development on foreign direct investment.

Liquified natural gas is also a significant determinant of foreign direct investment in the log-log GLS RE model. The variable measures the barrels of LNG produced each

year in a country. The positive causal relationship means that the country will have more investment if LNG production increases. If LNG production increases by 1 percent, it will increase FDI by 0.53 percent, keeping the other variables constant. At $\alpha = 0.05$, we reject the null hypothesis and conclude that the regression coefficient for LNG is statistically different from zero, given that GNI, HDI, and FSI are in the model. The log-linear GLS RE model shows that a one percent change in LNG would lead to a 0.48 percent change in FDI, holding other variables constant. At $\alpha = 0.05$, we reject the null hypothesis and conclude that the regression coefficient for LNG is statistically different from zero, given that LDC status, FSI, Minerals, PolStab, GNI, and HDI are in the model. The two models confirm that the presence of LNG in a country attracts FDI.

The log-linear GLS RE model shows that if a country has minerals (categorical variable one), FDI will increase by 0.571 units while other variables are kept constant. At $\alpha = 0.05$, we reject the null hypothesis and conclude that the regression coefficient for minerals is statistically different from zero, given that FSI, HDI, LDC, PolStab, GNI, and LNG are in the model. This finding confirms that countries with natural resources such as minerals receive FDI.

The variables of political stability and the absence of violence/terrorism range from negative 2.5 to 2.5. The log-log OLS model shows that a 1 percent change in the political stability variable leads to a 0.139 percent decrease in FDI, keeping other variables constant. At $\alpha = 0.05$, we reject the null hypothesis and conclude that the regression coefficient for PolStab is statistically different from zero, given that FSI, FDI, trade openness, and GNI are in the model. The log-linear GLS RE model shows that a one-unit change in political stability would lead to a 0.172 unit decrease in FDI, keeping

other variables constant. At $\alpha = 0.05$, we reject the null hypothesis and conclude that the regression coefficient for political stability is statistically different from zero, given that FSI, HDI, LDC, minerals, GNI, and LNG are in the model. This finding confirms the literature that changes in political stability and the absence of violence/terrorism negatively impact foreign investment.

The log-log OLS and log-linear OLS models show that gross national income positively correlates with foreign direct investment. This relationship means that FDI will increase if the GNI of a country increases. In the log-log OLS model, if GNI increases by 1 percent, FDI will increase by 0.96 percent while other variables are kept constant. At $\alpha = 0.05$, we reject the null hypothesis and conclude that the regression coefficient for GNI is statistically different from zero since PolStab, FSI, and TradOpen are in the model. In the log-linear OLS model, if GNI increases by 1 percent, FDI will increase by 0.95 percent while other variables are kept constant. At $\alpha = 0.05$, we reject the null hypothesis and conclude that the regression coefficient for GNI is statistically different from zero, given that HDI and TradOpen are in the model. The findings of these two models confirm that the higher the GDP, the more FDI a country will receive.

Trade openness has a positive causal relationship with foreign direct investment, so if a country's economy becomes more open to trade, it will receive more FDI. In the log-log OLS model, if trade openness increases by 1 percent, FDI will increase by 1.287 percent while other variables are kept constant. At $\alpha = 0.05$, we reject the null hypothesis and conclude that the regression coefficient for trade openness is statistically different from zero since PolStab, FSI, and GNI are in the model. In the log-linear OLS model, if trade openness increases by 1 unit, FDI will increase by 0.009 units, keeping

other variables constant. At $\alpha = 0.05$, we reject the null hypothesis and conclude that the regression coefficient for trade openness is statistically different from zero, given that HDI and GNI are in the model. The findings of these two models confirm that trade openness leads to more FDI.

In both the log-log and log-linear OLS models, when there are no changes in the explanatory variables, the foreign direct investment will have a negative value of US\$6.87 million and US\$4.04 million, respectively. When there are no changes in the explanatory variables in the log-log and log-linear GLS RE models, the foreign direct investment will have a value of US\$24.3 million and US\$26.6 million, respectively.

The R-squared of the log-log OLS model indicates that the model explains 79.5 percent of changes in foreign direct investment, while the r-squared for the log-linear OLS model indicates that the model explains 78 percent of the changes in FDI. The R-squared value indicates that the log-log and log-linear GLS RE models show that these models explain FDI by 57.8 percent and 59.6 percent, respectively. Given the R-squared value, the log-log OLS model best explains foreign direct investment.

Table 11 *Determinants of FDI*

Significant Variables	Generalized Least Squares Random Effects (GLS RE)	Generalized Least Squares Random Effects (GLS RE)	Ordinary least squares (OLS)	Ordinary least squares (OLS)
	Coefficients (z)	Coefficients (z)	Coefficients (t)	Coefficients (t)
	log-log model	log-linear model	log-log model	log-linear model
Least Developed Countries (LDC)	n/a	0.7531064 (5.07)	n/a	n/a
Fragile States Index (FSI)	n/a	-0.0077323 (-2.4)	n/a	n/a
Human Development Index (HDI)	n/a	5.79103 (13.65)	n/a	1.354884 (8.63)
Precious stones and mineral resources (Minerals)	n/a	0.570535 (6.69)	n/a	n/a
Trade Openness Index (TradOpen)	n/a	n/a	n/a	0.0085919 (20.79)
Political Stability and Absence of Violence/Terrorism (PolStab)	n/a	-0.1724128 (-2.35)	n/a	n/a
log Fragile States Index (logFSI)	-0.7096071 (-8.17)	n/a	-0.3844737 (-3.97)	n/a
log Human Development Index (logHDI)	1.819121 (8.85)	n/a	n/a	n/a
log Liquefied petroleum gas production (logLNG)	0.5266503 (34.94)	0.4813142 (25.41)	n/a	n/a
log Political Stability and Absence of Violence/Terrorism (logPolStab)	n/a	n/a	-0.1394594 (-4.67)	n/a
log Gross National Income (logGNI)	n/a	n/a	0.9622129 (59.4)	0.9471931 (80.72)
log Trade Openness Index (logTradOpen)	n/a	n/a	1.286723 (21.96)	n/a
_cons	24.26194 (74.96)	16.63094 (35.64)	-6.873949 (-8.54)	-4.038094 (-16.72)
	R-squared: 0.5776	R-squared: 0.5960	R-squared: 0.7951	R-squared: 0.7796
	(Wald chi2(3) = 2301.6)	(Wald chi2(3) = 3155.38)	F(4, 1923) = 1864.96	F(3, 3879) = 4574.12

n/a = not applicable - The variable was not significant for the model

Diagnostic tests for ordinary least-squares regression

Diagnostic tests for the OLS regression are done because, unlike the GLS RE model, it does not have in-built diagnostic testing. Diagnostic tests were conducted for the model's heteroskedasticity, multicollinearity, and normality. The results of the Breusch–Pagan/Cook–Weisberg test indicate the absence of heteroskedasticity in the model at the 95 percent confidence level since the p-value for the chi-square test is less than 0.05 (see Tables 12 and 13). The decomposition of the testing for heteroskedasticity through Cameron & Trivedi's decomposition of the IMtest shows the absence of heteroskedasticity and a normal distribution of the model. This result means the residual variance is constant and confirms one of the linear regression model's assumptions.

Figures 7 and 8 illustrate the model's homoskedasticity and normality, indicating that the model explains foreign direct investment. The multicollinearity among the variables is tested in the results shown in Tables 16 and 17. Variable inflation factors for independent variables (VIF) show that the VIF is less than five, with a mean VIF of 1.84 and 1.75, indicating that the variables are moderately correlated. The VIF statistics mean that the statistical inference from the model is reliable. The linearity is further depicted in Figures 9 and 10, indicating a linear relationship between the logFDI and the model's explanatory variables. The results of the Ramsey RESET test for the omitted variables, shown in Tables 18 and 19, indicate that at a confidence level of 95 percent, using the F test, the models are a good explanation of FDI and have no omitted variables. The results of the heteroskedasticity, normality, and linearity tests indicate that the coefficients of the OLS regression model that explain the FDI are the best unbiased linear estimates.

Table 12 *Breusch–Pagan/Cook–Weisberg test for heteroskedasticity (log-log model)*

Breusch–Pagan/Cook–Weisberg test for Heteroskedasticity	
Assumption: Normal error terms	
Variable: Fitted values of logFDI	
H0: Constant variance chi2 (1) =	6.50
Prob > chi2 =	0.0108

Table 13 *Breusch–Pagan/Cook–Weisberg test for heteroskedasticity (log-linear model)*

Breusch–Pagan/Cook–Weisberg test for Heteroskedasticity	
Assumption: Normal error terms	
Variable: Fitted values of logFDI	
H0: Constant variance chi2 (1) =	103.82
Prob > chi2 =	0.0000

Table 14 *Cameron & Trivedi's decomposition of the IMtest (log-log model)*

Source	chi2	df	p
Heteroskedasticity	36.83	14	0.0008
Skewness	37.21	4	0
Kurtosis	13.43	1	0.0002
Total	87.47	19	0

Table 15 *Cameron & Trivedi's decomposition of the IMtest (log-linear model)*

Source	chi2	df	p
Heteroskedasticity	134.06	9	0.0000
Skewness	73.06	3	0.0000
Kurtosis	27.88	1	0.0000
Total	235.01	13	0

Table 16 *Variance inflation factors for independent variables (VIF) (log-log model)*

Variable	VIF	1/VIF
log Fragile States Index (logFSI)	2.53	0.39514
log Gross National Income (logGNI)	2.16	0.46285
log Political Stability and Absence of Violence/Terrorism(logPolStab)	1.47	0.67927
log Trade Openness Index (logTradOpen)	1.19	0.83889
Mean VIF	1.84	

Table 17 *Variance inflation factors for independent variables (VIF) (log-linear model)*

Variable	VIF	1/VIF
Human Development Index (HDI)	1.98	0.505784
log Gross National Income (logGNI)	1.89	0.528754
Trade Openness Index (TradOpen)	1.37	0.727548
Mean VIF	1.75	

Table 18 *Ramsey RESET test for omitted variables (log-log model)*

Ramsey RESET test for omitted variables Omitted: Powers of fitted values of **logFDI**
H0: Model has no omitted variables F (3, 1920) = **21.59** Prob > F = **0.0000**

Table 19 Ramsey RESET test for omitted variables (log-linear model)

Ramsey RESET test for omitted variables Omitted: Powers of fitted values of **logFDI**

H0: Model has no omitted variables $F(3, 3876) = 54.73$ Prob > F = **0.0000**

Figure 7. Normality and homoskedasticity test for the ordinary least squares model (log-log model)

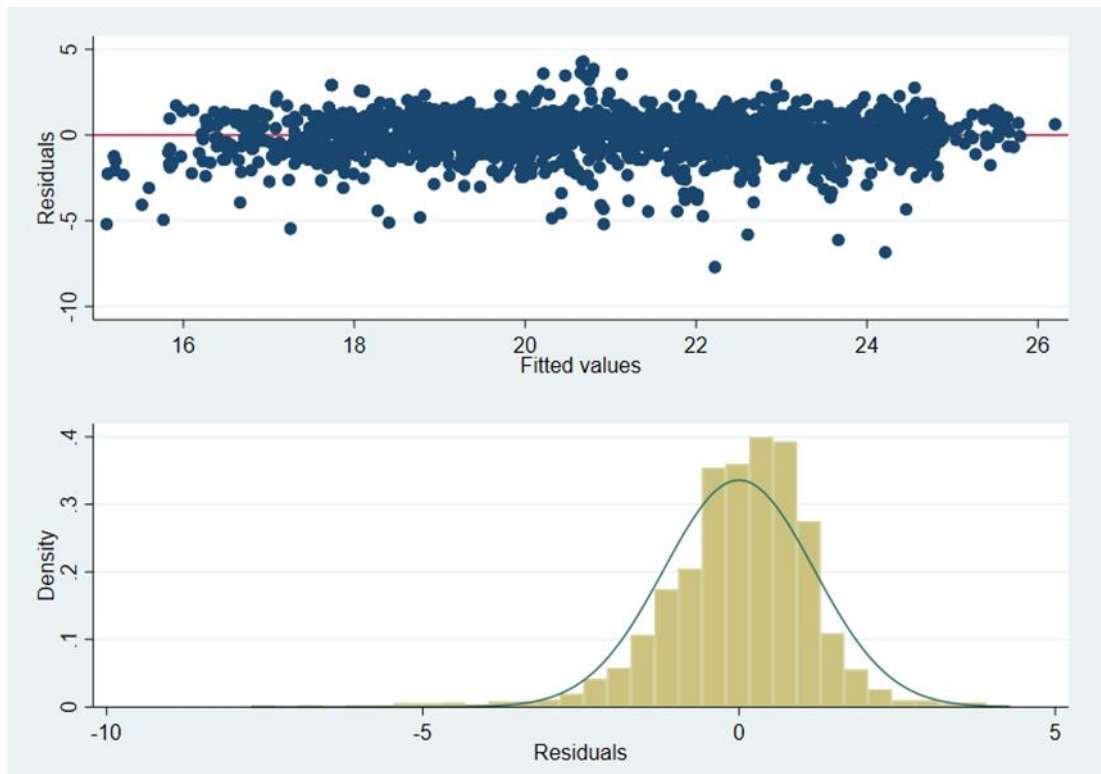


Figure 8. Normality and homoskedasticity test for the ordinary least squares model (log-linear model)

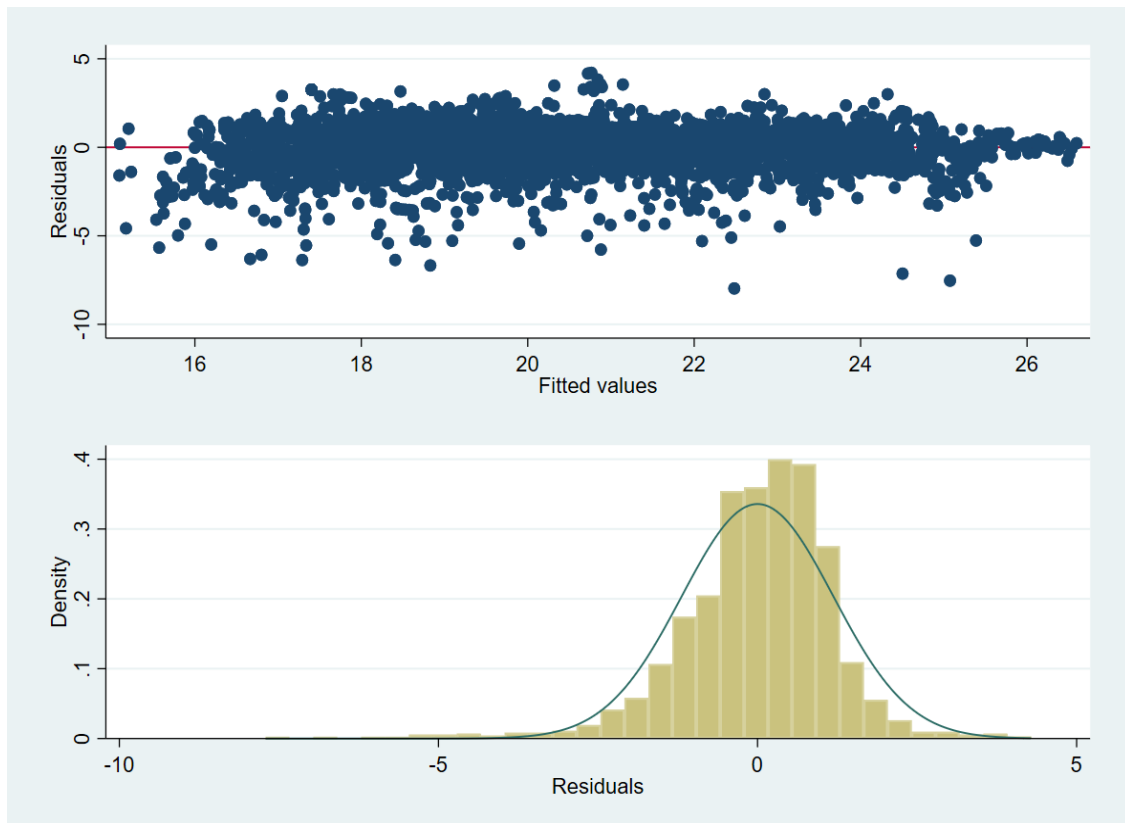


Figure 9. Linearity of the Ordinary Least Squares model (log-log model)

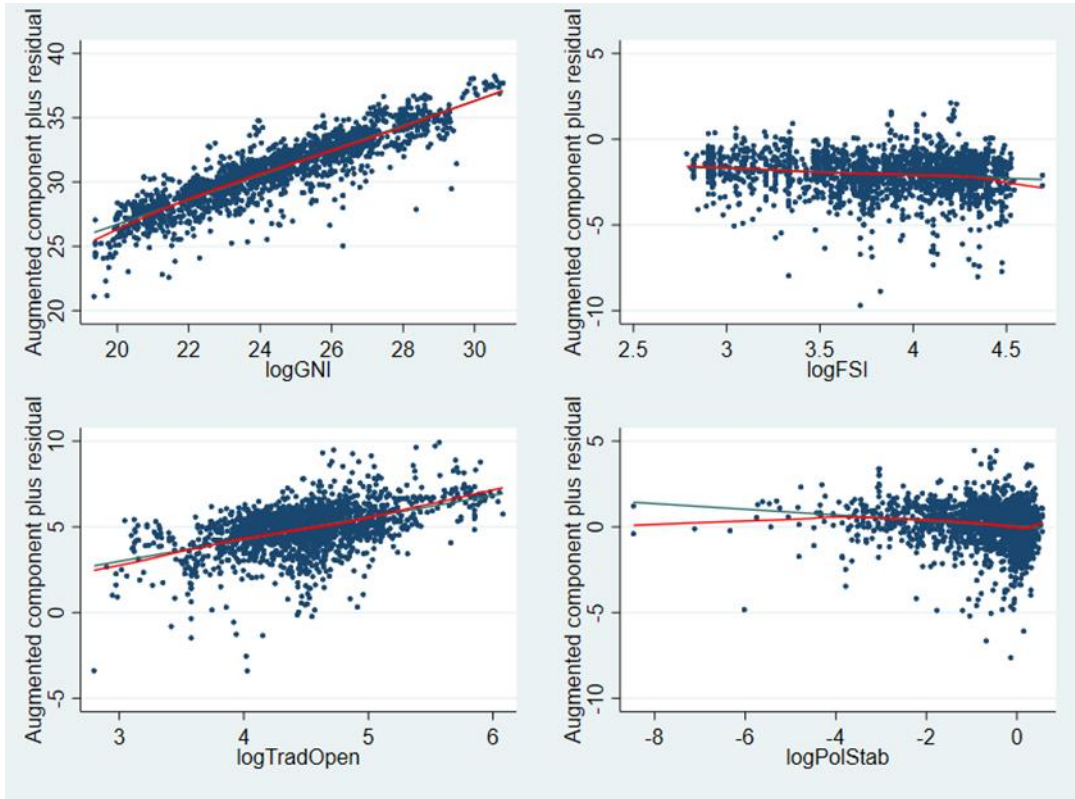
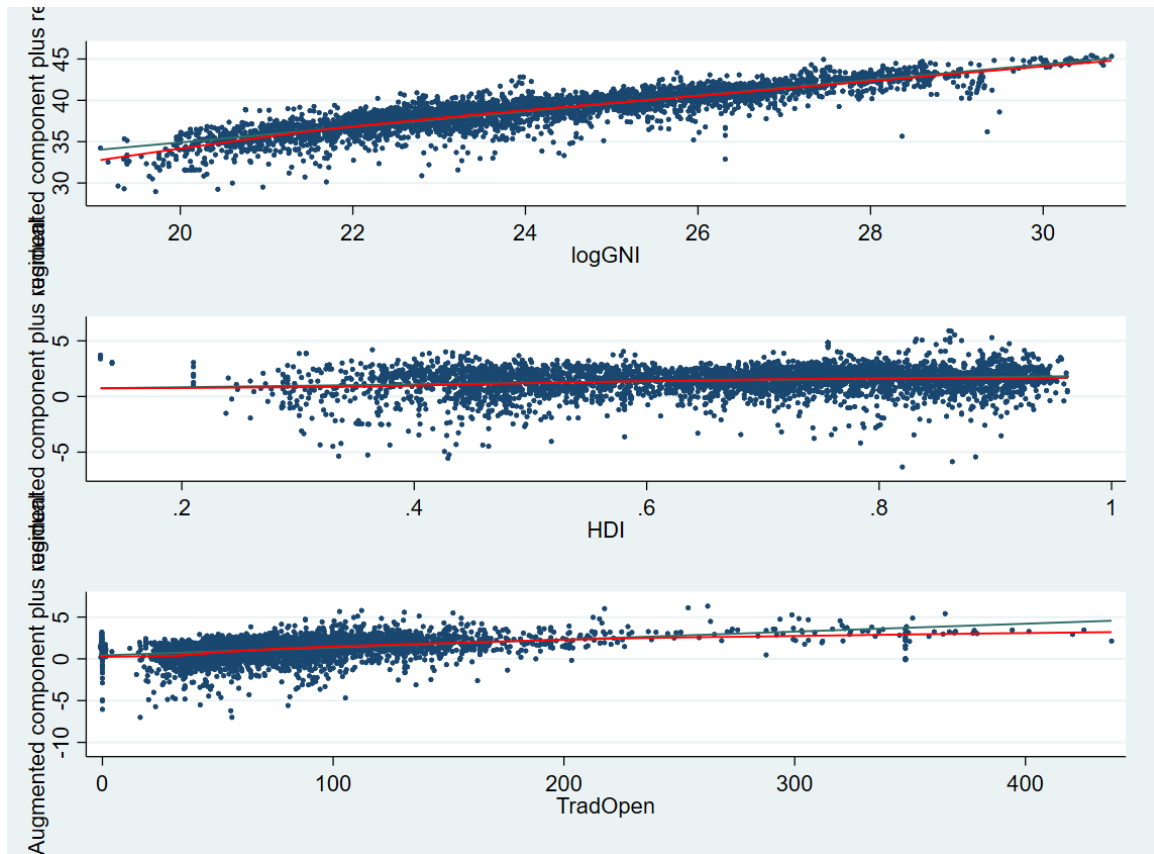


Figure 10. Linearity of the Ordinary Least Squares model (log-linear model)



Robustness tests for the ordinary least-squares model

The robustness of the OLS results was also tested to test the model's sensitivity to outliers. Robust regression identified each outlier with a Cook distance more significant than one from the residual; then, the weights were calculated to determine if the model was sensitive to these outliers. As shown in Tables 20 and 21, the coefficients of the explanatory variables are close to the coefficient values obtained for the models, as shown in Table 11. The OLS model is, therefore, robust and explains the FDI.

Table 20 *Robust regression check (log-log model)*

Significant variables	Coefficient t value
log Gross National Income (logGNI)	0.9566472 (68.79)
log Fragile States Index (logFSI)	-.3493121 (-4.20)
log Trade Openness Index (logTradOpen)	1.109677 (22.06)
log Political Stability and Absence of Violence/Terrorism(logPolStab)	-.1176722 (-4.60)
_constant	-5.972849 (-8.64)
F(4, 1923) = 2500.42	

Table 21 *Robust regression check (log-linear model)*

Significant variables	Coefficient t value
log Gross National Income (logGNI)	0.9392213 (94.39)
Human Development Index (HDI)	1.04717 (7.86)
Trade Openness Index (TradOpen)	0.0080463 (22.96)
_constant	-3.468708 (-16.93)
F(3, 3879) = 6050.14	

Discussion

The data analysis and findings demonstrate that the determinants of foreign direct investment are LDC status, market size, human development, trade openness, liquified natural gas, mineral resources, the country's fragility status, and political stability.

The variables were subjected to log transformations to mitigate skewness and achieve a normalized distribution. Also, log-linear regressions were run to consider index and categorical variables. The data set consists of 156 of the 195 countries worldwide, including 35 46 countries classified as Least Developed Countries (LDCs). It includes nine dependent variables. The GLS RE and OLS regression models were used to identify the eight variables that exhibited statistical significance. Several recent studies, including the work of (Giuliano & Ruiz-Arranz, 2005), have employed two regression models, namely fixed effects generalized least squares and ordinary least squares (OLS). The findings of this study suggest that the presence of oil reserves is not a significant determinant of foreign direct investment.

The Human Development Index (HDI) determines foreign direct investment (FDI). This finding implies that a higher level of skills and better health conditions within a population positively and substantially impact the flow of FDI into a country. This finding is consistent with the existing scholarly literature. For instance, (Balasubramanyam, 2001) conducted a study that demonstrated positive causation between a proficient labor force and the attraction of multinational corporations to a particular nation. According to a study (Kumari & Sharma, 2017), human capital significantly positively impacted foreign direct investment (FDI).

This study revealed that liquified natural gas (LNG) is a substantial and favorable factor influencing foreign direct investment (FDI). This finding implies that countries with more significant liquefied natural gas reserves (LNG) will likely attract higher foreign direct investment (FDI) levels. The findings of this study align with previous research conducted by (Balasubramanyam, 2001), (Holden & Pagel, 2012), and (Lu,

Kasimov, Karimov, & Abdullaev, 2020). These studies have demonstrated that nations endowed with natural resources, particularly gas, tend to receive higher levels of investment from transnational corporations. In addition, it has been observed that fragile countries that possess natural resources are more likely to attract foreign direct investment.

This research also indicates that a country's LDC status is essential in attracting FDI. As shown by UNCATAD (2022), LDCs have been the largest recipient of FDI. Wako (2021) and Holden and Pagel (2012) indicate that LDCs, particularly in Africa, are rich in natural resources. It is, therefore, consistent with the literature that minerals are a significant determinant of FDI.

The research also demonstrates that fragility, as quantified by the Fragile States Index (FSI), is a significant and consistent negative factor influencing foreign direct investment (FDI). This finding implies that countries with higher levels of fragility, as indicated by their fragility number, tend to attract lower levels of foreign direct investment (FDI). This discovery aligns with existing academic literature, specifically the study conducted by (Dimitrova & Triki, 2018), which demonstrates the adverse effects of fragility on foreign direct investment (FDI).

The research shows that political stability and the absence of violence/terrorism influence the Foreign Direct Investment (FDI) inflows. The negative coefficient of the PolStab variable indicates an inverse relationship between political stability and foreign direct investment (FDI) inflows. The present discovery aligns with previous academic works, such as (Vadlamannati, Tamazian, & Irala, 2009) and (Dimitrova & Triki, 2018),

which have shown the noteworthy influence of civil and political rights, as well as political instability, on foreign direct investment (FDI).

Gross national income (GNI) is a substantial and positive factor in determining foreign direct investment (FDI) within a given market. Expanding market size would result in a corresponding increase in foreign direct investment (FDI). The finding is substantiated by several scholarly works, such as (Vadlamannati, Tamazian, & Irala, 2009), (Kumari & Sharma, 2017), and (Wako, 2021) studies, which have demonstrated through empirical research that there exists a positive causal association between market size and the expansion of the market size and foreign direct investment (FDI).

Trade openness is crucial in influencing foreign direct investment (FDI) determination. An increase in trade openness is associated with a corresponding influx of foreign direct investment (FDI) into the nation. This finding aligns with previous research conducted by (Moussaa, Çahab, & Karagözc, 2016) as well as (Dimitrova & Triki, 2018), which demonstrated a positive relationship between trade openness, exports, imports, and foreign direct investment (FDI).

The regression analysis yields robust results, with estimators considered the best linear unbiased estimates. Consequently, these findings apply to all countries, including those classified as least developed countries (LDC). As noted above, the existing body of literature supports the findings of this study. According to the empirical evidence presented in the UNCTAD report for 2022, it is observed that the least developed country (LDC), Bangladesh, attracted a total of US\$2.9 billion in foreign direct investment (FDI) during 2021. Similarly, Mozambique's LDC received a substantial US\$5.1 billion in FDI the same year. In 2021, the least developed countries (LDCs) experienced a notable

increase in FDI, with a total inflow of US\$21 billion. This figure represents a 13 percent increase compared to the FDI received in the previous year, 2020.

This study presents regression analysis indicating that LDCs that experience a rise in foreign direct investment (FDI) possess one or more significant factors contributing to FDI flows. These factors include market size, human development, trade openness, availability of liquified natural gas, decreasing fragility, and political stability.

Policymakers should consider these findings when devising policies to attract foreign investment effectively. This research is significant given that foreign investment plays a vital role in generating a balance of payments surplus, fostering employment opportunities, enhancing skills, driving technological advancements, promoting economic growth, and facilitating the development of domestic firms.

Conclusions

The findings of this study indicate that the key factors influencing foreign direct investment in fragile and least developed countries include human development, liquefied natural gas, mineral deposits, LDC status, political stability, market size, trade openness, and fragility status. The presence of fragility and political instability has detrimental consequences, as evidenced by the inverse relationship between a country's fragility or political instability and the level of foreign direct investment. Consequently, we accept the null hypothesis that nations characterized by political stability, peace, and high gross national income (GNI) tend to attract a more significant foreign direct investment (FDI) inflow. The results align with the conclusions drawn in other scholarly publications.

The findings of this study are of particular significance for countries classified as fragile red alert and least developed countries. These countries must prioritize economic

growth and maintain open trade because the size of their market and the degree of trade openness play a vital role in attracting higher foreign direct investment inflows. Nations must prioritize the education and well-being of their citizens, as these factors play a crucial role in fostering human development. Political stability is a crucial factor that requires countries to prioritize establishing transparent political processes, including elections and transitions of power.

The comprehensiveness of the variables used in this study, specifically fragile states and human development indexes, ensures that all potential economic, social, and political factors that may impact foreign direct investment have been carefully considered. Moreover, using a sample size comprising 80 percent of countries and a total of 4,158 observations has yielded coefficients with strong statistical properties, serving as the best linear unbiased estimators for determining the factors influencing foreign direct investment.

Additional research can be conducted by deconstructing the indices into their respective components. For example, the fragile states index consists of 12 economic, social, and political indicators, while the human development index consists of three indicators. Research can involve utilizing various components as individual components of a research. In addition, additional regression methodologies can be employed to explore the determinants of FDI. The Least Developed Countries (LDC) category was found to be significant. In international development, countries are frequently classified according to their economic status. These categories, which include middle-income countries and advanced economies, can also be explored in new Foreign Direct

Investment (FDI) research to determine whether a country's category plays a significant role in explaining FDI patterns.

CHAPTER III – FREE TRADE AGREEMENTS IMPACT ON INTERNATIONAL TRADE

Introduction

This research paper investigates the effects of free trade agreements (FTAs) on global trade. An FTA, according to the International Trade Administration of the US Department of Commerce (2023), refers to a formalized agreement between two or more countries wherein these nations mutually consent to specific obligations that have implications for the exchange of trade-related goods and services (US Department of Commerce, International Trade Administration, 2023). The origins of contemporary global trade discussions can be traced back to the 1940s when the General Agreement on Tariffs and Trade (GATT) was established. Throughout eight rounds of negotiations, these discussions culminated in forming the World Trade Organization (WTO) in 1995. According to the World Trade Organization (2023), there have been eight rounds of negotiations. These rounds include the Geneva Round in 1947, the Annecy Round in 1949, the Torquay Round from 1950 to 1951, the Geneva Round in 1956, the Geneva or Dillon Round from 1960 to 1961, the Kennedy Round from 1964 to 1967, the Tokyo Round from 1973 to 1979, and finally, the Uruguay Round from 1986 to 1994. The ongoing trade negotiations are called the Doha Round, which was initiated in 2001 (World Trade Organization, 2023).

Establishing the World Trade Organisation meant that global trade was now rule-based. Therefore, the FTAs had to be registered under the Enabling Clause incorporated into the GATT in 1979, which benefits developing countries; Article XXIV of the GATT

agreed to in 1947, subsequently revised in 1994 that covers the trade in goods; and the General Agreement on Trade in Services (GATS) Article V which covers trade in services. By December 2022, there were 356 FTAs. The economic theories that underpin the study of international trade include the Ricardian model, the Heckscher-Ohlin model, and the gravity model. International trade is governed by the Most Favoured Nation principle, which means that countries offer the same trading terms to all trading partners. Regarding FTAs, countries must offer the same terms to countries outside of the FTA if that third country does substantial business with one of the countries in the FTA. The FTA member unilaterally decides on the trade terms for countries not part of the FTA.

Studies on FTAs have been done using the gravity model, the global trade analysis project (GTAP) model, and nonparametric statistics. Some studies, such as (Baier & Bergstrand, Economic determinants of free trade agreements, 2004), have shown the benefits of FTAs to economies, while other authors, such as (Bhagwati, 2008), see these FTAs as termites to free trade, eating away at the benefits of multilateral trade. Research conducted by (Limao, 2006) and (Karacaovali & Limao, 2008) on the United States and the European Union suggests that regionalism hinders liberalization and should be viewed as an obstacle to achieving global free trade. (Rodrik, 2018) research has shown the rising complexity of FTAs to include non-trade issues. The increase in FTAs creates a gap in knowledge of the impact of these FTAs, notably since these FTAs are registered with the WTO. To answer the research question ‘What is the impact of FTAs?’, the null hypothesis- Free trade areas (FTAs) allowed by the rules-based WTO

benefit all countries in the global economy is tested using the nonparametric Kruskal-Wallis test.

This research paper adds to the literature because it is the first to analyze all FTAs to identify if these FTAs can benefit all economies globally based on their key features. The findings of this research serve as a diagnostic of the impact of FTA. They can lead to additional research on the reform of the WTO so that global trade benefits all countries. The research starts with a literature review, then describes the data and methodology, followed by a discussion of the data analysis and research findings.

Review of the Literature

International Trade Theory

The international trade theory examines the principles and models for the cross-border exchange of goods and services. Multiple theoretical frameworks exist that explain international trade. These include the Ricardian model, the Heckscher-Ohlin model, and the log-linear gravity model. According to Krugman, Obstfeld, and Melitz (2018), the log-linear gravity model posits that countries engage in trade based on factors such as the trading partner's high GDP, geographical proximity between countries, or a combination of both. However, cultural connections are also recognized as additional motivations for trade participation. As an illustration, it can be observed that Indian immigrants residing in the United Kingdom often import goods from India to the United Kingdom, thus fostering the expansion of economic connections between the two countries (Krugman, Obstfeld, & Melitz, 2018)).

The World Trade Organisation (WTO) and the Concept of Free Trade

Bhagwati (2008) notes that Cordell Hull, United States Secretary of State from 1933 to 1944, bestowed with the Nobel Peace Prize in 1945, said unrestricted trade achieved global harmony and economic well-being. Keynes and other economists from the United Kingdom who were involved in the trade negotiations with the United States had reached a consensus on the importance of adhering to the Cordell-Hull perspective. According to Bhagwati (2008), this perspective emphasized the crucial role of nondiscrimination as a fundamental value that should be upheld in the envisioned framework for international trade. Consequently, the principle of nondiscrimination was incorporated into the General Agreement on Tariffs and Trade (GATT), ratified in 1947 by a coalition of 23 countries. The establishment of the World Trade Organisation (WTO) in 1995 resulted from eight negotiation rounds inside the General Agreement on Tariffs and Trade (GATT). The World Trade Organisation (WTO) comprises 160 member countries (Bhagwati, 2008).

However, world trade is under threat from various sources. First, James (2018) posits that the WTO dispute settlement body needs to be fixed because the United States has, for the past two years, prevented the appointment of judges to the WTO Appellate Tribunal (James, 2018). Further, Miles (2018) emphasized that the Appellate Tribunal is the mechanism through which WTO members can settle trade disputes. In 2007, the United States lost the case brought by Antigua to the WTO Appellate Tribunal. The case was about the US refusal to allow Antigua-licenced online gambling operators to access

the US market. The Tribunal ordered the US to pay Antigua and Barbuda US\$21 million annually until the block is removed. The US must still act on the judgment (Miles, 2018).

Furthermore, world trade is declining due to the on-shoring of production. Previously outsourced production is returning to home countries because of China's robotization of cheap labor and shortening supply chains. The 2017 Global Trade Alert Statistics report shows a rise in harmful trade protectionism since 2008, despite a brief fall in protectionism in 2017 in response to the US "America First" policies. The products most affected by trade protectionism are products made of iron and steel, other fabricated metals, motor vehicles, trailers and semi-trailer parts, and cereal (James, 2018) (Global Trade Alert, 2022).

Despite recent developments, large-scale trade wars and pre-1947 trade protectionism are unlikely. The threat of a trade war loomed in 2019 when the US imposed a 25 percent tariff on US\$200 billion in Chinese imports. This development was followed by US hostility towards Chinese companies such as Huawei. As a result, Huawei was banned from purchasing from US companies. Herrero (2019) reported that China retaliated by increasing tariffs on US\$60 billion of US imports (Herrero, 2019). Expanded protectionism and trade wars are unlikely for several reasons. First, James (2018) notes that the cost to countries such as the US is very high. Second, cheaper products imported from overseas are better for the poorer segments of the population in industrialized countries. Third, one of the hallmarks of the modern economy is the ability to move goods. It would be difficult to remove this ability through trade protectionism and wars. In addition, job losses due to trade are unlikely to reverse. Fourth, services

continue to be mainly domestic, except for tourism services that are traded internationally (James, 2018).

Most-Favoured-Nation Principle (MFN) and Special and Differential Treatment (SDT)

The WTO (2023) notes that MFN covers all trade, while the SDT covers trade between developing countries. The MFN principle has been part of world trade since 1940 and the beginning of the GATT negotiations. The principle means that if one country grants access to a country's market through negotiations, the new access should automatically be applied to other countries. Through this principle, all countries benefit without additional negotiations. Under GATS, countries can obtain MFN exemptions for a maximum of ten years based on a country-specific list submitted when joining the WTO (World Trade Organization, 2023). The SDT, agreed in the 2001 Doha Declaration, allows developing countries to implement their WTO commitments for extended periods. The extended period would allow these countries to benefit from increased trading opportunities and develop their trade infrastructure. The SDT is, however, subject to reviews (World Trade Organization, 2023).

The EU-ACP preferential trade

According to McQueen (1999), the Lome convention signed in 1973 between the European Union and 71 African Caribbean and Pacific (ACP) countries gave the ACP countries nonreciprocal trade access to the EU. That is, while ACP products, including bananas and sugar, could enter the EU market duty-free, the same was not applied to EU products entering the ACP region (McQueen 1999). The Cotonou agreement signed in 2000 between the EU and 77 ACP countries replaced the Lome convention and expired

in June 2023 (European Parliament 2023). Nevertheless, the termination of trade preferences, according to Goodison (2007), can be attributed to various factors, including the reform of the European Union's Common Agricultural Policy, the implementation of the Everything-But-Arms initiative for Least Developed Countries, modifications to the Generalised System of Preferences, the negotiation of bilateral trade agreements by the EU, the adoption of multilateral agreements aimed at reducing tariffs, and the rulings of the World Trade Organisation's dispute settlement mechanism. According to Goodison (2007), the end of trade preferences reduced the amount of trade between the EU and the ACP countries. For example, St Lucia's banana exports to the EU were 106,670 tonnes in 1996 before the erosion of the trade preferences. In 2005, banana exports to the EU amounted to 28,243 tonnes, indicating a significant decline due to erosion of trade preferences (Goodison, 2007).

The proliferation of free-trade agreements

Muller (2013) argues that the globalization of economies has led to a significant expansion in world trade, resulting in new economic powers and changes in nations' status. Economic growth and globalization require adaptation of regulations, leading to the emergence of FTAs (Muller, 2013). According to Dennis (2006), tariff liberalization is crucial in enhancing the price incentive structure for trade. However, it is now widely acknowledged that implementing other trade-related complementary policies is equally important. These policies encompass various areas, including transport and telecommunication services, customs procedures, port efficiency, standards and technical regulations, and the flexibility of factor markets. The recognition of these policies as

essential components in improving a country's trade performance has grown significantly (Dennis, 2006).

Motives for FTAs include neutralizing "beggar-thy-neighbor" trade policies, increasing market size, enhancing policy predictability, or signaling openness to investors and the political context (Valdés & Tavengwa, 2012). Furthermore, technological progress and increased private sector participation in infrastructure services also contribute to FTA proliferation (Fink & Molinuevo, 2008). According to Urata (2002), multilateral trade agreements through the WTO have become increasingly difficult due to disagreements among countries. As a result, there has been slow progress in the Doha Round trade negotiations. As an alternative, Urata (2002) argued that countries are signing FTAs. Other reasons for rapid expansion include slow progress in multilateral trade liberalization and limited coverage of WTO rules. Many countries realize the benefits of trade liberalization, such as economic growth. However, multilateral trade liberalization has become increasingly difficult due to disagreements among WTO members (Urata, Free trade agreements: A catalyst for Japan's economic revitalization, 2002). Bilateral and regional FTAs have been used since the 1980s to allow countries to reduce trade barriers, open domestic markets, promote new investment standards, enforce intellectual property, and enable the digital economy (Bay Area Council Economic Institute, 2017). Although FTA trade diversion can adversely affect non-members, FTA members benefit from improved terms of trade, trade creation, market expansion, and trade promotion (Urata, Japan's FTA strategy and free trade area of Asia Pacific (FTAAP), 2007).

According to the WTO database (2023), in January 2023, 356 RTAs were in force. Of these, 323 are under General Agreement on Tariffs and Trade 1947 (GATT) Article XXIV, 196 are under General Agreement on Trade and Services (GATS) Article V, and 63 are under the WTO Enabling Clause. The Enabling Clause is the WTO legal basis for the Generalized System of Preferences (GSP). In the GSP, WTO (2023) noted that developed countries offer nonreciprocal preferential treatment (such as zero or low duties on imports) to products originating in developing countries." GATT Article XXIV refers to creating customs unions and free trade areas. GATS Article V on economic integration does not prevent WTO members from entering agreements that liberalize trade (World Trade Organization, 2023).

In the view of Jagdish Bhagwati, FTAs undermine free trade. (Bhagwati, 2008) refers to FTAs as the 'termites' of free trade and the proliferation of FTAs as a pandemic. Since FTAs are for members only, it can be seen as discriminatory, mainly since trade is diverted from non-member sources to often more expensive member sources. Furthermore, the proliferation of FTAs has led to multiple preferences for a particular commodity. Although FTAs have been thriving, the multilateral trade process through the Doha round has slowed. FTAs are a systemic threat to the principle of nondiscrimination in world trade, leading to preferential trade that excludes other countries. The smaller, weaker nations within the FTAs bow to the lobbies of powerful hegemonic nations such as the USA (Bhagwati, 2008). Lobbies can include trade unions seeking to raise the production costs of rival firms, financiers seeking capital controls, and firms seeking more robust patent protection (United Nations Economic and Social

Commission for Asia and the Pacific, 2008). Many countries are pursuing FTAs, mistakenly believing that it is free trade. FTAs threaten the principle of nondiscrimination in international trade. For example, due to the EU common market (that includes an FTA), the EU only provides MFN tariffs to six countries: Australia, New Zealand, Canada, Japan, Taiwan Province of China, and the United States (Bhagwati, 2008).

Over the years, FTAs have become more extended and more profound. (Rodrik, 2018) notes these changes when he compared the 1985 US trade agreement with Israel with the US FTA with Singapore, signed in 2004. The 1985 agreement was devoted to trade issues such as tariffs and had less than 8000 words and only three annexes. In contrast, the 2004 FTA had 20 chapters of approximately 70,000 words, over a dozen annexes, and multiple side letters. Seven of the 20 chapters in the 2004 agreement cover trade topics, while the other 13 cover nontariff issues (Rodrik, 2018).

According to the World Bank database (2023), there has been a notable increase in the depth of trade agreements in recent years. The Free Trade Agreements (FTAs), according to Blanga-Gubbay, Conconi, Kim, and Parenti (2021), encompass various trade policy matters, such as export limitations, regulations on product origin, measures to streamline trade processes and customs procedures, and mechanisms for addressing trade disputes. Nevertheless, it is essential to note that free trade agreements (FTAs) encompass trade-related and non-trade policies. The policies encompassed in this list, according to Blanga-Gubbay, Conconi, Kim, and Parenti (2021), consist of Intellectual Property Rights, Technical Barriers to Trade, Public Procurement, Subsidies, Services

Investment, Sanitary and Phytosanitary Measures, Movement Capital, Visa and Asylum, State Owned Enterprises, Competition Policy, Environmental Laws, and Labour Market Regulations (Blanga-Gubbay, Conconi, Kim, & Parenti, 2021).

Several studies have found the contagion effect of FTAs; that is, after an FTA has been formed between two or more countries, other countries are likely to form FTAs, and countries in existing FTAs are likely to agree to more FTAs. (Baier & Bergstrand, Economic determinants of free trade agreements, 2004) found that the welfare gains for two countries having an FTA were positively related to the two countries' economic zones and GDP and relative capital-labor ratio. (Egger & Larch, 2008) Found that the existence of FTAs between countries *k* and *l* increases the likelihood that countries *i* and *j* would form or join an FTA (Chen & Joshi, 2010). Furthermore, (Baldwin & Jaimovich, 2012) also found that countries 'i' and 'j' would form an FTA within five years. (Baier, Bergstrand, & Mariutto, Economic determinants of free trade agreements revisited: Distinguishing sources of interdependence, 2014). (Kohl, 2014) found that the assumption that trade agreements bring about trade liberalization is overstated. It was modest even when allowing for a significant amount of time for the agreement to be phased in. Significant variation is found in the effectiveness of individual trade agreements. Variation can be attributed to agreement-specific characteristics such as the year of enforcement, the number of countries in the agreement, and the status of the WTO membership (Kohl, 2014).

The African Free Trade Area (AfCFTA)

The African Continental Free Trade Area (AfCFTA), according to AfCFTA (2023), encompasses many African Union member states, precisely 55 countries, and includes eight Regional Economic Communities. The primary objective of this initiative is to establish a unified market encompassing an extensive population of 1.3 billion individuals and a collective gross domestic product (GDP) amounting to approximately US\$3.4 trillion. The African Continental Free Trade Area (AfCFTA), according to AfCFTA (2023), is an integral component of Agenda 2063, representing the African Union's comprehensive and enduring development strategy to propel Africa towards becoming a prominent global force. The primary objective is to eliminate trade barriers and enhance intra-Africa trade, explicitly focusing on the manufacturing and services sectors. The African Continental Free Trade Area (AfCFTA) is expected to facilitate the development of regional value chains, thereby promoting investment opportunities and job creation. AfCFTA (2023) notes that the practical application of this initiative holds promise for promoting industrialization, generating employment opportunities, and attracting investments, thereby bolstering Africa's competitiveness in the medium to long run. The African Continental Free Trade Area (AfCFTA) has yet to be included in the World Trade Organization's Free Trade Agreement (FTA) database. As of April 2023, the AfCFTA Agreement has been signed by all 54 member states of the African Union (The African Free Trade Area , 2023).

According to AfCFTA (2023), the primary objective of the African Continental Free Trade Area (AfCFTA) is to facilitate the creation of a unified market within Africa,

foster economic integration, and align with the overarching Pan-African Vision outlined in Agenda 2063, which envisions a harmonized, prosperous, and tranquil Africa. This objective can be accomplished through the process of negotiations, the movement of capital and natural persons, as well as investments. The proposed plan establishes the groundwork for a Continental Customs Union, intending to foster sustainable socio-economic development, promote gender equality, and facilitate structural transformation. The proposed measure is expected to bolster the economic competitiveness of state parties and facilitate the advancement of industrial and agricultural sectors, thereby contributing to the promotion of food security. The AfCFTA (2023) concludes that the plan additionally acknowledges the complexities associated with multiple and overlapping memberships, thereby facilitating the acceleration of regional and continental integration endeavors. The initial stage of executing the agreement centers on facilitating trade in goods, trade in services, and establishing a mechanism for resolving disputes. The project's subsequent stage emphasizes various aspects, including investment, intellectual property rights, competition policy, digital trade, and the involvement of women and youth in trade (The African Free Trade Area , 2023).

The African Continental Free Trade Area (AfCFTA) presents a substantial prospect for fostering inclusive economic growth, promoting development, and mitigating poverty. According to the World Bank (2020), the complete implementation of the African Continental Free Trade Area (AfCFTA) will result in enhanced regional trade, reduced trade expenses, and improved border processes. This agreement will enable African nations to enhance their ability to withstand forthcoming economic

disruptions and promote fundamental reforms essential for sustained economic expansion. The African Continental Free Trade Area (AfCFTA) is anticipated to foster a rise in intra-African trade, particularly in the agricultural sector. Eliminating tariffs under the AfCFTA could lead to a substantial 574 percent increase in intra-African agricultural trade by 2030 (World Bank, 2020). Implementing the African Continental Free Trade Area (AfCFTA) is expected to enhance intra-African pharmaceutical trade. Presently, intra-African trade in this sector remains notably low, with only 3 percent of the demand fulfilled through intra-African trade. Consequently, the AfCFTA has the potential to bolster the resilience of health supply chains (World Economic Forum, 2023).

The World Economic Forum (2023) notes that the enhancement of transport and logistics infrastructure will play a pivotal role in facilitating the expansion of trade in goods, particularly in light of the anticipated growth in intra-African trade. The projected impact of the African Continental Free Trade Area (AfCFTA) is expected to result in a 28 percent increase in demand for intra-African trade. The AfCFTA presents potential business prospects in various sectors; however, companies must comprehend the implications of the evolving trade agreement on their strategic approaches to achieve success in the region. The World Economic Forum (2023) notes that Public-private initiatives, operational tools, and illustrative case studies provide valuable insights into the support mechanisms available to companies in developing effective strategies for navigating the future landscape of the African Continental Free Trade Area (AfCFTA) (World Economic Forum, 2023).

Regionalism, multilateralism, and Trade

According to Pomfret (2020), the World Trade Organization (WTO) has been engaged in a complex examination of the tension between regionalism and multilateralism in response to the significant increase in Free Trade Agreements (FTAs). The extent of regionalism can be assessed by examining the volume of trade facilitated through Free Trade Agreements (FTAs). The Regional Comprehensive Economic Partnership (RCEP) and the Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP) are megaregional agreements that exhibit loose geographical definitions and attract countries with similar interests as they seek to establish terms that go beyond the World Trade Organization (WTO) commitments. Following the withdrawal of the United Kingdom from the European Union in 2020, the UK promptly sought to negotiate agreements with non-EU countries to maintain consistency with the pre-existing agreements established by the EU. According to Pomfret (2020), the UK wanted to consider joining the Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP). Following the declaration by the United States of America regarding its decision to abstain from ratifying the Trans-Pacific Partnership (TPP), the remaining eleven member nations of the TPP reached a consensus in May 2017 to engage in a process of renegotiation. The Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP) is characterized as a "living agreement" due to its inclusion of an accession clause, which facilitates the attraction of new members. The Republic of Korea, Indonesia, the Philippines, Taiwan, and Thailand have all expressed their interest in becoming members (Pomfret, 2020).

Pomfret (2020) notes that the Regional Comprehensive Economic Partnership (RCEP) is a trade agreement established between the ten member countries of the Association of Southeast Asian Nations (ASEAN) and six partner nations. Including twenty chapters in the agreement surpassed the scope of the existing trade agreements between ASEAN and its partners. These chapters encompassed various areas, such as investment, intellectual property rights, competition, trade remedies, standards, e-commerce, and dispute settlement (Pomfret, 2020).

Pomfret (2020) notes that the agreement among the remaining countries was reached in November 2019 following India's withdrawal. On the 15th of November 2020, the agreement was signed by the remaining fifteen countries during a virtual summit that Vietnam hosted. The Regional Comprehensive Economic Partnership (RCEP) agreement, while not as comprehensive as the Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP), was primarily initiated by the Association of Southeast Asian Nations (ASEAN) to harmonize divergent regulations found within ASEAN's existing bilateral agreements with the remaining six participating nations. China could encounter opposition from current members of the Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP) due to the difficulties presented by five specific chapters within the agreement. According to Pomfret (2020), these chapters pertain to ensuring fair competition for state-owned and state-controlled enterprises, safeguarding intellectual property rights, establishing regulations for foreign investors, addressing issues related to e-commerce and data transfer, and upholding labor rights. The United States-Mexico-Canada Agreement (USMCA) contains a provision stipulating

that if Canada and Mexico express interest in becoming members of the Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP), they would be required to withdraw from the USMCA (Pomfret, 2020).

When a developing country becomes a member of a Free Trade Agreement (FTA), it can anticipate that its existing level of liberalization will be effectively safeguarded, limiting the capacity of future governments to exert significant influence over subsequent modifications, according to Schott (1997). In addition, it is possible to anticipate a higher level of liberalization compared to a scenario where only one party takes action, considering factors such as trade diversion and reciprocity. A Free Trade Agreement (FTA) can establish trade liberalization in a manner that is resistant to reversal and entails a heightened level of liberalization. Trade liberalization encompasses three primary forms: unilateral, multilateral, and regional liberalization (Schott, 1997):

- The process of unilateral liberalization confers advantages upon the nation, with most of its populace reaping benefits, albeit with the possibility of specific individuals experiencing temporary setbacks. The adjustment of exchange rates maintains external equilibrium, while unilateral liberalization policies do not overtly favor specific foreign suppliers, thereby avoiding trade diversion (Schott, 1997).
- Multilateral liberalization refers to the process wherein the liberalization efforts of other nations complement a country's efforts. This collaborative approach facilitates the opening of export markets for the country in question, thereby enhancing its terms of trade compared to the unilateral alternative. The phenomenon being observed in this context is known as the reciprocity effect. A nation experiences advantages when a

certain level of liberalization is linked with corresponding liberalization by its trading counterparts, increasing their imports from the country (Schott, 1997).

- Regional liberalization, encompassing bilateral Free Trade Agreements (FTAs), applies explicitly to imports originating solely from the regional context, namely the United States. The overall consequences of liberalization encompass the influx of imports, resulting in the customary beneficiaries and those who experience disadvantages. Nevertheless, in this particular scenario, the liberalization process is only partial, resulting in discriminatory outcomes that give rise to trade diversion effects. (Schott, 1997).

A Free Trade Agreement (FTA), according to Schott (197), has the potential to establish a lasting framework for trade liberalization due to its inherent difficulty in reverse and its capacity to facilitate a higher level of liberalization. A Free Trade Agreement (FTA) offers mutual exchange and is highly advantageous in the presence of trade impediments. Due to its discriminatory characteristics, trade diversion is a notable drawback of a Free Trade Agreement (FTA). For instance, when a country like Mexico imposes tariffs on imports from Japan while eliminating tariffs on imports from the United States, it diverges trade. Three distinct types of trade diversion can be identified: Vinerian trade diversion, trade contraction, and trade deflection, which are significant in international trade. (Schott, 1997):

- Vinerian trade diversion occurs when a country's external tariff remains unchanged when it joins the FTA, leading to some diversion of imports from Japan to the United States, for example (Schott, 1997).

- Trade contraction occurs if the external tariff level is raised due to the establishment of the FTA, causing imports from Japan to decline even more than they would when there is only a Vinerian trade diversion. The tariff does not have to be the same in the FTA, nor does the tariff imposed on Japanese goods be the same as the tariff for US goods; for example, countries in an FTA can choose the tariff to impose on trading partners outside the FTA (Schott, 1997).

- Schott (1997) notes that trade deflection refers to the phenomenon wherein goods originating from Japan are imported into the United States by way of Mexico, resulting in superfluous transportation expenses and undermining the intended objectives of protectionist measures implemented by the United States. The conventional approach to address this inherent issue of free trade agreements (FTA) involves implementing "rules of origin" for intra-FTA trade. However, this solution presents several technical challenges, including determining the appropriate ratio of domestic components that would be deemed acceptable. Assuming that rules of origin lack efficacy and trade deflection indeed occurs. In such circumstances, Schott (1997) notes that it can be observed that nations with high tariffs or other import restrictions against non-Free Trade Agreement (FTA) members will witness the circumvention of these tariffs, thereby creating a motivation to decrease them. One potential resolution to mitigate the complexities would be to transform the Free Trade Agreement (FTA) into a customs union, encompassing a shared external tariff and potentially additional shared limitations, such as anti-dumping measures. (Schott, 1997).

Schott (1997) concludes that regionalism can be seen as a multilateralism's supplement, alternative, or path toward it. The official US position is that it is a supplement. From the EU's actions regarding relenting on agriculture subsidies in the WTO negotiations and the proliferation of EU FTAs, one can surmise that the EU sees regionalism as an alternative to multilateralism. Schott (1997) notes that multilateral liberalization is preferable over regional liberalization, especially for developing countries with weaker domestic pressure groups. While regionalism may supplement a rules-based international trading system, pursuing regionalism should not slow down the strengthening of the multilateral system (Schott, 1997). The 'spaghetti bowl' of tariffs could lead to multilateral agreements on trade as countries seek to unbound complex FTAs such as the agreements signed by ASEAN countries (Baldwin R. , 2006).

Herrero (2019) notes that the functionality of the World Trade Organization (WTO) has notably declined, particularly within President Trump's tenure. Three primary reasons can be discerned: The rise in membership has resulted in more significant heterogeneity, as an increasing number of emerging countries have joined the organization. Notably, China and Vietnam, still characterized by state-led planned economies, have become new members. The United States has chosen to disengage from the World Trade Organization (WTO) to address its perceived trade issues. According to Herrero (2019), these disengagements are evident in the US's refusal to reappoint members to the WTO's appeals panel, resulting in a diminished panel size of three out of the original seven members (Herrero, 2019).

Consequently, Herrero (2019) notes that the WTO's dispute settlement mechanism needs to be fixed. China has significantly influenced the establishment of rules within the World Trade Organization (WTO), particularly in adopting a non-market measure that enables countries with state-controlled economies, such as China, to become members of the WTO. Numerous suggestions have been put forth regarding reforming the World Trade Organization (WTO), including proposals from the European Union. However, it is worth noting that these proposals have yet to effectively address the inclusion of China and the United States within the same framework (Herrero, 2019).

According to Hofmann, Osnago, and Ruta (2017), deep trade agreements increase trade more than shallow ones. The deepening of trade agreements is also related to the internationalization of production. Deep FTAs have 52 policy areas, 14 of which are WTO+, that confirm commitments made at the multilateral level in the WTO, and four additional areas: competition policy, intellectual property, movement of capital, and investment. The 18 areas are referred to as the core FTA provisions. According to Hofmann, Osnago, and Ruta (2017), the remaining provisions in FTAs, WTO-X provisions, still need to be agreed to in the WTO. The tables below explain these FTA provisions and the FTAs that have included the core provisions. As the table indicates, all FTAs include industrial provisions, and 99.6 include agricultural provisions (Hofmann, Osnago, & Ruta, 2017).

Table 22 *Provisions in FTAs*

WTO+		WTO-X	
· Tariffs Industrial goods	· Anti-corruption	· Financial assistance	
· Tariffs agricultural goods	· Competition policy	· Health	
· Customs administration	· Environmental laws	· Human Rights	
· Export taxes	· IPR	· Illegal immigration	
· SPS measures	· Investment measures	· Illicit drugs	
· State trading enterprises	· Labor market regulation	· Industrial cooperation	
· TBT measures	· Movement of capital	· Information Society	
· Countervailing measures	· Consumer protection	· Mining	
· Anti-dumping	· Data protection	· Money laundering	
· State aid	· Agriculture	· Nuclear safety	
· Public procurement	· Approximation of legislation	· Political dialogue	
· TRIMS measures	· Audiovisual	· Public Administration	
· GATS	· Civil protection	· Regional cooperation	
· TRIPS	· Innovation policies	· Research and technology	
	· Cultural cooperation	· SMEs	
	· Economic policy dialogue	· Social Matters	
	· Education and training	· Statistics	
	· Energy	· Taxation	
		· Terrorism	
		· Visa and asylum	

Source: (Hofmann, Osnago, & Ruta, 2017)

Table 23 *Core provisions included in FTAs*

Core Provision	2017	
	Included in FTAs	Legally enforceable (percent of FTAs)
FTA industrial	100	98.6
FTA agriculture	99.6	98.2
Customs	90.4	81.8
Export taxes	78.6	76.4
Anti-dumping	75.7	67.9
Competition policy	74.6	66.1
Technical Barriers to Trade (TBT)	70.4	54.3
Sanitary and phytosanitary (SPS)	66.8	52.5
State aid	65.7	57.9
General Agreement on Trade in Services (GATS)	65	50.7
Countervailing measures (CVM)	63.9	58.2
Trade-Related Aspects of Intellectual Property Rights (TRIPS)	57.1	55.4
Public procurement	56.4	42.9
Investment	55	38.9
Movement of capital	53.9	50.4
State trading enterprises	52.5	49.3
Intellectual Property Rights (IPR)	47.5	39.6
Trade-Related Investment Measures (TRIMS)	32.5	31.1

Source: (Hofmann, Osnago, & Ruta, 2017)

Gravity, GTAP, and other models for studying FTAs

Ornelas (2005) used an oligopolistic-political-economy model to examine preferential arrangements in FTAs. These FTAs involve participating countries mutually

eliminating tariffs on each other while independently setting tariffs against non-participating countries. The analysis revealed that establishing FTAs leads to a reduction in external tariffs. Furthermore, Ornelas (2005) notes that even countries not members of the FTA experience positive outcomes from the agreement. Free trade agreements (FTAs) should be regarded as advantageous for the global trading system, as governments endorse such arrangements solely when they enhance national welfare, thereby offsetting the reduced contributions made by governments. Lowering external tariffs leads to trade creation, which generates positive net gains for countries not members of the trading bloc (Ornelas, 2005).

Moreover, Ornelas (2005) argued that establishing a Free Trade Agreement (FTA) is advantageous for all participating nations, as governments driven by political motivations tend to support only those FTAs deemed beneficial for the overall welfare of their respective countries. The potential ramifications of Free Trade Agreements (FTAs) should be regarded as relatively harmless arrangements. However, they possess the capacity to jeopardize the integrity of the global trading system by compromising the sustainability of a multilateral free trade agreement (Ornelas, 2005).

Hannan (2016) applied synthetic control methods, an econometric technique commonly employed in comparative studies, to show that trade agreements have the potential to yield significant benefits. Specifically, Hannan's (2016) research findings indicate an average export increase of 80 percentage points for ten years. The annual export increase experiences a notable rise of 3.8 percentage points as a direct consequence of trade agreements. Moreover, emerging markets stand to benefit

significantly from trade agreements with advanced markets, as the potential gains in trade can be considerably higher. Significant gains in trade can be observed after addressing endogeneity concerns, with even more excellent outcomes when accounting for the anticipation effect. The magnitude of trade gains is contingent upon the income groups of the nations engaged in the trade (Hannan, 2016).

Antimiani, Mitaritonna, Salvatici, and Santuccio (2009) utilize the Global Trade Analysis Project (GTAP) model for the evaluation of potential trade agreements between the European Union (EU) and Asian nations revealed that regional trade agreements have the potential to increase tariffs as a result of non-cooperative actions. Additionally, such regional arrangements can foster a greater understanding of the interconnectedness between trading partners. The findings indicate that the proposed Free Trade Agreement (FTA) between the European Union (EU) and the Association of Southeast Asian Nations (ASEAN) would yield advantages for both parties. Notably, the EU stands to gain a larger share of benefits, amounting to approximately 70 percent. Antimiani, Mitaritonna, Salvatici, and Santuccio (2009) note that conversely, the ASEAN nations would primarily benefit from improved terms of trade, as the rise in export prices would offset the corresponding increase in import prices. The European Union (EU) is primarily advantaged by efficiency gains, given that the magnitude of such gains is considerably smaller in the context of the Association of Southeast Asian Nations (ASEAN) (Antimiani, Mitaritonna, Salvatici, & Santuccio, 2009).

Jung (2012) used the dynamic specification of the gravity equation, which augments the standard textbook gravity framework with an invisible trade-promoting

asset and is based on accumulating a country-pair-specific, invisible trade-promoting asset such as mutual knowledge of trading partners or trust between them. This dynamic gravity equation empirically disentangles the pro-trade effect of FTAs. The Jung (2012) study found that an FTA increases bilateral trade by approximately 35 percent on immediate impact and doubles it in the long run (Jung, 2012). The research by Roy (2010) found that the Customs Union (CU), not FTAs, is responsible for significantly greater bilateral trade volumes than FTA members. CUs promote more bilateral trade than FTAs (Roy, 2010). Japan has obtained substantial benefits from its trade agreement with Mexico, and Mexico has gained most of its imports from Japan, according to Urata (2007). The economic impacts of FTAs on the Japanese economy can be classified into static effects – trade creation and diversion- and dynamic effects, such as market expansion and competition promotion. ((Urata, Japan’s FTA strategy and free trade area of Asia Pacific (FTAAP), 2007).

As regional groupings increase, FTAs have grown over the past two decades. According to Foster-McGregor, Pöschl, and Stehrer (2010), studies using panel models with fixed effects and Heckman control functions account for endogeneity found evidence of FTAs' trade-creating effects, increasing the volume and variety of traded goods. Trade creation is significant in smaller exporters and for smaller country pairs. The Foster-McGregor, Pöschl, and Stehrer (2010) study also found a 97 percent increase in exports following forming an FTA with more prominent exporters. The probability of an FTA is higher the more significant and similar the trading partners (Foster-McGregor , Pöschl, & Stehrer, 2010).

The (Caporale, Rault, Sova, & Sova, 2008) study employed the gravity model to analyze the impacts of the association agreement between the Central and Eastern European countries (CEEC-4), namely Bulgaria, Hungary, Poland, and Romania, and the EU-15 before the CEEC-4 countries became part of the EU. The (Caporale, Rault, Sova, & Sova, 2008) research revealed that the countries belonging to the CEEC-4 with an association agreement experienced a 14.0 percent increase in trade with the European Union compared to countries without such an agreement.

Their study (Baier & Bergstrand, Economic determinants of free trade agreements, 2004) employed a general equilibrium monopolistic competition model inspired by Krugman to demonstrate that the net economic welfare benefits of an FTA between two countries were positively associated with several factors. These factors included the economic sizes of the two countries, the similarity of their GDPs, their proximity to each other, their joint remoteness from the rest of the world, and their relative capital-labor ratios (Baier & Bergstrand, Economic determinants of free trade agreements, 2004).

Simulations done by (Dennis, 2006) using version 6 of GTAP to assess the effects of FTAs on subregions within the Middle East and North Africa (MENA) region revealed a discernible increase in regional income ranging from 0.1 percent to 0.21 percent, indicating an increase in real GDP across all subregions of the MENA, with Tunisia seeing the most notable growth. The rise in GDP can be ascribed to increased economic activity and the positive impacts on factor markets. According to (Dennis, 2006), trade agreements between the MENA region and the EU can increase welfare advantages for

MENA countries. A phase-in period in FTAs can increase cross-border trade by 30-50 percent (Dennis, 2006). The effectiveness of economic integration agreements (EIAs), according to Kohl (2014), is enhanced when all participating members are also the World Trade Organisation (WTO) members. However, the absence of any EIA member from the WTO undermines the efficacy of such agreements (Kohl, 2014). According to (Kohl, 2014), EIAs are a consequence rather than a catalyst for increased cross-border engagement.

According to (Yao, Yasmeen, Li, Hafeez, & Padda, 2019), the effects of FTAs on the environment still need to be more conclusive. Proponents assert a competitive advantage in mitigating pollution by using environmentally sustainable technologies and producing green goods. In contrast, opponents contend that free trade poses risks to the environment. The pollution haven hypothesis posits that developing countries may see an increase in pollution levels after implementing an FTA due to relaxed environmental regulations in developing countries. Free-trade advocates contend that international trade reduces environmental pollution by promoting environmentally sustainable technologies and producing environmentally friendly goods. However, some contend that implementing free trade poses environmental risks, asserting that low-income countries should adopt more stringent regulations to improve their production processes (Yao, Yasmeen, Li, Hafeez, & Padda, 2019).

The study conducted (Valdés & Tavengwa, 2012) found that FTAs contain provisions on intellectual property mainly concentrated around certain countries and trading blocs, such as the EU, the US, Chile, Japan, and Mexico (Valdés & Tavengwa,

2012). The Australia-US FTA includes intellectual property, so the FTA governs all issues on intellectual property in Australia (Tully, 2016). Research conducted by (Limao, 2006) and (Karacaovali & Limao, 2008) on the United States FTAs and the European Union FTAs suggests that regionalism can hinder global free trade because MFN tariffs would have been lower by 1.5 percent, and the USA tariffs on goods traded under FTAs would have been 33 percent less.

Advanced-Economies FTAs

Trade negotiations accelerated after the enactment of the Trade Promotion Authority in August 2002 (Cooper, 2014). The Trade Promotion Authority (TPA) is a US constitutional authority that empowers the US Congress to enact tariffs and establish regulations about trade countries. The presence of established authorities and procedures serves to communicate to trade partners that trade agreements, which the President has negotiated, will be executed or subjected to a vote. The most recent TPA, TPA-2015, expired in July 2021 (Congressional Research Service, 2022). Congress has implemented most US free trade agreements (FTAs) under TPA statutes, most recently using TPA-2015 to approve and implement the U.S.-Mexico-Canada Agreement (USMCA). The current US government has yet to ask Congress for a new TPA, raising concerns over the input and role of Congress in new trade initiatives. Critical issues for Congress include types of agreements, negotiating objectives, consultation and notification, and implementing legislation. (Congressional Research Service, 2022).

Cooper (2014) states that the United States has successfully implemented bilateral and regional FTAs with several trading partners, such as Israel, Canada, and Mexico. The

involvement of the United States in FTAs is contingent on the approval of Congress. FTAs have a discernible influence on the United States economy, with differential effects across various sectors. FTAs raise significant policy concerns, including how much they advance or hinder the United States' long-term national interests and trade policy goals. Additionally, Cooper (2014) notes that it is necessary to determine the most suitable FTA arrangement that aligns with US national interests, establish criteria for selecting FTA partners, and assess whether FTAs should be viewed as a replacement for or a supplement to US commitments and interests in fostering a multilateral trading system through the WTO (Cooper, 2014).

The Bay Area Council Economic Institute (2017) posits that the United States has negotiated FTAs to promote its interests and establish alignment with its negotiating counterparts. The United States has benefitted from these FTAs through a rise in trade surpluses or a decrease in trade deficits with partner countries by 59 percent (US\$87.5 billion) in 2015. Additionally, these FTAs have resulted in substantial tariff savings of up to US\$13.4 billion in 2014. Manufacturing imports and exports have increased, with manufacturers in the United States recording a surplus of US\$12.7 billion in the trade of manufactured goods with FTA partners in 2015 (Bay Area Council Economic Institute 2017). Urata (2002) states that the 2002 Japan-Singapore Economic Partnership Agreement liberalized and facilitated trade and FDI. In addition, the countries agreed to economic and technical cooperation in various areas, including human resources, ICT, small and medium enterprises, and tourism (Urata, Free trade agreements: A catalyst for Japan's economic revitalization, 2002).

(Barrios, 2016) notes that the primary objective of the European Union and Mexico FTA is to improve Mexican exports to the European Union thus mitigating reliance on the United States regarding commercial activities. The agreement encompasses several aspects: market access, technical standards, sanitary and phytosanitary measures, rules of origin, safeguards, investments, and associated financial transactions. The free trade deal struck by Mexico bestows unique advantages upon the European Union that have not been extended to any other trading partner. During the period spanning from 1999 to 2010, there was a notable increase of 165 percent in Mexico's exports to the European Union. Barrios (2016) found that the European Union imports to Mexico simultaneously reached a value of Euros28 million. The European Union and Mexico FTA have established a framework that facilitates FDI between companies and investors from both regions without imposing specific performance obligations or offering incentives. The EU countries that have invested in Mexico include Spain, Belgium, the Netherlands, and Germany. European investments flow predominantly into several industries, including services, trade, construction, transport and communications, agriculture, and mining (Barrios, 2016).

However, Barrios (2016) notes that the geographical diversification of Mexico's exports remains limited, as there is a significant concentration of exports toward the United States. Most light automobiles exported from Mexico are predominantly directed toward the United States, accounting for approximately 71.2 percent of total exports. According to (Barrios, 2016), the main objective of European Union investments in

Mexico, specifically focusing on the automobile sector, has been strategically targeting the United States market.

The EU trade strategy assesses market potential, safeguards EU export interests, and establishes comparable agreements with rival entities (Muller, 2013). The EU-Korea FTA represented a pioneering milestone in FTAs, as it was the first deal of its kind for the EU with an Asian nation. The study by (Forizs & Nilsson, 2017) employed a computer general equilibrium model for a comparative analysis of the FTA and found a progressive enhancement of their economic ties. The European Union's exports to Korea have exhibited a consistent upward trend, experiencing a notable growth from EUR 32.3 billion in 2011 to EUR 47.3 billion in 2015. From 2011 to 2015, trade between the EU and Korea improved. Specifically, there was an increase of almost EUR 9.1 billion during this period, indicating a significant change from a deficit of EUR 4.0 billion in 2011 to a surplus of EUR 5.1 billion in 2015. From 2011 to 2015, there was significant growth in the value of Korean exports of chemicals and plastics, while specific import sectors within the EU declined. The trade patterns in the two major import sectors of the European Union have exhibited notable advancements since the agreement's implementation (Forizs & Nilsson, 2017).

However, Forizs and Nilsson (2017) observed trends suggest declining Korean exports of chemicals and plastics. The EU-Korea FTA has produced substantial advantages for several sectors within the EU, including machinery, appliances, and transport equipment. The trade balance in mineral goods experienced a shift from a deficit to a surplus, but the sectors of chemicals, plastics, and base metals exhibited a

decline. The EU-Korea FTA has been instrumental in fostering a notable surge in trade, particularly in machinery and appliances (Forizs & Nilsson, 2017).

Membership in the European Economic Area (EEA) is linked to more significant trade volumes than less extensive FTAs, particularly in services trade, according to Van der Marel and Shepherd (2013). The projected long-term consequences of exiting the single market include an approximate 60 percent decline in bilateral trade losses with other EEA countries. The study by Van der Marel and Shepherd (2013) revealed a positive correlation between EU membership and increased levels of bilateral trade. In contrast, the study indicated that less extensive FTAs do not affect trade flows equally. According to Ebel (2016), countries are more inclined to become members of the EEA if they possess geographic proximity while not sharing a shared border, language, or colonial history. The substitution of the United Kingdom's membership in the EEA with a conventional FTA with the remaining EEA countries is projected to result in a drop in goods trade, ranging from 35 percent to 44 percent in the long term. Conversely, if the UK were to replace its EEA membership with no FTA, goods trade would be expected to decline between 58 percent and 65 percent in the long run (Ebell, 2016).

Japan has pursued free trade agreements (FTAs) since the late 1990s due to global trade developments and the increasing importance of regional trade agreements, according to Urata (2007). The Japanese government recognizes FTAs as an option to achieve trade liberalization and expects them to promote Japan's economic growth through business opportunities and domestic policy reforms. The Free Trade Area of Asia Pacific is another example of Japan's FTA strategies, pursuing a multi-track approach to

trade liberalization (Urata, Japan's FTA strategy and free trade area of Asia Pacific (FTAAP), 2007).

Sub-Saharan Africa FTAs

According to McDonald and Walmsley (2003), the EU-Republic of South Africa FTA provides unrestricted entry of the EU into Botswana, Lesotho, Namibia, and Eswatini markets. In contrast, these four countries still need equivalent access to the European Union's markets. The Republic of South Africa (RSA) and the countries of Botswana, Lesotho, Namibia, and Swaziland are participants in the Southern Africa Customs Union (SACU), a customs union that has existed since 1910 and involves the sharing of customs revenues. The EU-Republic of South Africa FTA encompasses a wide range of commodities. However, it encounters significant points of disagreement, notably over the EU's safeguarding measures for specific agriculturally sensitive goods (McDonald & Walmsley, 2003).

Asian Economies FTAs

East Asia's most prominent and wealthiest countries are leading the spread of FTAs. Kawai and Wignaraja (2011) note that the spread of FTAs has sparked concerns about a 'spaghetti bowl' of trade deals, where the same commodity can be subjected to different tariffs and rules of origin for obtaining preferences. This regulation can raise transaction costs for enterprises, particularly SMEs, which may face higher administrative and business costs due to their limited capacity to deal with complex rules. The Asian noodle bowl effect of FTAs has impeded broader regional and global integration. Around 28 percent of firms in six East Asian countries use FTA preferences,

with a more significant proportion of firms in the machinery and automotive industry using FTAs than firms in the food, electronics, textile, and garment industries (Kawai & Wignaraja, Asia's free trade agreements how is business responding?, 2011).

FTAs now dominate East Asia. Mukhopadhyay and Thomassin (2008) point out that this domination is due to China's export-driven growth, Japan's economic crisis, South Korea's political leadership, and Singapore's aspiration for regionalism. Using the Global Trade Analysis Project (GTAP) model, Mukhopadhyay and Thomassin (2008) found that FTAs improved economic growth for each participating nation. The trade diversion observed in various tariff reduction scenarios resulted in significant changes in export and import shares. The impact of trade liberalization on welfare varies depending on the size of the country. In the case of large countries, trade liberalization can influence international terms of trade by increasing import and export prices. On the contrary, small countries may experience negative consequences due to trade liberalization, leading to welfare losses (Mukhopadhyay & Thomassin, 2008).

There are two classifications for East Asian FTAs, according to Fink and Molinuevo (2008): those that employ a positive list approach and those that adopt a negative list approach to determine sectoral inclusion and openness. A total of ten FTAs in East Asia have implemented a negative list technique to outline their commitments to market liberalization. Negative listing encompasses sectors and measures, allowing free trade in all covered service activities unless specified constraints are set. The Lao People's Democratic Republic-United States Bilateral Trade Agreement represents a unique example of FTAs in East Asia, wherein participating countries can delay their

commitment to unrestricted trade in sectors subject to liberalization obligations. Fink and Molinuevo (2008) note that 14 FTAs in East Asia adopt a positive list approach, where some sectors, such as telegraph services, postal services, and energy distribution, are included. These sectors may restrict foreign access if necessary. The factors to be considered with negative list agreements encompass transparency, adherence to a positive list framework, and a status quo extending beyond the negative list's confines. Positive-list agreements enable governments to customize their promises to address regulatory concerns more effectively, providing them with the assurance to undertake specific liberalization measures instead of entirely omitting sectors deemed sensitive (Fink & Molinuevo, 2008).

The ASEAN Free Trade Agreement, according to Calvo-Pardo, Freund, and Ornelas (2009), facilitates intra-bloc trade while minimizing any adverse impact on trade with non-member countries, primarily through implementing unilateral reductions in external tariffs by ASEAN member states. FTAs with neighboring countries are more likely to increase trade. Furthermore, the MFN tariffs imposed by the members harm imports from countries outside of ASEAN. On the contrary, intra-ASEAN trade is only negatively influenced by preferential rates (Calvo-Pardo, Freund, & Ornelas, 2009).

A 2008 survey by Zhang (2010) of 232 Chinese companies found that the use of FTAs is relatively high among Chinese firms, but the share of exports covered by FTAs is low. The most significant impediment to FTA use is the need for more information, with 45.1 percent of all firms and 62.9 percent of non-user firms expressing a lack of information. The top reasons for the non-usage of FTAs are time delays, administrative

costs, and small margins between MFN and FTA rates. Firms experienced net benefits from FTAs, including increased exports due to expanded market access, greater export convenience, promotion of FDI and new business opportunities, and lower tariffs. The most damaging impact of FTAs was increased competition from imported products and documentation and time delays related to the use of FTAs (Zhang, 2010).

The proliferation of Free Trade Agreements (FTAs) in the Asian region, according to Kawai and Wignaraja (2010), can be attributed to several factors, including market-oriented economic integration, the influence of European and North American economic integration, the impact of the 1997-1998 Asian financial crisis, and the sluggish advancements in the World Trade Organization's Doha negotiations. The geographical orientation of Asian FTAs is influenced by economic size, per capita income, protection levels, economic geography, and transnational corporation production network strategies. One of the primary concerns about Asian Free Trade Agreements (FTAs) revolves around the need to enhance the effective utilization of FTAs at the firm level. Additionally, there is a pressing need to advocate for including comprehensive agricultural trade coverage within these agreements. Furthermore, it is imperative to augment the incorporation of WTO-plus elements in Asian FTAs (Kawai & Wignaraja, Asian free trade areas: Trends, prospects, and challenges, 2010).

The ASEAN-China free trade agreement (ACFTA) has facilitated bilateral trade between China and ASEAN, including increasing China's exports to ASEAN from 7 to 9 percent of China's exports. In addition, ACFTA has led to the creation of trade for intermediate goods and increased China's investment in East Asia (Li & Maani, 2018).

East Asian FTAs incorporate regulations on rules of origin, which define the criteria for determining trade eligibility between participating countries for preferential treatment. These rules cover the origin of services and the origin of service providers. Service providers must meet specific criteria to be eligible for trade preferences (Fink & Molinuevo, 2008).

However, Fink and Molinuevo (2008) found that certain FTAs incorporate provisions that allow exceptions to the liberal rules of origin for foreign policy matters. These exceptions enable the denial of advantages to a legal entity if the party rejecting such benefits has diplomatic relations with or restricts transactions involving the said firm. Dispute settlement mechanisms, like those of the WTO, are commonly included in East Asia's FTAs. However, the Japan-Mexico Economic Partnership Agreement deviates from this trend by excluding provisions related to the financial services chapter from the purview of its dispute settlement system (Fink & Molinuevo, 2008).

FTA and FDI

Leshner and Miroudot (2006) found a growing trend among countries to include investment provisions, traditionally addressed through bilateral investment treaties (BITs), in FTAs. The quantity of newly established BITs has declined since the mid-1990s, although the number of FTAs containing significant investment clauses has increased. The correlation between trade and investment within FTAs is complex and encompasses trade substitution and efficiency-driven investment. FTAs that include significant investment measures have greater efficacy in stimulating FDI than those that focus solely on product trade. Moreover, implementing an FTA that includes significant

investment provisions has a favorable correlation with both trade and net inflows of FDI (Leshner & Miroudot , 2006).

According to Jang (2011), FTAs substantially influence the levels of FDI in countries that belong to both the Organisation for Economic Cooperation and Development (OECD) and those outside the OECD. FTAs harm FDI in pairs of countries within the OECD. On the contrary, they positively affect FDI in pairs of countries outside the OECD. The adverse impacts of the FTA on FDI exhibit an upward trend in conjunction with the geographical separation between countries. In contrast, the favorable effects diminish as the geographical distance expands (Jang, 2011). Bae and Jang (2013) note that the correlation and positive relationship between FTAs and horizontal FDI can be characterized as a trade-off involving the pursuit of economies of scale and implementing tariff-jumping strategies. Vertical FDI favors FTAs depending on the two countries' factor endowments or skill levels (Bae & Jang, 2013).

According to Thangavelu and Findlay (2011), Free trade agreements (FTAs) have the potential to stimulate foreign direct investment (FDI) by reducing trade barriers, enabling the smooth exchange of intermediate or finished goods between parent companies in the country of origin and foreign subsidiaries in the host country, and enhancing the ease of movement for financial resources and capital. This phenomenon could assist countries in pursuing increased foreign direct investment (FDI) inflows from a specific source country or region. FTAs with the respective party are an effective strategy for utilizing international agreements as effective instruments. The signing of Free Trade Agreements (FTAs) can facilitate political diplomacy and the alignment of

regulatory and institutional frameworks among participating nations. The empirical findings of econometric analysis indicate that multilateral agreements have a more significant positive impact on foreign direct investment (FDI) inflows in the Asia-Pacific region than bilateral agreements (Thangavelu & Findlay, 2011).

Kawai and Wignaraja (2011) note that several circumstances, including narrow preference margins, information asymmetry, and nontariff barriers, have shaped the utilization of FTAs within six East Asian countries. In the context of South Korea, the limited levels of preference and inadequate access to information provide substantial barriers to utilizing FTAs. On the contrary, the impact of delays and administrative expenses associated with rules of origin and nontariff barriers appears to be comparatively less significant. Thailand shows a notable utilization of FTA preferences. Kawai and Wignaraja (2011) point out that at the same time, nontariff barriers within FTA partner countries emerge as the primary obstacle, accounting for 36 percent of the reported obstacles. The increasing significance of FTAs in enhancing relations with significant markets underscores the crucial role of ASEAN's FTAs in facilitating regional economic activities. The presence of multiple rules of origin within overlapping FTAs imposes a significant burden on MSMEs, who often need more resources to allocate toward fulfilling these requirements. Firms with prior experience exporting to many countries and engaging in several FTAs are inclined to exhibit apprehensions regarding the business expenses associated with various rules of origin compared to firms that export to a single market or utilize a single FTA. Kawai and Wignaraja (2011) note that foreign ownership has a notable and favorable effect on the likelihood of expressing

dissatisfaction with various rules of origin. To engage in trade under FTA preferences, companies must obtain knowledge of the specific provisions outlined in the agreements. Furthermore, they must improve their capabilities, establish suitable regional sourcing strategies, and develop efficient systems for administering rules of origin (Kawai & Wignaraja, Asia's free trade agreements how is business responding?, 2011).

Research Methodology

Null hypothesis: Free-trade areas (FTAs) allowed by the rules-based WTO benefit all countries in the global economy

Alternative Hypothesis: Free Trade Areas (FTAs) allowed by the rules-based WTO benefit some countries in the global economy.

Data: The data for this study is the WTO database of FTAs. The database was downloaded in December 2022 from <https://rtais.wto.org/> and comprised 356 FTAs.

Methodology: The data collected through this research were analyzed using nonparametric statistics in STATA. Further data analysis in terms of tables and graphs to describe the findings of the nonparametric statistics was done in Microsoft Power BI and Excel.

The nonparametric statistics methodology used is the Kruskal-Wallis H test. Studies on trade and investment (Bovi, 2003) and (Girma, Görg., & Strobl, 2004) use nonparametric statistics to analyze trade agrnt data. The formula for the Kruskal-Wallis H-test that will be applied is:

$$H = \frac{12}{N - (N + 1)} \left(\sum_{i=1}^k \frac{R_i^2}{n_i} \right) - 3 (N + 1)$$

k = number of comparison groups

N = total number of observations in all groups

R = sum of ranks for sample i

n_i = sample size for sample i .

The test statistic for the H test is the chi-square two-tail test.

This study comprises a total of 356 samples, each of which corresponds to a specific FTA. For example, the United States-Mexico-Canada Free Trade Agreement (USMCA) is an individual sample.

The study assesses the disparities between the samples / FTA based on factors such as the number of countries included in the sample/FTA, the geographical regions encompassed by the FTA, and the specific coverage of the FTA. The initial criterion for determining the rank is the number of participating countries inside the FTA. As an illustration, the United States-Mexico-Canada Agreement (USMCA) encompasses three countries, indicating a sample size of three (3) countries. The second criterion pertains to the quantification of regions, where each region is assigned a rank based on the economic regional classification of countries conducted by the International Monetary Fund. In this study, the regions are assessed and categorized according to the Likert scale, where the region with the highest level of wealth is assigned a rank of six (6). In contrast, the region with the lowest level of wealth is assigned a rank of one (1).

Consequently, the regions have been ranked in the following order: The rankings of various regions based on economic development are as follows: Advanced - 6, Emerging and developing Asia - 5, Emerging and developing Europe - 4, Latin America

and the Caribbean - 3, Middle East and Central Asia - 2, and Sub-Saharan Africa - 1.

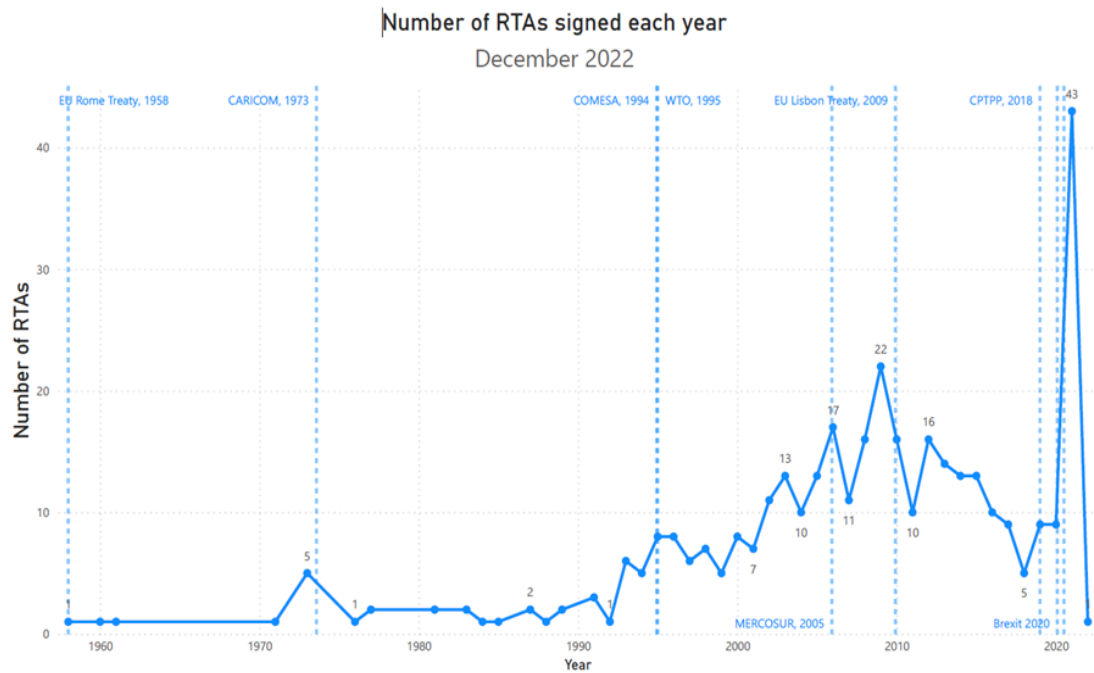
The third criterion refers to the extent of coverage inside the FTA, whether it encompasses goods, services, or both goods and services. If the FTA pertained exclusively to goods or services, a value of one (1) was assigned. On the contrary, if the FTA encompassed goods and services, a value of two (2) was assigned. These specific criteria and subsequent numerical assignments facilitated the conversion of qualitative FTA data into quantitative data, allowing its analysis through nonparametric statistical methods. The numerical values were summarised to create a composite score incorporating the observed variations.

The numerical data for the FTA were then uploaded to STATA, and the Kruskal-Wallis test was performed. The results of the Kruskal-Wallis test were utilized to determine whether FTAs enable disparities in global trade that do not yield advantages for all countries, according to the special and differential treatment of the World Trade Organisation (WTO).

Data analysis and findings

Examining the differences in FTA is necessary to address the study research question. The initial step involves analyzing the FTAs database to ascertain whether the 356 FTAs registered per the clauses and articles established by the World Trade Organisation (WTO) exhibit variations or similarities. FTAs have become an increasingly integral component of the rules-based global economic system.

Figure 11. FTAs signed each year



Author's calculation based on WTO Source: <https://rtais.wto.org/>

As shown in Figure 1, there has been a notable upward trend in the number of FTAs, particularly since the establishment of the WTO in 1995. Substantial spikes in FTA occurred after the implementation of the EU Lisbon Treaty in 2009 and the conclusion of the Brexit agreement in 2020. Given the varying number of countries and economic regions involved, assessing the distinctiveness of these FTAs is imperative. Such distinctions would show how these FTAs adhere to special and differential treatment principles or Most Favoured Nation status, as established in the multilateral WTO framework in 1995.

The Kruskal-Wallis H test was performed in STATA, using the three criteria defining each sample/FTA. The results indicated that, at a 95 percent confidence interval and a significance level of 0.05, the p-value obtained was less than 0.05 using the critical

values of the two-tailed chi-square test. Therefore, the null hypothesis that posits the universal benefits of FTA throughout the global economy is rejected. It can be inferred that FTAs selectively benefit certain countries within the global economy. The variations observed within the global trade system due to FTAs can be attributed to three key factors: the number of countries participating in each FTA, the economic regions encompassed by the FTAs, and the extent of coverage provided by the FTAs. The differences identified by the findings of the H-test obtained via STATA are as follows:

Differences in the Number of Countries in FTAs

The results of the chi-square test from Stata are as follows:

- kwallis score by (Number of Countries)

Kruskal-Wallis equality-of-population rank test

Table 24 *H* test by number of countries

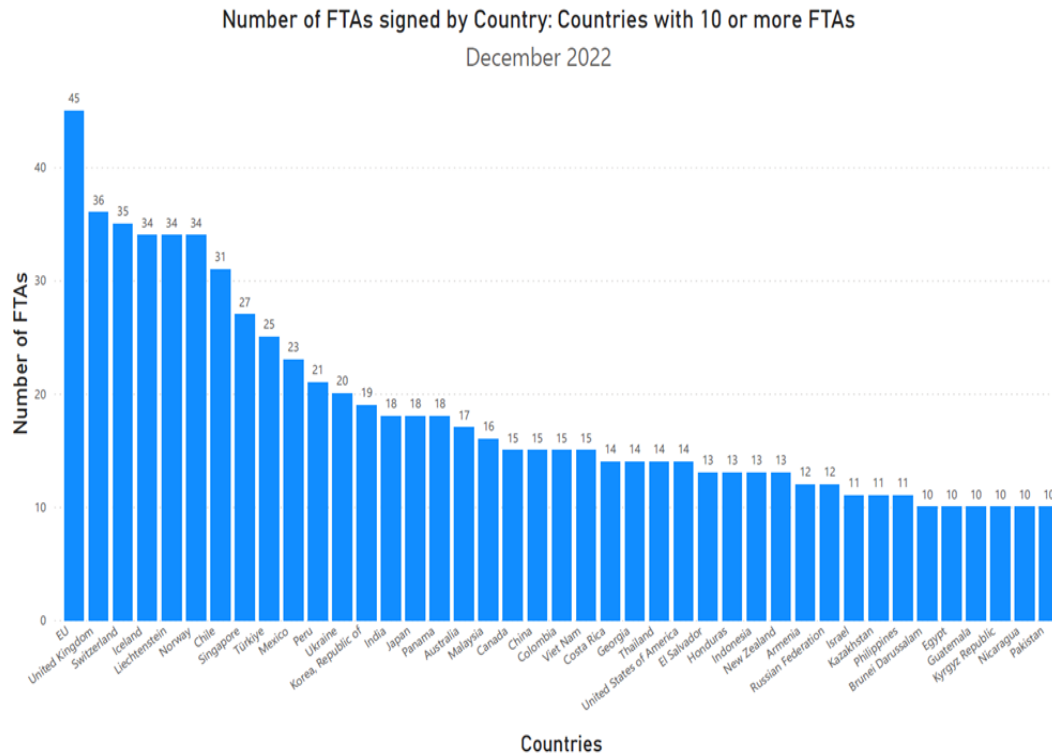
Numbers of countries	Observations	Rank sum
2	215	27444.5
3	5	709
4	13	1641.5
5	34	7556
6	11	2044
7	7	1591
8	2	521.5
9	2	506.5
10	2	596
11	6	1798.5
12	4	1118
15	4	1188.5
16	3	887
19	1	299.5
26	1	310
27	1	315.5
28	36	11906
29	1	325.5
30	2	686
31	1	353
32	1	349
33	2	688.5
41	1	355
42	1	356

Table 24 (continued).

<pre>chi2 (23) = 198.086 Prob = 0.0001 chi2 (23) with ties = 199.078 Prob = 0.0001 • return list scalars: r (chi2_adj) = 199.0783668080751 r (df) = 23 r (chi2) = 198.0855443300916</pre>

The initial disparity lies in the number of countries covered within each FTA. According to the data presented in Table 1, most FTAs, precisely 60.6 percent, are established between the two countries. Regarding country involvement, the highest number of FTAs is 36 FTAs among 28 countries. The FTAs that involve 28 countries are mainly between the EU, 27 member countries, and a single additional country. Among five countries, including Iceland, Liechtenstein, Norway, and Switzerland - European FTA (EFTA) members and one additional country have the third most significant number of FTAs - 34 - in terms of the number of countries participating.

Figure 12. Number of FTAs signed by country



Author’s calculation based on WTO Source: <https://rtais.wto.org/>

The variability in the number of FTAs signed by each country is illustrated in Figure 1. At present, the EU has entered into the most significant number of FTAs. The EU signs trade deals for its 27 member states, facilitated by its single market treaty (European Union, 2023). By the end of December 2022, the United Kingdom had signed the second-highest number of FTAs – 36. The UK FTAs were signed during the period spanning from 2020 to 2022 after the ratification of the United Kingdom's Brexit agreement with the European Union. The third group of countries exhibiting many FTAs consists of European FTA members. It is worth noting that sub-Saharan countries are absent from the list of countries that have signed ten or more FTAs.

Upon a more profound examination of the countries that have entered into agreements ranging from 10 to 45 FTAs, many noteworthy characteristics emerge. Most countries primarily participate in FTAs comprising nations within the same geographic area. An illustration of this can be seen in the EU countries and the EFTA countries. Furthermore, many countries mentioned can be classified as advanced economies and/or European nations. Except for Brazil, it should be noted that nine out of the top ten global economies have established ten or more FTAs. Specifically, the United States has 14 FTAs, China has 15 FTAs, Japan has 18 FTAs, and Germany, France, and Italy collectively possess 45 FTAs as part of the European Union. Additionally, India has 18 FTAs, the United Kingdom has 36 FTAs, and Canada has 15 FTAs.

The subsequent tables (Table 25 to Table 34) analysis reveals that the United States has entered FTAs with advanced economies, Latin America and the Caribbean, and the Middle East and Central Asia. In addition, most FTAs established by the United States are bilateral and involve only two countries. The United States-Mexico-Canada Agreement (USMCA) is a trilateral trade agreement involving three nations - Canada, Mexico, and the United States. Another trade agreement involves the United States, Bahrain, the Dominican Republic, and other countries in Central America. The USA does not have FTAs with sub-Saharan Africa, Emerging and Developing Europe, and Emerging and Developing Asia.

In addition to its agreements with other Asian countries through ASEAN (11 countries) and Asia-Pacific (6 countries), China has also entered primarily bilateral FTAs with two countries – Mauritius and Costa Rica. China currently does not have FTAs in

emerging and developing Europe. However, it has established one FTA specifically with one country in Sub-Saharan Africa, namely Mauritius. Additionally, China has entered three FTAs with nations in the Middle East and Central Asia, three with countries in Latin America and the Caribbean, and five with advanced economies.

Japan currently needs FTAs with countries in the Middle East, Central Asia, and sub-Saharan Africa. It should be noted that Japan has only established a single FTA with emerging and developing European countries, facilitated through its association with the European Union (EU).

Chile, a South American country, has established many Free Trade Agreements (FTAs), totaling 31, surpassing other non-European countries. These FTAs have been established primarily with Latin American and Caribbean countries and emerging and developing Asian countries. Egypt and Pakistan are among the Middle East and Central Asia countries that have established ten or more FTAs. Egypt has primarily entered multiple-country FTAs with ten or more nations.

Table 25 FTAs signed by the USA, December 2022

FTA Name	Coverage	Date of entry into force	Number of Countries	Number of Regions	Advanced economies	Emerging and developing Asia	Emerging and developing Europe	Latin America and the Caribbean	Middle East and Central Asia	Sub-Saharan Africa
United States-Mexico-Canada Agreement (USMCA/CUSMA/T-MEC)	Goods & Services	01-Jul-20	3	1	x					
United States - Panama	Goods & Services	31-Oct-12	2	2	x			x		
United States - Colombia	Goods & Services	15-May-12	2	2	x			x		
Korea, Republic of - United States	Goods & Services	15-Mar-12	2	1	x					
United States - Peru	Goods & Services	01-Feb-09	2	2	x			x		
United States - Oman	Goods & Services	01-Jan-09	2	2	x				x	
United States - Bahrain	Goods & Services	01-Aug-06	2	2	x				x	
Dominican Republic - Central America - United States Free Trade Agreement (CAFTA-DR)	Goods & Services	01-Mar-06	7	2	x			x		
United States - Morocco	Goods & Services	01-Jan-06	2	2	x				x	

Table 25 (continued).

United States - Australia	Goods & Services	01-Jan-05	2	1	x	
United States - Singapore	Goods & Services	01-Jan-04	2	1	x	
United States - Chile	Goods & Services	01-Jan-04	2	2	x	x
United States - Jordan	Goods & Services	17-Dec-01	2	2	x	x
United States - Israel	Goods	19-Aug-85	2	2	x	

Author's calculation based on WTO Source: <https://rtais.wto.org/>

Table 26 *FTA signed by China, December 2022*

FTA Name	Coverage	Date of entry into force	Number of Countries	Number of Regions	Advanced economies	Emerging and developing Asia	Emerging and developing Europe	Latin America and the Caribbean	Middle East and Central Asia	Sub-Saharan Africa
China - Mauritius	Goods & Services	01-Jan-21	2	2		x				x
China - Georgia	Goods & Services	01-Jan-18	2	2		x			x	
China - Korea, Republic of	Goods & Services	20-Dec-15	2	2	x	x				
Australia - China	Goods & Services	20-Dec-15	2							
Iceland - China	Goods & Services	01-Jul-14	2	2	x	x				
Switzerland - China	Goods & Services	01-Jul-14	2	2	x	x				
China - Costa Rica	Goods & Services	01-Aug-11	2	2				x		
Peru - China	Goods & Services	01-Mar-10	2	2		x		x		
China - New Zealand	Goods & Services	01-Oct-08	2	2	x	x				
China - Singapore	Goods & Services	01-Jan-09	2	2	x	x				
Pakistan - China	Goods & Services	01-Jul-2007(G) / 10-Oct-2009(S)	2	2		x			x	

Table 26 (continued).

Chile - China	Goods & Services	01-Oct- 2006(G) / 01-Aug- 2010(S)	2	2	x	x
ASEAN - China	Goods & Services	01-Jan- 2005(G) / 01-Jul- 2007(S)	11	1	x	
China - Macao, China	Goods & Services	17-Oct-03	2	1	x	
China - Hong Kong, China	Goods & Services	29-Jun-03	2	1	x	
Asia Pacific Trade Agreement (APTA)	Goods & Services	17-Jun- 1976(G) / 17-Sep- 2013(S)	6	1	x	

Table 27 FTAs signed by Japan, December 2022

FTA Name	Coverage	Date of entry into force	Number of Countries	Number of Regions	Advanced economies	Emerging and developing Asia	Emerging and developing Europe	Latin America and the Caribbean	Middle East and Central Asia	Sub-Saharan Africa
United Kingdom - Japan	Goods & Services	01-Jan-21	2	1	x					
EU - Japan	Goods & Services	01-Feb-19	28		x		x			
Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP)	Goods & Services	30-Dec-18	11	2	x	x				
Japan - Mongolia	Goods & Services	07-Jun-16	2	2	x	x				
Japan - Australia	Goods & Services	15-Jan-15	2	1	x					
Japan - Peru	Goods & Services	01-Mar-12	2	2	x			x		
India - Japan	Goods & Services	01-Aug-11	2	2	x	x				
ASEAN - Japan	Goods & Services	01-Dec-2008(G) / 01-Aug-2020(S)	11	2	x	x		x		
Japan - Viet Nam	Goods & Services	01-Oct-09	2	2	x	x				

Table 27 (continued).

Japan - Switzerland	Goods & Services	01-Sep-09	2	1	x		
Japan - Philippines	Goods & Services	11-Dec-08	2	2	x	x	
Brunei Darussalam - Japan	Goods & Services	31-Jul-08	2	2	x	x	
Japan - Indonesia	Goods & Services	01-Jul-08	2	2	x	x	
Japan - Thailand	Goods & Services	01-Nov-07	2	2	x	x	
Chile - Japan	Goods & Services	03-Sep-07	2	2	x		x
Japan - Malaysia	Goods & Services	13-Jul-06	2	2	x	x	
Japan - Mexico	Goods & Services	01-Apr-05	2	2	x		x
Japan - Singapore	Goods & Services	30-Nov-02	2	1	x		

Author's calculation based on WTO Source: <https://rtais.wto.org/>

Table 28 *FTAs signed by the EU, December 2022*

FTA Name	Coverage	Date of entry into force	Number of Countries	Number of Regions	Advanced economies	Emerging and developing Asia	Emerging and developing Europe	Latin America and the Caribbean	Middle East and Central Asia	Sub-Saharan Africa
EU - United Kingdom	Goods & Services	01-Jan-21	28	2	x		x			
EU - Viet Nam	Goods & Services	01-Aug-20	28	3	x	x	x			
EU - Singapore	Goods & Services	21-Nov-19	28	2	x		x			
EU - Armenia	Services	02-Jun-18	28	3	x		x		x	
EU - Japan	Goods & Services	01-Feb-19	28		x		x			
EU - Canada	Goods & Services	21-Sep-17	28	2	x		x			
EU - SADC	Goods	10-Oct-16	33	2	x					x
EU - Ghana	Goods	15-Dec-16	28	3	x		x			x
EU - Georgia	Goods & Services	01-Sep-14	28	3	x		x		x	
EU - Ukraine	Goods & Services	23-Apr-14	28	2	x		x			
EU - Moldova, Republic of	Goods & Services	01-Sep-14	28	2	x		x			
EU - Colombia, Ecuador and Peru	Goods & Services	01-Mar-13	30	3	x		x	x		

Table 28 (continued).

	EU - Central America	Goods & Services	01-Aug-13	33	3	x		x	x	
	EU - Eastern and Southern Africa States	Goods	14-May-12	32	2	x	x	x		x
	EU - Pacific States	Goods	20-Dec-09	31	3	x	x	x		
	EU - Korea, Republic of	Goods & Services	01-Jul-11	28	2	x		x		
	EU - Serbia	Goods & Services	01-Feb-2010(G) / 01-Sep-2013(S)	28	2	x		x		
	EU - San Marino	Goods	01-Apr-02	28	1	x				
134	EU - Cameroon	Goods	04-Aug-14	28	3	x		x		x
	EU - Côte d'Ivoire	Goods	03-Sep-16	28	3	x		x		x
	EU - CARIFORUM States	Goods & Services	29-Dec-08	41	3	x		x	x	
	EU - Bosnia and Herzegovina	Goods & Services	01-Jul-2008(G) / 01-Jun-2015(S)	28	2	x		x		
	EU - Montenegro	Goods & Services	01-Jan-2008(G) / 01-May-2010(S)	28	2	x		x		
	EU - Albania	Goods & Services	01-Dec-2006(G) / 01-Apr-2009(S)	28	2	x		x		

Table 28 (continued).

	EU - Algeria	Goods	01-Sep-05	28	3	x	x		x
	EU - Egypt	Goods	01-Jun-04	28	3	x	x		x
	EU - Chile	Goods & Services	01-Feb-2003(G) / 01-Mar-2005(S)	28	3	x	x	x	
	EU - Lebanon	Goods	01-Mar-03	28	3	x	x		x
	EU - Jordan	Goods	01-May-02	28	3	x	x		x
	EU - North Macedonia	Goods & Services	01-Jun-2001(G) / 01-Apr-2004(S)	28	2	x	x		
135	EU - South Africa	Goods	01-Jan-00	28	3	x	x		x
	EU - Morocco	Goods	01-Mar-00	28	3	x	x		x
	EU - Israel	Goods	01-Jun-00	28	2	x	x		
	EU - Mexico	Goods & Services	01-Jul-2000(G) / 01-Oct-2000(S)	28	3	x	x	x	
	EU - Tunisia	Goods	01-Mar-98	28	3	x	x		x
	EU - Andorra	Goods	01-Jul-91	28	2	x	x		
	EU - Palestine	Goods	01-Jul-97	28	3	x	x		x

Table 28 (continued).

	EU - Faroe Islands	Goods	01-Jan-97	28	2	x		x
	European Economic Area (EEA)	Services	01-Jan-94	30	2	x		x
	EU - Türkiye	Goods	01-Jan-96	28	2	x		x
	EU - Syria	Goods	01-Jul-77	28	3	x		x
	EU - Norway	Goods	01-Jul-73	28	2	x		x
	EU - Iceland	Goods	01-Apr-73	28	2	x		x
	EU - Switzerland - Liechtenstein	Goods	01-Jan-73	29	2	x		x
136	EU – Overseas Countries and Territories (OCT)	Goods	01-Jan-71	26	2	x		x
	EU Treaty	Goods & Services	01-Jan-58	27	2	x		x

Author's calculation based on WTO Source: <https://rtais.wto.org/>

Table 29 FTAs signed by India, December 2022

FTA Name	Coverage	Date of entry into force	Number of Countries	Number of Regions	Advanced economies	Emerging and developing Asia	Emerging and developing Europe	Latin America and the Caribbean	Middle East and Central Asia	Sub-Saharan Africa
India - United Arab Emirates	Goods & Services	01-May-22	2	2		x			x	
India - Mauritius	Goods & Services	01-Apr-21	2	2		x				x
India - Thailand	Goods	01-Sep-04	2	1		x				
India - Japan	Goods & Services	01-Aug-11	2	2	x	x				
India - Malaysia	Goods & Services	01-Jul-11	2	1		x				
ASEAN - India	Goods & Services	01-Jan-2010(G) / 01-Jul-2015(S)	11	2	x	x				
India - Nepal	Goods	27-Oct-09	2	1		x				
Korea, Republic of - India	Goods & Services	01-Jan-10	2	2	x	x				
India - Afghanistan	Goods	13-May-03	2	2		x			x	
Southern Common Market (MERCOSUR) - India	Goods	01-Jun-09	5	2		x		x		
Chile - India	Goods	17-Aug-07	2	2		x		x		
India - Bhutan	Goods	29-Jul-06	2	1		x				

Table 29 (continued).

South Asian Free Trade Agreement (SAFTA)	Goods	01-Jan-06	8	2		x				x	
India - Singapore	Goods & Services	01-Aug-05	2	2	x	x					
India - Sri Lanka	Goods	01-Mar-00	2	1		x					
South Asian Preferential Trade Arrangement (SAPTA)	Goods	07-Dec-95	7	2		x				x	
Global System of Trade Preferences among Developing Countries (GSTP)	Goods	19-Apr-89	42	5	x	x		x		x	x
Asia Pacific Trade Agreement (APTA)	Goods & Services	17-Jun- 1976(G) / 17-Sep- 2013(S)	6	1		x					

Author's calculation based on WTO Source: <https://rtais.wto.org/>

Table 30 *FTA signed by the UK, December 2022*

FTA Name	Coverage	Date of entry into force	Number of Countries	Number of Regions	Advanced economies	Emerging and developing Asia	Emerging and developing Europe	Latin America and the Caribbean	Middle East and Central Asia	Sub-Saharan Africa
United Kingdom - Iceland, Liechtenstein and Norway	Goods & Services	01-Dec-21	4	1	x					
United Kingdom - Mexico	Goods & Services	01-Jun-21	2	2	x			x		
United Kingdom - Serbia	Goods & Services	20-May-21	2	2	x		x			
United Kingdom - Albania	Goods & Services	03-May-21	2	2	x		x			
United Kingdom - Jordan	Goods	01-May-21	2	2	x				x	
United Kingdom - Ghana	Goods	05-Mar-21	2	2	x					x
EU - United Kingdom	Goods & Services	01-Jan-21	28	2	x		x			
United Kingdom - SACU and Mozambique	Goods	01-Jan-21	7	2	x					x
United Kingdom - Japan	Goods & Services	01-Jan-21	2	1	x					

Table 30 (continued).

140	United Kingdom - Colombia, Ecuador and Peru	Goods & Services	01-Jan-21	4	2	x	x
	United Kingdom - CARIFORUM States	Goods & Services	01-Jan-21	16	2	x	x
	United Kingdom - Central America	Goods & Services	01-Jan-21	7	2	x	x
	United Kingdom - Chile	Goods & Services	01-Jan-21	2	2	x	x
	United Kingdom - Côte d'Ivoire	Goods	01-Jan-21	2	2	x	x
	United Kingdom - Eastern and Southern Africa States	Goods	01-Jan-21	4	2	x	x
	United Kingdom - Faroe Islands	Goods	01-Jan-21	2	1	x	
	United Kingdom - Georgia	Goods & Services	01-Jan-21	2	2	x	x
	United Kingdom - Israel	Goods	01-Jan-21	2	1	x	

Table 30 (continued).

United Kingdom - Switzerland - Liechtenstein	Goods	01-Jan-21	3	1	x		
United Kingdom - Tunisia	Goods	01-Jan-21	2	2	x		x
United Kingdom - Ukraine	Goods & Services	01-Jan-21	2	2	x		x
United Kingdom - Kosovo	Goods	01-Jan-21	2	2	x		x
United Kingdom - Lebanon	Goods	01-Jan-21	2	2	x		x
United Kingdom - Morocco	Goods	01-Jan-21	2	2	x		x
United Kingdom - Pacific States	Goods	01-Jan-21	5	2	x	x	
United Kingdom - Palestine	Goods	01-Jan-21	2	2	x		x
United Kingdom - Korea, Republic of	Goods & Services	02-Jan-21	2	1	x		
United Kingdom - Cameroon	Goods	01-Jan-21	2	2	x		x

Table 30 (continued).

142	United Kingdom - Egypt	Goods	01-Jan-21	2	2	x			x
	United Kingdom - Singapore	Goods & Services	01-Jan-21	2	1	x			
	United Kingdom - Türkiye	Goods	01-Jan-21	2	2	x		x	
	United Kingdom - Viet Nam	Goods & Services	01-Jan-21	2	2	x	x		
	United Kingdom - Canada	Goods & Services	01-Jan-2021(G) / 01-Apr-2021(S)	2	1	x			
	United Kingdom - Kenya	Goods	01-Jan-21	2	2	x			x
	United Kingdom - Moldova, Republic of	Goods & Services	01-Jan-21	2	2	x		x	
	United Kingdom - North Macedonia	Goods & Services	01-Jan-21	2	2	x		x	

Author's calculation based on WTO Source: <https://rtais.wto.org/>

Table 31 *FTAs signed by Canada, December 2022*

FTA Name	Coverage	Date of entry into force	Number of Countries	Number of Regions	Advanced economies	Emerging and developing Asia	Emerging and developing Europe	Latin America and the Caribbean	Middle East and Central Asia	Sub-Saharan Africa
United Kingdom - Canada	Goods & Services	01-Jan-2021(G) / 01-Apr-2021(S)	2	1	x					
United States-Mexico-Canada Agreement (USMCA/CUSMA/T-MEC)	Goods & Services	01-Jul-20	3	1	x					
Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP)	Goods & Services	30-Dec-18	11	2	x	x				
EU - Canada	Goods & Services	21-Sep-17	28	2	x		x			
Canada - Ukraine	Goods	01-Aug-17	2	2	x		x			

Table 31 (continued).

	Canada - Honduras	Goods & Services	01-Oct-14	2	2	x		x
	Canada - Korea, Republic of	Goods & Services	01-Jan-15	2	1	x		
	Canada - Jordan	Goods	01-Oct-12	2	2	x		x
	Canada - Panama	Goods & Services	01-Apr-13	2	2	x		x
	Canada - Colombia	Goods & Services	15-Aug-11	2	2	x		x
	EFTA - Canada	Goods	01-Jul-09	5	1	x		
	Canada - Peru	Goods & Services	01-Aug-09	2	2	x		x
144	Canada - Costa Rica	Goods	01-Nov-02	2	2	x		x
	Canada - Chile	Goods & Services	05-Jul-97	2	2	x		x
	Canada - Israel	Goods	01-Jan-97	2	1	x		

Author's calculation based on WTO Source: <https://rtais.wto.org/>

Table 32 *FTAs signed by Chile, December 2022*

FTA Name	Coverage	Date of entry into force	Number of Countries	Number of Regions	Advanced economies	Emerging and developing Asia	Emerging and developing Europe	Latin America and the Caribbean	Middle East and Central Asia
United Kingdom - Chile	Goods & Services	01-Jan-21	2	2	x			x	
Chile - Indonesia	Goods	10-Aug-19	2	2		x		x	
Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP)	Goods & Services	30-Dec-18	11	2	x	x			
Chile - Thailand	Goods & Services	05-Nov-15	2	2		x		x	
Pacific Alliance	Goods & Services	01-May-16	4	1				x	
Chile - Viet Nam	Goods	01-Jan-14	2	2		x		x	
Hong Kong, China - Chile	Goods & Services	09-Oct-14	2	2		x		x	
Chile - Nicaragua (Chile - Central America)	Goods & Services	19-Oct-12	2	1				x	

Table 32 (continued).

Chile - Malaysia	Goods	25-Feb-12	2	2		x		x
Chile - Guatemala (Chile - Central America)	Goods & Services	23-Mar-10	2	1				x
Peru - Chile	Goods & Services	01-Mar-09	2	1				x
Chile - Honduras (Chile - Central America)	Goods & Services	19-Jul-08	2	1				x
Türkiye - Chile	Goods	01-Mar-11	2	2			x	x
Chile - Colombia	Goods & Services	08-May-09	2	1				x
Australia - Chile	Goods & Services	06-Mar-09	2	2		x		x
Chile - India	Goods	17-Aug-07	2	2			x	x
Panama - Chile	Goods & Services	07-Mar-08	2	1				x
Chile - Japan	Goods & Services	03-Sep-07	2	2		x		x
Chile - China	Goods & Services	01-Oct- 2006(G) / 01-Aug- 2010(S)	2	2			x	x

Table 32 (continued).

147	Trans-Pacific Economic Partnership	Goods & Services	28-May-06	4	3	x	x	x
	EFTA - Chile	Goods & Services	01-Dec-04	5	2	x		x
	Korea, Republic of - Chile	Goods & Services	01-Apr-04	2	2	x		x
	EU - Chile	Goods & Services	01-Feb-2003(G) / 01-Mar-2005(S)	28	3	x	x	x
	Chile - El Salvador (Chile - Central America)	Goods & Services	01-Jun-02	2	1			x
	United States - Chile	Goods & Services	01-Jan-04	2	2	x		x
	Chile - Costa Rica (Chile - Central America)	Goods & Services	15-Feb-02	2	1			x
	Chile - Mexico	Goods & Services	01-Aug-99	2	1			x
	Canada - Chile	Goods & Services	05-Jul-97	2	2	x		x

Table 32 (continued).

Global System of Trade Preferences among Developing Countries (GSTP)	Goods	19-Apr-89	42	5	x	x		x	x	x
Latin American Integration Association (LAIA)	Goods	18-Mar-81	12	1				x		
Protocol on Trade Negotiations (PTN)	Goods	11-Feb-73	15	5	x	x	x	x	x	

Table 33 *FTAs signed by Indonesia*

FTA Name	Coverage	Date of entry into force	Number of Countries	Number of Regions	Advanced economies	Emerging and developing Asia	Emerging and developing Europe	Latin America and the Caribbean	Middle East and Central Asia	Sub-Saharan Africa
EFTA - Indonesia	Goods & Services	01-Nov-21	5	2	x	x				
ASEAN Free Trade Area (AFTA)	Goods & Services	17-May-2010(G) / 12-Aug-1998(S)	10	2	x	x				
ASEAN - Hong Kong, China	Goods & Services	11-Jun-19	12			x				
Indonesia - Australia	Goods & Services	05-Jul-20	2	2	x	x				
Chile - Indonesia	Goods	10-Aug-19	2	2		x		x		
Indonesia - Pakistan	Goods	02-Sep-13	2	1		x				
ASEAN - India	Goods & Services	01-Jan-2010(G) / 01-Jul-2015(S)	11	2	x	x				
ASEAN - Korea, Republic of	Goods & Services	01-Jan-2010(G) / 01-May-2009(S)	11	2	x	x				
ASEAN - Australia - New Zealand	Goods & Services	01-Jan-10	12	2	x	x				
ASEAN - Japan	Goods & Services	01-Dec-2008(G) / 01-Aug-2020(S)	11	2	x	x		x		

Table 33 (continued).

Japan - Indonesia	Goods & Services	01-Jul-08	2	2	x	x			
ASEAN - China	Goods & Services	01-Jan-2005(G) / 01-Jul-2007(S)	11	1					x
Global System of Trade Preferences among Developing Countries (GSTP)	Goods	19-Apr-89	42	5	x	x	x	x	x

Author's calculation based on WTO Source: <https://rtais.wto.org/>

Table 34 *FTA signed by Egypt*

FTA Name	Coverage	Date of entry into force	Number of Countries	Number of Regions	Advanced economies	Emerging and developing Asia	Emerging and developing Europe	Latin America and the Caribbean	Middle East and Central Asia	Sub-Saharan Africa
United Kingdom - Egypt	Goods	01-Jan-21	2	2	x				x	
Southern Common Market (MERCOSUR) - Egypt	Goods	01-Sep-17	5	2				x	x	
Agadir Agreement	Goods	27-Mar-07	4	1					x	
Egypt - Türkiye	Goods	01-Mar-07	2	2			x		x	
EFTA - Egypt	Goods	01-Aug-07	5	2	x				x	
Pan-Arab Free Trade Area (PAFTA)	Goods	01-Jan-98	16	1					x	
EU - Egypt	Goods	01-Jun-04	28	3	x		x		x	
Common Market for Eastern and Southern Africa (COMESA)	Goods	08-Dec-94	19	2					x	x
Global System of Trade Preferences among Developing Countries (GSTP)	Goods	19-Apr-89	42	5	x	x		x	x	x
Protocol on Trade Negotiations (PTN)	Goods	11-Feb-73	15	5	x	x	x	x	x	

Author's calculation based on WTO Source: <https://rtais.wto.org/>

Differences in the Number of Regions in FTAs

- kwallis score, by (number of regions)

Kruskal–Wallis equality-of-populations rank test

Table 35 *H test by number of regions*

Number of Regions	Observations	Rank sum
1	122	9673
2	204	43769.5
3	24	8022
5	2	663.5

chi2 (3) = 202.213

Prob = 0.0001

chi2 (3) with ties = 203.252

Prob = 0.0001

- return list

scalars:

r (chi2_adj) = 203.2516282208352

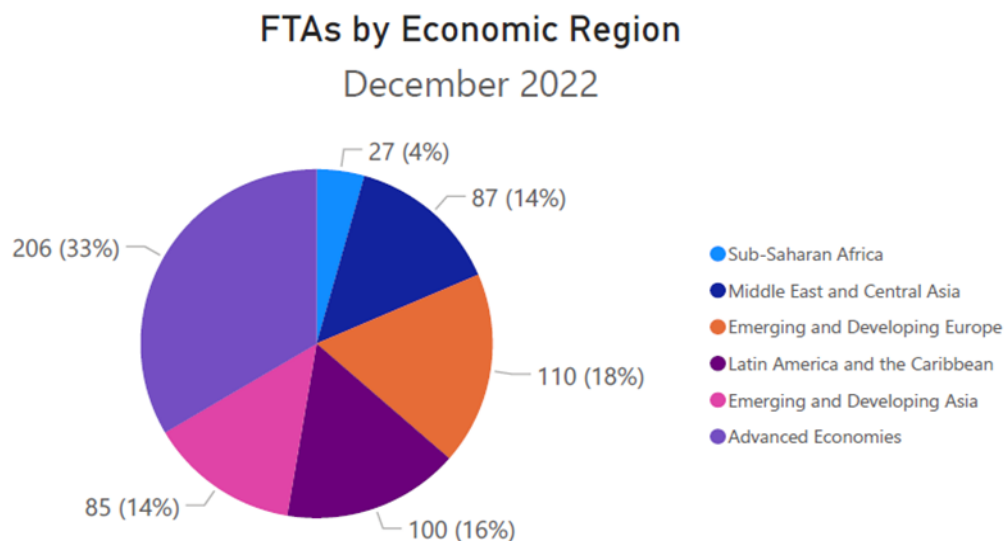
r (df) = 3

r (chi2) = 202.2126899304662

One notable distinction between the FTAs lies in the extent of the economic regions encompassed by each agreement. Most of the FTA), specifically 204 agreements, were established between two regions. The majority of the two regions' FTAs pertain to Europe. The review identified 84 FTAs established between advanced and emerging and developing Europe, whereas 78 FTAs exist between advanced economies and emerging

and developing Asia. In contrast, advanced economies possess eight FTAs in the sub-Saharan African region. Latin America and the Caribbean exhibit the highest number of FTAs only between countries within the region – 38 FTAs. The next highest is closely followed by advanced economies, which have established 33 FTAs with other advanced economies. The Global System of Trade Preferences (GSTP) among developing Countries and the Protocol on Trade Negotiations (PTN) are two FTAs encompassing nations' participation from five global economic regions. The GSTP includes 42 countries representing diverse regions, except emerging and developing European countries. The PTN consisted of 15 countries representing various regions worldwide, in addition to those in sub-Saharan Africa.

Figure 13. FTAs by Economic Region



Author's calculation based on WTO Source: <https://rtais.wto.org/>

Figure 13 shows that advanced economies account for almost one-third of all FTAs. This high number of FTAs is closely followed by emerging and developing European countries, which have signed approximately 18 percent of the FTAs. It is essential to acknowledge that most emerging and developing European countries, such as Poland and Romania, which have entered FTAs, are also members of the EU. According to the data presented in Figure 13, it can be observed that the sub-Saharan African countries have entered 27 FTAs, approximately 4 percent of the total number of FTAs worldwide.

Table 36 *FTAs for sub-Saharan Africa*

RTA Name	Coverage	Type	Date of entry into force	Number of Countries	Number of Regions	Advanced economies	Emerging and developing Asia	Emerging and developing Europe	Latin America and the Caribbean	Middle East and Central Asia	Sub-Saharan Africa
India - Mauritius	Goods & Services	FTA & EIA	01-Apr-21	2	2		x				x
Namibia - Zimbabwe	Goods	FTA	30-Apr-93	2	1						x
United Kingdom - Ghana	Goods	FTA	05-Mar-21	2	2	x					x
United Kingdom - SACU and Mozambique	Goods	FTA	01-Jan-21	7	2	x					x
China - Mauritius	Goods & Services	FTA & EIA	01-Jan-21	2	2		x				x
United Kingdom - Côte d'Ivoire	Goods	FTA	01-Jan-21	2	2	x					x
United Kingdom - Eastern and Southern Africa States	Goods	FTA	01-Jan-21	4	2	x					x
United Kingdom - Cameroon	Goods	FTA	01-Jan-21	2	2	x					x

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Table 36 (continued).

156	United Kingdom - Kenya	Goods	FTA	01-Jan-21	2	2	x			x
	Southern Common Market (MERCOSUR) - Southern African Customs Union (SACU)	Goods	PSA	01-Apr-16	9	2			x	x
	EU - SADC	Goods	FTA	10-Oct-16	33	2	x			x
	EU - Ghana	Goods	FTA	15-Dec-16	28	3	x		x	x
	Mauritius - Pakistan	Goods	PSA	30-Nov-07	2	2		x		x
	Türkiye - Mauritius	Goods	FTA	01-Jun-13	2	2			x	x
	EU - Eastern and Southern Africa States	Goods	FTA	14-May-12	32	2	x		x	x
	EU - Cameroon	Goods	FTA	04-Aug-14	28	3	x		x	x
	EU - Côte d'Ivoire	Goods	FTA	03-Sep-16	28	3	x		x	x
	EFTA - SACU	Goods	FTA	01-May-08	9	2	x			x
	Southern African Customs Union (SACU)	Goods	CU	15-Jul-04	5	1				x

Table 36 (continued).

157	Economic Community of West African States (ECOWAS)	Goods	CU	23-Aug-95	15	1						x
	Southern African Development Community (SADC)	Goods & Services	FTA & EIA	01-Sep-2000(G) / 13-Jan-2022(S)	16	1						x
	EU - South Africa	Goods	FTA	01-Jan-00	28	3	x		x			x
	East African Community (EAC)	Goods & Services	CU & EIA	07-Jul-2000(G) / 01-Jul-2010(S)	5	1						x
	West African Economic and Monetary Union (WAEMU)	Goods	CU	01-Jan-00	7	1						x

Table 36 (continued).

Economic and Monetary Community of Central Africa (CEMAC)	Goods	CU	24-Jun-99	6	1						x
Common Market for Eastern and Southern Africa (COMESA)	Goods	CU	08-Dec-94	19	2				x		x
Global System of Trade Preferences among Developing Countries (GSTP)	Goods	PSA	19-Apr-89	42	5	x	x		x	x	x

158

Author's calculation based on WTO Source: <https://rtais.wto.org/>

Given that this specific geographic area – sub-Saharan Africa - exhibits the most limited amount of FTAs – 27, further analysis is done. According to the data presented in Table 36, it can be observed that the sub-Saharan African region has entered the highest number of FTAs with advanced economies. Specifically, sub-Saharan Africa has signed a total of 14 FTAs, which accounts for almost 52 percent of the total FTAs established with advanced economies. Most of these FTAs are established with the EU, with six FTAs. This number of FTAs is closely followed by five FTAs formed with the United Kingdom. The sub-Saharan African region has signed only two FTAs, each with Latin America, the Caribbean, the Middle East, and Central Asia. There is only one FTA between two individual African countries, namely the Namibia-Zimbabwe FTA. Most FTAs within sub-Saharan Africa consist of six regional FTAs that involve between five and 16 countries. These agreements are regional African FTAs - East Africa, Central Africa, West Africa (with two FTAs), and Southern Africa (with two FTAs). Regional FTAs in Africa imply that most sub-Saharan African nations engage in FTAs established with regional blocs rather than on an individual country basis. Only five of the 46 countries in sub-Saharan Africa have entered individual FTAs. These countries include Mauritius, which has signed four FTAs, and Ghana, Cote d'Ivoire, and Cameroon, each with two FTAs. Furthermore, Kenya has signed one FTA.

Table 37 FTAs Interregional trade

FTAs Inter-regional trade, December 2022								
	Number of regions involved	Total FTAs for regions involved	Advanced economies	Emerging and developing Asia	Emerging and developing Europe	Latin America and the Caribbean	Middle East and Central Asia	Sub-Saharan Africa
Advanced economies	1	33	33	...	...	...	...	...
	2	147	...	38	41	37	22	9
	3	22	...	3	21	6	10	4
	5	2	...	2	1	2	2	1
Emerging and developing Asia	1	15	...	15	...	...	...	...
	2	62	38	...	1	12	8	3
	3	5	3	...	4	3	2	0
	5	2	2	...	1	2	2	1
Emerging and developing Europe	1	13	...	...	13	...	...	...
	2	71	41	1	...	2	26	2
	3	23	21	4	...	5	12	4
	5	1	1	1	...	1	1	0
Latin America and the Caribbean	1	38	...	...	...	38	...	...
	2	53	37	12	2	...	1	1
	3	6	6	1	5	...	0	0
	5	2	2	2	2	...	2	1
Middle East and Central Asia	1	15	...	...	...	...	15	...
	2	58	22	8	26	1	...	1
	3	12	10	2	12	0	...	0
	5	2	2	2	1	2	...	1
Sub-Saharan Africa	1	7	...	...	...	...	...	7
	2	15	9	3	2	1	1	...
	3	4	0	4	0	0	...	...
	5	1	1	1	0	1	1	...

Source: based on WTO data

Author's calculation based on WTO Source: <https://rtais.wto.org/>

An analysis of the interregional FTAs depicted in Table 37 reveals that advanced economies possess the highest number of two-region interregional FTAs with emerging and developing Europe (41 FTAs), emerging and developing Asia (38 FTAs), and Latin America and the Caribbean (37 FTAs). Most of the FTAs are established among countries within the same geographic region. Latin America and the Caribbean exhibit a notable prevalence of intraregional FTAs, with 38 FTAs. Similarly, sub-Saharan Africa demonstrates a comparatively lower number of intraregional FTAs, amounting to seven within the area. Emerging and developing economies in Asia exhibit limited economic

connections with both emerging and developing Europe, as seen by only six FTAs between the two regions.

Similarly, the trade contacts between emerging and developing Asian economies and sub-Saharan Africa are relatively modest, with four FTAs in place. Limited trade exists between the Latin America and Caribbean region, the Middle East and Central Asia (with three FTAs), and sub-Saharan Africa (with two FTAs). Sub-Saharan Africa predominantly trades with advanced economies, having established 10 FTAs. The region also maintains economic relations with emerging and developing Asia, having entered 8 FTAs with countries in this region.

Differences in FTA Coverage

- kwallis Score, by (GoodsorServices1Goods)

Kruskal-Wallis equality-of-population rank test

Table 38 *H-test by coverage of goods and services*

Goods/Services and Goods and services	Observations	Rank sum
1	167	26719.5
2	189	36826.5

Table 38 (continued).

chi2 (1) = 10.168

Prob = 0.0014

chi2 (1) with ties = 10.219

Prob = 0.0014

- return list

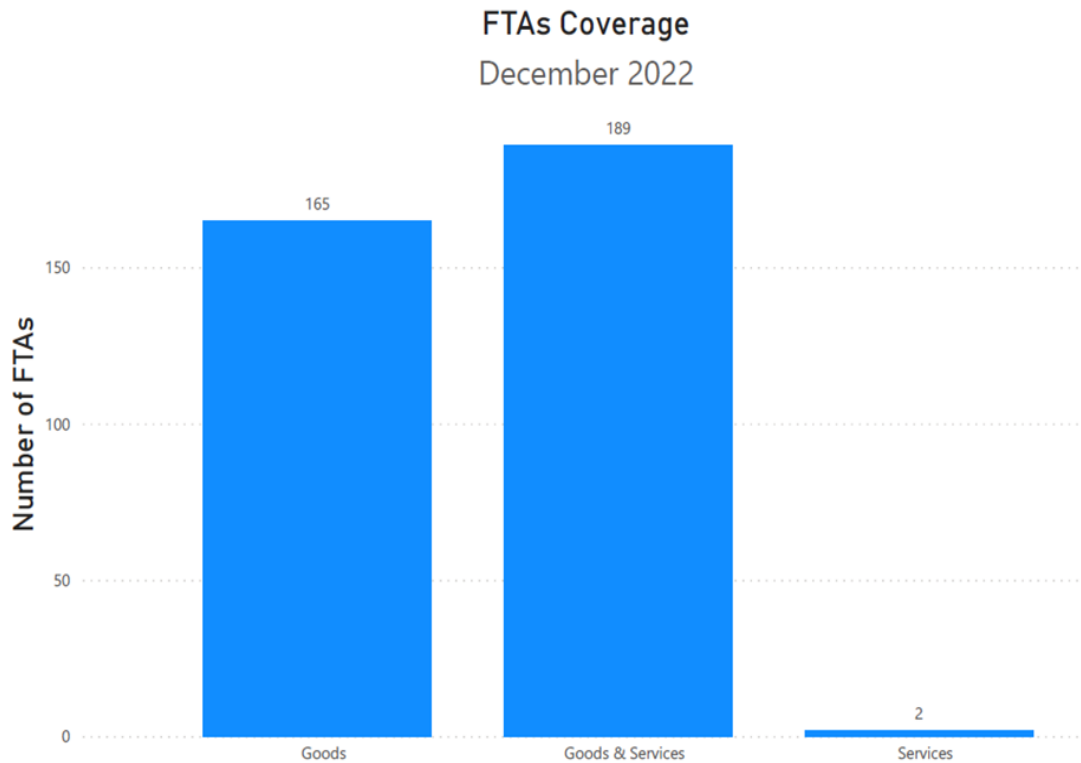
scalars:

r (chi2_adj) = 10.21931516902522

r (df) = 1

r (chi2) = 10.16835048626194

Figure 14. FTA coverage by goods and services



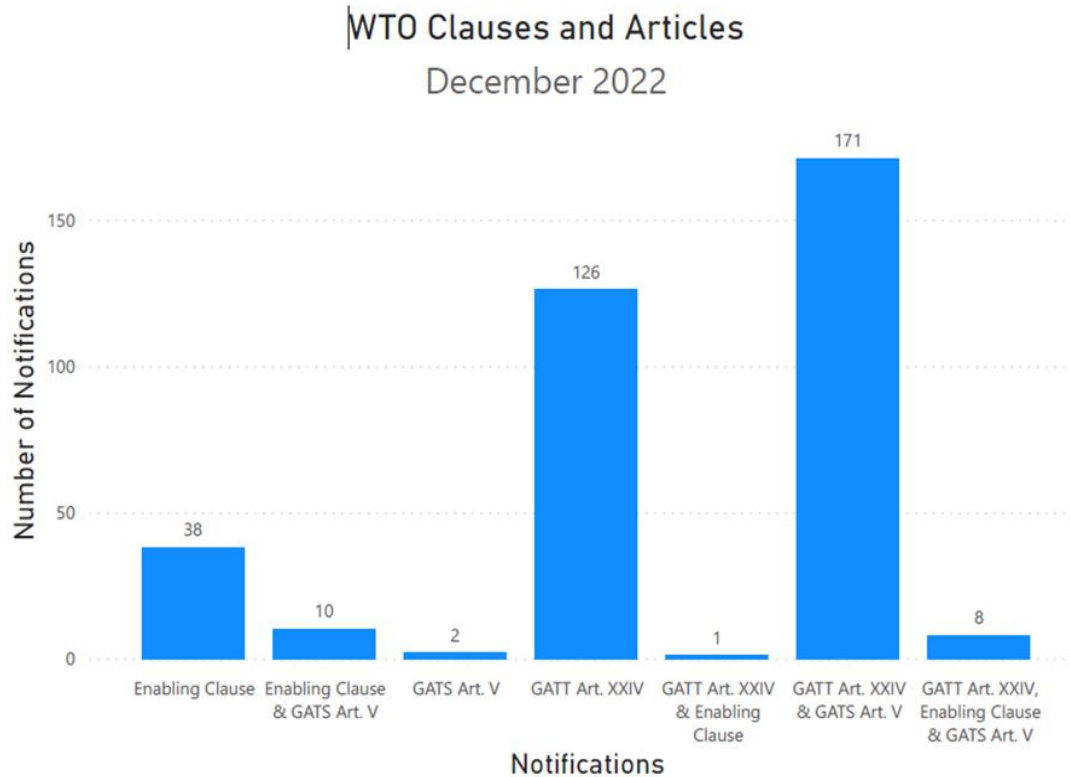
Author's calculation based on WTO Source: <https://rtais.wto.org/>

A notable area of distinction among FTAs relates to their coverage.

Approximately 53 percent of FTAs relate to the exchange of goods and services. Some countries entered FTAs focused solely on goods, followed by later agreements encompassing goods and services. The services FTAs are exclusively limited to the European region. Two significant agreements are worth mentioning. The first is the EU FTA with Armenia, which was signed in 2019. The second is the European Economic Area agreement between the EU and the European FTA, signed in 1996. Some countries, like Egypt, have entered FTAs that exclusively pertain to goods, while other countries,

such as the UK, have a majority of their FTAs (18 out of 34) focused solely on trade in goods.

Figure 15. FTAs WTO Notifications by Clauses and Articles



Author's calculation based on WTO Source: <https://rtais.wto.org/>

The provisions and articles within the WTO framework at the foundation of the FTAs are the Enabling Clause, General Agreement on Trade in Services (GATS) Article V, and the General Agreement on Tariffs and Trade (GATT) Article XXIV. Countries that participate in forming FTAs must inform the WTO about their FTA by one, two, or all three specified articles and clauses.

The WTO (2023) notes that the Enabling Clause, formally known as the "Decision on Differential and More Favourable Treatment, Reciprocity and Fuller

Participation of Developing Countries," was incorporated into the General Agreement on Tariffs and Trade (GATT) in 1979. Its purpose is to authorize developed member countries to provide developing countries with preferential treatment that differs from the treatment given to other developed countries, according to the (World Trade Organisation, 2023). The enabling clause applies exclusively to developing countries.

The General Agreement on Trade in Services, Article V (GATS Art. V), was agreed in 1995 upon the establishment of the WTO. This agreement allows WTO members to engage in agreements that promote trade liberalization in services. These agreements are characterized by extensive sectoral coverage and eliminating discriminatory practices. According to the (World Trade Organisation, 2023), non-participating countries outside of FTAs can derive advantages contingent upon significant business operations between these countries and the FTA member countries.

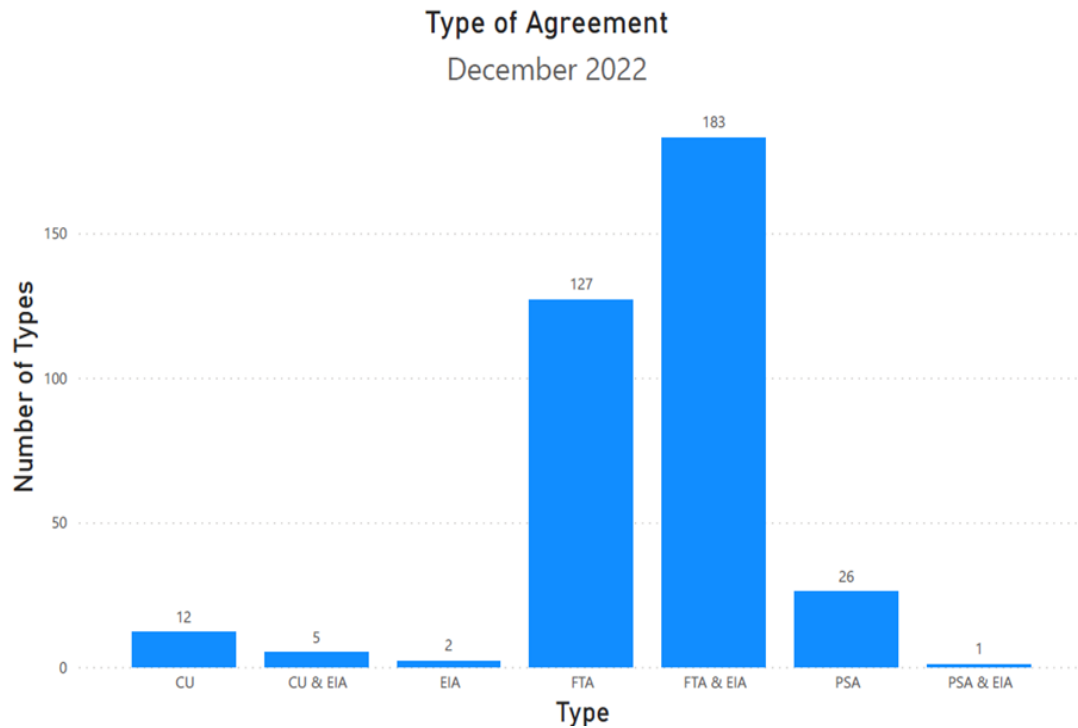
Article XXIV of the General Agreement on Tariffs and Trade (GATT) 1947, revised in 1994 (GATT Art. XXIV), encompasses provisions about establishing Customs Unions and FTAs. Art XXIV of the GATT permits the consolidation of multiple customs areas into a single customs territory, facilitating the removal of tariffs and trade barriers among member nations of a customs union or FTAs (World Trade Organisation, 2023).

As shown in Figure 15, a total of eight FTAs encompass the entire range of clauses and articles that serve as the basis for the existence of FTAs. The Latin American and Caribbean countries are members of six of these FTAs. Mexico has established four FTAs with Uruguay, Peru, Colombia, and Chile. Additionally, Chile has entered two additional FTAs, one with Peru and the other with Colombia. The remaining two FTAs

encompassing all three clauses and articles are in Asia, with the Republic of Korea (South Korea) participating in both agreements. The Agreement between the Republic of Korea and the member countries of the Association of Southeast Asian Nations (ASEAN) covers a total of eleven nations. A separate agreement has also been established between Korea and India.

The Enabling-Clause agreements encompass developing and developed countries, as seen by including developed countries in two out of the 38 signed enabling clause FTAs. Australia and New Zealand are signatories of the South Pacific Regional Trade and Economic Cooperation Agreement. The Protocol on Trade Negotiations (PTN) encompasses the participation of Israel's and South Korea's advanced economies. All agreements, including enabling clauses, relate to facilitating trade in goods. Of the ten FTAs governed by the enabling clause and Article V of GATS, eight pertain to emerging and developing Asian countries, three involve countries from the Middle East and Central Asia, two involve advanced economies, two involve sub-Saharan Africa, and one covers Latin America and the Caribbean. The FTAs are for trade in goods and services, involving four FTAs between two countries and two FTAs involving eleven countries. The six-nation Gulf Cooperation Council has provided a WTO notification under GATT Article XXIV and the enabling clause. Most notifications about FTAs fall within the purview of GATT Art XXIV and GATS Art V – 171 FTAs; notifications solely under GATT Article XXIV amount to 126.

Figure 16. Type of Agreement



Author's calculations based on WTO Source: <https://rtais.wto.org/>

There are seven distinct types of agreements for FTAs, including the Customs Union (CU), Economic Integration Agreements (EIA), Free Trade Area (FTA), Partial Scope Agreements (PSA), CU&EIA, FTA&EIA, and PSA&EIA.

The term FTA, as stated in Paragraph 8 (b) of GATT Art. XXIV is a collection of two or more customs territories where duties and other regulations restricting trade are eliminated on a significant portion of trade between the constituent territories. This elimination applies to goods originating within these territories (World Trade Organisation, 1994).

According to the (World Trade Organisation, 1994), the term CU is defined in Paragraph 8 (a) of GATT Art. XXIV refers to establishing a single customs territory to

replace multiple customs territories. The CU involves eliminating duties and other restrictive trade regulations, except in cases where they are deemed necessary. The objective is to eliminate such barriers to trade for a significant portion of the trade between the constituent territories of the union, or at least for a substantial portion of trade involving goods originating from these territories. Additionally, each union member is expected to apply similar duties and other regulations to trade involving territories not part of the union (World Trade Organisation, 1994).

The term EIA, as specified within the GATS Article V (World Trade Organisation, 2023), enables member countries to establish agreements that promote trade liberalization in services. These agreements must have significant coverage across several sectors and aim to eliminate discriminatory practices. According to the (World Trade Organisation, 2023), non-participating nations that maintain significant economic activities with countries involved in FTAs might derive advantages from such agreements.

The term PSA, which is not explicitly defined or referenced by the WTO, means that the PSA applies only to specific goods. PSAs are officially communicated by paragraph 4 (a) of the Enabling Clause, as stated by (World Trade Organisation, 2009).

Most FTAs, precisely 51.4 percent, fall under the category of FTA&EIA. These agreements encompass goods and services and are implemented globally across all six economic regions. FTAs account for 35.7 percent of the total agreements, encompassing various economic zones and only focussing on exchanging goods. Most of the 26 PSAs are concentrated in Latin America, the Caribbean, and emerging and developing Asia and

are limited to trade in goods only. The Asia-Pacific Trade Agreement (APTA) represents the only agreement for goods and services in the form of PSA&EIA among six Asian countries. The five CU&EIA are mainly for regional agreements, namely the Eurasian Economic Union (EAEU), East African Community (EAC), Southern Common Market (MERCOSUR), Caribbean Community and Common Market (CARICOM), and the EU Treaty. These agreements pertain to trade in both goods and services.

Discussion

The literature review and the research findings and data analysis of the 356 FTAs enable this discussion section to provide insights that address the research question – What is the impact of FTAs? It should be noted that the most prominent global traders do not have FTAs with each other. For example, the US does not have agreements with China and the EU, nor does China have a trade agreement with the EU. The insights will focus on (1) an increase in trade due to the positive correlation between GDP in current USD, the value of exports and imports for all regions and FTAs, (2) an increase in trade based on the direction of trade for selected countries; (3) supporting the gravity model's dynamic and static versions, (4) memberships of FTAs and observer and membership status of the WTO; (5) erosion of the MFN principle of the WTO; and (6) FTAs succeeding where WTO multilateral agreements fail.

The first FTA was signed in 1958, and as of December 2022, 356 FTAs had been signed. As shown in the findings and data analysis above, FTAs differ based on the number of countries involved, from a minimum of two countries (215 FTAs) to a maximum of 42 countries (one FTA). Furthermore, these FTAs differ in the number of

economic regions involved, ranging from one region (122 FTAs) to five regions (two FTAs). Further, FTAs differ based on the coverage of the FTAs in terms of goods or services or goods and services, which one of the three WTO notifications, Enabling Clause, GATS Art. V, or GATT Art. XXIV that applies to the FTA, and which one of the seven types of FTA it is. Due to these differences, the impact of FTAs varies from country to country and from economic region to economic region.

Increase in trade and GDP

(Ornelas, 2005) concludes that all countries benefit from FTAs regardless of whether they are in an FTA. This conclusion of Ornelas 2005 is borne out in the tables, which show a very high correlation between the increase in FTAs and the increase in imports, exports, and GDP. As pointed out by (Rodrik, 2018) and (Leshner & Miroudot, 2006), FTAs have become all-encompassing on economic issues, including matters relating to investment. As such, a positive correlation between imports, exports, and GDP with FTA was observed in all regions. As the FTAs increased, exports and imports of goods and services increased. Note that exports and imports are flows, and GDP is stock.; therefore, both stocks and flows of economic activity increased.

The CGE model of two-country FTAs shows that an FTA increases bilateral trade by approximately 35 percent on immediate impact and doubles it in the long run (Jung, 2012). Between 1995 (the start of the WTO) and 2022, imports, exports, and GDP increased in all world regions. The increase in world trade strongly correlates positively with the formation of the WTO and the subsequent mushrooming of FTAs. As shown in Table 39, imports from East Asia and the Pacific in 2022 were more than 1000 percent

higher than imports in 1995. As the East Asia Pacific region began to sign FTAs in the early 2000s (with the region’s first FTA signed in 2003), imports more than doubled annually. Evaluation of FTAs using GTAP version 6 showed that each ASEAN country in FTAs with China, Japan, and the Republic of Korea showed increased economic growth (Mukhopadhyay & Thomassin, 2008). The EU-Korea FTA has contributed to increased trade between the EU and Korea, with machinery and appliances exhibiting trade patterns as expected (Forizs & Nilsson, 2017).

Table 39 *Imports of Goods and Services by Region (US\$ billions) – selected years between 1995 and 2022*

Region	1995	2005	2010	2016	2017	2018	2019	2020	2021	2022
High income	5,162.2	9,986.3	14,494.2	14,308.9	15,565.7	16,996.6	16,825.8	15,181.2	18,430.4	20,716.0
Sub-Saharan Africa	97.4	212.6	434.7	388.1	421.2	477.1	482.2	356.6	458.8	531.3
Latin America & Caribbean	333.0	669.7	1,255.3	1,192.7	1,309.0	1,429.4	1,397.4	1,154.1	1,548.1	1,867.1
East Asia & Pacific (excluding high income)	387.9	1,096.4	2,923.1	2,871.4	3,267.9	3,768.5	3,685.1	3,423.6	4,410.7	4,651.6
Europe & Central Asia (excluding high income)	207.8	443.2	793.4	756.6	890.0	937.4	947.6	854.4	1,068.5	1,184.5
Middle East & North Africa (excluding high income)	104.7	278.2	436.4	407.4	450.1	456.9	454.4	366.4	420.3	473.4

Source: World Bank, World Development Indicators

The subsequent highest import increase is the Europe and Central Asia region, which increased by more than 570.0 percent by 2022, first more than doubling by 2005, after the region started to sign FTAs. Imports of goods and services increased in sub-Saharan Africa by 545.5 percent between 1995 and 2022. Imports from the region more than doubled yearly during the first ten years after the WTO, as the region began to sign FTAs. Despite the low number of FTAs for sub-Saharan African countries, freer trade through FTAs and the creation of the WTO have increased trade in the region.

The lowest increases in imports since the formation of the WTO in 1995 and the mushrooming of FTAs are in advanced high-income economies (401.3 percent increase

between 1995 and 2022) and the Middle East and North Africa (452.1 percent increase between 1995 and 2022). Data analysis and findings noted that advanced economies have signed FTAs with all regions. The number of trade agreements signed by the EU has benefitted EU countries. Between 1999 and 2010, EU foreign trade more than doubled and now accounts for more than 30 percent of the EU countries' GDP (European Union, 2023).

Similarly, the export figures shown in Table 6 indicate that exports have increased across all regions since the 1995 formation of the WTO and the mushrooming of FTAs after the Doha round of trade negotiations started in 2001. East Asia and the Pacific region again led the way with an export increase of 1,395.7 percent between 1995 and 2022. The highest increase of 335.8 percent was between 1995 and 2005 after the first FTAs were signed. The lowest export increase between 1995 and 2022 was for sub-Saharan Africa (490.1 percent increase) and Middle East and North Africa (499 percent increase), reflecting the lower FTAs signed by these regions.

Table 40 *Exports of Goods and Services by Region (US\$ billions) – selected years between 1995 and 2022*

Region	1995	2005	2010	2016	2017	2018	2019	2020	2021	2022
High income	5,349.8	9,864.1	14,948.6	14,822.6	16,174.9	17,618.3	17,301.0	15,579.2	18,983.7	20,767.1
Sub-Saharan Africa	98.2	226.9	350.5	311.7	370.5	426.7	415.5	327.4	441.7	481.3
Latin America & Caribbean	317.1	739.3	1,174.8	1,165.8	1,282.8	1,371.5	1,366.2	1,192.4	1,507.2	1,761.8
East Asia & Pacific (excluding high income)	375.2	1,259.0	3,334.1	3,185.7	3,544.5	3,884.1	3,863.6	3,837.0	4,885.1	5,236.7
Europe & Central Asia (excluding high income)	207.1	522.8	863.4	775.0	922.7	1,089.6	1,071.3	878.8	1,227.3	1,407.5
Middle East & North Africa (excluding high income)	93.2	313.8	318.9	304.4	362.7	415.5	379.8	270.5	379.8	465.1

Source: World Bank, World Development Indicators

The correlation between economic growth and trade is strongly positive. As shown in Table 41, economic growth is highest in regions with more FTAs. For example,

high-income countries/advanced economies have the highest number of FTAs and the highest GDP, US\$61 billion, by the end of 2022, an increase of 236.5 percent. The East Asia-Pacific region is doing the best in exports and imports and has done the best in economic growth since 1995. The East Asia-Pacific region GDP increased by 1,603.1 percent between 1995 and 2022, from US\$1,321.7 billion to US\$ 21,189.3 billion. Sub-Saharan African countries and the North of the Middle East, with a lower FTA and a lower rate of growth in exports and imports, also had lower GDPs at US\$2.1 billion and US\$1.7 billion, respectively, in 2022.

Table 41 *GDP (current US\$) by Region (US\$ billions) – selected years between 1995 and 2022*

Region	1995	2005	2010	2016	2017	2018	2019	2020	2021	2022
High income	26,016.5	37,831.1	48,273.6	49,306.3	51,570.9	54,839.7	55,315.5	53,938.0	60,016.7	61,535.8
Sub-Saharan Africa	377.6	823.4	1,696.0	1,576.5	1,705.9	1,774.2	1,823.4	1,714.1	1,926.5	2,047.3
Latin America & Caribbean	1,921.6	2,862.8	5,376.5	5,249.7	5,832.6	5,706.1	5,622.8	4,777.6	5,510.5	6,246.6
East Asia & Pacific (excluding high income)	1,321.7	3,106.5	13,326.9	13,611.8	14,876.7	16,639.9	17,207.1	17,487.4	20,837.4	21,189.3
Europe & Central Asia (excluding high income)	721.5	1,589.6	2,921.7	2,777.9	3,118.4	3,182.9	3,248.0	2,990.9	3,581.7	4,124.7
Middle East & North Africa (excluding high income)	371.2	808.5	1,439.1	1,475.8	1,476.9	1,400.0	1,408.6	1,284.9	1,507.0	1,677.0

Source: World Bank, World Development Indicators

Direction of trade for selected countries

The finding that trade agreements benefit the countries with the FTA more than those without the FTA is confirmed by the study done by (Hannan 2016), which stated that countries with FTA had an 80 percent increase in exports over ten years and a 3.8 percent annual increase in exports. Tables 42 to 44 show the direction of trade statistics from three countries, Ghana, Mexico, and Japan, for the selected years. Some of the partner countries in the FTAs are included in the tables. In addition, the years when these

countries joined the FTAs and the trade in those years are highlighted. It is clear from these three tables that there is a clear before and after picture of the value of trade between countries after the signing of the FTAs.

In the case of Ghana, exports and imports with the EU countries France, Germany, Spain, and the United Kingdom continued to increase after signing the FTA. For example, Ghana's exports to Spain were US\$21.1 million in 2000 before the signing of the FTA. In 2022, Ghana's exports to Spain were US\$106.9 million US dollars for the year, an increase of 506.6 percent. A similar picture of an increase in imports shows that Ghana's imports from the UK were US\$265.4 million in 2000, compared to an increase in annual imports in 2022 of US\$945.6 million. It should be noted that the UK traded with Ghana under the EU FTA until 2020 when the Brexit agreement came into force. From 2021, the UK traded with Ghana under a separate UK-Ghana FTA.

Following the revision of the ECOWAS treaty in the 1990s, Ghana's trade with other West African states increased. Both imports and exports have increased steadily. For example 1990, Ghana's exports to Burkina Faso were US\$ 4 million. In 2002, exports to Burkina Faso amounted to US\$269.3 million.

In the case of Mexico, exports and imports increased after the signing of FTAs. In 1992, Mexico signed the first version of the USMCA (previously known as NAFTA). Table 43 shows that in 1995, Mexico's exports to the US were US\$66.5 billion compared with US\$18.8 billion two years before the FTA was signed. By 2022, Mexico's exports to the USA amounted to US\$472.6 billion. Mexico's imports from the United States were similarly very high after the 1992 signing of NAFTA.

In the case of Japan, Table 44 shows that exports and imports increased after the country signed the FTA. For example, Japan signed an FTA with Vietnam in 2009. From 2010 onwards, Japan's trade with Vietnam more than doubled. In 2005, Japan's imports from Vietnam were US\$4.5 billion compared to imports of US\$26.3 billion from Vietnam in 2022. Overall, trade increases after signing an FTA, making trade without an FTA less advantageous.

Table 42 *Ghana – Direction of Trade Statistics with selected Countries – selected years between 1990 and 2022 (US\$ billions)*

Ghana													
Exports, FOB to Partner Countries													
US Dollars, Millions													
Country	1990	1995	2000	2005	2010	2015	2016	2017	2018	2019	2020	2021	2022
Burkina Faso	4.0	5.3	5.9	0.8	72.9	327.3	427.3	490.7	272.8	277.7	223.7	227.8	269.3
Côte d'Ivoire	4.6	8.1	10.0	14.7	26.5	58.6	33.4	50.8	55.6	52.7	63.4	64.5	76.3
France	44.5	125.3	39.3	150.5	65.0	794.3	139.6	261.8	358.0	377.0	229.5	233.8	276.3
Germany	390.6	192.5	84.5	74.0	67.4	147.6	147.5	233.1	213.5	213.3	376.6	287.7	285.7
Spain	26.6	51.1	21.0	52.8	66.8	152.7	149.1	213.2	584.5	171.7	163.6	115.1	106.9
Togo	6.9	6.0	60.1	0.1	70.1	185.4	289.5	194.5	139.4	159.9	205.8	209.6	247.7
United Kingdom	169.0	235.3	296.7	217.1	175.8	314.9	95.2	329.5	491.5	415.1	365.4	539.6	732.9

Imports, CIF from Partner Countries													
US Dollars, Millions													
Country	1990	1995	2000	2005	2010	2015	2016	2017	2018	2019	2020	2021	2022
Burkina Faso	0.5	4.8	40.1	0.1	6.8	13.9	12.2	14.4	50.7	115.6	61.5	62.4	62.2
Côte d'Ivoire	105.7	101.1	67.8	11.0	49.9	98.6	66.0	102.0	119.2	93.2	108.2	138.0	131.4
France	54.4	89.5	92.4	159.1	498.1	228.5	382.2	192.9	282.6	158.3	147.2	175.4	161.6
Germany	133.3	192.9	205.2	283.2	272.3	322.3	440.7	341.5	305.8	246.3	255.2	343.0	334.1
Spain	10.4	58.5	139.6	93.1	114.5	263.1	167.1	754.6	199.2	139.1	95.9	144.8	147.5
Togo	4.6	3.2	49.8	76.3	85.9	152.9	85.9	87.4	61.0	67.2	47.8	61.0	58.1
United Kingdom	317.7	415.8	265.4	368.7	387.3	795.9	1,106.7	1,099.1	604.1	685.6	1,531.1	1,293.7	945.6

Source: IMF Direction of Trade Statistics, <https://data.imf.org/?sk=9d6028d4-f14a-464c-a2f2-59b2cd424b85&sid=1409151240976>, downloaded August 2023

Table 43 *Mexico – Direction of Trade Statistics with selected Countries – selected years between 1990 and 2022 - (US\$ billions)*

Mexico									
Exports, FOB to Partner Countries									
US Dollars, Millions									
Country	1990	1995	2000	2005	2010	2015	2020	2021	2022
Bolivia	3.8	24.1	26.6	36.9	97.2	172.0	112.4	169.0	179.5
Brazil	166.7	800.3	517.2	890.2	3,781.0	3,798.9	3,055.3	3,656.4	4,539.6
Canada	225.6	1,979.4	3,340.0	4,234.5	10,685.6	10,544.8	11,139.4	13,059.6	15,585.9
Chile	90.1	489.9	431.3	667.7	1,863.4	1,861.4	1,319.2	2,079.5	1,795.3
Colombia	109.5	453.3	461.8	1,548.3	3,757.1	3,668.1	2,612.7	3,434.2	3,690.6
Cuba	104.0	355.1	209.2	221.6	307.3	355.7	246.9	284.5	269.5
France	548.5	482.9	374.5	372.7	586.8	2,098.4	1,295.3	1,380.5	1,275.3
Germany	341.3	515.5	1,543.9	2,289.4	3,571.7	3,608.0	6,585.5	7,540.8	8,339.1
Israel	215.1	10.5	54.6	87.3	88.8	147.0	190.2	249.1	249.9
Japan	1,502.4	928.1	930.5	1,470.0	1,925.6	3,017.5	3,652.1	4,194.2	4,702.5
Panama	71.9	224.1	282.8	463.3	882.3	1,042.5	1,163.3	1,350.4	1,303.1
Peru	68.2	178.9	210.0	345.0	973.6	1,650.9	1,195.3	1,557.6	1,727.2
Spain	1,445.3	778.7	1,503.0	2,954.1	3,838.0	3,294.9	3,323.0	4,913.1	5,489.2
United Kingdom	183.9	504.5	869.8	1,188.2	1,733.7	1,967.6	2,619.0	3,033.0	2,908.7
United States	18,837.1	66,475.2	147,399.9	183,562.8	238,684.4	308,869.5	338,701.1	399,000.8	472,583.6
Uruguay	35.9	76.7	108.0	65.6	207.6	218.2	172.5	263.6	278.8

Imports, CIF from Partner Countries									
US Dollars, Millions									
Country	1990	1995	2000	2005	2010	2015	2020	2021	2022
Bolivia	5.9	5.6	14.2	31.7	47.5	31.6	32.7	54.6	63.5
Brazil	393.6	621.8	1,911.1	5,527.1	4,587.1	4,899.6	5,972.4	9,333.6	12,876.7
Canada	429.8	1,511.7	4,257.6	6,539.5	9,123.9	10,545.2	8,825.3	11,923.4	13,986.9
Chile	40.8	548.2	947.3	1,859.4	2,069.5	1,569.3	1,383.0	2,260.7	2,288.9
Colombia	35.6	107.2	289.8	715.6	843.1	977.9	1,025.5	1,485.4	2,171.0
Cuba	58.8	6.9	29.7	21.5	18.8	13.2	13.7	10.9	10.7
France	788.0	1,081.0	1,554.6	2,718.5	3,205.9	3,950.5	3,593.4	4,374.0	4,716.0
Germany	1,834.7	2,955.9	6,103.9	9,190.7	11,741.4	14,814.2	14,703.5	18,266.2	19,562.4
Israel	17.5	51.3	314.3	392.9	540.8	736.6	699.6	849.9	1,053.1
Japan	1,411.4	3,968.8	6,853.6	13,862.4	15,915.6	18,411.4	14,730.4	18,109.8	19,395.0
Panama	165.1	9.8	126.8	83.1	34.2	128.0	36.2	51.9	122.6
Peru	65.5	108.6	187.3	472.1	357.4	722.2	607.3	743.5	1,113.7
Spain	554.2	763.5	1,515.8	3,524.1	3,426.2	4,828.0	3,987.3	4,869.0	5,987.7
United Kingdom	649.3	584.9	1,156.7	1,978.1	2,125.2	2,485.7	1,919.8	2,221.6	2,602.2
United States	21,830.2	59,394.0	135,186.5	125,660.2	153,707.8	198,021.2	177,827.9	234,243.7	280,927.8
Uruguay	39.3	19.2	88.2	278.6	247.2	395.6	315.4	350.0	458.3

Source: IMF Direction of Trade Statistics, <https://data.imf.org/?sk=9d6028d4-f14a-464c-a2f2-59b2cd424b85&sid=1409151240976>, downloaded August 2023

Table 44 *Japan – Direction of Trade Statistics with selected Countries – selected years between 1990 and 2022 - (US\$ billions)*

Japan									
Exports, FOB to Partner Countries									
US Dollars, Millions									
Country	1990	1995	2000	2005	2010	2015	2020	2021	2022
Australia	6,926.4	8,103.7	8,580.3	12,512.6	15,868.9	12,843.9	12,131.7	15,240.9	16,519.2
Brunei Darussalam	86.3	131.3	56.3	104.8	149.7	120.5	103.2	227.6	59.7
Chile	484.0	916.0	659.5	942.0	2,723.9	1,670.1	1,009.3	1,843.4	2,267.4
France	6,144.7	6,066.8	7,492.1	7,820.0	6,706.1	5,262.0	5,639.1	6,676.7	6,447.5
Germany	17,926.3	20,328.3	19,998.2	18,741.7	20,316.2	16,234.9	17,402.4	20,749.7	19,556.4
India	1,711.4	2,542.9	2,488.5	3,523.7	9,051.9	8,104.0	9,080.7	12,853.6	13,860.9
Indonesia	5,051.9	9,969.0	7,603.7	9,332.3	15,918.2	11,545.3	9,166.4	13,310.8	15,027.6
Malaysia	5,529.1	16,801.7	13,886.3	12,624.4	17,636.8	12,003.9	12,556.4	15,605.8	16,464.1
Mexico	2,276.4	3,572.4	5,210.8	6,881.4	9,576.3	10,472.0	8,367.8	10,831.6	10,905.4
Mongolia	14.0	42.4	28.6	73.4	161.0	251.8	340.6	497.1	491.8
Peru	76.1	300.1	351.9	274.1	994.5	791.6	465.8	702.7	739.7
Philippines	2,510.0	7,099.9	10,256.7	9,154.0	11,052.6	9,485.9	8,781.4	11,090.3	12,146.7
Singapore	10,738.8	23,005.8	20,830.0	18,528.8	25,225.8	19,867.2	17,633.0	20,030.7	22,335.6
Spain	2,420.5	2,395.6	3,305.1	5,184.7	3,225.1	2,384.6	2,175.5	2,420.1	2,686.4
Switzerland	2,936.8	2,407.6	2,094.1	2,169.6	7,798.4	2,698.8	4,825.0	4,411.3	4,133.5
Thailand	9,149.8	19,719.3	13,634.2	22,562.7	34,222.3	27,985.1	25,418.1	33,007.6	32,475.5
United Kingdom	10,817.4	14,073.2	14,836.7	15,176.8	14,226.3	10,729.9	10,694.1	10,358.8	11,038.0
Vietnam	214.5	922.1	1,974.7	3,590.2	8,178.1	12,529.7	17,034.6	19,069.8	18,607.2

Imports, CIF from Partner Countries									
US Dollars, Millions									
Country	1990	1995	2000	2005	2010	2015	2020	2021	2022
Australia	12,358.5	14,514.2	14,774.3	24,406.4	45,188.0	34,817.4	35,622.9	51,642.2	87,576.3
Brunei Darussalam	1,277.8	1,342.1	1,652.7	2,281.9	4,105.7	2,347.2	1,735.5	2,241.1	2,544.5
Chile	1,616.4	3,209.8	2,833.3	4,987.6	7,759.4	6,006.4	6,552.0	7,393.5	7,837.3
France	7,612.8	6,692.9	6,410.0	8,507.0	10,295.3	9,480.0	9,255.5	11,562.3	10,147.6
Germany	11,642.2	13,702.9	12,732.5	17,870.3	19,288.3	20,276.4	21,209.5	23,643.8	22,750.6
India	2,074.7	2,916.8	2,636.7	3,193.7	5,683.3	4,867.4	4,718.3	6,129.5	6,531.4
Indonesia	12,743.9	14,198.5	16,371.0	20,767.7	28,254.9	19,762.6	14,487.9	19,493.2	28,606.1
Malaysia	5,411.4	10,544.6	14,490.4	14,686.2	22,714.7	21,529.3	15,909.6	19,640.7	25,990.3
Mexico	1,913.3	1,485.0	2,388.3	2,541.9	3,486.8	4,747.8	5,428.9	5,752.5	6,403.5
Mongolia	17.6	90.3	9.6	6.5	23.7	54.0	14.5	35.7	36.7
Peru	564.4	539.5	351.4	695.3	2,179.5	1,240.4	2,182.1	2,774.9	3,087.8
Philippines	2,149.5	3,495.5	7,189.6	7,716.9	7,932.9	8,878.6	9,299.8	10,783.8	10,882.6
Singapore	3,581.0	6,846.4	6,426.1	6,697.5	8,151.0	7,902.1	8,540.1	8,823.5	9,842.8
Spain	906.5	1,518.0	1,363.3	1,765.5	2,613.8	3,660.4	2,900.3	5,365.6	6,951.9
Switzerland	4,096.7	4,056.0	3,281.7	5,036.0	6,789.8	7,387.3	7,453.2	8,251.7	7,928.2
Thailand	4,164.3	10,129.8	10,595.2	15,574.3	21,032.6	20,421.8	23,762.0	26,291.6	26,653.8
United Kingdom	5,258.1	7,145.2	6,580.3	6,711.3	6,373.2	6,511.5	6,017.9	6,888.2	6,847.4
Vietnam	597.4	1,715.9	2,637.0	4,534.3	8,174.9	15,136.7	22,023.7	22,910.8	26,344.7

Source: IMF Direction of Trade Statistics, <https://data.imf.org/?sk=9d6028d4-f14a-464c-a2f2-59b2cd424b85&sid=1409151240976>, downloaded August 2023

Supporting the gravity model's dynamic and static versions

Data analysis and findings confirm the static gravity model: countries with high GDP and close geographic proximity trade more. The data analysis and findings show that advanced economies with the highest GDP have the most FTAs – 206 FTAs or 33 percent of all FTAs. Also, most of the world's top 10 economies have 15 or more FTAs. For example, the EU has 45 FTAs, the UK has 36 FTAs, and Japan has 18 FTAs. The second aspect of the Gravity model regarding geographic proximity as a determinant of trade is proven by high intraregional FTAs. For example, Latin America and the Caribbean have 38 FTAs within the region, and sub-Saharan Africa has seven intraregional FTAs, second only to Africa's nine FTAs with advanced economies. It is important to note that sub-Saharan Africa does not have FTAs among the various regional groupings such that ECOWAS, which covers West Africa, does not have an agreement with SADC, which covers Southern Africa. The African Union is not registered with the WTO as an FTA. Other examples of FTAs within regions include the EU in Europe, USMCA in North America, COMESA in East and Southern Africa, CARICOM in the Caribbean region, MERCOSUR in South America, and SPARTECA in the South Pacific.

The data and findings also support the dynamic version of the Gravity model posited by (Jung, 2012), that is, the trade promotion effects of an FTA lead to increased trade. Tables 42 to 44 above show that trade increased after the signed FTA. For example, Mexico's exports to the United States increased yearly after signing the first

trade agreement in 1992. In 1990, Mexico's exports to the USA amounted to US\$18.8 billion. In 2022, Mexico recorded US exports of US\$472.6 billion.

Countries are more likely to be part of FTAs than members of the WTO.

In a possible threat to multilateralism, countries are more likely to join FTAs than the WTO. As shown in Table 45 below, some countries have signed up for FTAs. For example, Eritrea (a member of the Common Market for Eastern and Southern Africa (COMESA) FTA is not a member or observer of the WTO, and North Korea (a member of the Global System of Trade Preferences among Developing Countries (GSTP) FTA) is not a member or observer of the WTO. It should be noted that Eritrea joined COMESA in 1994, and North Korea joined GSTP in 1989, therefore before the WTO formation in 1995. Other countries, such as Kiribati, have joined FTAs in the twentieth century but are not members of the WTO. Some countries have recently formed, such as South Sudan (2011) and Kosovo (2008), and although South Sudan has yet to join an FTA, the country is an observer of the WTO. However, Kosovo is neither an observer nor a member of the WTO but has signed three FTAs with Türkiye, the United Kingdom, and the Central Europe Free Trade Agreement. Some countries are constituents/colonies of other countries, so memberships of FTAs and WTO should not matter; these countries include Aruba, a constituent of the Kingdom of the Netherlands.

Table 45 *FTAs and WTO – members and observers, December 2022*

Country grouping	Countries not in FTAs	WTO Observers	Countries not members or observers of WTO
Advanced economies		Andorra, Holy See	Monaco, San Marino Kiribati, Marshall Islands, Micronesia, Nauru, Democratic People's Republic of Korea, Palau, Tuvalu
Emerging and developing Asia	Palau, Timor-Leste	Bhutan, Timor-Leste	
Emerging and developing Europe Latin America and the Caribbean	Aruba	Belarus, Bosnia and Herzegovina, Serbia Bahamas, Curacao	Kosovo Aruba, St. Maarten
Middle East and Central Asia	Djibouti, Mauritania, Somalia	Algeria, Azerbaijan, Iran, Iraq, Lebanon, Libya, Somalia, Sudan, Syria, Turkmenistan, Uzbekistan	Palestine
Sub-Saharan Africa	South Sudan, São Tomé and Príncipe	Comoros, Equatorial Guinea, Ethiopia, Sao Tome and Principe, South Sudan	Eritrea

Source: Author's calculation based on WTO data

Erosion of MFN

The move away from MFN and mushrooming FTAs has contributed to a multi-tier trading system, the CU and GATS Art. V allows countries not part of the FTAs to also benefit from the terms of the FTAs. However, how individual members of the FTA consider non-members' benefits substantial business operations' is open to interpretation by individual members (Ornelas, 2005). From the list of current FTAs, Mexico has entered FTAs with other Latin American and Caribbean countries, Uruguay, Peru,

Colombia, and Chile, which, in theory, allows these four countries to benefit from the USMCA. Also, the Japan-Mexico FTA allows Japan to benefit from the USMCA and access the US market (Fink & Molinuevo, 2008). The many FTAs signed by the EU since the 2001 Doha Round, particularly with Asian countries, have threatened the WTO's multilateral trade liberalization system.

Furthermore, EU countries benefit more from the EU-ASEAN FTAs (Antimiani, Mitaritonna, Salvatici, & Santuccio, 2009). The US increasing its tariffs on Chinese goods is a clear indication that members of FTAs do not necessarily give the same benefits to non-members; considering that China is the US's largest trading partner, imports from China to the US do not get the same benefits as imports from Mexico and Canada. As noted in the research conducted by (Limao, 2006) and (Karacaovali & Limao, 2008) on the United States and the European Union, regionalism hinders external liberalization. It should be viewed as an obstacle to achieving global free trade. In addition, in the early 2000s, the EU's preferential treatment for ACP countries was found to be against WTO rules and scrapped. However, although registered with the WTO on paper, the current rollout of the several FTAs should allow benefits to be shared among all nations, substantial business operations are open to interpretation, and countries can make decisions unilaterally on how countries outside the FTA can benefit.

FTAs succeeded where the multilateral system failed.

One example of free trade agreements (FTAs) is when countries like North Korea and Eritrea, which did not join the World Trade Organisation (WTO), still benefit from the trading system because they are part of FTAs. Another instance is that, after the 2001

Doha Declaration, the United States and other nations actively promoted FTAs as they sought consensus on clauses they wanted to include in the declaration. After the 2001 Doha Declaration, the United States engaged in regional trade negotiations incorporating intellectual property standards known as "TRIPS-plus." These standards deviate from the goals of the Doha Declaration. The 2002 Australia-US FTA was the first agreement following this approach. Pursuing intellectual property protection through regional trade agreements has been partly driven by America's desire to establish standards it had expected but failed to secure through the WTO Trade-Related Aspects of Intellectual Property Rights (TRIPS) agreement. The US offered market access to allies and smaller economies in return for more substantial commitments on domestic intellectual property regulations surpassing TRIPS' minimum requirements. This market access hindered the utilization of the agreement's flexibility, as discussed by Tully (2016).

The Trans-Pacific Partnership (TPP) agreement, signed in 2016 but still awaiting ratification, represents another avenue through which the United States aims to pursue its TRIPS-plus agenda, as stated by the US Trade Representative in 2018. It is noteworthy that the TPP provisions regarding pharmaceutical intellectual property. These provisions limit pharmaceutical innovators' research and development opportunities in developing countries, inhibiting their ability to use reverse engineering to create equivalents or product improvements. The adoption of processes observed within India's industry would be hindered by prospective parties, as highlighted by (Tully, 2016). Although the US withdrew from the TPP following President Trump's memorandum on January 23, 2017, and as of August 20, 2023, President Biden has not yet rejoined it, there is potential for

the eleven countries involved to proceed with a new agreement that does not involve the US or China. Despite this withdrawal, embracing the principles outlined within the TPP could produce economic benefits and positively impact American workers (Bay Area Council Economic Institute, 2017). The TPP Intellectual Property chapter includes measures to safeguard US exports and protect consumers against infringement of intellectual property rights (US Trade Representative, 2018).

Conclusion

The research findings unequivocally indicate that the effects of free trade agreements (FTAs) are exclusively beneficial to the participating members of the FTA. Free trade agreements (FTAs) have positively impacted countries with many of such agreements, leading to increased exports, imports, and gross domestic product (GDP). The sub-Saharan African regions exhibit a comparatively lower prevalence of FTAs, which is associated with lower levels of gross domestic product (GDP), exports, and imports compared to countries with a higher prevalence of FTAs

The H-test conducted on the critical characteristics of free trade agreements (FTAs) reveals that the variations in FTAs can be attributed to factors such as the number of participating countries, the regions involved, and the extent of coverage in terms of goods, services, or both. These differences lead to rejecting the null hypothesis, indicating that FTAs do not universally benefit all countries.

The trade statistics for selected countries indicate a noticeable rise in trade values after implementing FTAs. Before the signing of the United States-Mexico-Canada Agreement (USMCA), formerly known as the North American Free Trade Agreement

(NAFTA), Mexico's exports to the United States amounted to US\$18.8 billion in 1990. However, in 2022, these exports substantially increased, reaching US\$472.6 billion.

The research findings indicate variations in the number of countries involved in an FTA, spanning from two to 42 countries. It is worth noting that FTAs can also be established between regional groups, such as the European Union and Pacific States. The number of regions involved in FTAs varies in different cases. For example, there are instances where only two regions are involved in five FTAs, while in other cases, a single region is involved in 122 FTAs, and two regions are involved in 201 FTAs.

The study additionally revealed that advanced economies possess the most FTAs, accounting for 206 FTAs, representing 33 percent of the total FTAs. In contrast, sub-Saharan Africa exhibits the lowest number of FTAs, with only 27 FTAs, representing 4 percent of the total FTAs. Approximately 53 percent of Free Trade Agreements (FTAs) related to the exchange of goods and services, encompassing the provisions outlined in both the General Agreement on Tariffs and Trade (GATT) Article XXIV and the General Agreement on Trade in Services (GATS) Article V.

The research findings support the static and dynamic iterations of the gravity model. Specifically, these findings indicate that FTAs positively impact trade promotion. Countries with a higher GDP also tend to engage in more FTAs. Furthermore, a significant proportion, namely 34 percent, of FTAs are established between countries within the same geographic region.

The number of nations not affiliated with the WTO exceeds those not participating in FTAs. Additionally, FTAs have proven successful in areas where the

WTO has faced challenges. For instance, while the United States could not secure consensus on Trade-Related Aspects of Intellectual Property Rights (TRIPS) within the WTO, it managed to achieve agreement on TRIPS-plus provisions through FTAs with other countries. Participating countries can unilaterally extend the terms of the FTA to these countries to extend the benefits of FTAs to non-participating countries. The available evidence substantiating the implementation of such measures by countries is limited. However, the United States does not need China with tariff rates equivalent to those offered to Mexico. Consequently, the Most Favoured Nation (MFN) principle is not implemented.

The findings of this study are linked to previous research conducted by Bhagwati (2008), which revealed that the European Union (EU) exclusively grants most favored nation (MFN) tariffs to a limited number of countries, namely Australia, New Zealand, Canada, Japan, Taiwan Province of China, and the United States. According to studies conducted by Limo (2006) and Karacaovali and Limo (2008), regionalism in the United States and the European Union has been found to impede multilateral liberalization, thereby presenting a significant barrier to attaining global free trade. The escalating intricacy of these agreements further exacerbates the disparities in global trade caused by FTAs; as Rodrik (2018) noted, FTAs have expanded beyond trade-related matters to encompass nontrade concerns.

The findings presented in this study are of considerable significance, as they offer a potential explanation for the phenomenon of underdevelopment observed in certain developing nations. International trade, exports, and imports are GDP components and, as

such, promote economic expansion. Countries with limited international trade can experience reduced economic growth. According to the findings of this study, it is evident that the region of East Asia and the Pacific, which has participated in 85 FTAs, experienced a remarkable growth in Gross Domestic Product (GDP) from 1995 to 2022. Specifically, GDP surged by an impressive 1,603.1 percent, from US\$1,321.7 billion in 1995 to US\$21,189.3 billion in 2022. However, it was observed that Sub-Saharan African countries and regions of North Africa in the Middle East with comparatively lower FTA and slower growth rates in exports and imports also showed lower Gross Domestic Products (GDP) at US\$2.1 billion and US\$1.7 billion, respectively, in 2022.

The findings suggest the need for reform in the global trade system to ensure equitable benefits for all nations. This study has determined that there are variations between FTAs, leading to disparate outcomes for individual nations. Consequently, FTAs only uniformly benefit some countries. One of the factors cited for the proliferation of FTAs is the slow progress of the ongoing Doha Round of trade negotiations. The findings of this study can be used as empirical support to advance multilateral trade negotiations.

One notable limitation of this study is the need to examine the legal provisions within FTAs and their impact on trade with non-FTA countries. Consequently, research needs more robust empirical evidence on the distinct effects of FTAs on global trade, including trade diversion and creation and terms of trade. Moreover, utilizing the GTAP model would have yielded additional empirical support regarding the disparities induced by FTA. These limitations may be valuable considerations for future research on free trade agreements (FTAs). Moreover, it is worth considering conducting additional

research to investigate the causal relationship between free trade agreements (FTAs), the subsequent increase in gross domestic product (GDP), and the growth in exports and imports of goods and services. It is important to note that the current study primarily examined these variables' correlations, leaving room for further investigation of the underlying causality.

CHAPTER IV –THE ROLE OF THE DIGITAL ECONOMY IN CROSS-BORDER TRADE

Introduction

This research sees the digital economy as economic activity by producers and consumers enhanced by digital inputs, including digital infrastructure, technologies, and services (OECD 2020). Cross-border data access is essential for the digital economy because it increases economic activity and productivity. Every sector, including services, agriculture, manufacturing, and retail, relies on the global data flow. The digital economy has brought benefits to firms, consumers, the economy, and society due to the efficiencies that it enables. The big firms in the digital economy include Alphabet, Microsoft, Apple, Meta, and Amazon. The digital economy operates through various platforms, including booking.com, uber, and social media.

Internet globalization and the ability for cross-border data movement are transforming international trade in five key areas. MSMEs and developing countries can use digital platforms to export, with online payment mechanisms providing a global reach. IT, financial, professional, and education services can be traded online, with new digital services like cloud computing becoming crucial business inputs. Data collection and analysis allow new services to add value to goods exports, underpinning global value chains. The growth of digital technologies like 3D printing and M2M communications complicates trade transactions, affecting regulatory cooperation and trade-related principles like rules of origin (Brookings, 2023).

This research aims to explain how the digital economy enables cross-border trade flows, examining the enabling environment and digital platforms that propel the digital

economy. The research has a literature review examining definitions, economic growth, and development impacts, businesses and consumers, and policies and regulations. The research answers the question of the digital economy concerning cross-border trade and investment using a case study methodology.

Review of the Literature

Definition and Features of the Digital Economy

Industrial production, services supply, and commercial transactions have been revolutionized by digitalization. Also, digital platforms are increasingly used for producing, marketing, and distributing goods and services (Neeraj, 2019). The digital economy relies on technologies, services, and data for production and consumption (OECD, 2020). The active development of the digital economy started in the 1990s with the development of the World Wide Web (www), the Digital Internet, computerization, automation, and the operations of information and communication companies (Kuznetsov, Ukolova, Monakhov, & Shikhanova, 2018).

The OECD (2020) concludes that the digital economy has expansive societal impacts and extends beyond the economic activities usually recorded in economic statistics. The comprehensive definition includes a tiered framework to enable precise measurement and comparability of the digital economy by statistical offices to address this. This comprehensive definition includes various tiers, such as the Core measure (hardware, software), Narrow measure (digital economy, platform economy), and Broad measure (includes gig and sharing economy). This comprehensive definition is between a bottom-up approach (number of people employed) and a top-down/trend-based approach (digital technologies) (OECD, 2020).

The information technology-producing industries in the digital economy can be divided into hardware industries, such as computer equipment and semiconductors; software industries, such as retail trade software; and communication equipment and communication services involving radio and TV (Henry, et al., 1999).

Peng (2016) notes that the digital economy involves e-commerce (business-to-business (B2B), business-to-consumer (B2C), and consumer-to-consumer (C2C)), payment services, advertising, and cloud computing. The prominent features of the digital economy are liquidity, such that intangible assets can be easily transferred, and information technology has reduced costs. The features also include virtual production, where goods and services are related to data used in servers, and multidimensional, where multiple groups interact on the platform across various jurisdictions. The digital economy also has high value since it combines knowledge and technology and is primarily data-dependent (Peng, 2016).

Arbache (2018) states that digitalization transforms markets and products, production, payments and delivery, and human capital requirements. Productivity is boosted, and companies are exposed to new ideas, technologies, management, and business models that create market access channels at relatively low costs. Digital technologies are increasingly becoming an entry requirement for firms and are no longer a competitive advantage source (Arbache, 2018).

According to Satyanand (2021), the digital economy uses Internet-based technologies to produce and trade goods and services and any transaction conducted over the Internet. The digital economy is based on interconnectedness between people, organizations, and machines. The technologies supporting the Internet are advanced in

cloud computing, data analytics, automation, artificial intelligence, blockchain, robotics, additive Manufacturing (3D printing), and the Internet of Things. Satyanand (2021) notes that these technologies have accelerated development, referred to as the fourth industrial revolution. The first, second, and third industrial revolutions refer to the steam engine, electricity, mass production, personal computers, and the Internet. The digital economy has three layers: first is physical infrastructure and software such as fiber optic cable, mobile phones, and computers; second, digital services and platform economy; and the third layer includes e-commerce, computer algorithms, the shared economy, and the gig economy (Satyanand, 2021). The OECD grouping of the digital economy is shown in Table 46.

Table 46 Digital Economy Categorization

Digital Industry Grouping	Description/Examples
Digitally enabling industries	Internet service providers, software, computer manufacturers, telecom companies, and website developers
Digital intermediary platforms charging a fee	Travel booking portals, Food delivery companies, and platforms facilitating online auctions
Data and advertising drive digital platforms	Social media platforms, Search engines, information-sharing platforms, and developers of zero-priced phone applications
Firms dependent on intermediary platforms	Independent service providers obtaining jobs from digital platforms, businesses selling through a third-party digital platform
E-tailers	Retail and wholesale businesses that purchase and resell goods or services digitally receive most of their orders.
Digital-only firms providing financial and insurance services	Digital-only banks, financial service providers, and payment system providers.
Other producers only operate digitally.	Fee-charging digital-only media providers, subscription-based digital service providers

Source: (Kole, 2021)

According to Li, Kim, Lang, Kauffman, and Naldif (2020), innovation has relied on digital technologies, including blockchain technology, 3D printing, and machine learning, effectively reshaping the manufacturing industry and the global industrial structure. The transition to the digital economy has three stages. In the pre-transaction stage, various innovations, including Google searches and social media, have reduced search costs. In the transaction stage, the software processes enable the completion of processes and identify consumer preferences. While in the post-transaction stage, goods such as e-books, digital music, and movies can be delivered digitally (Li, Kim, Lang, Kauffman, & Naldif, 2020).

According to Krajnovic, Sikiric, and Bosna (2018), the digital economy, based mainly on internet transactions, enables flexible high-speed interaction between market players, thus enabling quick re-organization of company resources and contributing to new value-added and business models. The impact of technology has resulted in more accessible access to high-quality and timely information. (Krajnovic, Sikiric, & Bosna, 2018).

According to (Henry et al., 1999), information technology has brought benefits to consumers and producers, changed the speed of economic exchange, and pushed the limits of established economic performance. Indices tracking the digital economy require new economic measures and measurement techniques. The US Bureau of Economic Analysis has been developing new measures to consider the digital economy in overall economic activity, for example, revising how the GDP is measured (Henry, et al., 1999).

Neeraj (2019) notes that the digital market is oligopolistic because of its domination by a few big players. Digital markets have three broad segments: B2B, B2C,

and C2C. The B2C segment was valued at US\$2.2 trillion in 2015. The B2C segment usually involves online retail marketing platforms, travel services, cloud computing services, social networking sites, ride-sharing platforms, online payment services, and paid media content. The dominant firms are Google, Amazon, Apple, Facebook, and Microsoft. Neeraj (2019) concluded that Google is the most dominant digital market firm, including the largest search engine market, five of the top six universal web platforms, and 93 percent of the Top 14 commercial web functions. The market dominance comes from first-mover advantages, either garage experiments or Ph.D. projects, network effects where the patents power the technology, and extensive embedded consumer use, which makes it difficult for competitors to challenge the position (Neeraj, 2019). An exception to the first-mover advantages is Facebook overtaking Myspace. According to (Hartung, 2011), Facebook succeeded because it used a 'white space' innovation strategy that allowed the market to determine how the company developed compared with Myspace, which wanted to implement a plan on how social media should work.

According to Mesenbourg (2021), the digital economy includes the supporting infrastructure, the electronic business processes, and the transactions. The supporting infrastructure includes the hardware, software, and telecommunication networks. The electronic business processes include access to vendor catalogs and electronic payments to vendors. The transactions include downloads of e-books, software, music, and movies (Mesenbourg, 2021).

According to Sadulloevich (2017), since 2000, global ICT developments have shown three broad trends: the upward trend in communication services, the growth in

broadband, and the growing predominance of mobile over fixed services. Mobile literacy has begun to address this need by pinpointing the digital skills smartphone users must know to get the best from their mobile internet experience. Two forces driving mobile literacy are the mobility and convenience achieved through apps, which fuel numerous opportunities, and the penchant for smartphone users to demand more information than they supply and engage in more social than "serious" activities compared to PC users. The fastest-growing sector globally is the Information and Communication Technologies (ICT) sector, which contributes to transforming other sectors and economic growth (Sadulloyevich, 2017).

According to Sadulloyevich (2017), many countries have implemented policies and initiatives to foster growth and advancement in the Information and Communication Technology (ICT) sector. These policies can be classified into three distinct categories: Policies prioritizing information and communication technology (ICT) encompass various areas such as the digital economy, telecom and mobile policies, broadband infrastructure, digital inclusion, E-Government initiatives, universal services, and access to funding. Secondly, sector-specific policies are implemented to address the needs of various sectors, including education, workforce development, rural development, agriculture, health, public libraries, youth, and women; and finally, national development plans that include vision, goals, and critical trends. (Sadulloyevich, 2017).

Spiegel and Waldfogel (2021) report that in 2020, digital markets are a notable departure from the ideal state of perfect competition. The overwhelming dominance of Amazon primarily characterizes the online retail sector, while Google holds a similar position in the realm of online search advertising. Bing, on the other hand, occupies a

considerably distant second place in the search engine market. The differentiation between Internet retailers continues to be primarily driven by branding, awareness, and trust. According to Spiegel and Waldfogel (2021), there is increasing apprehension regarding the potential market dominance, competition distortion, and innovation deceleration that may arise from the emergence of digital platforms such as Google, Amazon, Facebook, Apple, and Microsoft. These platforms significantly influence diverse industries, including social networking, music streaming, and cloud services. The aforementioned large corporations, whose operational frameworks rely on direct or indirect network effects, rank within the top ten most valuable companies, each possessing valuations in the trillions of dollars. The issue of economic power concentrations and apprehensions regarding competitive behavior and anti-competitive mergers have garnered significant scrutiny concerning these prominent digital corporations (Spiegel & Waldfogel, 2021).

Digital technology, according to Gautier and Lamesch (2021), encompasses information technology (IT) and communication technology (CT). Information technology (IT), encompassing artificial intelligence (AI), robots, and machine learning, can enhance data processing efficiency, minimize task requirements, and create economic incentives for concentrated activities. ICT, such as the internet and smartphones, can overcome geographical barriers, facilitate communication and coordination, and promote specialization of tasks. CT has become prevalent in various domains, including social media, e-commerce, net-assisted transportation (UBER), matching services in lodging, e-payments, and fintech. CT technology has significantly enhanced the accessibility of

information, communication, and economic opportunities for a wide range of individuals. (Gautier & Lamesch, 2021).

Gautier and Lamesch (2021) note that the five most prominent tech giants, Apple, Alphabet (Google), Amazon, Facebook, and Microsoft, have been the most active in acquisitions and acquired 175 firms between 2015 and 2017. These acquisitions are driven by their interest in the products and inputs developed by the startups and the potential to restrict competition and consolidate their companies' market position. The revenue streams from platforms are highly concentrated, with most revenues coming from platform products (devices) for Apple, merchants for Amazon, advertising for Facebook and Google, and business and platform products for Microsoft (Gautier & Lamesch, 2021).

Digital economy and economic growth and development

Daly (1974) notes that physical wealth, natural resources, and population define the steady-state economy. Low depletion rates maintain these at the input and high pollution rates at the output end. The cost of maintaining these stocks is low in terms of low birth and death rates for the population and low production and depreciation rates for natural resources. Economic growth is based on the physical flow of natural resources. Services contribution to the steady state economy does not refute the steady state economy. Rostow's characterization of the present economy as high mass consumption and the Ricardian relative scarcity of a particular resource relative to another still holds. Also, economies cannot grow beyond the frontier of the total system, and economic growth will continue because technology will grow exponentially (Daly, 1974).

The foundations of the digital economy lie in the number of people with higher education who can efficiently develop and use technology at all levels. Schumpeter (1926) notes that economic development is based on the skills and knowledge of entrepreneurs. Innovation and knowledge will provide a competitive advantage and technological advancement. Human capital has expanded beyond education and skills to include health care. In addition, ICT has also led to the advancement of human capital and can increase competitiveness (Abdurakhmanova, Shayusupova,, Irmatova, & Rustamov, 2020).

The digital economy can also be analyzed from the microeconomic lens. BelleFlamme (2016) notes that digital goods are non-rival, meaning that consumption from one user does not prevent consumption by another user. The marginal cost of delivering the digital good is close to zero on the supply side. Digital goods are also non-excludable in the absence of legislation, and on the supply side, the reproduction cost is negligible (BelleFlamme, 2016).

The digital economy is primarily concentrated in North America (the USA), Europe, and Asia (China). Satyanand (2021) found that 2016 data indicates that the USA accounted for 35 percent of the digital economy, followed by China at 13 percent. They collectively account for 90 percent of the world's platforms like Pinterest, Facebook, and Amazon; they also hold a significant share of markets, including cloud computing (75 percent), blockchain-related patents (75 percent), and Internet of Things technologies (50 percent). Furthermore, the United States is home to the world's top 100 websites, 40 percent hosted in co-location centers. North America and the Asia Pacific region also dominate the emerging next-generation digitally enhanced manufacturing technologies,

accounting for 70 percent of advanced digital production technology patents and 40 percent of its exports (Satyanand, 2021).

Bukht and Heeks (2017) found that developing countries can benefit from the digital economy, including economic growth and increased labor and capital productivity. However, the lack of digital skills, technology penetration, and limited resources means that the digital economy has not expanded in the global south. The digital economy has led to faster economic growth in the global north. According to studies by the OECD and the World Bank in 2014 and 2016, respectively, the digital economy makes a significant contribution to employment and creating jobs, accounting for around 1 percent of the workforce in developing countries and 4 percent of the workforce in the global north, despite concerns of automation at the beginning of the digital economy. Labor productivity is generally higher in the digital economy than in the overall economy, at US\$160,000 per head in the ICT sector compared with US\$90,000 per head in the overall economy (Bukht & Heeks, 2017) (World Bank, 2016).

Satyanand (2021) concludes that digital manufacturing technologies can result in firms returning to developed countries. Satyanand (2021) research found that in 2020, digital manufacturing concentrated in just ten countries: the US, Japan, Germany, China, Taiwan province of China, France and the United Kingdom, Switzerland, the Republic of Korea, and the Netherlands. Digitalization can also prompt traditional MNEs to restructure global investment and return to developed countries because of automation and robotics. Through digitalization, MNEs could also scale to a regional hub, standardize products, and diversify geographically to expand their value chains (Satyanand, 2021).

The World Bank (2016) reports that the spread of the digital economy has been so rapid that more households in developing countries possess mobile phones than have access to electricity or clean water. Further, 70 percent of the poorest people in the world possess a mobile phone. Internet users were estimated at more than 3.2 billion in 2015. The transformational nature of technology includes India's digital identification system promoting inclusion of disadvantaged groups, China's Alibaba's B2B e-commerce site promoting efficiency, and Kenya's M-Pesa digital payment platform generating financial sector innovation. Digital dividends are not spreading because of the lack of internet connection for 60 percent of the world's population (World Bank, 2016).

Satyanand (2021) states that the digital economy is advancing sustainable development through a smaller ecological footprint because of the sharing economy and greener, more efficient manufacturing. Cross-border e-commerce is done in China and Malaysia, facilitating international shipments to individual customers. The digital economy has revolutionized investment promotion and facilitation, including websites, social media, video conferencing, and virtual meetings (Satyanand, 2021).

Research by the World Bank (2016) found that although routine transactions have become cheaper and faster due to digital technology, some tasks cannot be automated and require human judgment, intuition, and discretion. Worker productivity has increased because of the digital economy, including monitoring teacher performance and attendance. The digital economy can enable and accelerate development; for example, online business registries ease market entry for new and innovative firms. Greater internet access has enabled an explosion of production and consumption. While people,

businesses, and governments are connected, the connection is lower in developing countries (World Bank, 2016).

According to Barefoot, Curtis, Jolliff, Nicholson, and Omohundro (2018), the value added by the digital economy totaled US\$1,302.2 billion for the US economy in 2016. Hardware, e-commerce, and digital media grew faster within the digital economy, with telecommunications growing the slowest at 3.6 percent per year. In 2016, the digital economy employed 5.9 million workers, representing 3.9 percent of total employment. Most workers worked in service-provider industries, including retail, broadcasting, and telecommunications. Total compensation for digital-economy workers was US\$674.0 billion, or 6.8 percent of total industry compensation. The Bureau of Economic Analysis's ICT sector includes computer networks, software, telecommunication equipment and services, structures, and the Internet of Things (IoT). E-commerce, digital media, and big data are all part of the digital economy (Barefoot , Curtis, Jolliff, Nicholson, & Omohundro, 2018).

The World Bank (2016) notes that governments are increasingly digital, with all 193 member states of the UN having national websites, 73 countries allowing people to file their income tax online, 60 countries allowing businesses to register online, and 101 enabling citizens to create personal online accounts. Internet access is mainly through mobile phones. The internet has led to greater collaboration among economic agents. The Internet promotes development through three main mechanisms – inclusion through search and information, efficiency through automation and coordination, and innovation through scale economies and platforms (World Bank, 2016).

According to the World Bank (2016), the ICT sector contributes approximately 6 percent to the GDP of the OECD countries and lower in developing countries. In the United States, the digital economy contributes 7 percent to GDP. In Ireland, it contributes 12 percent, and in Kenya, it contributes 3.8 percent. Within high-income countries, the contribution has declined by 0.7 percent between 1995 and 1999 and 0.4 percent between 2010-14. The World Bank (2016) found that the Internet has contributed to the increase in cross-border trade, with a 10 percent increase in Internet use in exporting countries, increasing products traded by 0.4 percent. This development has also encouraged the unbundling of production processes in services markets, so firms in India, Jamaica, and the Philippines have captured a share of the back-office processes market. The Internet has significantly contributed to growth in various economic sectors by lowering costs and increasing efficiency and labor productivity (World Bank, 2016).

According to Ahmedov (2020), production has changed due to modern digital technologies, including the Internet, with many processes and systems using artificial intelligence. Many developing countries have gained access to modern technologies, allowing them limited participation in the global value chain. The digital economy can be used to use digital technology to create environmentally friendly production capacities that can overcome infrastructure limitations and significantly increase international competitiveness. The Internet's impact on international trade includes individual entrepreneurs, MSMEs, and large firms using the Internet to trade reasonably priced products in large quantities and at low cost to a global market and access to the latest foreign products and technologies. Ahmedov (2020) notes that the digital economy has changed the structure and configuration of international trade. Many products, especially

services, are included in the digital area, primarily due to the digitization of goods. Digitalization has also increased competition in the world market and can lead to a decrease in the level of profitability in international trade. The digital economy and international trade lead to the inclusion and significant democratization of the economy, with the involvement of households and MSMEs. The resulting increase in data flows and the involvement of millions of producers and consumers increases the priority for global regulation in the digital economy (Ahmedov, 2020).

The ICT sector accounts for only about 1 percent of the workforce in developing countries and 3-5 percent of employment in OECD countries. High-tech jobs generate additional jobs in other sectors in the US, and the M-Pesa digital payment system in Kenya generates additional income for over 80,000 agents (World Bank, 2016).

The World Bank (2016) further noted that the digital economy also creates new opportunities for entrepreneurship and self-employment. The internet has created job opportunities, promoting inclusion for women, persons with disabilities, and people in remote areas, with 44 percent of global online workers being women. The Internet has also increased worker productivity, especially for highly skilled workers. Digital technologies have also lowered information and search costs. For example, agriculture uses technology for price information, soil quality, and weather (World Bank, 2016).

Schumpeter (1911) argued that economic growth results from innovations that combine new products, processes, markets, sources of supply, and organizations, making innovation in the digital economy virtually unlimited. Technological innovation, according to (Schumpeter, 1911), involves the cognitive dimension that comprises the knowledge base, the organizational and institutional dimension that involves the

interactions between the stakeholders, and the economic dimension that seeks to convert technical possibilities into business opportunities. Carlsson (2004) notes that Technology can grow due to the addition of new capabilities, integration, structuring of design spaces, and accumulating know-how. The internet, therefore, gives rise to many technical combinations. General-purpose technologies like the internet, digitization, and electricity have always led to a broader impact and greater possibilities (Carlsson, 2004) (Schumpeter, 1911).

The World Bank (2016) found that internet automation has led to job losses, for example, booksellers, travel agents, and music store employees. It has also led to new digital goods and services and increased the variety of goods and services available. Also, existing jobs, such as health and education, have been transformed due to digital technologies. A survey of 12 African countries found that 65 percent of people perceive digital technologies, particularly mobile phones, have made them better off. A McKinsey survey in Europe and the United States in 2010 found that households are also willing to pay an average of US\$50 a month for services they now get for free online (World Bank, 2016).

The World Bank (2016) notes that the Internet has raised public sector capabilities and contributed to government efficiency. It has enabled governments to better communicate and share information with the citizens. Countries such as Estonia, Korea, and Singapore, at the forefront of digital advancement, employ data analytics and digital platforms to facilitate expedited and well-informed policy formulation. The internet has also provided novel opportunities for the practice of participatory democracy. For instance, Iceland has undertaken an experimental approach by utilizing crowdsourcing

techniques to involve its citizens in constitution-making. Similarly, Brazil and Estonia have also embarked on initiatives to explore comparable methods of engaging their populations in democratic decision-making. Education has also benefited through online learning and massive online open courses (MOOCs), and in the health sector, people can connect with providers over the Internet (World Bank, 2016).

Meltzer and Lovelock (2018) found that approximately 12 percent of international trade is through e-commerce, including on platforms like Amazon and Alibaba. Cross-border data flows have contributed US\$2.8 trillion to the global economy in 2014. according to a 2016 World Bank study, a 10 percent increase in Internet penetration leads to a 1.9 percent increase in exports, and a 10 percent increase in Internet penetration leads to a 0.6 percent increase in imports (Meltzer & Lovelock, 2018).

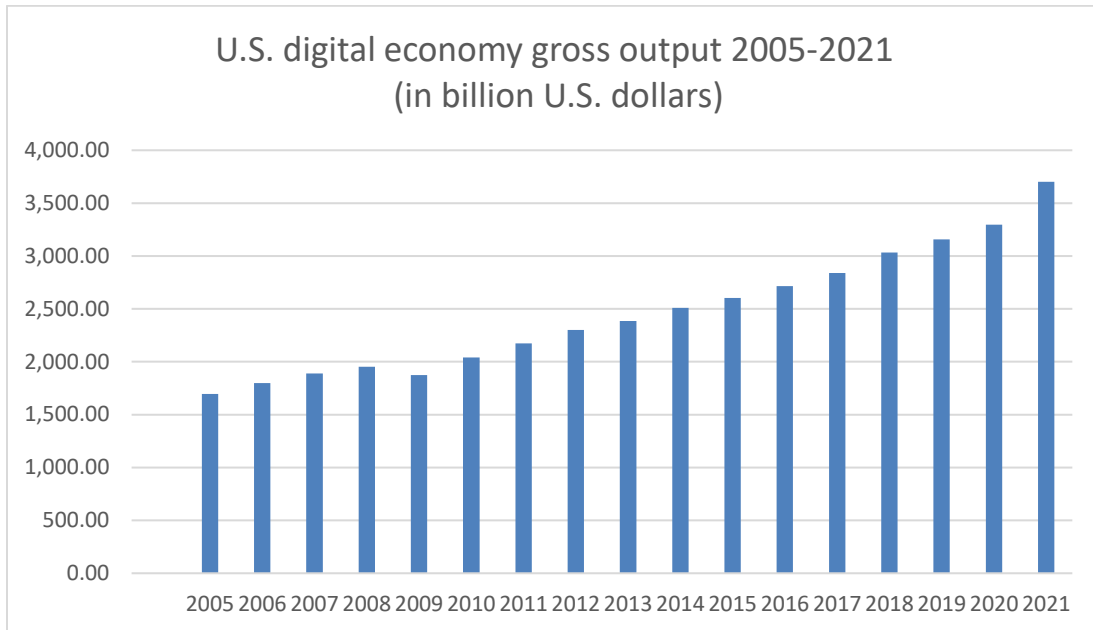
The World Bank (2016) found that the utilization of digital identification has the potential to address the challenges faced by impoverished individuals, who often encounter difficulties in obtaining the required identification documentation. Several countries have implemented digital identity programs for various purposes, including general use and specific applications like electoral processes or post-conflict aid distribution. These initiatives offer several advantages, notably enhancing the efficiency of the public sector. As an illustration, approximately 900 million individuals in India have received digital identification numbers over the last five years. The World Bank (2016) noted that individuals utilize these identification numbers to initiate bank account openings, oversee the attendance of civil servants, and ascertain the beneficiaries of government subsidies. The electronic identification system (e-ID) implemented in

Nigeria has exposed approximately 62,000 fictitious employees within the public sector, resulting in an annual cost reduction of US\$1 billion (World Bank, 2016).

According to the World Bank (2016), Digital technologies can facilitate the participation of individuals facing poverty in the electoral process by offering reliable means of identifying and mitigating fraud and intimidation risks through enhanced monitoring mechanisms. Utilizing mobile phones facilitates individuals' ability to document instances of violence and voter intimidation, thereby enhancing levels of electoral engagement. The proliferation of online platforms can mitigate the potential for media capture and pose challenges to censorship by increasing the diversity and abundance of informational sources (World Bank, 2016).

Michell (2022) noted that the Digital economy is now a significant part of the U.S. economy (see Figure 17 below). Cross-border trading in the digital economy has expanded in recent years. Regarding suppliers, China, the USA, and the U.K. are the leading countries for cross-border e-commerce at US\$301.5 billion, US\$103.9 billion, and US\$30.5 billion, respectively. On the other hand, in terms of consumers, Israel, Austria, and Singapore have the most significant amount of cross-border eCommerce. Of all the e-commerce conducted in these countries, 84 percent is cross-border for Israel, 83 percent for Austria, and 78 percent for Singapore (Michell, 2022).

Figure 17. Gross output from the digital economy



Source: Statista, 2023 <https://www.statista.com/statistics/962053/digital-economy-gross-output-usa/>

Research by the World Bank (2016) found that the Internet has significantly enhanced efficiency and productivity by facilitating automation and enabling data-driven management. Several countries have implemented automation in tax and customs administration, budget preparation, execution, and accounting with different success rates. The implementation of electronic filing has resulted in a reduction in tax compliance costs. At the same time, establishing one-stop computerized service centers and online portals has significantly enhanced service efficiency. Implementing e-procurement systems has enhanced competition and infrastructure quality in India and Indonesia. Digital technologies have the potential to enhance management practices through the monitoring of worker performance. (World Bank, 2016).

According to the World Bank (2016), the existing body of impact evaluation literature demonstrates an increasing number of studies that indicate favorable outcomes associated with implementing technology-based monitoring systems in reducing worker

absenteeism, mainly when implemented alongside other institutional reforms. In Uganda, using mobile phones by head teachers to record attendance and transmit data to a centralized database has resulted in a noteworthy reduction of absenteeism by 11 percentage points. The Internet also offers real-time data to enhance planning and managing service facilities. Implementing a mechanism that enables citizens to provide prompt and targeted feedback has proven instrumental in enhancing performance. The World Bank (2016) noted that mobile applications such as SeeClickFix and FixMyStreet enable users to submit reports regarding various concerns in the United States and the United Kingdom. Simultaneously, internet call centers facilitate the ability of individuals to report issues and monitor their progress. The Nairobi Water Company employs the MajiVoice platform. At the same time, the electricity supply company utilizes a comparable system to effectively manage complaints, monitor the progress of their resolution, and provide regular updates to the public. When effectively implemented, citizens enthusiastically seize the opportunity to provide feedback, diminishing the time required to find a solution. (World Bank, 2016).

Tayibnapis, Wuryaningsih, and Gora (2018) noted that in Indonesia, e-money has been experiencing rapid growth since its introduction regarding the instruments in circulation and transactions. The digital products offered by banks benefit from innovative technology, including biometrics and artificial intelligence, to improve security. In the US, lending businesses that do not use banks have increased in the sharing economy. These include the Lending Club, Prosper, and Zopa. According to Tayibnapis, Wuryaningsih, and Gora (2018), internet banking uses uncomplicated bureaucratic approaches without guarantees or collateral. The government has regulated

other growth areas in Indonesia's financial industry, such as equity crowdfunding. Financial technology and digital banking enable cheaper, faster, and more efficient transactions for security, privacy, and lifestyle. For example, one can easily and quickly purchase a ticket or book a hotel online without going to an office. Tayibnapis, Wuryaningsih, and Gora (2018) note that Indonesia's MSME and educational institutions engage in IT, but a digital hub similar to Silicon Valley is required to support these technology-based industries. The government can also encourage collaboration between financial service providers and banking. Indonesia's MSMEs have successfully increased their product sales because of the digital economy, where sales volume and market expansion have increased. For example, Indonesia's batik fashion is now being sold online in Europe and the USA (Tayibnapis, Wuryaningsih, & Gora, 2018).

The World Bank (2016) notes that the Internet can automate some tasks in complex occupations, business activities, or public services. However, it still requires human capabilities, and computers cannot provide solutions. For instance, traditional tasks like accounting or banking can be automated, while others require complex reasoning, human discernment, and intuition skills. Public services like information provision or automation of routine permissions can be automated, but others, like teaching or policing, require human discretion and judgment (World Bank, 2016).

According to the World Bank (2016), digital technologies have the potential to enhance productivity and overall well-being but can also contribute to heightened levels of inequality. Global trends suggest that there has been a significant decline in the proportion of national income allocated to labor, mainly routine labor, in several developing countries. This decline in labor income share has been accompanied by a rise

in inequality, particularly in regions where the shift towards capital and away from labor has been more pronounced. The phenomenon of increasing inequality has been associated with technological advancements. The World Bank (2016) notes that one observed phenomenon is the increasing polarization of the labor market, characterized by the growing prominence of high- and low-skilled jobs. The proportion of employment categorized as middle-skilled has declined in most developing countries. Notably, these occupations tend to occupy higher positions within the income distribution in low-income countries, particularly in the African region. As an illustrative case, China has experienced a temporary surge in regular, intermediate-level workforce as a consequence of the expanding mechanization in the agricultural sector (World Bank, 2016).

According to Abendin and Duan (2021), the digital economy has contributed to sustainable economic growth through increased international trade. It gives countries a competitive edge as they export to their trading partners. Digitalization has positively impacted foreign trade because it lowers transaction costs, facilitates the transmission of business information, and gives quick access to foreign markets. The digital economy enhanced Africa's ability to absorb the positive economic growth effects of international trade, promoting the development of the financial sector, using static and dynamic models on 19 years of panel data from 54 countries (Abendin & Duan, 2021).

The World Bank (2016) points out that technological disruptions can potentially yield amplified returns to education within developing nations, particularly among individuals possessing tertiary education or higher qualifications. Furthermore, the returns on education are observed to be most pronounced in occupations that heavily rely on information and communication technology (ICT), and these returns are experiencing

a notable upward trajectory. Individuals lacking these particular skills are compelled to pursue employment in occupations that require lower levels of skill and involve non-routine tasks, such as janitorial services, hospitality, or personal care. The ramifications for developing nations are contingent upon the rate at which technological disruption occurs. According to the World Bank (2016), job automation is more likely in less economically developed nations than in more advanced economies, where many jobs have become obsolete. However, implementing this process is expected to be more time-consuming in lower-income countries due to their relatively limited technological advancements and lower wage rates. Policymakers must consider the historical context that job displacement and losses resulting from technological advancements are inherent to economic advancement (World Bank, 2016).

The World Bank (2016) notes that an increase in productivity resulting from the emergence of the digital economy facilitates allocating human and financial resources towards sectors that offer greater returns. Furthermore, tasks that involve physical exertion, repetitive actions, or potential hazards can be transformed into digital processes. The utilization of telemedicine and automated diagnostics enables medical professionals to effectively provide healthcare services to a larger population, including remote areas that experience a scarcity of physicians. Concerns regarding the phenomenon of "technological unemployment" can be traced back to the era of the Industrial Revolution. However, it is worth noting that economies have demonstrated a remarkable capacity to adjust and accommodate substantial transformations within labor markets throughout several centuries (World Bank, 2016).

According to UNCTAD and the IMF balance of payments, the seven ICT-enabled services include communication, insurance, finance, computer and information, other business services, personal, recreational, and cultural services, and royalties and license fees. The US Bureau of Economic Affairs has five categories of digitally enabled services in their cross-border statistics – professional, business, and technical services (except construction) such as legal briefs, consulting services and engineering designs, royalties and license fees such as e-books, music, movies, and software; insurance services including paying premiums, financial services such as paying bills and telecommunications such as video conferencing. Most US digitally deliverable services exports went to Asia, the Pacific, and Europe, with the highest values of digitally deliverable imports from the United Kingdom, Canada, Ireland, and Japan (Nicholson & Noonan, 2014).

The World Bank (2016) notes that individuals can enhance their competencies to comprehend and capitalize on digital prospects. The advent of the internet was anticipated to foster a sense of responsibility and political empowerment, allowing individuals to engage in the policymaking process and establish online communities to ensure governmental accountability. Nevertheless, it is worth noting that the Internet's influence on persistent issues, such as enhancing the delivery of public services and promoting democratic engagement among marginalized populations, has been relatively restricted. The efficacy of utilizing the Internet to enhance accountability among service providers is contingent upon contextual factors, specifically the robustness of the preexisting accountability dynamics between policymakers and providers. A comprehensive analysis of seventeen digital engagement initiatives revealed that the three

cases examined demonstrated a collaborative effort between civil society organizations and the government (World Bank, 2016).

Conversely, most of the initiatives examined experienced failure in the absence of such partnerships. The importance of offline mobilization must be recognized, given citizens' relatively low adoption of digital channels. (World Bank, 2016).

The World Bank (2016) posits that political involvement and engagement of individuals facing poverty have exhibited limited prevalence, with the internet disproportionately favoring political elites and augmenting governments' ability to shape social and political dialogue. Digital technologies have occasionally led to a rise in overall voter participation; however, it does not guarantee an increase in well-informed or representative voting outcomes. The challenge of engaging citizens remains a topic of ongoing debate among social scientists, with no consensus reached regarding the internet's potential to disproportionately empower citizens or political elites, exacerbate polarization, or enhance or diminish social capital. The efficacy of technology implementation in governmental contexts is often more favorable when it effectively tackles issues about disseminating and surveilling uncomplicated information. Technology's efficacy is contingent upon governments' pre-existing responsiveness in the context of more intricate challenges, such as enhancing provider management or facilitating citizen engagement. According to the World Bank (2016), implementing initiatives that enhance governmental entities' transparency and accountability is imperative to bridge the divide between evolving technology and stagnant institutions. Implementing initial ICT policies incorporating private sector involvement and minimal regulatory intervention has facilitated widespread accessibility and cost-effectiveness in

mobile telephony services. Nevertheless, the dissemination of Internet services has encountered obstacles in its expansion, primarily attributed to policy shortcomings such as regulatory capture, privatization initiatives, inadequate spectrum management, burdensome taxation, and the monopolization of international gateways. (World Bank, 2016).

Arbache (2018) notes that including intangible elements within goods and the availability of digital technologies, platforms, and advanced capital goods are causing significant changes in global production, wealth distribution, and cross-border trade. The digital economy has significantly transformed cross-border trade and challenged the traditional understanding of limited capital resources and technological accessibility. Robots and other advanced technologies have resulted in a reduction in prices. Additionally, the emergence of e-commerce platforms has facilitated swift and cost-effective market access. Consequently, developing countries must reassess their FDI policies, primarily since the decline in ICT prices facilitated investment opportunities and the integration of digital technologies (Arbache, 2018).

The World Bank (2016) notes that utilization of the Internet and its associated benefits exhibit notable disparities across different countries, with policy agendas adapting to the evolving digital landscape. Countries characterized by limited internet usage should prioritize the establishment of a solid groundwork by eliminating obstacles hindering internet accessibility and adoption. Additionally, efforts should be made to foster basic and digital literacy among the population. Furthermore, leveraging the internet for fundamental governmental functions such as information dissemination should be emphasized. As countries progress towards increased internet adoption, it

becomes imperative to establish robust competition regulation and enforcement mechanisms. This regulation entails facilitating smooth market entry and exit processes, developing advanced cognitive and socioemotional skills, and implementing efficient e-government delivery systems to manage service providers and engage citizens effectively. (World Bank, 2016).

The World Bank (2016) posited that countries that have reached advanced stages of digital transformation are confronted with formidable undertakings. These include but are not limited to fostering competition within the "new economy," guaranteeing continuous opportunities for learning throughout one's lifetime, leveraging the internet for most governmental operations, and promoting policy-making processes that encourage greater citizen participation. The degree of digital adoption among firms exhibits variation across countries, which can be attributed to factors such as technological knowledge, accessibility, and utilization. Competitive pressure is the primary catalyst for firms adopting new technology and increasing productivity (World Bank, 2016).

According to Arbache (2018), most enterprises employ digital technology, whereas some organizations create, disseminate, and administer said technologies. These actors establish the criteria and frameworks upon which digital products and cross-border trade are operated and utilized. Nations that possess firms engaged in the role of platform developers and digital technology managers are inclined to experience the secondary advantages that emanate from the digital economy, including heightened productivity and competitiveness, sustained economic expansion, job stability, and wealth accumulation (Arbache, 2018).

A country's business climate facilitates this adoption, including laws and regulations, open trade regimes, and special interests. Banks need more incentive to invest in efficiency-boosting technology in countries with heavily regulated markets. However, competition policies and enforcement are complex, and many low-income countries need help to design and implement them effectively. This situation highlights the importance of a country's business climate in determining the speed of digital adoption (World Bank, 2016).

According to the World Bank (2016), in countries with emerging digital economies, the focus is on promoting connectivity and establishing competition regulations. Despite 74 middle- and high-income countries removing tariffs on ICT capital goods, some countries, such as Turkey and Djibouti, still treat computers and smartphones as luxury goods. Telecom firms are often treated as cash cows, but improving business benchmarking exercises and information programs can be practical. Countries must enhance the firm registration process and establish enhanced market transparency to mitigate instances of price collusion, market sharing, and rigged public procurement. To facilitate the entry of additional innovative enterprises into markets. E-government systems can simplify these processes and promote more openness. State control, entrepreneurship barriers, and trade restrictions hinder the adoption of digital technology-protected sectors (World Bank, 2016).

Horoshko, Horoshko, Bilyuga, and Horoshko (2021) note that the rapid development of ICT contributes to society's integration and interconnectedness. Robotics is part of the digital economy; robotization allows states to minimize costs and increase profits. The study of Japan's robotics production found that Japan adheres to the tactics of

fully satisfying domestic needs in robotics, resulting in a low need for importing robotics and greater flexibility in contract policy due to the independence from foreign supplies. However, increasing underproduction can negatively affect Japan, such as losing trade. On the other hand, overproduction will lead to the loss of financial investments and the accumulation of obsolete samples of manufactured goods (Horoshko , Horoshko, Bilyuga, & Horoshko, 2021).

The World Bank (2016) notes that competition authorities are present in most countries; however, enforcing regulations about market restrictions exhibits considerable variation, particularly in cases where state or politically affiliated firms derive advantages. The increased accessibility of online service delivery has heightened the significance of trade-in services. Ethiopia, India, and Zimbabwe exhibit the most stringent regulations on service trade, whereas other countries impose restrictions on services such as legal or accounting activities. Countries have the potential to enhance their competitiveness and promote the adoption of digital technology by systematically diminishing market distortions and establishing robust mechanisms for enforcing competition. According to the World Bank (2016), these measures can significantly impact conventional enterprises and online platforms. The emergence of Uber and Airbnb has brought about significant transformations in the domains of ridesharing and subletting. However, regulatory bodies need help classifying these platforms as either taxi services, hotel accommodations, or software providers. New York and Massachusetts states have established regulations about these platforms within the United States. The World Bank (2016) posits that these regulations aim to enforce safety measures and tax obligations while simultaneously alleviating regulatory burdens for competing entities.

Companies such as Amazon, Facebook, and Google encounter comparable regulatory obstacles, as they are frequently accessible to consumers but possess significant influence over marketers and booksellers owing to their dominant positions in online advertising and book markets. Developing nations can benefit from studying the experiences of developed nations when formulating their strategies for addressing the challenges posed by digital multinational enterprises (MNEs) (World Bank, 2016).

According to Sadulloyevich (2017), the digital economy facilitates the ability of businesses and societies to adjust and flourish effectively within the contemporary context of uncertainty. Since the 1990s, Uzbekistan has been actively integrated into the global information and communication technology (ICT) market. The country's ICT market has experienced substantial growth in recent years, primarily attributed to introducing novel technologies and services and expanding their scope of provision. Information and communication technology (ICT) is pivotal in Uzbekistan's developmental trajectory. The government's policy actively advocates for the comprehensive integration and advancement of information technologies within the country. In recent years, a significant increase of 119 percent in the number of domains registered under the "UZ" domain (Sadulloyevich, 2017).

Sadulloyevich (2017) concludes that the user base of the national email system, uMail.uz, has expanded to a total of 398,500 individuals. A total of 1,728 software products have been developed by 360 companies, encompassing various sectors such as social sphere and education (818 products), economy and finance (249 products), production (244 products), and other sectors. Official websites for government bodies and state authorities have been established, accompanied by the introduction of 95 state

information resources and 499 state information systems. The total number of electronic digital signature users has reached 1,720,000. Nevertheless, the adoption of personal computers and the Internet in Uzbekistan remains comparatively lower than that of European countries, thereby highlighting a significant disparity in digital competencies among distinct demographic segments. (Sadulloyevich, 2017).

The digitalization process could enhance the efficiency of expenditure optimization across multiple industries and mitigate service deficiencies. Leveraging ICT can achieve a significantly higher standard. Uzbekistan's digital economy has five key domains: regulatory frameworks, human resources, educational initiatives, the establishment of research capabilities and technical reserves, the development of information infrastructure, and the enhancement of information security measures. Information security requires robust measures, techniques, and systems within national and telecommunications systems to protect information effectively (Sadulloyevich, 2017).

Additionally, Sadulloyevich (2017) concluded that it is necessary to develop practical tools, methods, and systems to safeguard national information resources. Furthermore, unique organizational, procedural, institutional, and educational measures should be implemented to prevent and counteract societal information threats proactively. Uzbekistan has a scientific and innovative infrastructure encompassing diverse development institutions, technology parks, and small industrial zones. These resources hold significant potential for fostering the growth of the digital economy and should be effectively utilized for this purpose (Sadulloyevich, 2017).

Data and the Digital Economy

The digitalization of the economy, according to Lohsse, Schulze, and Staudenmayer (2017), has led to the datafication of business processes, leading to an increasing mass of data, as data is essential for the digital economy since it drives business models and processes. In one day, Google processes more than 24 petabytes of data (1 petabyte is 10^{15}), which is several thousand times the printed material in the US Library of Congress. By 2013, data stored globally was estimated at 1200 exabytes (1 exabyte is 10^{18}), where one byte is a single character (Lohsse, Schulze, & Staudenmayer, 2017).

Lohsse, Schulze, and Staudenmayer (2017) reported that data is a non-rivalrous resource, meaning we can all use it simultaneously. However, it is also an excludable resource, meaning it is not automatically available, and its uses and availability can be restricted. The data collected is not shared with other market players, so the data holder has the bargaining power to impose a transaction cost for data access. The question surrounding data is whether the data producer (consumers and businesses) has property rights to the nonpersonal or anonymized stored data held by digital MNEs (Lohsse, Schulze, & Staudenmayer, 2017).

Satyanand (2021) notes that digital firms collect, process, and analyze these data without the consent of their originators, which presents problems for data privacy and security and data ownership and value. International rules do not allow countries to share corporate profits from data commercialization. Several countries are increasingly adopting measures to assert sovereignty over and regulate the data generated within their territorial boundaries, aiming to maximize economic benefits and foster the growth of

domestic data processing sectors. Social networks have emerged as an indispensable medium for interpersonal communication but also present inherent hazards. With the increasing prevalence of digitalization, robust data privacy and protection regulations will be expected to become customary in cross-border trade and investment (Satyanand, 2021).

According to Meltzer and Lovelock (2018), Cross-border data access is essential for the digital economy, increasing economic activity and productivity. Every sector, including manufacturing services, agriculture, and retail, relies on the global data flow. The free flow of data reduces transaction costs and increases efficiencies, transforming international trade and allowing businesses to participate in the global economy. The data flows allow goods exports, purchases and consumption of services, and support to the global value chain. Small businesses now have access to the same data previously reserved for large companies, which is particularly significant for East Asia, where small businesses use digital platforms like eBay or Alibaba to reach customers worldwide (Meltzer & Lovelock, 2018).

Neeraj (2019) posits that data flow is essential for the digital market to function. The TPP contains several requirements prohibiting data localization and promoting free cross-border data flow. Several interest groups had lobbied for the e-commerce chapter within the TPP. Big data has enabled tech companies to analyze large volumes of information, including shopping history, travel itinerary, search history, and ideological positions, to tailor pricing, suggest recommendations, and target advertisements. The localization of data would prevent these big data analytics. The data can also be misused,

as shown in the revelations regarding the misappropriation and improper data by Facebook and Cambridge Analytica (Neeraj, 2019).

According to Nicholson and Noonan (2014), data flows in bytes per a specific period, such as per hour, can be categorized as purely non-commercial, such as government or military communications, commercial data and services between businesses, for example, supply chain information, data flows between a producer and a consumer, example music sales or online banking, and digitally enabled data and services such as map and direction, free email and search engine. Data flows between producer and consumer are usually geographically specific due to intellectual property and can be blocked in certain locations (Nicholson & Noonan, 2014).

Chen, Cheng, Ciuriak, and Kimura (2019) highlight that the digital economy presents prospects for G20 economies to expedite inclusive economic growth. Promoting the unrestricted movement of data, accompanied by appropriate policies to address additional public policy objectives, is crucial in harnessing the potential of digital technology. Nevertheless, the current state of policies about data flow and businesses associated with data still needs to be more developed and fragmented across various nations. (Chen, Cheng, Ciuriak, & Kimura, 2019).

Digital economy and business operations

Transnational companies' activities have been a significant driver of the digital economy, as these companies use modern technologies in their businesses. MSMEs have also been actively using these technologies, which reduce transaction costs for these businesses. (Kuznetsov, Ukolova, Monakhov, & Shikhanova, 2018).

According to Satyanand (2021), multinational enterprises in the digital economy can be divided into three categories. The first is the ICT MNE, comprising telecommunication firms that enable Internet and mobile data connectivity, IT component and device firms for computers and laptops, and IT service software and services firms. These include companies like AT&T providing internet connectivity or Apple designing laptops, phones, and other devices. Additionally, IT Software and services firms such as Oracle primarily develop the software powering the economy's products and services. Satyanand (2021) points out that the second category of digital economy MNEs is the digital MNEs that provide digital platforms for e-commerce and digital content, for example, online retailers and travel agencies. The third is the purely digital firms that deliver completely virtual services for customers, for example, search engines and social networks. These purely digital firms also enable the exchange of goods and services, software for research and development, and digital solutions such as web hosting, online payments, and email services (Satyanand, 2021).

According to Li, Kim, Lang, Kauffman, and Naldif (2020), the digital economy has also reshaped the global value chain so that manufacturing involves both the tangible and intangible. The digital economy has brought about changes in the structure and distribution of the economy, resulting in new forms of economic value. From 2000 to 2015, digital platforms grew at a rate two and a half times faster than the economy, contributing to 15.5 percent of the global value added in 2016 (Li, Kim, Lang, Kauffman, & Naldif, 2020).

Box and Lopez-Gonzalez (2017) concluded that digitalization has facilitated trade, improved logistics, including cross-border e-commerce, and made global markets

accessible to smaller and new firms. Distributed ledgers, or blockchain, have the potential to further reduce transaction costs by enhancing contract transparency and enforceability. AI and big data can facilitate global value chain coordination. Companies such as Skype, WhatsApp, Google, Dropbox, LinkedIn, PayPal, and Amazon have all facilitated trade. It is now easier for firms to participate in the global value chains and gain access to new markets. Additive Manufacturing offers new opportunities for companies to accelerate design processes, reduce production steps, and explore new market niches. Blockchain technology offers lower transaction costs and better trust (Box & Lopez-Gonzalez, 2017).

According to Satyanand (2021), digital companies are some of the world's largest. In 2020, digital platforms accounted for 56 percent of the market capitalization of the world's 20 top firms. Also, 15 tech firms are among the 100 largest companies in the world. Digital-focused companies have experienced a growth rate that is 2.5 times faster than other firms between 2000 and 2015. These companies contributed 15.5 percent (to US\$11.5 trillion) of the global value added in 2015. The characteristics of digital MNEs include delivering their services globally from anywhere in the world, having a smaller foreign assets footprint than all other MNEs, fewer employees than other MNEs, large unspent profits, and a geographic footprint concentrated in developed countries. Digital MNE's investment drivers are mainly high digital connectivity, digital skills, and a sound and stable regulatory environment, unlike traditional MNEs seeking natural resources and cheap labor (Satyanand, 2021).

The advent of technologies has empowered MNEs in traditional sectors to seamlessly integrate, manage, and monitor their production and supply chain activities in real time. This transformation has prompted shifts in how these businesses are organized.

Digital trade is a business model that relies on the Internet and uses digitally enabled transactions (Li, Kim, Lang, Kauffman, & Naldif, 2020).

Box and Lopez-Gonzalez (2017) concluded that digitalization has allowed information sharing and bundling services and enabled more physical and traditional trade. Digital trade characteristics include unpacking production logistics, trading in smaller quantities, changing the tradable nature of services, and bundling goods and services. Digitalization has changed how we trade; for example, digital platforms have replaced intermediaries, thereby reducing informational asymmetries, enabling upscaling production, and allowing individuals to engage in international trade directly. Digitalization has also changed what is created; for example, new information industries provide data analytics, cybersecurity, and remote computer services (Box & Lopez-Gonzalez, 2017).

According to Satyanand (2021), MNEs outside the digital economy have begun harnessing digital technologies for customer insight, engagement, and resource planning, including using software as a service SaaS. Manufacturing firms generally use AI to automate production-related processes, and financial services firms use AI for fraud detection and customer insights. Also, traditional MNEs have begun to build their digital software. Digital firms have FDI lightness due to their reliance on local networks and partners, for example, air Airbnb. For instance, it took a century for the Marriot hotel chain to establish its presence in 122 countries, while Airbnb, a hotel platform, achieved this feat in just eight years by expanding its reach to 190 countries. Some companies use at least one of the five AI technologies - advanced machine learning, computer vision, natural language, virtual assistants, robotic process automation, and (Satyanand, 2021).

According to Li, Kim, Lang, Kauffman, and Naldif (2020), MNEs can remotely control automated production processes with robotics and AI capabilities. This phenomenon has led to a shift from centralized labor factories towards a globally dispersed network of innovative production units digitally managed by a few computers and highly skilled employees. Digitalization has also facilitated integration and monitoring throughout supply chains, enabling MNEs to provide services and support to customers during and after production. Global issues, such as technological barriers and consumer data control, have led to new monopoly power for digital platform firms (Li, Kim, Lang, Kauffman, & Naldif, 2020).

Micro-small and Medium Enterprises (MSME) can sell internationally without intermediaries due to the digital platforms. Digitalization is also enabling traditional sectors to customize manufacturing across geographies, which can create new value. However, profit margins can be reduced due to higher competition. The digital economy can also bring new technologies and economic organization to LDCs (Satyanand, 2021).

The World Bank (2016) notes that digitization optimizes inventory and supply chain management, reduces capital equipment downtime, and reduces risk. Companies like UPS use advanced reservation and pricing algorithms to optimize operations. E-commerce has also led to higher Total Factor Product growth, faster inventory turnover, and more efficient livestock production in countries like Botswana and Uruguay. The digital economy automation has led to zero marginal cost, significant economies of scale, and more competition. Price comparison websites enable low prices, but companies still discriminate by offering different prices based on purchase history, geographic location, and other metrics (World Bank, 2016).

According to Lestari, Darma, Amalia, and Setini (2020), COVID-19 accelerated digital economy transformation in many countries because businesses were forced to transform during the pandemic. Demand for streaming services increased, consumers bought necessities online, and many institutions resorted to work-from-home to maximize workforce productivity while at the same time maintaining company credibility. The digital economy has positively impacted efficiency and productivity and reduced production costs. In Indonesia, the utilization of digital services grew significantly, with e-commerce reaching a value of IDR40 billion in 2019 (Lestari, Darma, Amalia, & Setini, 2020).

Carlsson (2004) notes that digitization and the internet have increased oil finds and reduced the cost of finding and producing oil. The digital technology that has contributed to oil production includes computers, seismic imaging, and a combination of the two, directional drilling, measurement while drilling, and the internet. For example, geologists can set off booms or pings and then use 3-D surveys to infer location and process the data on their computers. Higher-resolution 3-D imaging increased the payoff for accurate drilling. As pointed out by Carlsson (2004), the computing time for processing data for processing one square kilometer's worth of data fell from 800 minutes to 10 minutes between 1985 and 1995, and the cost of analyzing a 50-square mile survey fell from US\$8 million in 1980 to US\$90,000 in 2004. In other industries, productivity has increased; for example, companies can collaborate more with their suppliers and customers. The digital economy has also led to growth in online banking, for example, self-service banking access. It has also made it easier to purchase airline tickets and facilitated business-to-business transactions in the automobile industry. The

defense industry has also benefitted from cheaper production and collaborative software. The internet has also brought market efficiency and new combinations of new products and industries. The Internet has made connecting people, ideas, and bodies of knowledge more straightforward (Carlsson, 2004).

According to Kapustina, Pereverzeva, Stepanova, and Rusu (2019), the digital economy has significantly changed retail business. Regarding revealing and informing, e-commerce driven by big data arrays and predictive analysis uses web advertising, email shots, and Google search systems compared with previous TV and print adverts. Customers and businesses based on digital recommendation can use rating systems reviews and online comparison compared with in-store displays for comparison and selection. For purchases and payments, customers can now use online ordering and online payment systems versus cash or cards in the shop based on pre-orders and personalized pricing. Kapustina, Pereverzeva, Stepanova, and Rusu (2019) note that retailers can use auto-replenishment shopping carts and blockchains to support personal electronic credit cards versus membership and cumulative cards for customer loyalty and retention. Available product range planning and management is now based on data analysis rather than ad hoc experience-based purchases. Also, supply management is done through a flexible system of cooperating with suppliers rather than a competitive system of supplier management. Blockchains and the share economy are being used for logistics compared to the past's linear and labor-intensive logistics. Firms have become more service-oriented than traditional (Kapustina, Pereverzeva, Stepanova, & Rusu, 2019).

According to Henry et al. (1999), the two facets of the digital economy are e-commerce, transactions over the Internet, and the IT that makes e-commerce possible.

Before 1995, e-commerce was conducted by telephone and facsimile. The Internet has offered opportunities for businesses to access new markets with a global reach. The Internet has significantly impacted businesses, enabling them to gain a competitive edge by providing valuable information, increasing consumer options, creating novel services, optimizing purchasing procedures, and reducing costs. The growth of e-commerce is propelled by customer demand as a business requirement (Henry, et al., 1999).

Henry et al. (1999) note that the Internet has enforced price discipline, enabling customers to access price information from multiple sources. As exemplified by Amazon.com, retail electronic businesses have successfully utilized the benefits of electronic commerce by providing a diverse array of on-demand content and promptly addressing customer needs. The Internet has also allowed firms to consider which tasks can be performed in-house and which can be outsourced and provided by others. It has also created new relationships and augmented supply chain processes, such as logistic and financial intermediaries like FedEx and UPS (Henry, et al., 1999).

According to BelleFlamme (2016), digital innovations have changed digital products, particularly music and video. There are now new intermediaries, distribution modes, and business models. The new intermediaries include Spotify, Google Play Music, Apple Music, YouTube, Netflix, Hulu, Amazon Prime Video, and streaming services from HBO and Showtime. The content distribution is in real-time and over the Internet, so users do not have to download files. Also, there is a single access point for a vast content library. The new business models are either subscription-embedded advertising free or freemium, where the basic is free, and the consumer pays for premium content (BelleFlamme, 2016).

BelleFlamme (2016) notes that digital platforms are the intermediaries between content producers and end users. Streaming services enlarge the options available to end users. Consumer choices have changed, with consumers now having access to an extensive library of temporary and subscription-based content, significantly reducing consumer search costs because of value-added services such as recommendations, social networks, and content sharing. Consumers can rent or purchase streaming services, indicating substitutability between the two. According to BelleFlamme (2016), some empirical evidence suggests complementarity, particularly in European research into the use of subscription services where Customers may view free services before downloading channels. Streaming services have been one of the best ways to tackle digital piracy than previous methods of copyright enforcement. Streaming has modified how consumers use content by removing the incentives to seek alternative ways to discover content, such as radio or television. Streaming platforms have connected users, content producers, and advertisers, where consumers can see free content with adverts. Content producers and advertisers have been multihoming their content and adverts on several platforms. However, consumers usually view this content on a single platform—streaming platforms usually operate as resellers, where they buy content and resell it to consumers (BelleFlamme, 2016).

Kraus and Palmer (2019) state that digitalization has changed business models, so many businesses are shifting to a digital environment. The success of digital entrepreneurs depends on the technological status of the platform used to engage in businesses. A vital feature of the digital economy is the sharing economy, which uses platforms that share and market economic services, for example, Uber, Airbnb, and

Wikipedia. The dimensions of the sharing economy include the sharing of digital content, the sharing of physical goods, and crowdfunding. The digital economy's win-win situation is that customers and entrepreneurs can interact directly. Digitalization has resulted in the disruptive transformation of entrepreneurship, which includes some businesses being entirely conducted online and other businesses producing digital products. Further, production, advertising, distribution, transactions, and customer relationships are conducted online (Kraus & Palmer, 2019).

According to Eckhardt and Bardhi (2015), the sharing economy has garnered extensive acclaim as a prominent sector of growth, characterized by its ability to disrupt established industries such as hotels and automobiles and offer consumers convenient and economically advantageous access to resources. Nevertheless, it is essential to note that the term "sharing economy" is somewhat misleading, as it more accurately represents an access economy. This observation suggests consumers prioritize affordability and convenience over cultivating social connections with fellow consumers and the company. The ascent of Uber in the market for short-term car rides can be observed through its strategic focus on pricing, reliability, and convenience. Eckhardt and Bardhi (2015) note that in contrast, Lyft, a service with striking similarities, differentiates itself by positioning itself as a friendly alternative. The primary motivation for consumers to utilize Airbnb is its affordability, particularly in high-cost urban areas. Hence, organizations prioritizing convenience and affordability over cultivating interpersonal relationships will possess a competitive edge. (Eckhardt & Bardhi, 2015).

Kraus and Palmer (2019) note that online platforms depend on self-generated community interactions, so entrepreneurial activities and outcomes are still being

determined. The dynamic part of digital entrepreneurship depends on digital platforms, technological power, and platform advancement and improvement. The commercialized businesses' digital platform allows businesses to connect, and customer platforms such as Google or Apple offer innovation where entrepreneurs can develop products or services; for example, app developers can use Apple iOS or Google Android to develop new products. Also, transaction platforms allow for online retail or demand services, and integration platforms allow for transaction and innovation. The platform strategy in the digital economy includes social media, financing, human resources, accommodation, e-commerce, and digital payments (Kraus & Palmer, 2019).

According to Kraus and Palmer (2019), the digital economy also depends on the digital ecosystem organizing and scaling interactions between customers and businesses. This ecosystem includes connected devices such as computers, mobiles and tablets, cloud services, and the Internet of Things (IoT). The digital ecosystem supports entrepreneurs in developing ideas, engaging in digital marketing, getting information, and innovating. The digital ecosystem involves sharing and voluntary contributions to platforms where users provide content, such as Facebook and Instagram. Also, there is the sharing of tangible assets such as Airbnb and Uber and the user-intensive business model that combines paid and unpaid customers where the business relies on customers to network, for example, Spotify (Kraus & Palmer, 2019).

Nazarenko and Zhong (2020) state that the digital economy has accelerated penetration and integration across industries by introducing business models and optimizing economic structures. The retail industry has experienced growth due to mobile internet usage, big data analytics, and other emerging technologies. The digital economy

has seamlessly merged with retail, finance, and transportation sectors, giving rise to business models. One of the impacts of the economy on retail is the widespread use of the Internet. This impact has significantly enhanced the convenience, intelligence, and range of services provided by terminals. The growing popularity of retailing has played a role in improving both the quality and capacity of the retail market (Nazarenko & Zhong, 2020).

Arbache (2018) concluded that prominent corporations, including Google, Amazon, and Microsoft, develop digital devices and platforms that facilitate the operations of external entities. These companies adhere to predetermined standards within a specified framework to ensure compatibility and interoperability. Platform developers establish the rules governing product and service development and marketplace interaction. These regulations directly impact access, market conditions, and prices. Nevertheless, the primary importance lies in the data that users freely generate. The collection and analysis of data play a pivotal role in the digital economy, particularly in products and services. This issue has heightened difficulty for new market entrants seeking to challenge established incumbents. Large e-commerce corporations and platform developers acquire this data, thereby impeding the growth of start-up enterprises. (Arbache, 2018).

Chen, Cheng, Ciuriak, and Kimura (2019) found that e-payments and fintech are experiencing significant growth in emerging and developing countries. These advances effectively reduce transaction costs and sometimes serve as a viable alternative to conventional payment systems. The global trends in fintech development encompass various technological advances, such as biometric authentication, machine learning,

blockchains, online credit scoring, and peer-to-peer (P2P) financing. This technological progress serves as the foundation for the ongoing evolution of the fintech industry.

(Chen, Cheng, Ciuriak, & Kimura, 2019).

Benefits of the Digital Economy

The World Bank (2016) reported that the Internet has reduced search and information costs so that parties who did not know each other in the past can now meet and form a market. Also, information asymmetries have been reduced to allow markets to take place. Transactions that existed before the Internet are now cheaper, faster, and more convenient. The reasonable prices of digital technology have allowed businesses and governments to switch from labor and non-ICT to digital technology. Factors of production that are not substituted have become more efficient. For example, workers who use the Internet have become more efficient. The automation of the Internet has generated new business models (World Bank, 2016).

The advantages that small businesses and consumers derive from "free" internet services are of utmost importance, and the rapid pace of technological advances poses challenges for countries to bridge the gap without including foreign service providers (Chen, Cheng, Ciuriak, & Kimura, 2019).

According to the World Bank (2016), internet automation has reduced transaction costs to zero. This reduction is prevalent in e-commerce platforms, digital payment systems, electronic books, music streaming services, and social media platforms. The zero marginal cost phenomenon has encouraged the participation of more buyers and sellers, thereby generating positive network effects and facilitating social mobilization and political protests. The World Bank (2016) notes that the Internet facilitates the

advancement of inclusion, efficiency, and innovation, frequently functioning within a platform or "two-sided market" framework, including ride-sharing services, online crowdfunding platforms, job matching platforms, room-sharing platforms, and music websites. The advantages of digital technologies include business inclusivity, increased productivity, and innovation. Additionally, the Internet creates employment opportunities, enhances human resource utilization, and generates consumer surplus value. Furthermore, the digital economy enhances government entities' capacities and facilitates citizens' accessibility to government services (World Bank, 2016).

Greenstein (2020) posits that digitalization has reduced search, replication, communication, tracking, and verification costs. Digitalisation has restructured the supply of goods and services, particularly in the creative industry. As a result, new products have tripled between 2000 and 2008, and consumer surplus has increased. The ease in replication and personalization of digital services has increased the supply of these services. Digital goods have created significant gains in well-being. The decrease in newspaper advertisements has offset the increase in digital advertisements. Digital platforms have facilitated supply and demand matching, particularly in the gig economy, where workers supply services when demand is high. Digital platforms have also provided data for analysis; for example, Yelp data has contributed to research on gentrification. The reduced cost of storing consumer data has increased privacy concerns (Greenstein, 2020).

According to the World Bank (2016), the Internet facilitates market entry with cloud computing, reducing startup costs and risk to investors. Most internet firms compete with offline firms, fueling competition that benefits consumers. Examples

include Uber disrupting taxi markets, TransferWise reducing regulatory rents, and eKeebo circumventing restaurant licenses in Uganda. Digital technology offers significant personal welfare benefits and economic opportunities, including mobile phones and the Internet (World Bank, 2016).

Arbache (2018) notes that the Internet has significantly expanded consumer access to a wide range of goods and services, fostering a highly competitive marketplace that presents novel prospects for entrepreneurial endeavors and the generation of employment opportunities. Governments derive advantages from technological advancements that facilitate enhanced and expanded public services, foster improved governance practices, assess policy effectiveness, and ultimately achieve superior outcomes (Arbache, 2018).

The digital economy has contributed to the erosion of information asymmetries so that companies can better meet the needs of consumers, and consumers can easily find information due to the interconnectedness that has also created opportunities (Sadulloevich, 2017).

Policies and regulations of the digital economy

The WTO does not cover Digital trade and e-commerce where countries, especially those participating in Global Value Chains (GVCs), desire to standardize regulations. However, FTAs such as the US-Korea FTA, CPTPP, and the USMCA include chapters on digital trade and e-commerce (Pomfret, 2020).

According to Neeraj (2019), the challenges the digital economy poses include the applicability of WTO agreements, particularly the GATT and GATS, for several reasons. For example, the bifurcation of production into goods and services has become blurred.

The manufacturing of physical goods now includes digital 3D printing and incorporating digital components in innovative goods that contain computer chips and process data in digital services. Products such as books, music, films, and software previously traded as physical goods are now traded digitally. Neeraj (2019) notes that physical products can be ordered over the Internet from Amazon, and people can go to a physical shop to purchase the same item. While the European Union in 1999 classified products such as movies and books traded digitally as services, the US and other countries classified these products as goods or a hybrid of goods and services under GATT. The WTO Agreement on technical trade barriers applies in electronic transmissions due to concerns around theft of personal data and technical regulations, including unauthorized surveillance and malicious software. The WTO appellate body notes that a product can be good and have service attributes simultaneously. Therefore, multilateral agreements on digital trade must address the classification of digital products as goods or services. Electricity use has been proposed as an argument to classify digital products as good (Neeraj, 2019).

The World Bank (2016) indicated that introducing digital technology without essential analog complements, such as regulatory frameworks promoting competition, skill sets that effectively utilize technology, and accountable institutions, gives rise to numerous challenges and instances of failure. The Internet facilitates economies of scale for businesses; however, impeding competition may result in an excessive concentration of market power and the emergence of monopolies, thereby hindering innovation. The potential for increased inequality, rather than improved efficiency, arises when the automation of tasks through internet technology surpasses the skill level of workers. As technological advancements continue to unfold, specific proficiencies inevitably need to

be updated, necessitating the acquisition of novel skills by workers to enhance their productivity. Using the Internet to mitigate information barriers may inadvertently result in increased control rather than empowerment and inclusion, particularly when governments need more accountability (World Bank, 2016).

According to the World Bank (2016), the Internet has emerged as a prominent catalyst for economic expansion, facilitating enhanced and expedited dissemination of information for businesses. Consequently, this has resulted in a broader array of options for consumers and simplified comparisons of prices. However, it is essential to consider that three potential problems may arise. Non-ICT firms' adoption of digital technologies has exhibited a sluggish pace in certain countries. Large firms characterized by rapid growth, high-skill requirements, export-oriented operations, and urban locations tend to demonstrate a higher propensity for utilizing digital technologies. The observed variation could be attributed to disparities in income levels, distinct characteristics of sectors, varying managerial proficiencies, or hindrances to adopting digital goods and services, such as the imposition of substantial import duties in certain nations (World Bank, 2016).

The World Bank (2016) notes that the impact of online businesses encroaching upon the territory of their offline counterparts can be substantial, leading to significant disruption. In such instances, regulators frequently need help with the appropriate action. The emergence of "on-demand economy" companies such as Uber and Airbnb has posed significant challenges to traditional taxi and hotel industries, leading to disruptions in cities worldwide, including Paris, Delhi, and Beijing. Furthermore, the dominance of numerous online platforms and intermediaries presents additional potential hazards (World Bank, 2016).

BelleFlamme (2016) notes that digital goods can be produced and distributed efficiently, which can lead to copyright infringement. The effect of digitalization on goods is either static or dynamic. For the static effects, the pricing of digital goods is displaced due to digital piracy since end users can reproduce the goods without the authorization of the legal owners. The impact on supply and demand includes users unwilling to pay the price to acquire the original product but are only willing to pay any additional value that the digital product brings. According to BelleFlamme (2016), this phenomenon can, however, reduce creators' future profits and incentive to create and the market power of the copyright holder. Due to the lower cost, consumer surplus increases. Piracy can positively affect copyright holders' profits due to the new consumers discovering the producer and sharing the information. Copyright holders may market cheaper or free versions and gain additional revenues through a menu of product options. The dynamic effect of digital piracy is that the copyright holders would not be incentivized to produce new works or works of higher quality. Further, digitalization reduces the cost of creating, producing, and distributing information goods. Since copyright holders are no longer in a monopoly position, price discrimination has been very low (BelleFlamme, 2016).

According to the World Bank (2016), economic history reveals that companies are often inclined to exploit their dominant market position, and it is plausible that large Internet firms may exhibit similar tendencies. Natural monopolies are advantageous for the Internet because specific platforms exhibit market dominance. These platforms generate substantial profits and expand their market share by acquiring competitors or developing competing services. Local startups, including those in developing nations,

prioritize their efforts toward specialized and narrow market segments. Regulatory authorities are examining several prominent internet corporations, including Google, which commands nearly one-third of the worldwide digital advertising revenue, and Amazon, the primary sales platform book publishers utilize. Safaricom, the operator of the M-Pesa payment system, has exhibited resistance towards the entrance of rival service providers. At present, it remains premature to ascertain the extent to which these issues will impede the overarching economic advantages of the Internet or be alleviated by the industry's minimal barriers to entry and swift technological advancements. (World Bank, 2016).

The World Bank (2016) notes that internet-based business models of established and emerging firms have generally proven advantageous for consumers. This advantage can be attributed to the highly dynamic nature of markets, where advantages derived from scale or being an early mover are often transient. Policies must be in place to guarantee equitable market entry and competition for all innovative companies. Alternatively, the economic performance among firms of varying sizes and across different countries may exhibit more significant disparity, thereby exacerbating the divergent performance of national economies (World Bank, 2016).

The European Union began enforcing the General Data Protection Regulation (GDPR) 2018 for EU citizens to address this, and a study of EU digital traffic and e-commerce after GDPR shows a decline of 10 percent in page views and revenues. Many countries are now considering data protection and privacy regulation versions (Greenstein, 2020).

The World Bank (2016) pointed out that the lack of a universal agreement among countries regarding emerging matters such as privacy, cybersecurity, censorship, and Internet governance has resulted in the adoption of varied and cautious approaches to regulating the internet. Examining supply-side information and communication technology (ICT) policies encompasses a value chain that encompasses various stages, namely the initial, intermediate, and imperceptible segments. This process entails enhancing and deregulating markets for satellite dishes and eliminating monopolistic control over international gateways and cable landing stations. The middle phase of the proposed strategy encompasses implementing market liberalization measures for the construction and operation of backbone networks. This phase includes promoting open access to existing networks held by incumbent providers (World Bank, 2016).

According to the World Bank (2016), the digital economy mandates the inclusion of optical fiber links, internet exchange points, and local caches for commonly accessed content in significant infrastructure initiatives. Government policies have the potential to promote last-mile connectivity through the implementation of measures such as allowing the existence of competing facilities and requiring the provision of local access lines to competitors at wholesale rates. The concept of the invisible mile encompasses various strategies in the field of spectrum management. These strategies include expanding the available spectrum, promoting fair competition by granting access to multiple entities, fostering the sharing of crucial infrastructure, and liberalizing the market for spectrum resale (World Bank, 2016).

The World Bank (2016) notes that the Internet faces vulnerabilities and threats from cybersecurity and censorship. These issues undermine trust in the internet, increase

costs for businesses and governments, and result in economic losses. Due to different countries' privacy and data protection approaches, developing a multistakeholder global approach is challenging to ensure internet safety (World Bank, 2016).

Cecere, Jean, Lefrere, and Tucker (2021) found that algorithms regulate advertising on platforms like Instagram and Facebook. A recent study analyzed over one million adverts across countries found that COVID-19 ads were more likely to be disqualified if they lacked a disclaimer since the algorithm considered COVID-19 a national matter. However, human interventions are necessary alongside automated decision-making algorithms to ensure regulations are upheld (Cecere, Jean, Lefrere, & Tucker, 2021).

The World Bank (2016) found that the Internet can facilitate economic development. Nevertheless, the widespread adoption and deployment of the Internet have faced significant hindrances from well-established markets, labor forces, and the public sector, resulting in a certain degree of hesitation. It is imperative to enhance the analog complements of digital investments to attain internet-enabled inclusive growth without enduring disruption. According to the World Bank (2016), three key policy objectives can be identified based on this analysis: firstly, creating a business environment that enables firms to effectively utilize the Internet to enhance competition and foster innovation for the benefit of consumers—secondly, establishing a responsible government that effectively employs the Internet to empower its citizens and provide efficient services. Lastly, the policy can include business regulations that facilitate market entry, education and training systems that equip individuals with the skills firms seek, and the presence of capable and accountable institutions. These objectives have gained

increased significance with the widespread adoption and diffusion of the Internet (World Bank, 2016).

Munger (2020) found that the digital economy has led to 'clickbait media,' where a critical player is Facebook. 'Clickbait media' falls within the economic theory of contestable markets where firms can rapidly enter and exit the marketplace, competing away any profit from existing firms and driving down profits. The 2016 US presidential election brought attention to the problem of reliable news when misleading content was often spread through social media platforms. 'Clickbait media' employs freelancers who can anonymously produce articles that do not need to meet the same standards as print newspapers or cable news. Munger (2020) posits that many zero-credibility news forums on the internet have been established, generating hyper-partisan stories. One way to address this is for Facebook and Google to provide further weight in their algorithms to reputable news outlets. However, if these platforms implement an assertive system of verifying information, dissatisfied users may leave and replicate clickbait media on a new platform (Munger, 2020). If persons are banned or demonetized, they tend to go to smaller niche platforms with a mainly national audience, such as Truth Social (Donald Trump) and Rumble (Russell Brand). The UN (2023) notes that the General Assembly will discuss information integrity at the 2024 session. The General Assembly is expected to agree on a non-binding resolution that addresses several internet-related issues, including disinformation, misinformation, hate speech, data access, increased transparency, and user empowerment (United Nations, 2023).

Meltzer and Lovelock (2018) note that governments restrict data flows, including introducing localization measures requiring prior consent before global data transfer.

Other measures include preventing data from being transferred and requiring a domestic copy. The reasons include protecting citizens, protecting national security, leveling the regulatory playing field, ensuring rapid access to data by law enforcement officials, and improving economic growth or competitiveness. Cross-border data flows can undermine domestic regulatory standards in privacy, consumer protection, and healthcare (Meltzer & Lovelock, 2018).

Peng (2016) found that the digital economy has contributed to tax base erosion and profit sharing (BEPS) by weakening the link between economic activity and specific locations. Internet sites and servers usually do not have joint physical locations. This situation can lead to net income tax countries losing taxes. Also, since digital transactions have certain features, national tax authorities need help identifying tax transaction status and determining the appropriate tax liability, including the tax treatment for multinational corporations. Peng (2016) found that multinational corporations use digital economy features in low-tax countries to structure their company and achieve profit transfer without violating international tax law. Joint action by many systems and countries is required to address tax base erosion of profits in the digital economy, including transfer pricing and harmful tax. Since June 2020, the G20 finance ministers and central bank governors have begun international cooperation to address tax issues in the digital economy (Peng, 2016).

Peng (2016) noted that the BEPS concern in the digital economy is how to separate taxable income from the activities that generated it. The virtual characteristic of the digital economy means that traditional tax rules cannot effectively establish the taxpayer, the location of the economic activity, and the relevant tax authority. Taxes can

also be eroded due to multinationals establishing foreign companies for tax avoidance purposes. Companies have also planned taxes to avoid taxes in the digital economy. Peng (2016) posits that national tax authorities require reliable information to determine tax collection in the digital economy, mainly due to countries' high degree of information asymmetry. One way of addressing these tax issues is the signing of double taxation treaties (Peng, 2016). As of October 2023, 116 countries have signed double taxation treaties (International Centre for Tax and Development, 2023).

According to Mishra (2017), the Internet has become the primary mechanism for international trade; therefore, Internet governance and international trade law interface on several issues, including cross-border data flows, cybersecurity, privacy, data protection, and online consumer protection. Internet openness is equivalent to the liberalization of trade flows, and cross-border data flows are necessary for e-commerce and impact the background processes of Internet governance. However, many countries restrict the cross-border data flow on several grounds, including domestic privacy and cybersecurity regulations. The European-United States privacy shield is a bilateral agreement that facilitates data transfer over the Internet. Mishra (2017) notes that FTAs now include legal provisions to prevent governments from interfering with digital data flows; for example, the electronic commerce chapter 14 of the TPP mandates cross-border data flows and the legal framework for protecting personal information. Also, the recent USMCA has provisions on cross-border data flows. However, most FTAs do not directly regulate data flows (Mishra, 2017)). Information security is an essential national security element (Frolova, Polyakova, Dudin, Rusakova, & Kucherenko, 2018).

According to Mitchell and Mishra (2020), the digital economy integrates developing countries' MSMEs into the global economy, but international trade laws need to be revised to address the digital economy issues. Multifaceted regulation for the digital economy includes various types of institutions, human rights, internet governance, and development institutions. Although the WTO e-commerce work program is lagging, several FTAs, such as the USMCA and TPP electronic commerce chapter, have addressed issues relating to the digital economy. Several stakeholders, including the technology industry, civil society, and various governments, are showing significant interest in the direction of digital economy regulations (Mitchell & Mishra, 2020).

According to Mitchell and Mishra (2020), the US government has been leading the way on various initiatives, including adding the digital economy to FTAs and countering the rise of digital powers such as China and the EU data protection policies. Countries are converging on three approaches to digital economy regulations – the market-based approach for choice, the interventionist approach for strong regulation, and the guarded approach favor strong data protection policies, online censorship, and cybersecurity to protect domestic interests. The existing international legal framework on digital trade is deficient in addressing the critical policy challenges of the modern digital economy. Mitchell and Mishra (2020) note that the WTO regulations are outdated; for example, GATS does not cover multi-functionality such as Google or cross-border data flows. Despite this, the WTO dispute settlement mechanism is rarely used. Data localization is commonly used to block cross-border data flows. To improve the regulatory framework, the WTO should directly or indirectly address the regulatory barriers to digital trade. WTO members identified four objectives for e-commerce

regulation: enabling the environment for digital technology, balancing public policy with technical innovation, and finding global solutions for policy challenges to support developing countries' needs (Mitchell & Mishra, 2020).

According to Chen, Cheng, Ciuriak, and Kimura (2019), the current state of the policy regime regarding data governance is in its early stages and is characterized by a lack of maturity and fragmentation across various countries. Four policies advocate for the promotion of free trade in goods. These policies include liberalizing and facilitating trade, addressing and mitigating market failures that lead to distortions, reconciling value judgments with economic efficiency, and integrating imported goods and trade activities into the domestic policy framework. Chen, Cheng, Ciuriak, and Kimura (2019) note that public policy intervention for the Internet can be justified in various circumstances.

Firstly, there is a need for additional policy efforts to promote liberalization and facilitation. Secondly, if there is evidence of market failure, indicating that the market alone cannot adequately address specific issues related to the internet. Thirdly, suppose important values or social concerns are at stake that require regulatory intervention. In that case, policy intervention may be necessary if there is a need to accommodate the smooth flow of data across borders. There are four distinct categories of policies about data flows and data-related businesses. These categories, according to Chen, Cheng, Ciuriak, and Kimura (2019), include (i) Policies aimed at liberalization and facilitation, (ii) Policies concerning customs duties on electronic transmissions, (iii) Policies regarding customs duties on parcels, specifically de minimis thresholds, and (iv) Policies addressing electronic authentication and electronic signatures. The primary objective of these policies is to enhance the efficiency of data and data-related transactions while also

mitigating the risk of market inefficiencies in the digital economy resulting from network externalities, economies of scale and scope, and widespread information asymmetry (Chen, Cheng, Ciuriak, & Kimura, 2019).

Chen, Cheng, Ciuriak, and Kimura (2019) note that the digital economy's concentration is significantly influenced by its reliance on data. However, it is essential to exercise caution when implementing competition policy remedies, as market distortion is primarily caused by the misuse of market power rather than simply market concentration. Numerous nations express apprehensions, specifically regarding prominent platform corporations such as Google, Amazon, Facebook, Apple Inc., and Baidu, Alibaba, Tencent, due to their extensive utilization of big data, potential engagement in unfair trade practices, and strategies to assimilate prospective competitors. Germany enacted a substantial competition law reform to establish a regulatory framework tailored to the digital economy in 2017. Government intervention in consumer protection is necessary to ensure the safety and well-being of consumers, promote optimal welfare outcomes, and foster the growth and expansion of online markets (Chen, Cheng, Ciuriak, & Kimura, 2019).

According to Chen, Cheng, Ciuriak, and Kimura (2019), digital transformation has given rise to various traditional and emerging concerns about safeguarding intellectual property rights (IPR), specifically in data. The concerns above encompass databases' patentability, data ownership, the confidentiality of algorithms and source code, and the proliferation of trade secrets. The conventional methods employed to encourage the creation of intellectual property (such as patents and copyrights) need to be more suited to address the extensive magnitude of data generated by artificial

intelligence. The Trade-Related Aspects of Intellectual Property Rights (TRIPs) within the World Trade Organization (WTO) exhibit limitations in safeguarding intellectual property rights (IPR), particularly in the context of the digital age. Chen, Cheng, Ciuriak, and Kimura (2019) concluded that data and privacy protection have emerged as a paramount concern within the context of the digital economy, necessitating the development of policies that effectively balance these values with considerations of economic efficiency. The issue of cybersecurity is of great importance to both governmental entities and private industries. In certain nations, the disclosure of source code is mandated as a prerequisite for market entry, or the provision of "backdoor access" to proprietary and encrypted data is demanded. These requirements potentially threaten protecting companies' intellectual property rights (IPR). International cooperation in policy-making can be achieved through various means. For instance, the Organization for Economic Cooperation and Development (OECD) evaluates compliance cases involving prominent multinational corporations such as IBM and Microsoft operating in China (Chen, Cheng, Ciuriak, & Kimura, 2019).

Additionally, Chen, Cheng, Ciuriak, and Kimura (2019) note that the Reform Government Surveillance group actively opposes requests for backdoor access to proprietary and encrypted data, contributing to global efforts to safeguard digital privacy and security. Companies place significant emphasis on the notion that the existence of backdoors within their systems can give rise to vulnerabilities in terms of security for external entities. Determining an appropriate degree of cybersecurity regulation presents a formidable task, given that excessive regulation hampers economic dynamism while

insufficient regulation exposes entities to cyber-attacks. (Chen, Cheng, Ciuriak, & Kimura, 2019).

According to Chen, Cheng, Ciuriak, and Kimura (2019), value-added taxes (VATs) imposed on sellers by numerous countries are subject to considerable controversy. There is a contention that domestic service providers may encounter a comparative disadvantage compared to foreign service providers facilitated by the Internet, as the latter are not subjected to taxes imposed by importing nations. Another contentious matter pertains to corporate income taxes, specifically concerning the substantial profits generated by large multinational corporations. The need for more transparency surrounding their earnings and the intricate intricacies of their value chain design and operation are frequently undisclosed to the public. Several nations have initiated or are contemplating implementing interim measures aimed at levying taxes on digital services provided by foreign platforms, typically in the form of sales-based taxation (Chen, Cheng, Ciuriak, & Kimura, 2019).

Chen, Cheng, Ciuriak, and Kimura (2019) reported that in May 2018, the OECD Committee on Digital Economy Policy formed the Expert Group on Artificial Intelligence in Society (AIGO) to delineate public policy and principles for international cooperation. The existing Guidelines for AI encompass five fundamental principles: inclusive and sustainable growth and well-being, human-centered values and fairness, transparency and explainability, robustness and safety, and accountability. One of the primary concerns pertains to the inadequate disclosure of information regarding the operations of large multinational corporations (Chen, Cheng, Ciuriak, & Kimura, 2019).

In the context of small economies, Chen, Cheng, Ciuriak, and Kimura (2019) posited that it is arguable that the early liberalization of digital-related businesses may yield more favorable outcomes than safeguarding nascent domestic enterprises. The rise of digital privacy and the rise of data-driven economies have led to significant changes in business operations and interactions. This development has led to a growing concern about the World Trade Organization's (WTO) role in regulating data flow and ensuring that it is used responsibly and moderately. The rise of data realms has also led to data localization requirements, which can pose challenges for developing countries in their efforts to formulate data governance. The European Commission has imposed a fine of €4.34 billion on Google for engaging in unlawful practices related to Android mobile devices, which have reinforced Google's dominant position in the search engine market (Chen, Cheng, Ciuriak, & Kimura, 2019)).

According to Chen, Cheng, Ciuriak, and Kimura (2019), the OECD has also provided a toolkit for protecting digital consumers. In addition to the challenges posed by data privacy and the rise of data-driven economies, there are concerns about technology companies' role in antitrust blind spots. For example, Apple and other tech companies have been known to resist encryption backdoor proposals by the U.S. Department of Justice and FBI. A multi-stakeholder approach, including private companies, academics, and civil society, is needed to address these issues and ensure the digital economy remains competitive and fair (Chen, Cheng, Ciuriak, & Kimura, 2019).

Research Methodology

Research question: How does the digital economy impact trade and investment?

Null hypothesis: The digital economy is part of the steady-state economy based on natural resources from which trade and investment derive.

Alternative Hypothesis: The digital economy has led to a new steady-state economy where new goods and services can be produced and traded, mainly because of the global nature of the digital economy.

The research will use a case study methodology that includes descriptive statistics to establish the most significant drivers of cross-border trade due to the digital economy.

Data will be sourced from online databases such as World Bank Development Indicators and Statista and center on the following framework:

Table 47 *Digital Economy Facilitating Frameworks*

<p>Digital Industry</p> <p>Grouping</p>	<p>List of producers and facilitating frameworks</p>
<p>Digitally enabling industries</p>	<p>Percentage of the population using the Internet (by country)</p> <p>Shipping companies for the digital purchase of goods, including</p> <p>DHL</p> <p><u>Computer manufacturers including -</u></p> <p>Lenovo</p> <p>Apple</p> <p><u>Web development software, including</u></p> <p><u>Wix</u></p>
<p>Digital intermediary platforms charging a fee</p>	<p><u>Food delivery companies' travel booking portals and</u></p> <p><u>platforms facilitating online auctions, including</u></p> <p>Uber</p> <p>Booking.com</p> <p>Airbnb</p> <p>Fiverr</p>

Table 47 (continued).

<p>Data and advertising drive digital platforms</p>	<p><u>Search engines, including</u> Google <u>Social media platforms, including</u> YouTube Instagram Twitter Tik-Tok Zero-priced phone applications and information-sharing platforms, including WhatsApp</p>
<p>Firms dependent on intermediary platforms</p>	<p>Independent service providers who get jobs from digital platforms and businesses who supply via a third-party digital platform, including Social Media Content Creators eBay sellers Amazon sellers</p>
<p>E-tailers</p>	<p>Retail and wholesale businesses engaged in buying and retailing goods or services that receive most of their orders digitally, including. Alibaba</p>

Table 47 (continued).

<p>Digital-only firms providing financial and insurance services</p>	<p>Digital-only banks, financial service providers, and digital-only payment system providers, including Paypal</p>
<p>Other producers only operate digitally.</p>	<p>Paid digital media providers and subscription-based digital service providers, including Netflix</p>
<p>Cloud Computing, Artificial Intelligence, and Data Services</p>	<p>Companies and software that provide/facilitate the collection of big data and cloud computing: Amazon. Microsoft Meta Alphabet</p>

Source: Adapted from (Kole, 2021)

The analysis of the digital economy will examine causality, significant trends, and significant variables that answer the following questions.

- (1) Who are the leading players, and what is their volume and value of cross-border trade?
- (2) Where are the major producers and consumers of the global digital economy, and what are the reasons for the location?

- (3) What are goods and services?
- (4) How are value-added and profit created?
- (5) What is the enabling environment for cross-border mobility?
- (6) How trade is conducted
- (7) Internet connections and the export and import of Digital goods and services

Data Analysis and Findings

Internet connections and the export and import of Digital goods and services

Internet connections and computer devices are required to participate in the digital economy (see Figure 18 and Tables 48 and 49). According to the World Bank development indicators (2023) (see Figure 18), internet connections are highest in high-income countries. In 2021, 90.2 percent of the population had internet access, followed by upper-middle-income countries, where 74.3 percent had internet access 2021. On the other hand, only 20 percent of people in low-income countries have access to the Internet, followed by 30 percent of people living in LDCs. Regarding geographic regions, North America had the highest percentage of internet access in 2021, at 91.2 percent, followed by Europe and Central Asia, with 86.5 percent of the population accessing the internet in 2021. At the other end of the spectrum is sub-Saharan Africa, where only 35.9 percent of the population had internet access in 2021 (World Bank, 2023).

Regarding owning mobile devices, in high-income and upper-middle-income countries in 2021, there were approximately 124 mobile phones for every 100 persons, while in low-income countries, there were 60 mobile phones for every 100 persons in 2021. In fragile conflict-affected and least-developed countries, mobile phone ownership

was 77 per 100 persons in 2021. Mobile phone ownership is highest in Europe and Asia, with 127 phones per 100 persons in 2021, compared with 84 phones per 100 persons in sub-Saharan Africa (World Bank, 2023).

Figure 18 shows the trend in ICT goods and services exports and imports. ICT goods exports and imports encompass various types of equipment, including computers, peripherals, communication equipment, consumer electronic equipment, electronic components, and other miscellaneous items. Software is generally excluded, but embedded software is only partially excluded from certain ICT goods, such as video game consoles. The digital and information revolution has changed various aspects of life, including education, communication, business, and health care. New information and communications technologies (ICT) offer improved health, distance education, better service delivery, opportunities for economic growth, and social and cultural advancements. However, developing countries need more information on who uses ICT, their purposes, and their impact on people and businesses (World Bank 2023).

According to the World Bank (2023), ICT exports are calculated as a percentage of total exports by dividing the value of a country's ICT goods exports by its total exports. Similarly, ICT goods imports are calculated as a percentage of total imports by dividing the value of a country's ICT goods imports by its total imports. As shown in Graph 1, exports of ICT goods come mainly from high-income, upper-middle-income, and middle-income countries at 11.7 percent, 15.8 percent, and 17.4 percent of goods exports, respectively, in 2021. In terms of ICT goods imports, high-income, upper-middle-income, and middle-income countries at 13.4 percent, 15.1 percent, and 17.1 percent of goods imports, respectively, in 2021. In terms of ICT services exports, which

can include uploading videos to social media or providing remote ICT services, the highest ICT services exports as a percentage of services exports came from lower-middle-income countries (36.2 percent), middle-income countries (20.7 percent), and fragile and conflict-afflicted countries (17.5 percent) (World Bank, 2023).

Regarding international trade in goods and services by region, almost half of South Asia's services exports – 47.4 percent comprises ICT services, while for goods, 2 percent of exports are for ICT goods, and 8.8 percent of imports are for ICT goods. East Asia Pacific leads the way in the exports and imports of ICT goods, with 28 percent of exports being ICT goods and 25 percent being ICT goods. On the other hand, only 0.31 percent of sub-Saharan African exports are ICT goods, and only 4.8 percent of imports are ICT goods (World Bank, 2023).

Figure 18. Internet usage and exports and imports in ICT goods and services by Income Group and Region

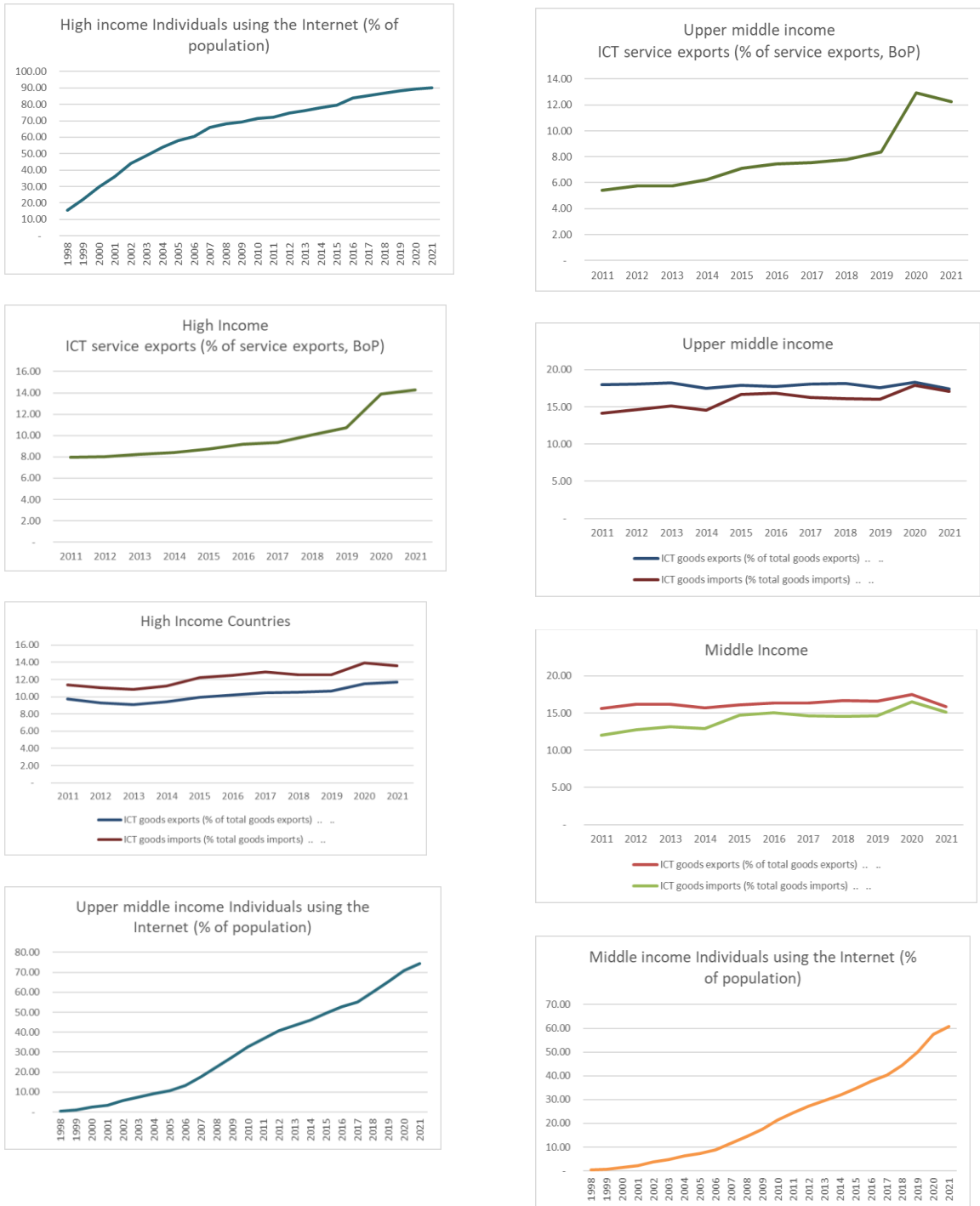


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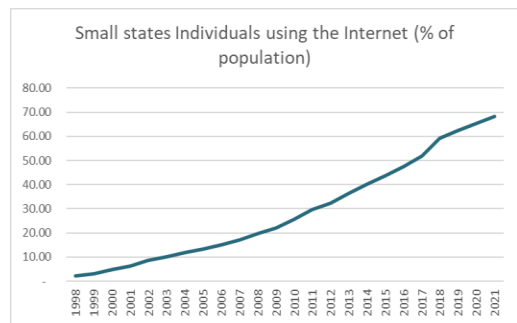
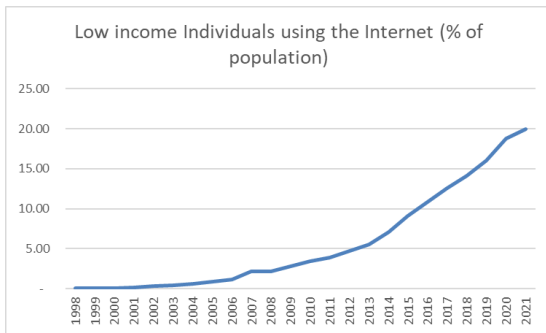
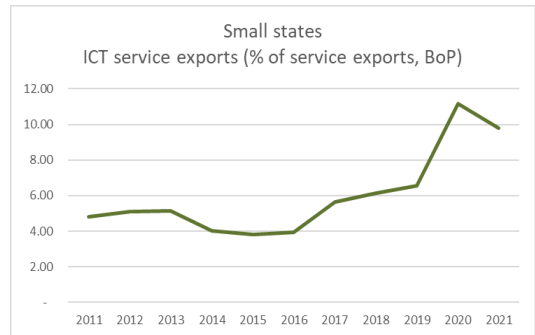
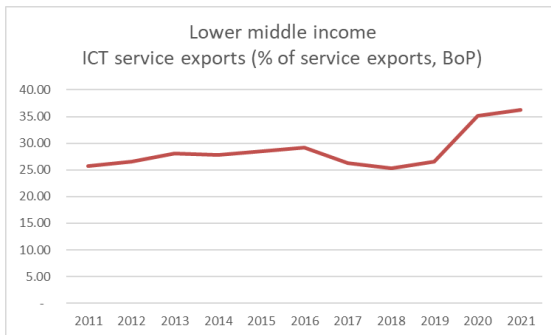
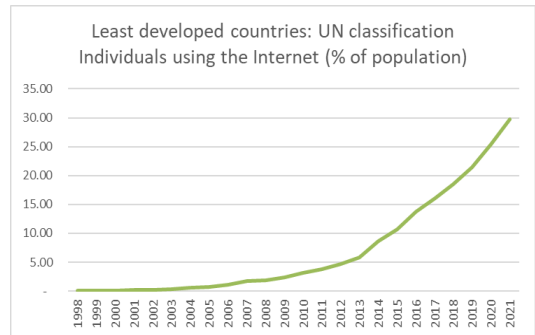
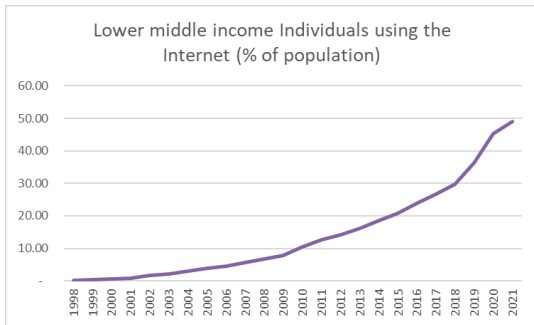
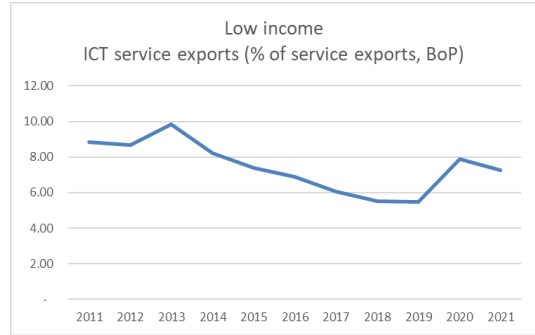
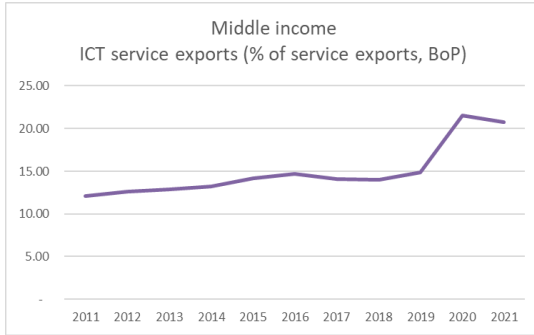


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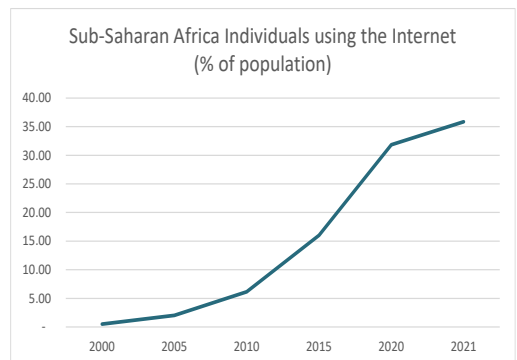
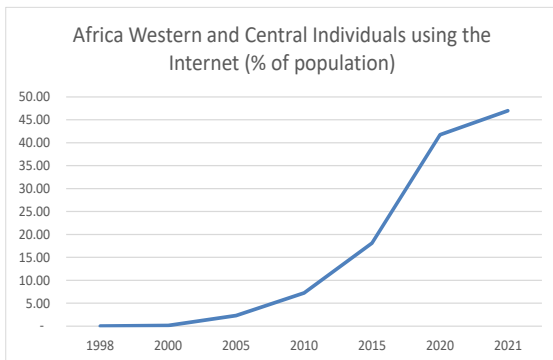
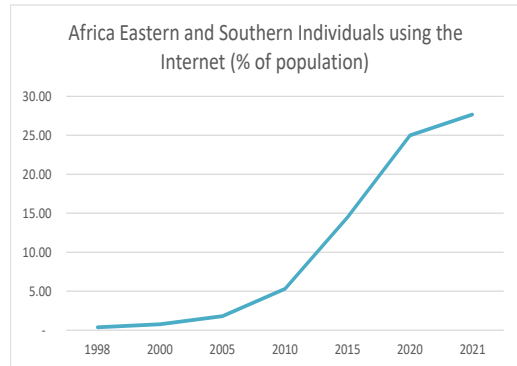
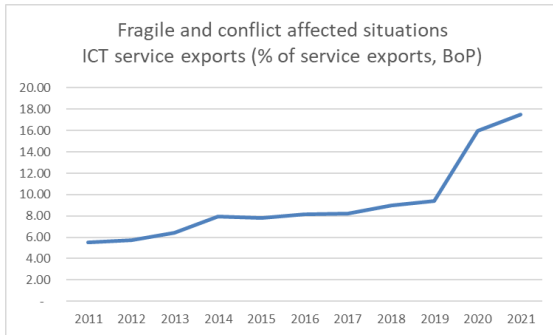
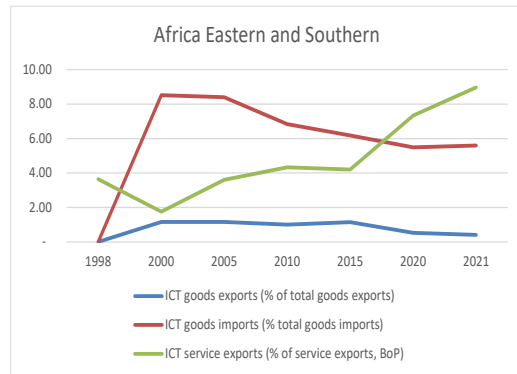
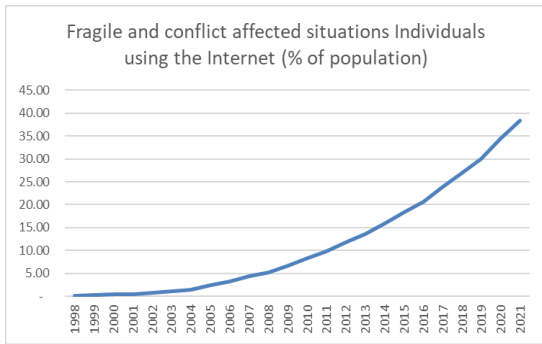
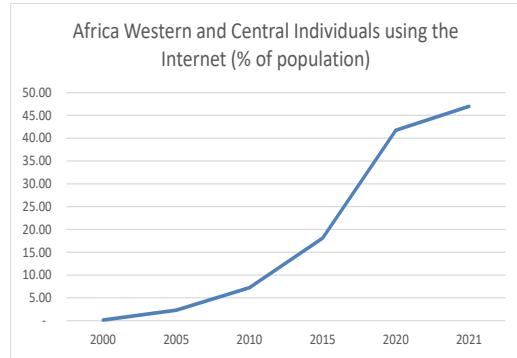
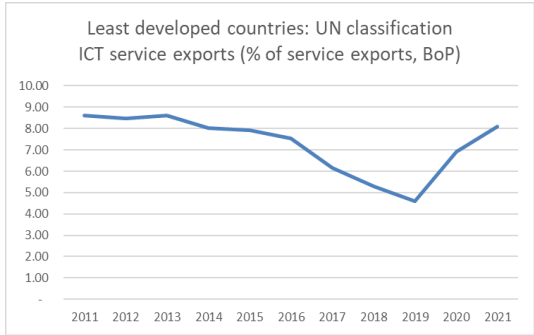


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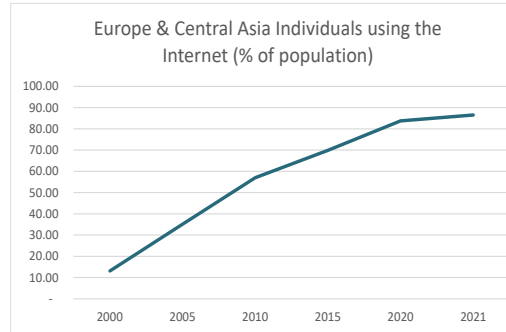
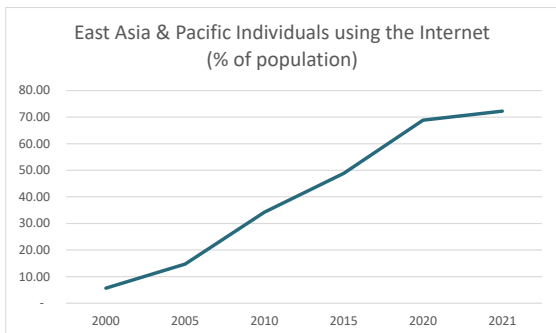
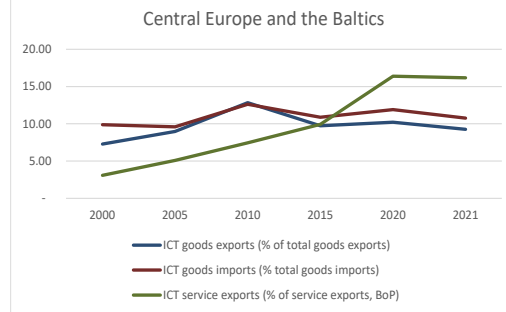
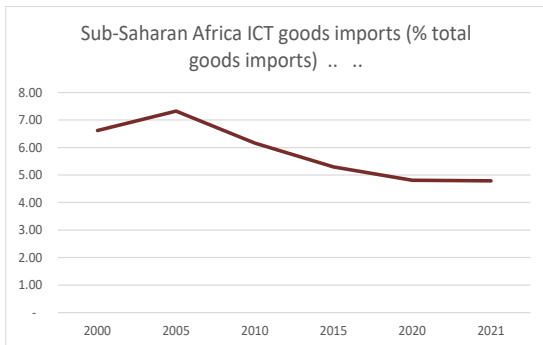
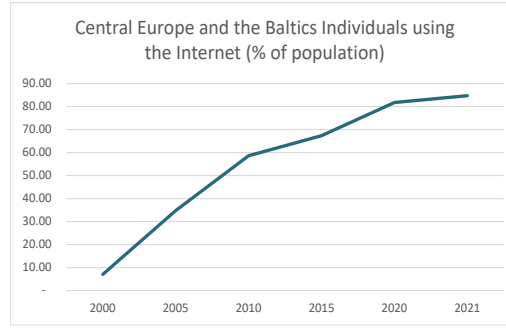
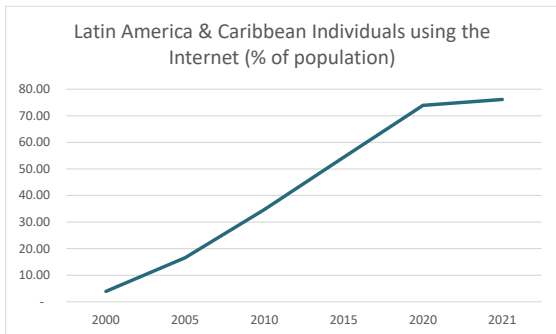
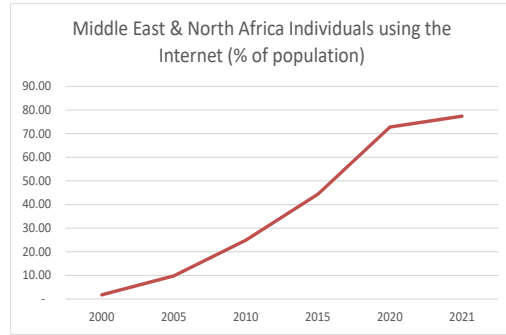
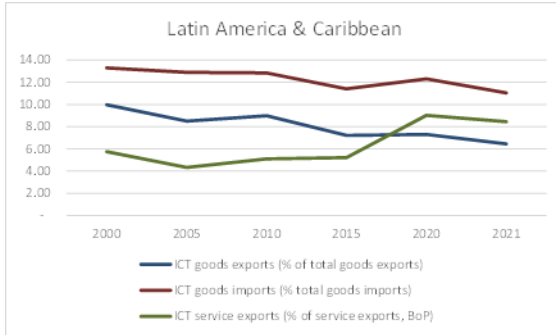
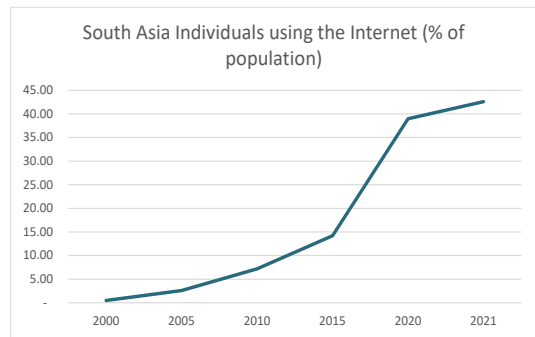
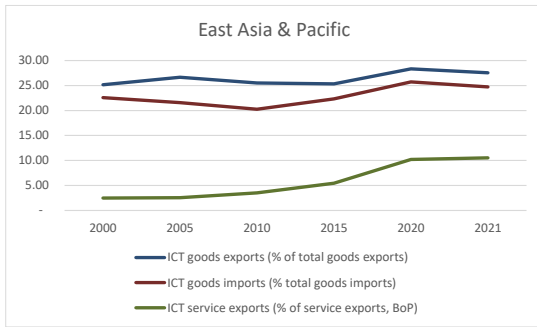
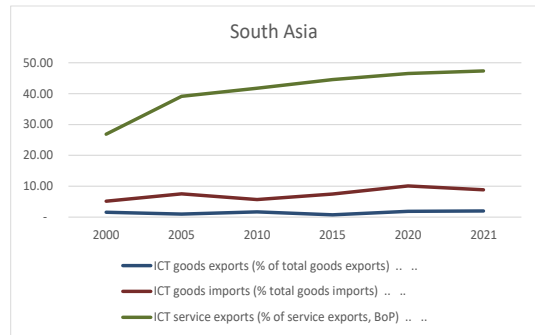


Figure 18 (continued).



Source: World Bank Development Indicators

Table 48 *Mobile cellular subscriptions (per 100 people) – By income group*

Country Name	1998	2000	2005	2010	2015	2020	2021
Fragile and conflict affected situations	0.48	1.31	12.70	43.54	71.98	76.87	77.11
High income	23.60	48.35	83.24	109.27	118.70	121.85	124.28
Least developed countries: UN classification	0.07	0.27	5.00	33.17	66.75	75.90	77.85
Low income	0.03	0.18	4.45	26.94	53.56	55.63	59.51
Lower middle income	0.26	0.97	12.08	63.60	83.98	95.99	96.53
Middle income	1.33	4.34	24.85	72.99	95.67	108.02	109.67
Small states	3.60	10.74	42.13	88.99	113.81	110.59	114.39
Upper middle income	2.34	7.56	37.58	82.75	108.27	121.49	124.52

Source: World Bank <https://www.who.int/data/gho/indicator-metadata-registry/imr-details/2974>

Table 49 *Mobile cellular subscriptions (per 100 people) – By regional group*

Country Name	1998	2000	2005	2010	2015	2020	2021
Central Europe and the Baltics	5.72	20.67	82.06	121.74	126.08	121.62	124.40
East Asia & Pacific	5.33	11.46	34.24	73.98	104.11	126.54	127.88
Europe & Central Asia	12.28	34.14	81.21	120.33	124.31	124.90	127.57
Latin America & Caribbean	4.20	12.23	43.25	97.29	111.65	102.07	107.93
Middle East & North Africa	1.66	4.48	27.74	88.99	105.91	108.89	113.50
North America	24.37	37.75	67.08	90.10	100.42	102.96	105.36
Sub-Saharan Africa	0.61	1.72	11.99	44.09	74.55	82.13	84.22

Source: World Bank <https://www.who.int/data/gho/indicator-metadata-registry/imr-details/2974>

Freight Forwarders for Physical Goods

According to Freightos (2022), the top ten freight forwarders that make global trade possible are Kuehne+Nagel, DHL, DB Schenker, Expeditors International, C.H. Robinson, CEVA Logistics, Nippon Express, Geodis, Hellman Worldwide Logistics, and Bollore Logistics. Kuehne+Nagel, a Swiss company, serves 1300+ locations in 100+ countries in Europe, the Middle East and Africa, North America, Central and South America, and Asia Pacific. The company serves the aerospace, automotive, fast-moving consumer goods (FMCG), healthcare, high-tech, perishables, and industrial industries (Freightos, 2022).

Deutsche Post DHL Group is a German postal service and international courier company (Carrier, 2023). DHL serves 220+ countries in auto-mobility, chemicals, consumer, energy, engineering, manufacturing, healthcare, retail, and technology (Freightos, 2022). In 2020, according to Carrier (2023), DHL Supply Chain & Global Forwarding emerged as the foremost global third-party logistics provider, boasting a substantial revenue of US\$28.4 billion. In 2017, DHL commanded a market share of more than 40 percent in the Asia-Pacific and European courier and local delivery service provider markets. The company's revenue in 2021 was primarily generated in Europe, with over 21.5 billion Euros coming from Germany and 23.7 billion Euros from the rest of Europe. In 2021, the company also ranked globally among the top five ocean freight forwarders and airfreight forwarders (Carrier, 2023).

Freightos (2022) reported that DB Schenker, a German company, serves 1,850+ locations globally in the automotive, technology, consumer goods, special transport, industrial healthcare, retail and fashion, perishables, oil and gas semiconductors, and solar items. Expeditors International is a US company serving 350+ locations across 100+ countries. The company specializes in technology and digital solutions by providing a booking platform, trade management software, sensor-based logistics, and ocean forecasting. The company provides services to the automotive and mobility, fashion and retail, aviation and aerospace, healthcare, manufacturing, oil and energy, and technology industries. Freightos (2022) states that C.H. Robinson, a US company, serves 150+ countries. The French companies CEVA Logistics, Geodis, and Bollore Logistics serve 170+ countries, 65+ countries, and 110+ countries, respectively. The industries of these companies include aerospace, consumer and retail, healthcare, energy, perfume and

cosmetics, aid and relief material, FCMG, manufacturing, engineering, food and beverage, and soft commodities. Bollore Logistics is the largest logistics company in Africa and one of the biggest freight forwarders in the oil industry. CEVA Logistics is the best shipper for trading with China. Nippon Logistics, the only Japanese firm in the top 10, serves 49 countries, mainly in Asia, through logistics hubs for storage and distribution with cold chain facilities for perishables. The company serves several industries, including automotive, aerospace and aviation, food and perishables, pharmaceuticals, telecommunication, and electronics (Freightos, 2022).

Table 50 List of the top 10 global freight forwarders

Provider	Gross Logistics Revenue (\$ billions)	Ocean(Twenty-foot Equivalent Unit (TEUs)) millions	Air(Metric Tons) (millions)
Kuehne + Nagel	20-50	4-5	2-3
DHL	20-50	2-4	2-3
DB Schenker	20-50	2-4	1-2
Expeditors	10-20	1-2	1-2
C.H. Robinson	20-50	1-2	0.3-0.5
CEVA Logistics	10-20	1-2	0.3-0.5
Nippon Express	10-20	0.5 -1	0.5 -1
GEODIS	10-20	0.5 -1	0.3-0.5
Hellmann Worldwide Logistics	3-5	0.5 -1	0.5 -1
Bolloré Logistics	5-10	0.5 -1	0.5 -1

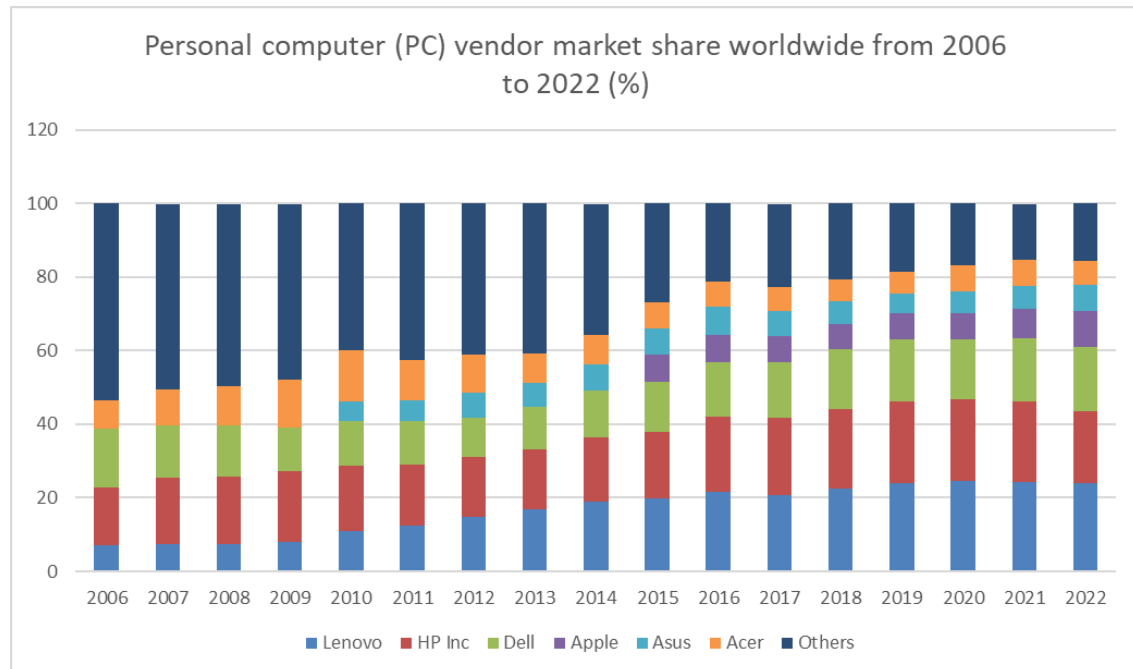
Source: A&A's Top 25 Global Freight Forwarders List <https://www.freightos.com/freight-resources/top-freight-forwarders/>

Devices – Computers, Tablets and Smartphones

Alsop (2023) reports that the global economic slowdown in 2022 negatively impacted the Personal Computer (PC) market, with shipments falling by over 16 percent and up to 29 percent in the final quarter. PCs come in stationary and portable forms, including workstations, desktops, laptops, notebooks, netbooks, and tablets. In 2022, 260

million notebook units were shipped worldwide. The global PC market in 2022 was led by Lenovo, with a 25 percent market share, followed by HP, with a slightly under 20 percent share. Lenovo recorded 69 million PC shipments, while HP had 56 million (Alsop, 2023).

Figure 19. Personal computer (PC) vendor market share worldwide from 2006 to 2022



Source: Statista <https://www.statista.com/statistics/267018/global-market-share-held-by-pc-vendors/>.

Laricchia (2023) in Tablets - Statistics and facts reported that tablets perfectly combine mobile devices and computers, balancing the two. The first touchscreen tablet, the iPad, revolutionized the global tablet market in 2010 and influenced companies like Samsung and Huawei to release similar devices. The tablet market is expected to be worth nearly US\$50 billion in 2023, contributing significantly to technology and consumer expectations. Tablet shipments peaked in 2014, but the demand for mobile PC devices during the pandemic slightly increased. According to Laricchia (2023) in Tablets

- Statistics and facts, worldwide tablet shipments are projected to amount to 143 million units in 2023, indicating a decline from the previous figure of 230 million units recorded in 2014. Apple continues to maintain its position as the dominant vendor, while Samsung and Amazon closely contend for market share. Despite Apple's significant market share exceeding 30 percent in recent years, the competitive landscape remains robust due to ongoing efforts by manufacturers to create novel products that entice consumers away from Apple's offerings. The Android operating system developed by Google has emerged as the dominant platform for tablets, primarily owing to its open-source licensing model, which effectively lowers production expenses for manufacturers. Apple's iOS platform currently commands approximately 25% of the market share, with Microsoft's Windows operating system and various smaller vendors collectively dominating the remaining market segments. (Laricchia, Tablets - Statistics & facts, 2023).

Laricchia (2023) in Smartphones - Statistics and facts noted that smartphones have become essential to our lives with advanced computing capabilities and connectivity. Introduced in the late 90s, they gained popularity with Apple's iPhone in 2007, offering user-friendly features like a touchscreen interface and virtual keyboard. The first Android OS smartphone was introduced in 2008, making smartphones indispensable. Since 2008, the smartphone industry has grown significantly, with shipments reaching 1.2 billion units in 2022. According to Laricchia (2023) in Smartphones - Statistics and Facts, by the end of 2022, 68 percent of the world's population was smartphone users. However, smartphone subscriptions exceed the number of users, with an estimated 6.5 billion subscriptions used in 2022. Samsung dominated the global smartphone market in Q1 2023, holding 22.5 percent of the market share.

Huawei once held a strong position, but trade restrictions have impacted its market share. Laricchia (2023), in *Smartphones - Statistics and facts*, noted that other Chinese firms, such as Xiaomi, have filled the gap left by Huawei, such as Xiaomi's rise from 10 percent in Q1 2020 to 17 percent in Q4 2022. The competition for the remaining top five vendors is fierce. Nokia, once the leading smartphone vendor globally, lost ground in early 2011, occupying around one-quarter of the market. The decline highlights the importance of staying ahead of tech innovation trends and competitors. Nokia's failure to adapt to new trends and competitors led to a diminished company, highlighting the need for innovation (Laricchia, *Smartphones - Statistics & facts*, 2023).

Software development

Vailshery (2023), in *Software Development - Statistics and Facts*, found that software development encompasses the processes of conceptualizing, designing, implementing, and maintaining software systems, which adhere to a structured sequence of phases commonly referred to as the software development life cycle. The software development process encompasses various stages, namely requirements analysis, design, development, testing, implementation, documentation, and evolution. Programming languages such as JavaScript and C++ are commonly employed in software development, with JavaScript emerging as the prevailing choice in 2022, as it is utilized by approximately 65 percent of software developers. The software industry, an integral component of the information technology market, has witnessed substantial expansion in recent years, notwithstanding a temporary downturn attributable to the COVID-19 pandemic. Software development is a pivotal component of the IT industry, serving as its creative driving force. Vailshery (2023) in *Software development - Statistics and facts*

reported that prominent technology companies such as Adobe allocate significant resources towards research and development. Software development can be categorized into several types: application development, mobile app development, web development, API development, and embedded systems development. Application development focuses on creating software applications for PC operating systems, while mobile app development is increasingly popular due to smartphones. Developers typically work with Android and iOS operating systems, but some work exclusively with one. Web development involves creating websites for the internet or intranet (Vailshery, Software development - Statistics & facts, 2023).

Market Leaders in the Digital Economy

Google/Alphabet

Table 51 *Google/Alphabet Range of Products and Services for Various Applications*

Product/service	Details
Watch, Listen and Play	YouTube, Google Play Music, Chromecast, Google Play Movies, and YouTube TV
Browser	Chrome
Search	Search, Finance, Flights, News, Scholar, Patents, Books, Images, Videos, Hotels, Translate
Navigation	Maps, Waze
Productivity tools	Drive, Docs, Sheets, Slides, Forms

Table 51 (continued).

Social & communications	Gmail, Allo, Hangouts, Google Duo, Google+, Messages, Translate
Storage and organization	Photos, Contacts, Calendar, Keep
Personal Assistant	Google voice assistant
Services	Fiber, DNS, Project Fi, Google pay
Devices	Pixel 3, Connected Home, Pixel Slate, Google Wifi
For Business	Google Ads, AdSense, Analytics, Google My Business, Google Survey

Source: <https://market.us/statistics/web-search-engine/google/>

Bianchi (2023) found that Google provides various digital products and services, encompassing online search functionality, advertising solutions, cloud computing capabilities, and software offerings. As of February 2023, Google's websites held the top position in terms of visitation among multi-platform web properties in the United States. It recorded an impressive count of 274.49 million unique visitors, representing a dominant market share of 61.4 percent among the leading providers of search engine services. In 2015, Alphabet Inc., a conglomerate based in the United States, was established as the primary entity overseeing Google and other subsidiary companies. According to Bianchi (2023), as of March 2023, the market capitalization of Alphabet Inc. was estimated to be US\$1.22 trillion. In the fiscal year 2022, Google's primary

revenue source was advertising, with the majority originating from advertising on Google Sites, amounting to US\$191.69 billion. In January 2023, Google held a dominant position in the global search engine market, capturing a market share of 84.69 percent (Bianchi, 2023).

Furthermore, Bianchi (2023) concluded that Google offers various localized versions of its search engine to cater to specific regions. The organization has undergone an expansion of its services, encompassing the inclusion of YouTube, a platform dedicated to sharing video content. This addition has profoundly impacted the dynamics of user-generated content and the curation of online videos. In addition to its core search engine services, Google has diversified its operations to include content provision, with a notable focus on the Android mobile operating system. As of 2022, Bianchi (2023) noted that Android has emerged as the dominant player in the global smartphone operating system market, capturing nearly 70 percent of the market share. The acquisition of content for Android devices is facilitated through the Google Play Store, a digital platform that provides access to a vast selection of applications totaling more than 2.6 million. Google's product portfolio encompasses a variety of offerings, such as the Chrome browser, ChromeOS, hardware devices, mobile devices, and Google Pay, an online payment system. In 2023, Google's parent company directed its attention towards machine learning and artificial intelligence (AI) in response to the notable increase in generative AI and AI-driven search. Alphabet, a prominent entity in the technology industry, has established itself as a significant proprietor of patents. Its portfolio encompasses a multitude of artificial intelligence (AI) start-ups, notably including DeepMind (Bianchi, 2023).

Apple

According to Laricchia (2023) in *Apple - statistics and facts*, Apple is a global tech giant with a diverse ecosystem, including iPhone, iPad, Mac, wearables, home devices, accessories, and services. Under Steve Jobs' leadership, the company has experienced significant growth, from US\$8 billion in 2004 to over US\$394 billion in 2022. The company's innovative designs and creative advertisements have made it one of the world's most valuable brands, with a loyal fan base and impressive revenue growth. In 2001, Apple introduced the iPod, a success with hundreds of millions of units sold. Laricchia (2023) in *Apple - statistics and facts* note that iPods declined in popularity due to smartphones becoming personal music players. In 2007, the iPhone revolutionized the global smartphone market with its interface, allowing users to make calls and browse the internet. The iPhone is Apple's most successful product, contributing significantly to the company's revenue. The 16th generation includes the iPhone 14/14 Plus and iPhone 14 Pro/14 Pro Max. Apple holds 30 percent of the wearables market following the launch of Apple Watch in 2015. Apple also has a large share of the wearables market from the launch of AirPods. Apple also has the HomePod, Apple Music, Apple TV+, Apple Arcade, and iCloud (Laricchia, *Apple - statistics & facts 2023*). Shvartsman (2023) pointed out that Apple had US\$202.5 billion in cash and investments in March 2022, accounting for 7.4 percent of the S&P 500's total, a 4 percent increase from 2021. By comparison, Alphabet currently holds US\$169.2 billion, while Microsoft has US\$132.3 billion, or 5 percent of the S&P 500's total (Shvartsman, 2023).

Microsoft

According to WallStreetZen (2023), Microsoft Xbox Live had nearly 100 million players in 2020, and the Xbox Game Pass service has over 15 million subscribers. Microsoft Office 365 had 258 million subscribers/seats globally in April 2020. In January 2022, Microsoft Teams had 270 million active users. Microsoft Windows has 75.1 percent of the desktop operating system market share, MacOS has 15.6 percent, and Linux has 2.77 percent. WallStreetZen (2023) noted that Microsoft is second to Amazon in the infrastructure as a service (SaaS) cloud service at 21.1 percent and 38.9 percent market share, respectively. Microsoft earned 50.1 percent of its US\$198.3 million revenue for 2022 from the US and 49.5 percent from the rest of the world (WallStreetZen, 2023). Microsoft's market cap in 2023 is US\$2.3 trillion. Microsoft's revenue is primarily from commercial licensing of its software and operating systems, including Windows OS sales, search advertising, and gaming (Vailshery, Microsoft - Statistics & facts, 2023).

Digital platforms

Statista Research Department (2023) reported that Uber Technologies, established in 2009, provides a range of services encompassing bike-sharing, air taxis, and Uber Eats. As of 2019, the number of monthly users in the United States reached 110 million. The company operates across 72 countries and has completed over 7.6 billion trips. In the fiscal year of 2022, Uber reported a net revenue of approximately US\$32 billion. Statista Research Department (2023) found that during the initial quarter of 2023, Uber recorded a global revenue of US\$31.41 billion. As of December 2022, Uber maintains its position as the dominant global ride-hailing operator, boasting a market capitalization of US\$49

billion. In 2012, Lyft, a notable contender, entered the market and challenged Uber's business model by providing distinct services. Although Lyft does not directly invest in new business patterns, its successful strategy advances existing economic possibilities. In 2022, Uber commanded a significant portion of the worldwide ride-hailing and taxi market, accounting for 25 percent, whereas Lyft held a comparatively smaller market share of 8 percent (Statista Research Department, 2023).

According to Statista Research Department (2023), Booking Holdings Inc. is a travel technology corporation headquartered in the United States. It is a conglomerate of travel, tourism, and hospitality aggregators and metasearch engines. The company operates in a total of 200 countries and offers its services in 40 different languages. Its portfolio includes websites such as Booking.com, Priceline.com, Kayak.com, Agoda.com, Rentalcars.com, Cheapflights, Momondo, and OpenTable. Statista Research Department (2023) reported that Booking Holdings emerged as the dominant online travel agency globally in 2021, amassing a substantial revenue of approximately US\$11 billion. In 2022, the valuation of the online travel market amounted to US\$433 billion. In June 2023, Booking.com achieved the highest position in the global travel and tourism website rankings, attracting over 614 million online visitors. According to Statista Research Department (2023), the mobile application, which garnered approximately 80 million downloads on iOS and Google Play platforms, emerged as the most widely downloaded application among travel agency apps. TripAdvisor and Airbnb ranked second and third in that order. The substantial traffic volume on its website and mobile application demonstrates the company's popularity. Between February and June 2023,

there was a notable surge in the number of visits to Booking.com, with figures rising from 495.5 million to 614.1 million by June (Statista Research Department, 2023).

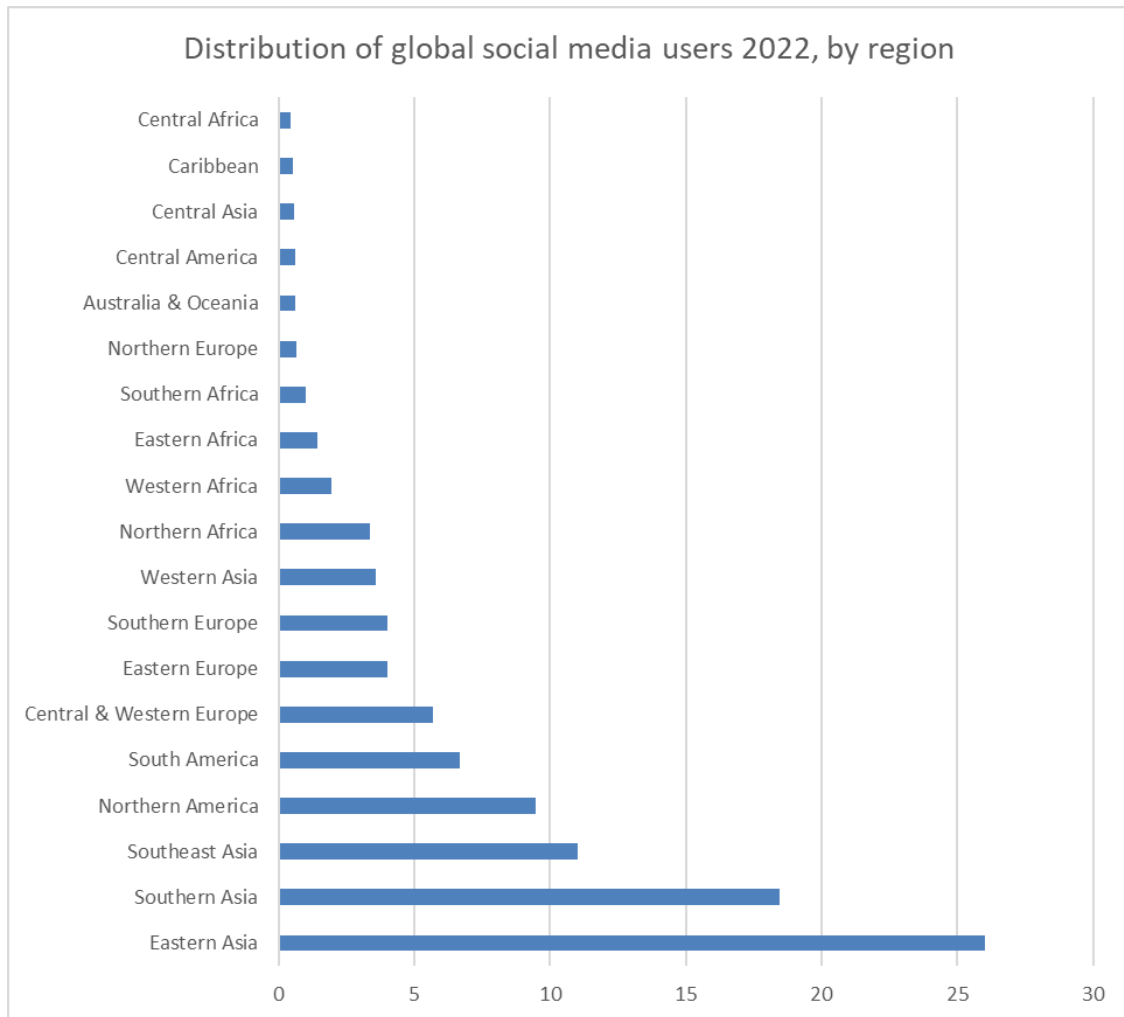
According to Statista Research Department (2023), Airbnb, established in 2007, facilitates hosts' rental of properties or rooms. The company derives its revenue by charging service fees to both hosts and guests. In 2022, Airbnb generated a total global revenue of US\$8.4 billion. The North American region accounted for US\$4.2 billion of this revenue, while the Europe, Middle East, and Africa (EMEA) region contributed US\$2.9 billion. Statista Research Department (2023) reported that in 2022 the EMEA region witnessed 168 million bookings, surpassing North America by over 30 million. In 2022, the global aggregate of Airbnb accommodations and activities amounted to 393.7 million nights, while Airbnb disclosed its record-breaking gross booking value of US\$63.21 billion. According to Statista Research Department (2023), recent data indicated that Airbnb.com is third in global website traffic, recording 105.8 million visits in January 2023. Booking.com received the highest number of visits, totaling 564 million, while Tripadvisor.com followed with 161 million visits. Regarding the number of downloads, Airbnb ranked fourth with 52 million, while Booking.com surpassed it with an additional 30 million downloads. As of April 2023, the market capitalization of Airbnb stands at US\$73.34 billion (Statista Research Department, 2023).

According to Smith (2023), Fiverr is an internet-based marketplace established in 2010 that facilitates the connection between independent contractors, corporate entities, and individual clients. The platform promotes freelancers' skills and services, enabling buyers to identify and engage suitable freelancers for their projects. The services include graphic design, digital marketing, writing, translation, video and animation,

programming, music, and audio. Individuals who work independently can establish and define the scope of their services and determine the appropriate pricing and turnaround periods for their work. Smith (2023) reported that potential buyers can peruse these available services and engage the services of independent contractors according to their specific requirements and financial constraints. The platform provides a robust payment system and a comprehensive dispute resolution process, ensuring security for all parties involved. The Fiverr platform has experienced significant growth, attracting many freelancers and businesses who utilize its services to secure employment or engage the services of skilled professionals. The organization has broadened its offerings, encompassing educational and training programs, financial management services, and other provisions. Fiverr's novel approach to the gig economy has garnered significant popularity among freelancers and buyers on a global scale (Smith, 2023). WallStreetZen (2023) reported that in August 2023, Fiverr had 4.2 million active buyers, with each buyer spending an average of US\$262.00. Fiverr buyers spent US\$1.12 billion in 2022 compared with US\$1.02 billion in 2021. The company took 30.2 percent of the buyers' spending, and the remaining went to the freelancers. The largest market for Fiverr is the USA, with buyers spending US\$172.7 million in 2022, followed by Europe with US\$84.5 million, Asia-Pacific with US\$48.6 million, Israel with US\$3.44 million, and the rest of the world bought US\$28.2 million from the freelancers on Fiverr (WallStreetZen, 2023).

Social media platforms

Figure 20. Distribution of global social media users in 2022 by region (percent)



Source: Statista <https://www.statista.com/statistics/295619/regional-distribution-of-social-media-usersworldwide>

Dixon (2023), in *Social Media - Statistics and Facts*, reported that the global penetration rate of social media stands at 59.4 percent, with the predominant usage concentrated in Eastern Asia. As of the conclusion of 2022, the global user base of social media platforms reached a substantial figure of 4.59 billion individuals. The prevalence and extent of social media usage are rising with the expanding global digital community. The advent of online platforms has facilitated the accessibility of information, thereby

revolutionizing global participation. According to Dixon (2023) in Social Media - Statistics and Facts, social media, initially perceived as platforms primarily utilized by younger individuals, has now become a ubiquitous tool employed by individuals of all age groups for many purposes, including but not limited to business endeavors, social interactions, romantic pursuits, political engagement, and interpersonal communication. In 2022, a significant proportion of individuals utilizing social media platforms engaged in activities such as maintaining connections with family and friends, occupying their leisure time, seeking inspiration, and consuming news articles. A significant majority, exceeding 70 percent, of the adult population in Nigeria, Thailand, Malaysia, and South Africa use social media platforms to access news content. The duration of time allocated to engaging with social media platforms has exhibited a consistent upward trend over the past ten years, culminating in an average of 151 minutes dedicated to this activity daily in the year 2023. Dixon (2023) in Social Media - Statistics and Facts noted that in 2021, Facebook Ltd. underwent a rebranding initiative and adopted the name Meta Platforms Inc. A renewed emphasis accompanied this strategic move on developing and exploring the metaverse concept. Meta Platforms Inc. now directs its attention toward advancing and integrating various applications within its Family of Apps, encompassing Facebook, Instagram, Messenger, and WhatsApp. In the fiscal year of 2022, the company achieved a total revenue of more than US\$116 billion. Facebook, the preeminent social networking platform, boasts an impressive user base of nearly three billion individuals who engage with the platform monthly (Dixon, Social media - Statistics & facts, 2023).

Dixon (2023) in Social Media - Statistics and Facts noted that Facebook has consistently demonstrated a sustained growth pattern in its global user count for over ten

years. Meta's Instagram platform has gained recognition for its visually appealing imagery and focus on the lives of celebrities. However, its content offerings have recently expanded to encompass a broader range of subjects. In 2023, most users, precisely over 50 percent, preferred humorous posts, whereas 46 percent preferred creative content. According to Dixon (2023) in Social Media - Statistics and Facts, in December 2021, the monthly active users on Instagram reached approximately two billion. While this signifies a notable increase in audience size, it remains comparatively smaller than that of Facebook's predecessor. The primary factor contributing to the popularity of Instagram is its extensive user base. TikTok, a social media platform introduced in 2017, currently boasts a user base of more than one billion individuals who engage with the platform monthly. The platform primarily centers around the documentation of choreographed movements and the creation of lip-synced audiovisual content, with a specific target audience of individuals aged 18 to 24, predominantly female users. The application's second most prominent user group comprises individuals who identify as male (Dixon, Social media - Statistics & facts, 2023).

Dixon (2023) in Social media - Statistics and facts reported that as of March 2023, Khabane "Khaby" Lame, an Italian comedian, is the most followed content creator on the social media platform TikTok, boasting a substantial following of over 155 million individuals. In close pursuit, dancer Charli D'Amelio has amassed an impressive following of 150 million followers. The United States stands as the foremost global market for social media advertising, having allocated a total expenditure of US\$72.3 billion in 2023. China and the United Kingdom trail behind, with respective expenditures of US\$71 billion and US\$9 billion. As of January 2023, Facebook emerged as the

predominant platform marketers utilize, as indicated by 89 percent of global marketers acknowledging their utilization of Facebook. The utilization of Instagram and LinkedIn as platforms for advertising was observed, with TikTok being employed for promotional purposes by a quarter of marketers (Dixon, Social media - Statistics & facts, 2023).

Table 52 *Top 5 TikTok earners 2022*

Name of TikToker	Number of subscribers (millions)	Earnings per post (US\$)
Charlie D’Amelio	150	\$105,770
Khabane Lame	155	\$92,270
Bella Poarch	90.1	\$66,829
Addison Rae	87.9	\$65,194
Will Smith (the famous actor)	72.3	\$53,741

Source: <https://www.hopperhq.com/blog/2022-tiktok-rich-list/>; www.statistica.com

Furthermore, Dixon (2023), in Social Media - Statistics and Facts, noted that a significant majority of industry professionals - 86 percent, identified increased exposure as the primary advantage of utilizing social media as a marketing tool. By contrast, 76 percent of respondents indicated that the most notable benefit was the rise in traffic levels. The utilization of social media platforms is predominantly cost-free; however, technology companies actively encourage the acquisition of paying subscribers to mitigate the impact on advertising revenues. Dixon (2023) in Social Media - Statistics and Facts concluded that the Meta Verified program subscribers are granted a blue verification badge, enhanced account protection, and direct assistance, all for US\$11.99 and US\$14.99, respectively. Twitter Blue subscribers also have a verification mark, edit tweets, and use NFTs as profile pictures. As of April 2023, the number of subscribers to

Twitter Blue is estimated to be approximately 640,000. Snapchat and Reddit offer premium versions at lower costs (Dixon, Social media - Statistics & facts, 2023).

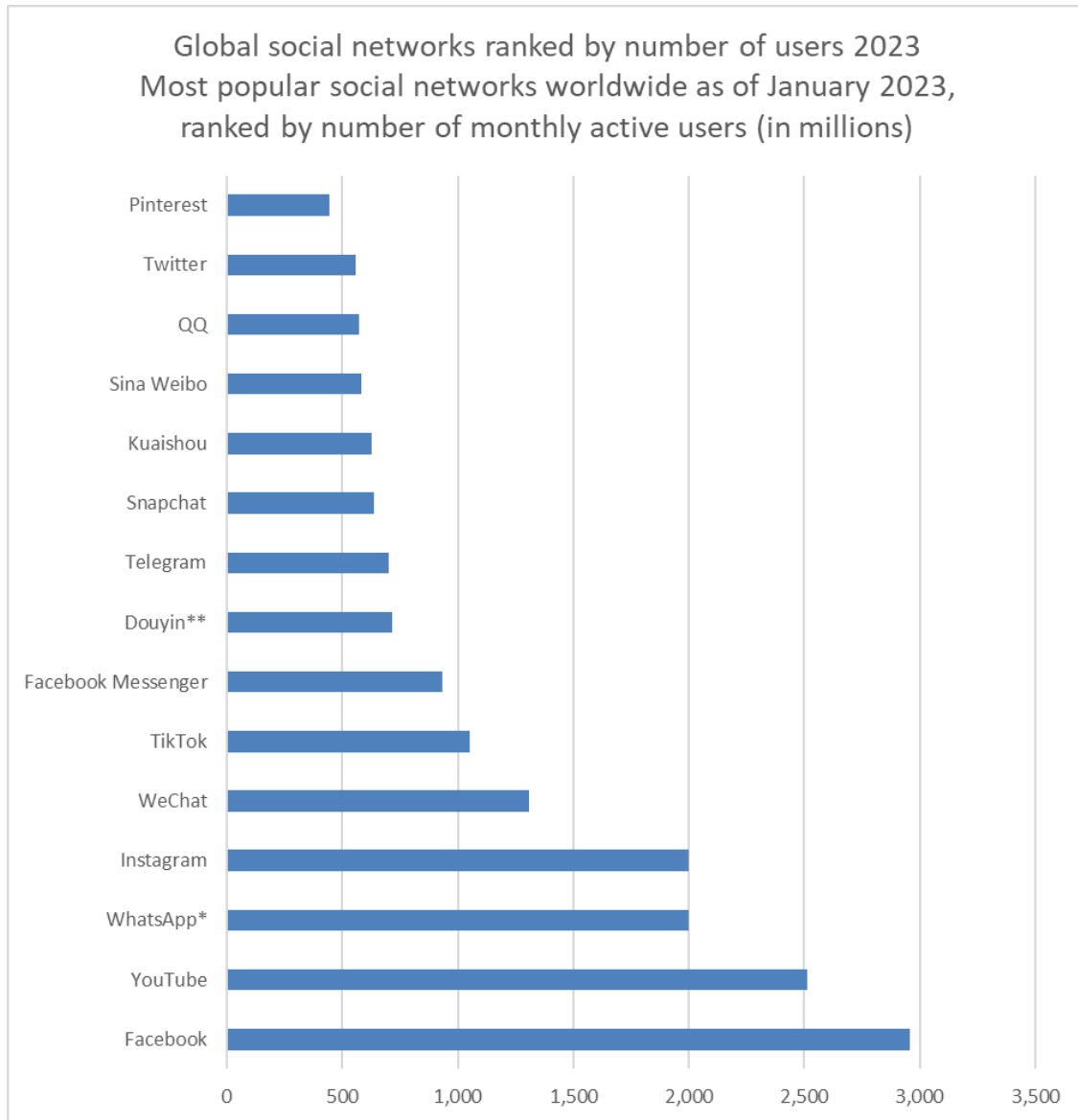
According to Dixon (2023) in Facebook - Statistics & facts, as of January 2023, Facebook, the pioneering worldwide social network, boasts an impressive user base of approximately three billion individuals who engage with the platform monthly. As of January 2023, India boasts the most extensive Facebook user base globally, comprising 314 million individuals, corresponding to approximately 10.6 percent of the total user population. The countries of the United States, Indonesia, and Brazil individually possess a user base of more than 100 million individuals on the social media platform Facebook. In 2022, Meta Platforms, the parent company of Facebook, disclosed a decline in revenue exceeding US\$116 billion, marking the initial annual decrease since 2009. Meta's average revenue per user was recorded at US\$39.6, indicating a decline of 3 percent compared to the previous year, 2021. The financial contractions observed can be attributed to business normalization following the COVID-19 pandemic and the emergence of competitive forces such as TikTok. The average revenue per user of Facebook was observed to be lower than that of Meta, amounting to US\$10.86 (Dixon, Facebook - Statistics & facts, 2023).

Dencheva (2023) notes that social media, including TikTok and Instagram, has become the main channel for digital marketing, with companies spending US\$230 billion in adverts in 2022. The US is the largest global social media ad market, and marketers from other countries also leverage social media for promotion. A survey reveals that social media was the top marketing channel used by most industry specialists in 2022. Benefits include increased exposure, traffic, and lead generation. According to Dencheva

(2023), during the second quarter of 2022, the average monetary value of online shopping orders from social media platforms attained a noteworthy milestone of US\$86 billion globally, thereby underscoring its considerable prospects as a commercial platform. The projected increase in brand discovery and social media shopping is expected to significantly increase social media ad views, reaching over one billion in 2022. In 2022, a significant majority of experts who employ Facebook for promotional activities voted it the foremost social media platform for marketing, with a consensus of 90 percent.

Dencheva (2023) noted that Instagram, a social media platform under the ownership of Facebook, has emerged as a highly profitable marketing platform. It enables businesses to effectively advertise their offerings by utilizing diverse formats such as photos, tags, Stories, and Reels. Instagram has also facilitated the rise of influencer marketing, as many content creators are engaging in brand collaborations. TikTok, a rapidly expanding global brand, is utilized by corporations to enhance brand visibility and capitalize on prevailing short video trends. Both platforms exhibit noteworthy download and engagement metrics, rendering them well-suited for establishing connections and facilitating communication with consumers (Dencheva, 2023).

Figure 21. Global social networks ranked by number of users, 2023 (in millions)



*social networks and messenger/chat app/voip included;

**Figures for TikTok do not include Douyin

Source: <https://www.statista.com/statistics/272014/global-social-networks-ranked-by-number-of-users/>

Dixon (2023) in Meta Platforms - Statistics and Facts reported that Meta Platforms, formerly Facebook Inc, focuses on the metaverse, virtual reality, and its Family of Apps, which includes Facebook, Messenger, Instagram, and WhatsApp. YouTube, a strong competitor, has around 2.5 billion monthly users. In 2022, the mobile

app Meta Quest, explicitly designed for Meta's virtual reality headsets, garnered over ten million downloads. Meta also released Threads, a text-focused social network, on July 5th, 2023, which amounted to 30 million sign-ups within one day in response to Twitter's significant changes. Dixon (2023) Meta platforms - Statistics and facts, reported that following the 2018 Cambridge Analytica scandal, Meta was fined in 2022 and 2023 for violating The European Union's data protection and privacy legislation. In September 2022, the Irish Data Protection Commission imposed a Euro405 million fine on Meta for infringing on Instagram's privacy settings designed for children. In November 2022 and January 2023, the EU Commission fined Meta again for data scraping and illegal advertising practices (Dixon, Meta platforms - Statistics & facts, 2023).

Ceci (2023), in YouTube - Statistics and Facts, reported that YouTube, purchased by Google in 2006 after its establishment in 2005, currently holds the position as the most extensive online platform globally. In February 2023, the abbreviated vertical video functionality, YouTube Shorts, achieved a milestone by exceeding 50 billion daily views. YouTube has emerged as a prominent online platform, attracting a vast global user base due to its wide-ranging content encompassing various categories such as music, gaming, do-it-yourself (DIY) projects, and educational videos. According to Ceci (2023) in YouTube - Statistics and Facts, in November 2022, YouTube experienced 75 billion website visits globally, while its revenue for June 2022 amounted to approximately US\$40 million. Also, in November 2022, YouTube experienced 72 billion visits from mobile devices, constituting approximately 90 percent of the overall visitation. After 2022, the United States and South Korea emerged as the primary sources of visits,

accounting for 12 billion and 8.25 billion, respectively (Ceci, YouTube - Statistics & facts, 2023).

According to Ceci (2023) in YouTube - Statistics and facts, desktop users amounted to a mere 8 billion. India boasted the most extensive user base, comprising a staggering 470 million individuals, while the United States ranked second with a user count of 246 million. In April 2022, YouTube experienced a significant influx of video content, with an average rate of 500 hours of video uploaded every minute. This observation supports an increasing desire for digital video content within the online platform. The platform has facilitated the emergence of a novel cohort of content creators, exemplified by individuals like MrBeast, who have achieved celebrity status and garnered a staggering 112 million subscribers. Ceci (2023) in YouTube - Statistics and Facts noted that YouTube also emphasizes corporate media content, encompassing authorized music videos that have the potential to attain viral status rapidly, garnering an impressive 100 million views within a span of fewer than 48 hours. The versatility of the video format renders it a highly effective medium for capturing the attention of substantial audiences. As of February 2023, "Baby Shark," a children's song originating from Korea, is the most-viewed video on the YouTube platform, marking the first instance of a video surpassing 10 billion views. The global viewership of YouTube has emerged as a substantial revenue stream for Google and Alphabet, generating advertising revenues exceeding US\$29 billion in 2022. This figure represents approximately 11.35 percent of Google's annual revenue (Ceci, YouTube - Statistics & facts, 2023).

Table 53 *Top 5 YouTube earners for 2022*

Name of YouTube content creator	Number of subscribers (millions)	2022 Annual earnings \$millions	Main Content
Mr Beast (Jimmy Donaldson)	97.7	54	Ironic humor, pranks, and surprises
Jake Paul	20.4	45	Music videos, day-in-the-life, comedy skits
Markiplier (Mark Fishbach)	33.1	38	Video games encounter with new technology
Rhett and Link	4.99	30	Discussion series
Unspeakable	13.9	28.5	Content for children

Source: <https://targetinternet.com/resources/highest-earning-youtube-vloggers-of-2022/>

Vlogs, or blogs in video format, emerged in the early 2000s and rapidly spread online. The proliferation of social media platforms and YouTube has given rise to various sub-categories within user-generated videos. As of January 2023, a significant portion of internet users, approximately 30%, engaged in viewing tutorials, how-to videos, and live streams, thereby establishing these forms of video content as the most prevalent and sought-after. Online video has become crucial for content creators, as it attracts users, increases engagement, and generates brand deals. Twitter and Reddit are text-based social platforms that allow users to create and post video content. YouTube has become a significant professional opportunity for creators, offering various opportunities such as affiliate marketing and merchandise sales. The platform has been instrumental in generating 425,000 employment opportunities in the United States and 122,000 in Brazil. This employment growth has made a noteworthy contribution to the respective countries'

gross domestic products, amounting to US\$25 billion in the United States and six billion Brazilian reais in Brazil. According to a survey conducted among professional YouTube content creators in the United States, a significant majority (81 percent) acknowledged the platform's efficacy in disseminating their content to global audiences. According to a United Kingdom survey, 80% of creative entrepreneurs acknowledged that YouTube offers them unique prospects for creative expression and financial gain, which are not readily available through conventional media channels (Ceci, Online video content creators - Statistics & facts, 2023).

Ceci (2023) in Online video content creators - Statistics and facts found that, nevertheless, it is essential to note that a substantial number of views only sometimes results in financial gains for content creators. The monetization program for YouTube Shorts, introduced in February 2023, determines revenue distribution by considering advertisements displayed during video transitions. This allocation of funds encompasses expenses related to music licensing and serves as a means of incentivizing content creators. While there may be some reservations among creators regarding the monetization potential of Shorts, it is evident that this format enhances the discoverability and visibility of content. TikTok, a digital platform introduced in 2017, has gained significant popularity as a means of content monetization, particularly among individuals belonging to the Millennial and Gen Z demographics. As of September 2022, most individuals engaged in content creation fall within the age range of 18 to 24 years old (Ceci, Online video content creators - Statistics & facts, 2023).

According to Ceci (2023), Online video content creators - Statistics and facts, in 2023, TikTok has recently implemented a paywall system and introduced a subscribers-

only access feature called "Series," enabling content creators to generate revenue from their content. The eligibility criteria for the Creator Fund entail a minimum requirement of 100,000 views within the past 30 days, along with a follower count exceeding 10,000. In May 2022, TikTok began distributing advertising revenue to its most prominent content creators by implementing the pulse feature (Ceci, Online video content creators - Statistics & facts, 2023).

According to Hoskins (2023), In 2022, the owner of OnlyFans, Leonid Radvinsky, received dividends amounting to US\$338 million from the online platform. OnlyFans is utilized by individuals in various professions such as sex work, music, and celebrity status. The platform's parent company, Fenix International, disclosed a pre-tax profit of US\$525 million for the fiscal year 2022, representing a notable increase from the US\$432 million recorded in the previous year, 2021. The exclusive proprietor of Fenix, Leonid Radvinsky, possesses an individual wealth approximated to exceed US\$2 billion. Hoskins (2023) noted that the platform currently accommodates a user base of approximately 240 million individuals, referred to as "Fans," and supports the creative endeavors of over three million creators. In 2022, there was a significant increase in the number of creators on the platform OnlyFans, with a growth rate of 47%, resulting in a total of nearly 3.2 million creators (Hoskins, 2023).

Hoskins (2023) noted that the number of users on OnlyFans also experienced a notable rise of 27%, reaching approximately 239 million users. For the initial occasion, most of the revenue generated by the entity was derived from non-subscription services, specifically including tips and on-demand content provided by creators. Fenix acquired

20% of the payments processed on the platform, while the remaining 80% was allocated to the creators (Hoskins, 2023).

According to Biino (2023), OnlyFans has become a lucrative business for adult entertainers. Eight OnlyFans models reported making between US\$143,000 and US\$5.4 million a year, with Bryce Adams, with 660,000 subscribers making US\$6.4 million in 2022. The platform has paid out US\$10 billion to creators since its founding in 2016, with over 2 million creators. Creators can earn money through subscriptions, pay-per-view content, messages, tips, promo "shoutouts," and coaching. Biino (2023) noted that users pay a fee (monthly or annual) to unlock content, with the creator keeping 80% of the revenue while 20% goes to OnlyFans. Creators can also set prices for the content on their feeds, which can be accessed free of charge. Pay-per-view messages allow fans to chat with creators, with some relying on ghostwriters to respond to the high volume of messages. Tips are another way creators can earn money, with subscribers sending cash through tips. Amber Sweetheart, whose OnlyFans business is based on her connection with her fans, made US\$2.6 million in 2022. Creators often take advantage of the monetization options OnlyFans offers and make money off-platform. Seven adult content creators charge different amounts for different types of content on the platform, and their pricing strategies vary (Biino, 2023).

Ceci (2023), in *Online Video Content Creators - Statistics and Facts*, found that in September 2022, OnlyFans, founded in 2016, saw 140,000 new accounts and over 22.5 million new content pieces. Creators can monetize photos and videos through subscriptions, direct messaging, and custom content requests. In January 2023, the platform had over 1.6 billion global visits. OnlyFans hosts celebrities, internet

personalities, and small creators (Ceci, Online video content creators - Statistics & facts, 2023).

According to Ceci (2023) in Online Video Content Creators - Statistics and Facts, the creator economy is a significant sector in the digital economy, with companies supporting creators of top-rated online video companies, generating significant financial opportunities. The provision of support encompasses various activities such as disseminating educational courses, distributing merchandise, creating content, and implementing advertising strategies. In 2022, the revenue generated by companies engaged in merchandise services amounted to more than US\$511 million. In contrast, companies involved in subscription services witnessed an approximate revenue of 308 million US dollars. Spotter and Jellysmack are commercial entities that engage in the practice of licensing their collections of social media videos. In doing so, they provide content creators with initial monetary compensation for exclusive rights to the advertising revenues generated by said videos. Jellysmack, a prominent platform in the creator economy, boasts a collection of esteemed content creators such as PewDiePie, MrBeast, The Try Guys, and TikTok influencer Kallmeris. Notably, Jellysmack has achieved the highest value per website visitor in this industry, resulting in an impressive annual revenue of US\$216 million. (Ceci, Online video content creators - Statistics & facts, 2023).

E-tailers

According to Statista Research Department (2023), eBay is one of the largest consumer internet and online services companies globally. It connects buyers and sellers in over 190 markets and ranks as the second most visited online marketplace in 2023,

only surpassed by Amazon. eBay's annual net revenue reached US\$10.4 billion in 2021. eBay's number of active buyers has declined, with lower customer satisfaction and gross merchandise volume. To address these issues, eBay announced several new acquisitions in 2022, including Known Origin, myFitment, TCGplayer, and Certilogo. These acquisitions aim to increase customer satisfaction across the platform for sellers and buyers. eBay app launched in 2008 is used by millions globally. The app had over ten million downloads in 2022, with the United States being the largest market, followed by the UK and Germany, with over two million downloads in the same year (Statista Research Department, 2023).

Quaker (2022) reported that Amazon is a global platform for first- and third-party sellers, with Amazon's fulfillment services completing the same number of sales as third-party sellers (Coppola, 2023). Amazon Business, the B2B e-commerce channel, has grown significantly since 1999, with third-party sellers accounting for over 60 percent of sales and exceeding US\$25 billion in annualized sales. It offers sellers the chance to reach millions of customers in over 100 countries, with over 1 million customer accounts, 150,000 sellers, and over 10 billion annualized sales. Amazon's Storefronts in the US have a vast product range, featuring 2.5 million products from 30,000 businesses. In 2020, the company created 400,000 jobs and invested US\$34 billion in infrastructure while committing to hiring over 100,000 US veterans and military spouses (Quaker, 2022).

Coppola (2023) reported that in fiscal year 2022, Amazon.com recorded a significant net sales revenue of approximately US\$514 billion. The primary sources of the company's revenue include e-retail sales, revenues from third-party sellers, retail

subscriptions, and AWS cloud services. Amazon Prime is a subscription-based service that provides a range of benefits to its members. These benefits include complimentary expedited shipping, reduced shipping costs, and access to Amazon Prime Video and Music, which allows members to stream a curated selection of movies and TV shows. Amazon has experienced a reduction in size since the initial quarter of 2022 and has disclosed financial losses in its two most significant international markets, namely Germany and the United Kingdom. The organization disclosed a net deficit of US\$2.7 billion for the fiscal year 2022. (Coppola, 2023).

Ma (2022) found that Alibaba Group, founded in 1999, engages in B2B, B2C, and C2C e-commerce, cloud computing, entertainment, logistics, and financial services. The company launched the world's largest sales event - the Singles' Day online shopping event in 2009. Alibaba also owns third-party platforms Alipay, Aliwangwang, and Alimama.com. The company faces competition from platforms like Pinduoduo, Douyin, and Kuaishou. Alibaba accounted for 25 percent of the global e-commerce market in 2020. Alibaba Group's market value at the end of 2022 was US\$237.8 billion, and the company's annual revenue in the fiscal year ending March 31st, 2022, surpassed 850 billion yuan, a 40 percent increase over 2012. China's anti-monopoly law investigation led to the company being fined US\$2.8 billion in 2020 (Ma, 2022).

Table 54 *Top 10 Online Selling Platforms*

Rank	E-Commerce platforms
1	Amazon.com
2	eBay
3	Shopify
4	WooCommerce
5	Etsy
6	Facebook Marketplace
7	Instagram Shopping
8	BigCommerce
9	Rakuten
10	Poshmark

Source: <https://www.linkedin.com/pulse/top-10-online-selling-platforms-your-business-gino-mondini>

Online Education

According to WallStreetZen.com (2023), Coursera, founded in 2012, is a popular online learning platform. At the end of 2022, there were 118.1 million registered learners on Coursera; of this amount, 18,103 were pursuing first and second degrees. Coursera paid enterprise customers increased by 13 percent over 2021, reaching 1,149 at the end of 2022. Most Coursera students are in the US, with 22.1 million students, followed by India, with 19 million students; Mexico, with 5.7 million students; Brazil, with 4.8 million students; and China with 3.7 million students. WallStreetZen.com (2023) noted that Coursera's popularity is growing globally. Users in Paraguay increased by 98 percent between October 2020 and September 2021, followed by Lebanon with a 97 percent increase, the Philippines by 85 percent, Guyana by 74 percent, Indonesia by 69 percent, and Kenya by 61 percent. In 2022, Coursera made US\$295.6 million from consumer revenue, US\$181.3 million from enterprise revenue, and US\$46.9 million from students pursuing degrees, a slight decrease from the US\$48.7 million made in 2021. In 2022,

Coursera made US\$276.0 million from users in the US, US\$130.6 million from Europe, Middle East, and African users, and US\$68.9 million in Asia-Pacific users. Over 275 universities across the globe have partnered with Coursera to offer degree and non-degree courses. Coursera offers 5,400 courses, and as of 2021, users had watched 282 million lectures on mobile devices. In 2022, 39 million enrolments and Coursera users completed 70 million assessments and tests (WallStreetZen.com, 2023).

Yahoo Finance (2023) reported that edX, a global online learning platform, was created in 2012 by Harvard and MIT to provide the best education globally. As part of 2U, Inc., it connects over 78 million people with job-relevant programs across various career disciplines, including artificial intelligence, robotics, sustainability, and public health. edX works with over 250 partners and offers over 4,000 digital courses on the edX platform (edX 2023). The organization functions within two distinct divisions: Degree Programs and Alternative Credentials. The Degree Program segment offers technological solutions and services specifically designed for online degree programs, focusing on catering to students pursuing either undergraduate or graduate degrees. The Alternative Credential segment provides various educational opportunities through online courses, executive education programs, technical boot camps, and micro-credential programs. These offerings are designed to cater to individuals who are interested in enhancing their career prospects or pursuing personal development goals. The segment specifically targets students seeking shorter and more affordable educational options. (Yahoo Finance, 2023).

Table 55 *Top 10 MOOC platforms*

Rank	Online education platform
1	Coursera
2	edX
3	Udemy
4	Udacity
5	FutureLearn
6	Khan Academy
7	Canvas Network
8	Kadenze
9	Iversity
10	OpenLearning

Source: <https://www.bestcolleges.com/blog/platforms-for-online-courses/>

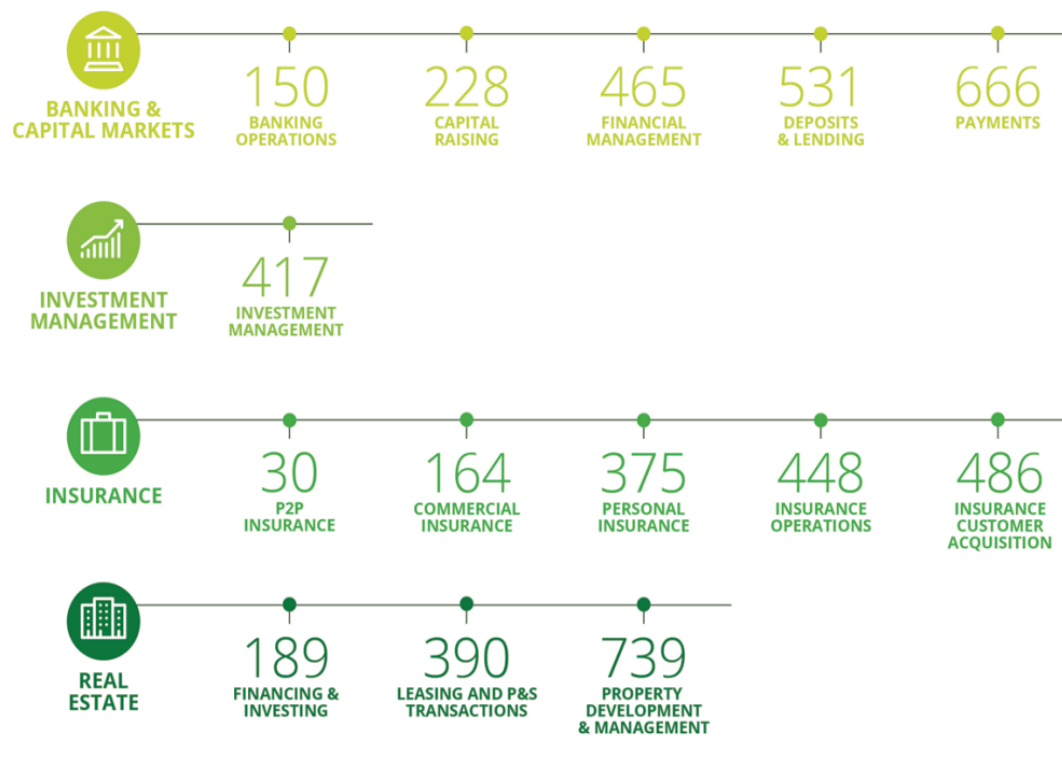
Digital-only financial and insurance services

Statista Research Department (2023) states that Fintech refers to small start-up companies that develop innovative technological solutions such as online payments, big data, alternative finance, and financial management. The industry experienced rapid growth between 2012 and 2021, with high adoption rates and investments. The US and China have seven of the top 10 fintech companies. However, the Irish payment processing platform Stripe is the highest-valued fintech start-up, and European fintech company Revolut has more than 25 million customers (Statista Research Department, 2023). Deloitte (2017) noted that countries like the United States and the United Kingdom are considered fintech-friendly due to their educated and entrepreneurial workforce, government incentives for innovation, and significant capital pools seeking investment returns. The United States has the highest number of fintechs in operation and investments across various categories, including payments, deposits and lending, financial management, and investment management. Fintechs have accelerated

technology innovation and altered customer expectations but have yet to significantly disrupt existing providers or traditional financial services infrastructures like exchanges or payment networks. While the dollars invested are similar, the US fintech world still comprises thousands of smaller companies (Deloitte, 2017).

Deloitte (2017) noted that China's large diversified companies, including Tencent and Ping An, attract high investment interest. Some countries favor specific fintech categories due to local market needs or expertise. For instance, India has been a favorable market for payment start-ups due to the need for leapfrogging payment options due to the burgeoning middle class with sizeable mobile penetration. The commercial insurance sector also shows how local expertise can drive start-up activity (Deloitte, 2017).

Table 56 *Number of Fintech companies by category, 2017*



Source: Deloitte <https://www2.deloitte.com/tr/en/pages/financial-services/articles/fintech-by-the-numbers.html>

WallStreetZen (2023) reported that PayPal started in 1999 and has 435 million active accounts, including the 10 million accounts it gained in January 2020 following its acquisition of Honey. The active accounts include 35 million for merchants. In 2022, PayPal users made 51.4 transactions, an increase from the 45.4 transactions in 2021. In 2022, the company handled 22.4 billion transactions, which amounted to US\$1.357 trillion in successful transactions, up from US\$1.246 trillion in successful transactions in 2021 from the 19.4 billion transactions handled. Of the 22.4 billion transactions made in 2022, 13 percent were for cross-border transactions. The company revenue for 2022 was US\$27.5 billion, of which US\$15.8 billion came from the US, US\$2.1 billion from the UK, and the remainder from the rest of the world. PayPal has the largest share of the global online payment service at 40.9 percent, Stripe follows this at 20.1 percent of the market, Shopify pays installments at 13.6 percent, and Amazon pays at 4.9 percent. In the US, PayPal has a 59.6 percent market share (WallStreetZen, 2023).

According to de Best (2023) in Cryptocurrency - Statistics and Facts, the cryptocurrency market experienced notable downward pressure towards the conclusion of 2022 after the collapse of FTX and Alameda and Well's liquidation of FTT by Binance. Furthermore, the decline in Ethereum's price can be attributed to apprehensions among investors and a substantial trading volume, purportedly triggered by an individual who illicitly acquired 228,500 ETH (equivalent to more than US\$400 million) from FTX and subsequently liquidated them on the market. The decline of FTX resulted in financial challenges for other cryptocurrency providers, as evidenced by Genesis, an investment bank, contemplating bankruptcy due to the suspension of customer withdrawals and new loan activities. Bitcoin and Ethereum are widely regarded as the leading digital currencies

within the cryptocurrency market, estimated to have encompassed approximately 10,000 distinct cryptocurrencies by the conclusion of 2022. de Best (2023) in Cryptocurrency - Statistics and facts, found that additional noteworthy cryptocurrencies encompass Dogecoin (DOGE), which experienced a substantial price surge after the tweets made by Elon Musk in 2021, and LUNA, an algorithmically governed stablecoin that encountered a near-collapse in 2022 as a consequence of an escalated supply. Stablecoins, including Tether (USDT) and USD Coin (USDC), are experiencing an expansion in their market size. Most of these coins possess relatively diminutive market capitalizations and do not exert substantial influence within the cryptocurrency market (de Best , Cryptocurrency - Statistics & facts, 2023).

According to de Best (2023) in Bitcoin (BTC) - Statistics and facts in November 2022, the price of Bitcoin experienced a significant decline, reaching its lowest point in two years. Specifically, on November 10th, 2022, the exchange rate for one Bitcoin was valued at USD15,742.44, in contrast to the rate of BTC1 = US\$67,167.02 observed on November 9th, 2021. This decline was primarily attributed to apprehensions surrounding the potential collapse of FTX, a cryptocurrency exchange, and Genesis Global Capital, a crypto lending firm closely associated with the FTX platform. The repercussions stemming from the collapse of FTX are anticipated to extend to various traders and enterprises, given its prominent standing as one of the leading cryptocurrency exchanges in 2022. de Best (2023) in Bitcoin (BTC) - Statistics and facts noted that the level of popularity of Bitcoin can be assessed by conducting a comparative analysis of its trading volume with that of domestic currencies across various nations. Bitcoin transactions cannot be traced back to their original starting point, and trading Bitcoin to USD or GBP

represents only a fraction of the total trading volume. The data about Bitcoin frequently relies on domestic surveys, wherein individuals residing outside the United States and Europe exhibit a higher propensity for cryptocurrency ownership in 2022. de Best (2023) in Bitcoin (BTC) - Statistics and facts noted that the analysis of Google search data reveals a notable increase in searches for "Bitcoin" in Africa and Latin America compared to other regions. The cryptocurrency market operates under a system of self-regulation. An illustrative example is Binance, a prominent platform that permits professional traders to employ algorithms and price forecasting techniques that are typically prohibited within regulated financial markets (de Best , Bitcoin (BTC) - Statistics & facts, 2023).

Digital Subscription-Based Service Media Providers

Stoll (2023) notes that initially a DVD-by-mail service, Netflix has become a global video streaming leader. It transitioned to a subscription video-on-demand model in 2007. To counter the recent losses in subscribers, Netflix introduced a lower-cost ad-supported tier in November 2022 and implemented measures to reduce account sharing. Netflix's success is mainly due to its vast wealth of original content and ability to adapt to changing technologies and consumer demands, with a focus on local content worldwide (Stoll, 2023).

According to Stoll (2023), Netflix started in 1997 and had 230.8 million subscribers at the end of January 2023. Of this amount, 74.3 million subscribers are in the US and Canada, 76.8 million are in EMEA, 41.7 million are in Latin America, and 38.0 million are in Asia-Pacific. Most people access Netflix through their subscription (55 percent), while 27 percent use the subscription of a member of their household, 14

percent use the subscription of a friend or family member outside of their household, and 5 percent access Netflix as part of a special free promotion. Netflix's average revenue per user is US\$16.23 in the US and Canada, US\$10.43 per user from Europe, the Middle East, and Africa, US\$8.30 per user from Latin America, and US\$7.69 per user from the Asia-Pacific region. As of February 2023, Netflix is the biggest streaming platform, with 230.8 million subscribers, compared to 200 million for Amazon Prime Video and 152.1 million for Disney+. Stoll (2023) noted that Netflix made US\$14.1 billion from its US market for 2022, an increase from the US\$13 billion made in 2021. The fourth quarter 2022 revenue shows receipts of US\$3.6 billion from the US and Canada, US\$2.4 billion from Europe, the Middle East and Africa, US\$1.0 billion from Latin America, and US\$857.0 million from Asia-Pacific. Streaming makes up 99.5 percent of Netflix's revenue at US\$31.5 billion in 2022, with 0.5 percent or US\$145.7 million in DVD sales. DVD sales in 2022 were less than the 2021 US\$182.3 million. Blockbuster declined to buy Netflix for US\$50 million in 2000. Also, Netflix produced 371 original titles in 2019, such as *Orange is the new black*, and has received 480 award nominations and 204 wins (Stoll, 2023).

Table 57 *Top 10 On-Demand Streaming Services*

Rank	Streaming Platforms
1	Netflix
2	fuboTV
3	Disney+
4	Amazon Prime Video
5	Crunchyroll
6	Hulu
7	YouTube TV
8	Peacock
9	HBO Max
10	Paramount+

Source: <https://www.usnews.com/360-reviews/technology/streaming-services>

Cloud Computing

According to Vailshery (2023) in *Cloud computing - Statistics and facts*, cloud computing, a segment of IT services, utilizes networks of remote servers for storage, management, and processing, with an expected revenue of over US\$400 billion in 2022. Cloud computing provides access to various technologies at lower costs, reducing barriers like technical expertise. The market can be categorized into three distinct service models: infrastructure, platforms, and software. Customers make decisions regarding adopting private, public, or hybrid cloud deployment models, considering their specific business requirements and concerns related to security. Vailshery (2023), in *Cloud computing - Statistics and facts*, reported that Software as a Service (SaaS) is the largest cloud computing segment, accounting for most market revenue. It is used for enterprise applications like customer relationship management and resource planning. SaaS providers manage infrastructure and platforms, while customers pay for software and databases. Significant players include Salesforce, Microsoft, Adobe, and SAP. Platform

as a Service (PaaS) is a cloud computing platform that allows customers to utilize a computing platform for application development. According to Vailshery (2023) in Cloud Computing - Statistics and Facts, this service includes access to operating systems, web servers, databases, and programming language environments. Microsoft Azure, Amazon Web Services, Google Cloud, and IBM Cloud are prominent providers in the field. Despite experiencing rapid market growth, Platform as a Service (PaaS) is projected to remain the smallest segment within the cloud computing industry. Infrastructure as a Service (IaaS) offers customers remote assistance through storage, servers, virtual machines, and networking resources. Traditional IT infrastructure spending exhibits a state of stagnation as organizations increasingly embrace cloud-based IT solutions, which currently comprise less than 50% of the Software-as-a-Service (SaaS) market. Amazon holds a significant market share, accounting for nearly 50% of the market. Microsoft and Alibaba closely trail regarding market control (Vailshery, Cloud computing - Statistics & facts, 2023).

Artificial Intelligence (AI)

According to Haan (2023), the AI market is expected to reach US\$407 billion by 2027, a significant increase from its US\$86.9 billion revenue in 2022. By 2030, AI is predicted to significantly boost the United States' GDP by 21 percent, demonstrating its profound impact on economic growth. ChatGPT's rapid adoption rate, which reached 1 million users within five days of its release, is a testament to its widespread use. The Forbes consumer sentiment survey indicates that AI is expected to significantly boost the US GDP by 2030, indicating its significant impact on economic growth. Haan (2023) noted that the global self-driving car market is projected to increase from 20.3 million in

2021 to 62.4 million by 2030, resulting in 10 percent of vehicles becoming driverless. A Forbes Advisor survey revealed that 64 percent of businesses believe AI will boost productivity, indicating growing confidence in its potential to transform business operations. According to Haan (2023), UpCity reported that 50 percent of US mobile users use voice search daily, indicating the increasing use of AI-powered voice assistants. An annual growth rate of 37.3 percent in AI technologies is predicted between 2023 and 2030, highlighting the rapid impact of AI on various industries. A report by IBM indicates that 25 percent of companies are implementing AI to address labor shortages, as AI aids in optimizing operations and compensating for human resource shortages. China leads in AI adoption, with 58 percent of companies deploying it and 30 percent considering integration (Haan, 2023).

According to Haan (2023), the US has a lower adoption rate of 25 percent and 43 percent, exploring its potential applications. Seventy-seven percent of people are concerned about AI's potential job loss in the future, indicating widespread concern about the technology's impact on employment opportunities. A McKinsey report predicts that AI advancements could impact 15 percent of the global workforce between 2016 and 2030, potentially displacing 400 million workers worldwide. The World Economic Forum predicts that AI will generate approximately 97 million new jobs, potentially addressing concerns about workforce displacement (Haan, 2023).

Haan (2023) concluded that the integration of AI in businesses is increasing demand for AI support roles, with 39 percent of businesses hiring software engineers and 35 percent hiring data engineers in 2022, according to a McKinsey report. Accenture predicts that AI adoption will significantly benefit the manufacturing sector, potentially

generating a US\$3.8 trillion gain by 2035, significantly altering the sector's economic impact. A Forbes Advisor survey indicates that the potential impact of AI on website traffic concerns 24 percent of business owners. According to a report by Forbes Advisor, a significant majority of business owners (97 percent) express confidence in the potential benefits of ChatGPT for their enterprises. According to Haan (2023), approximately one-third of these respondents intend to use ChatGPT to generate website content. At the same time, 44 percent have set their sights on leveraging its capabilities to create multilingual content. According to a report by Forbes Advisor, a significant majority of business owners, precisely 64 percent, believe that artificial intelligence (AI) can potentially improve customer relationships. Haan (2023) noted that this finding suggests a favorable perspective regarding the impact of AI on interactions with clients. Over 60 percent of business owners believe AI will boost productivity, with 64 percent stating it will enhance efficiency and 42 percent predicting it will streamline job processes. Thirty-five percent of businesses need more technical skills to use AI effectively, highlighting organizations' challenges in adopting this technology (Haan, 2023).

According to Thormundsson (2023), the global size of the AI market in 2023 is US\$207 billion, with Baidu being the largest AI patent holder. Artificial intelligence (AI) is now ordinary in daily life, mimicking human cognitive abilities. It learns from past experiences to understand language, make decisions, and solve problems. AI capabilities like computer vision and conversational interfaces are integrated into various industries, with high-tech, telecommunications, financial services, and healthcare and pharmaceuticals being the most prominent sectors for AI adoption. Thormundsson (2023) reported that these capabilities, such as computer vision and conversational interfaces, are

becoming increasingly prevalent in various business processes. The AI ecosystem comprises machine learning, robotics, artificial neural networks, and natural language processing. Machine learning uses existing data to apply knowledge to new or predicted data. Robotics focuses on developing and training robots, typically following general rules and being predictable. Robots are trained by Deep learning to act with self-awareness (Thormundsson, 2023).

According to Thormundsson (2023), the global artificial intelligence (AI) market is experiencing growth due to heightened levels of investment. Between 2020 and 2022, there was a significant rise in corporate global investment in AI start-ups, amounting to an increase of five billion US dollars, nearly doubling the previous levels. The most well-funded artificial intelligence enterprises primarily consist of machine learning and chatbot firms, with a specific emphasis on developing human-machine interfaces. A positive correlation exists between the increased investment in artificial intelligence (AI) and the escalating need for individuals possessing AI expertise. Numerous companies are currently advertising employment prospects for individuals possessing expertise in artificial intelligence (AI) across diverse sectors of the business landscape. However, global organizations face significant challenges in successfully recruiting and filling AI-related vacancies (Thormundsson, 2023).

Mearian (2023) found that generative AI platforms like ChatGPT, Dall-E2, and AlphaCode rapidly advance, making it nearly impossible to prevent the technology from producing erroneous or offensive responses. As AI tools improve at mimicking natural language, it will be challenging to distinguish fakes, prompting companies to protect themselves against the worst outcomes. Generative AI relies on large language models

(LLMs), which access massive troves of information and are controlled by millions or billions of parameters. It is essential to ensure responsible research, robust documentation of LLMs and their dataset development, reasons for creation, and watermarks identifying content created by a computer model. According to Mearian (2023), further investigation is imperative in generative AI models, as they cannot ensure the absence of harmful discourse or the reinforcement of biases inherent in the data they assimilate. Meta AI, the research division of Meta Platforms, has decided against making certain LLMs available for commercial purposes due to the inability to ensure the absence of inherent biases, toxic language, or other problematic content. LLMs can be refined by utilizing particular data sets, enabling them to deliver more tailored responses that cater to specific enterprise applications (Mearian, 2023).

Antonopoulos (2023) pointed out that concerns about AI's use include legal and ethical guidelines, which may be resolved or amplified as systems evolve. The issues with AI include biases, accuracy, transparency, misinformation, privacy, lack of human judgment, job implications, inclusivity, and inaccessibility. These issues are particularly relevant in journalism. AI systems can create biases through built-in algorithms, training data, and biases in news outlets, such as consistently promoting articles aligning with specific political ideologies or stereotypes. Openness about training data and methods is crucial to enforce through regulations. AI can be managed with human editing to prevent biased material. AI systems may misidentify inaccurate information or fail to provide context. Humans can complement the work of AI to prevent inaccuracies. According to Antonopoulos (2023), AI adoption in the newsroom is still in its early stages, and it is tempting to rely on AI without fully understanding its operations, decision-making

processes, and underlying algorithms. One of the most significant advancements is "explainable AI," which provides clear explanations for its decisions and enables users to understand how information is selected and filtered. AI has produced deepfake video and audio, demonstrating how easy it is to create embarrassing and fake content. AI's ability to provide personalized content and recommendations involves sharing user data, including browsing history, reading habits, and personal preferences. This extensive data collection raises concerns about privacy and security (Antonopoulos, 2023).

Antonopoulos (2023) also pointed out that users must confirm their consent to use their data for AI training. Also, digital news businesses should treat this issue with data minimization, strong encryption, access control, clear privacy policies, and regular audits to ensure compliance. Critics argue that the potential loss of jobs for humans due to automation in the newsroom is a significant concern. However, this presents an opportunity for journalists to improve their skills, invest in training programs, and adapt to new roles. Antonopoulos (2023) found that AI can be efficient in certain areas, but new workflows will be created, with journalists supervising algorithmic output. Both humans and AI systems must collaborate and complement each other to produce editorial content effectively. AI tools can provide equal access to news content and services, offering features like text-to-speech, automated closed-captioning, alternative formats, and multi-modal interfaces for communication via text, audio, and visual means (Antonopoulos, 2023).

The study by (Freund, Mulabdic, & Ruta , 2019), finds that 3D printing increases world trade by reducing production costs. The paper also analyzes 35 other products using 3D printing, confirming this insight. However, it suggests that product

characteristics like weightiness can impact the relationship between 3D printing and trade (Freund, Mulabdic, & Ruta , 2019).

Big Data Analytics

According to Taylor (2023), the worldwide business intelligence and analytics software application market earned US\$15.3 billion in 2021. Big data refers to large, complex data sets, such as healthcare and social media metrics, that can be delivered in near real-time using modern technology. Traditional methods cannot analyze big data due to its size, speed, and complexity. Big data analytics can provide powerful insights and a competitive edge despite its cost. The market value is expected to reach over US\$655 billion by 2029, compared with US\$241 billion in 2021. The field of big data analytics has experienced significant growth due to the proliferation of the "Internet of Things" (IoT) and the expanding interconnectedness of devices (Taylor, 2023).

Taylor (2023) noted that the sheer magnitude of data in big data analytics presents significant obstacles for organizations that store and analyze data within their premises. The scenario above gave rise to the "analytics as a service" (AaaS) paradigm, enabling enterprises to conduct analytical tasks through a cloud-based subscription service. This approach circumvents the need for expensive on-site storage and processing expenditures. The field of big data analytics, which possessed a market value of 5.29 billion in the year 2020, plays a pivotal role in digital transformation across various industries. Among the various facets of big data analytics, predictive analytics is the most advanced and sophisticated (Taylor, 2023).

Meanwhile, Taylor (2023) noted that the social media analytics market is projected to increase from 7.01 billion in 2021 to 26.3 billion in 2028. However, while 57

percent of organizations claim to use data to drive innovation, the transformation must be completed, with only 27 percent of leading organizations claiming to be data-driven. Prominent big data and analytics software providers like Oracle, Microsoft, SAP, and IBM offer specialized tools to facilitate advanced and predictive analytics, data mining, forecasting, and data optimization. Taylor (2023) noted that these processes are synergistically combined to assist clients in making data-driven business decisions for the future of their company. SAS is the dominant player in the advanced and predictive analytics software market, whereas Informatica holds a leading position in the analytic data integration and integrity software segment. SAS and Informatica are prominent companies in this industry segment (Taylor, 2023).

Web conferencing

WallStreetZen.com (2023) reported that Zoom, launched in 2011, has over 350 million users globally. The app moved from 10 million users in March 2019 to 350 million by end-December 2020. By October 2022, Zoom had 5.5 percent of the web conferencing market share, compared with G-Suite, which has 86.8 percent of the market share, and Skype 1.53 percent. Zoom earned US\$4.1 billion in the fiscal year 2022, of which US\$2.7 billion came from the Americas, US\$801.5 million from Europe, the Middle East, and Africa, and US\$564.1 million from Asia-Pacific (WallStreetZen.com, 2023).

Court cases and policy issues in the Digital economy space

Since its 2004 Initial Public Offering, Google has acquired 256 companies, these include:

Table 58 *Google Top 10 acquisitions*

Rank	Company acquired	Acquisition year	Sector	Acquisition value(US\$)
1	Motorola Mobility 1/	2012	Telecommunications	\$12.5 billion
2	Nest	2014	Home automation	\$3.2 billion
3	DoubleClick	2007	Online advertising	\$3.1 billion
4	Looker	2019	Data analytics	\$2.6 billion
5	Fitbit	2007	Consumer electronics	\$2.1 billion
6	YouTube	2005	Online video platform	\$1.65 billion
7	Waze	2007	GPS navigation software	\$1.3 billion
8	HTC	2017	Telecommunications	\$1.1 billion
9	AdMob	2006	Mobile advertising	\$750 million
10	ITA Software	2011	Software and travel	\$700 million

Source: (Cattlin, 2023) <https://www.forex.com/en-us/news-and-analysis/google-acquisition-history/>

Note (1) Motorola was later sold to Lenovo for US\$2.9 billion

According to McCabe and Kang (2023), in September 2023, the US et al. v Google court case started in Washington, DC. The case follows a three-year investigation by the US Justice Department on Google's abuse of power to stifle competition. This case is the first monopoly trial in the Internet era to examine the power wielded by digital companies. The ruling from the trial can have a broad ripple effect, including dismantling large internet companies. Google is accused of paying companies, so Google is the default search engine on devices and platforms. Google responds that customers can change the default search engine. Google has a 91 percent share of the search engine market (McCabe & Kang, In Its first monopoly trial of modern internet era, U.S. sets sights on Google, 2023).

Yoon and Suhartono (2023) reported that Indonesia's policies for TikTok changed in October 2023 with the ban on TikTok's venture into a retail platform. Indonesia has TikTok's second largest user base, with 125 million TikTok users. TikTok attempted to launch its retail platform in Indonesia to generate more revenue. However, the country banned all commerce on social media platforms to protect local business owners, although TikTok is not banned in the country. TikTok also recently faced restrictions from Australia, Canada, Europe, and the US for political and security reasons. India banned TikTok in 2020 (Yoon & Suhartono, 2023).

Yaffe-Bellany, Goldstein, and Moreno (2023) noted that the outcome of the fraud trial against Sam Bankman-Fried, which started in September 2023, may change how cryptocurrency is viewed and traded globally. The New York Times reports that Mr. Bankman-Fried is charged with orchestrating a conspiracy to use US\$10 billion from customers of the failed cryptocurrency exchange FTX (Yaffe-Bellany, Goldstein, & Moreno, 2023). On November 3, Sam Bankman-Fried was found guilty of seven fraud and conspiracy charges. He will be sentenced in March 2024 and faces up to 110 years in prison (Morrow, 2023).

McCabe (2022) pointed out that among several cases to block mergers and acquisitions is the case by the US Federal Trade Commission (FTC) to block Meta's purchase of the virtual reality start-up Within for US\$400 million. The case is expected to test little-known legal arguments, including that Meta's deal hurt potential competition in a virtual reality products market that could be robust in the future. The argument is novel since the market for virtual reality products is nascent (McCabe, Why losing to Meta in court may still be a win for regulators, 2022).

Federal Trade Commission (FTC) (2023) reported that the FTC and 17 state attorneys sued Amazon for interlocking anticompetitive and unfair strategies to maintain its monopoly power illegally. The anticompetitive strategies include overcharging sellers and stifling innovation. Amazon extracts enormous monopoly rents, including replacing search results with paid advertisements, biasing Amazon search results to preference for Amazon products over ones that Amazon knows are of better quality, and charging costly fees on sellers that rely on Amazon to stay in business (Federal Trade Commission, 2023).

The Bay Area CBS (2023) reported that Kelly McKernan, a Nashville-based artist, sued the makers of an AI tool after entering her name into the AI engine and generating art that resembles her distinctive style. Two other artists - Karla Ortiz and Sarah Andersen have also joined the suit to protect their copyrights and careers from AI tools. The suit is against Stability AI, the London-based maker of text-to-image generator Stable Diffusion, Midjourney image generator, and the online gallery DeviantArt. They seek class-action damages and a court order to stop companies from exploiting artistic works without consent. (CBS Bay Area, 2023)

According to Small (2023), comedian Sarah Silverman has initiated a class-action legal proceeding against OpenAI and Meta, alleging that these entities have engaged in copyright infringement. The lawsuits assert that the companies engaged in unauthorized reproduction of the author's literary works, such as Silverman's memoir titled "The Bedwetter," by scraping illicit online repositories referred to as "shadow libraries," which house numerous texts without proper authorization. The litigation against Meta references the research publication authored by the company, which discusses the

utilization of a large-language model for training chatbots. The lawsuit alleges that the copyrighted materials were replicated and incorporated for training. The plaintiffs are pursuing compensation for losses and equitable remedies, which may encompass modifications to the large-language model and ChatGPT systems. The origin of training datasets for OpenAI's ChatGPT program is relatively obscure (Small, 2023).

Small (2023) noted that the lawsuit contends that ChatGPT's capacity to produce summaries of the plaintiffs' works can only be attributed to its training on their copyrighted works. The exhibit contains the text produced in response to the request for a summary of Silverman's memoir. The lawsuit is part of an increasing array of legal proceedings that have the potential to establish the parameters governing the learning process of artificial intelligence, as well as the extent to which copyright laws will govern the content utilized by algorithms for training datasets (Small, 2023).

Answers to Case Study Questions

The digital economy does not change trade theory; that is, trade is still explained by Heckscher Ohlin, Gravity, Ricardian, and other trade theories. However, the digital economy changes how we trade and invest; therefore, it is essential to examine how it happens. The following seeks to explain how the digital economy impacts trade and investment:

Enabling environment for digital economy cross-border trade

Access to the internet, whether through a laptop, desktop, mobile phone, or tablet, is essential for participation in the digital economy. The data analysis and findings show that all income groups and geographic regions can access the internet and devices. However, high-income and upper-middle-income countries and countries located in North America, Europe, and Asia have more access and devices compared with low-income and sub-Saharan countries at the lower end of the spectrum.

Internet access can change if satellites are used. Haynes (2023) noted that Satellite providers are SpaceX's Starlink, HughesNet, Viasat, and T-Mobile. One can sign up for satellite internet via the company's websites. Starlink, a low Earth orbit satellite internet provider, offers unlimited data, above broadband speeds, and less latency than most other providers. It offers both residential fixed-location plans and portable satellite internet options. Compared to Viasat and HughesNet, Starlink offers more data and faster speeds but is more expensive upfront due to equipment fees. It is less widely available than Viasat or HughesNet. However, SpaceX regularly launches more satellites, so availability is increasing globally. Starlink is available in the continental US (limited in the south and west and rural areas), Canada, Australia, New Zealand, Denmark, Austria, Belgium, France, Germany, the Netherlands, and the United Kingdom (Haynes, 2023).

Leading digital economy players and systems for cross-border

The leading players and systems in the digital economy provide search engines, devices, digital platforms, social media platforms, payment systems, learning platforms, cloud computing, data analytics, and artificial intelligence.

Table 59 *Top 10 digital companies in the world by market capitalization as of end-2022*

Rank	Company	Market Capitalization (US\$)	Revenue (US\$ billions)	Earnings/Net income (US\$ billions)
1	Apple	2.774 trillion	383.9	112.2
2	Microsoft	2.431 trillion	211.9	89.3
3	Alphabet (Google)	1.743 trillion	289.5	73.8
4	Amazon	1.320 trillion	538.0	16.6
5	NVIDIA(provides AI, software and hardware)	1.130 trillion	32.7	11.4
6	Tesla	826.91 billion	94.0	13.5
7	Meta Platforms(Facebook)	811.65 billion	120.5	28.7
8	TSMC(provides semiconductors) Taiwan	463.09 billion	72.0	22.6
9	Tencent(all digital economy offerings) China	377.77 billion	83.1	35.1
10	Broadcom (semiconductors, software)	348.86 billion	35.5	16.4

Source: <https://companiesmarketcap.com/tech/most-profitable-tech-companies/>

Note: (1) All companies are American companies unless otherwise stated.

(2) The list is in the order of market capitalization; the revenue and earnings may fall differently. Companies with higher revenue and earnings are off the list because they are outside the Top 10 for market capitalization.

As shown in the data analysis and findings in the previous section, these companies provide the mechanism through which the digital economy and cross-border trade are possible. Google enables internet searches and platforms like YouTube, among other services and products. Apple goods and services include devices, operating systems, and app development. Microsoft provides devices, software, and cloud computing. Amazon services include cloud computing and an e-tailer platform, and Meta

has the largest social media platform, which includes Facebook. The data analysis and findings also show that companies outside the top 10 digital economy companies provide products and services essential for the global economy and are widely used. Zoom, for example, is being used by 350 million people globally and became particularly essential during the recent pandemic, facilitating work from home. Travel and tourism have expanded through Booking.com, Uber, and AirBnB platforms. Cross-border payments have also become more accessible because of PayPal and similar companies. Persons can work collaboratively across borders due to cloud computing. People can enjoy movies and music due to Netflix and Spotify while residing in any country.

AI has made 3D manufacturing and improved processes for many sectors across the globe. The ability to analyze data from the internet has resulted in better marketing performance for companies. It allows law enforcement from a country such as the US to identify criminal content and contact law enforcement in another country to catch criminals. One example from Cimpanu (2021) is how the FBI helped Australian law enforcement capture criminal gangs (Cimpanu, 2021). Coursera, edX, and other platforms have enabled quality education for millions across the globe. Zoom and MS Teams have also contributed to online learning. Alibaba, eBay, and similar platforms have also enabled global trade in goods. Social media platforms have been essential for building social networks and promoting goods and services trade. As noted in the findings, a US professional YouTube content creators survey found that 81 percent reported that YouTube helps content exports to international audiences. For physical goods, shipping companies' digital logistic systems have made it easier for someone who buys a digital good over the internet to ship it to their customer in another country.

Goods and services in digital economy cross-border trade

The digital economy has narrowed the list of services classified as non-tradable across international borders. Persons can work from home and trade services such as education, professional services including architectural drawings, and personal entertainment across the various platforms to various countries. Further, products previously traded as physical goods, such as books, music CDs, and movie DVDs, are now traded electronically. Movies, for example, are moving to mainly digital since companies like Netflix had 99.5 percent or US\$31.5 billion in 2022 revenue through the digital delivery of the movies compared to 0.5 percent of the revenue for DVD sales. Shipping companies such as DHL have made trading in physical products easier.

Producing and exporting in the digital economy –

Producers can produce any product or service in their niche areas, find a suitable digital platform, follow the sign-up rules, and start trading. The producer of services such as a YouTube video of their daily life can earn revenue from advert revenues and fans' subscriptions. For example, people with movie ideas can shop that script for Netflix, such as the Korean director/producer for the Squid Game. Further, if Netflix refuses, for example, the person can publish their movie on YouTube. A person creating music can sell it on Spotify or publish it on YouTube to reach a global audience and earn a living. A producer of a physical good can establish a storefront on Amazon, eBay, Etsy, or all three and sell their product globally.

Consuming and importing in the digital economy

All one needs to consume and import in the digital economy is a device and an internet connection. While some services are free with adverts, free with limited access,

or promotions free for a limited time, others require a subscription. Some subscriptions, such as Netflix, can, however, be shared. However, not all digital entertainment platforms allow their digitized product to cross the border. For example, the BBC iPlayer programs are only available in the UK. Also, not all FinTech allows cross borders; for example, Cash App is only available for US customers. On the other hand, PayPal is global.

The way forward on harnessing the power of the digital economy

The digital economy is a critical element of the 21st century and essential for the functioning of the economy, including cross-border trade in goods and services.

However, the current court cases in These include the ongoing court cases in the US.

The outcome of these cases can lead to new regulations regarding cryptocurrency (Bankman-Fried case), new grounds regarding restricting mergers (the Meta case), and the breakup of Google and Amazon, along with enormous fines for these companies.

Further, the power of TikTok can be cut in other countries, given the government policy change in Indonesia regarding selling on social media platforms. Governments also

must deal with the issues relating to cross-border data flows to facilitate digitized products, cybersecurity, copyright for products shared digitally, and taxes for businesses

operating in the digital economy. Governments also need to have an enabling

environment – internet access, for example, along with the necessary training and

infrastructure so that their economies can benefit from the digital economy, including

through cross-border trade. There is also work to be done by the WTO and other

multilateral a regarding global approaches to issues such as the classification of goods

and services, taxes, and copyright.

Conclusion

From the evidence presented in this research, one can answer the research question by concluding that the digital economy is essential to cross-border trade and investment in goods and services. The evidence also rejects the null hypothesis and concludes that the digital economy has created new goods and services, moving the economy to a new, steady state.

In the digital economy, MNEs provide the platforms and technologies through which value is created. Platforms include social media platforms like Facebook and Amazon for retail trade, Zoom for web conferencing, Airbnb for accommodation, Booking.com for flights, and Coursera for online education. The digital economy has also changed how business is done; for example, cloud computing has reduced staff and infrastructure in many firms. The largest digital economy market capitalization firms include Alphabet, Microsoft, Apple, Meta, and Amazon (AMAMA).

The digital economy benefits firms, consumers, economies, and society nationally and globally. Benefits include reduced search and transaction costs, entrepreneurship and employment opportunities, and the reduction of information asymmetries. However, several challenges are yet to be addressed by the digital economy, including cybersecurity, cross-border data flows, copyright, and taxes. The outcome of cases in the US courts against Google, Amazon, and Meta may fundamentally change the internet. Also, governments, particularly in developing countries, should provide the enabling environment that would allow their countries to benefit from the digital economy.

Further research in the areas of law, technology, economics, public administration, business, and international development is needed in the field of the

digital economy. In law, research can be done on effective copyright laws for the digital economy. Further study can be done on creating a digital platform where healthcare services can be traded across borders. Currently, persons can access good health information from anywhere in the world by accessing websites such as the Mayo Clinic or WebMD. Globally, people can also make appointments to see doctors in another country; for example, anyone globally can make an appointment online to see a doctor in Turkey due to the country's active medical tourism. More research is required on how large AI language models can be customized for various technological professions. More research can be done on how the digital economy can promote economic growth and development, research, and jobs in public administration, economics, and business. Also, more studies can be done on the digital economy and economic growth since the technology of the digital economy has changed the trajectory of growth and employment for many countries. Also, governments can seek to identify ways in which countries can localize data flows so that entrepreneurship and employment can be generated within a country rather than profits flowing to digital MNEs. In international development, agencies such as the WTO and UNCTAD conduct research on areas that require global agreement, including the classification of goods and services and taxing internet transactions.

CHAPTER V – CONCLUSION

The research findings from these three essays can contribute to national and multilateral discussions. Due to the benefits of FDI, countries can implement policies and programs that promote higher GNI and HDI and trade openness if they wish to increase FDI. At the same time, countries can endeavor to reduce their fragility and political instability. At the multilateral level, discussions can acknowledge that FTAs are creating a multi-tier system in global trade since only members of an FTA can benefit from the tariff and non-tariff measures of the FTAs. Further, given the increasing role of the digital economy in international trade and investment, multilateral discussions and agreements in this area are necessary.

The key factors influencing foreign direct investment in fragile and least developed countries include human development, liquefied natural gas, political stability, market size, trade openness, and fragility status. The presence of fragility and political instability has detrimental consequences, as evidenced by the inverse relationship between a country's fragility or political instability and the level of foreign direct investment.

The findings of this study are of particular significance for countries classified as fragile red alert and least developed countries. These countries must prioritize economic growth and maintain open trade because the size of their market and the degree of trade openness play a vital role in attracting higher foreign direct investment inflows. Nations must prioritize the education and well-being of their citizens, as these factors play a crucial role in fostering human development. Political stability is a crucial factor that

requires countries to prioritize establishing transparent political processes, including elections and transitions of power.

The research findings unequivocally indicate that the effects of free trade agreements (FTAs) are exclusively beneficial to the participating members of the FTA. Free trade agreements (FTAs) have positively impacted countries with many of such agreements, leading to increased exports, imports, and gross domestic product (GDP). The sub-Saharan African regions exhibit a comparatively lower prevalence of FTAs, associated with a lower gross domestic product (GDP), exports, and imports compared to countries with a higher prevalence of FTAs.

The H-test conducted on the critical characteristics of free trade agreements (FTAs) reveals that the variations in FTAs can be attributed to factors such as the number of participating countries, the regions involved, and the extent of coverage in terms of goods, services, or both. The trade statistics for selected countries indicate a noticeable rise in trade values after implementing FTAs. Before the signing of the United States-Mexico-Canada Agreement (USMCA), formerly known as the North American Free Trade Agreement (NAFTA), Mexico's exports to the United States amounted to USUS\$18.8 billion in 1990. However, in 2022, these exports substantially increased, reaching a value of USUS\$472.6 billion.

From the evidence presented in this research, one can answer the research question by concluding that the digital economy is essential to cross-border trade and investment in goods and services. In the digital economy, MNEs provide the platforms and technologies through which value is created. Platforms include social media platforms like Facebook and Amazon for retail trade, Zoom for web conferencing,

Airbnb for accommodation, Booking.com for flights, and Coursera for online education. The digital economy has also changed how business is done; for example, cloud computing has reduced staff and infrastructure in many firms. The largest digital economy market capitalization firms include Alphabet, Microsoft, Apple, Meta, and Amazon.

The digital economy benefits firms, consumers, economies, and society nationally and globally. Benefits include reduced search and transaction costs, entrepreneurship and employment opportunities, and the reduction of information asymmetries. However, several challenges are yet to be addressed by the digital economy, including cybersecurity, cross-border data flows, copyright, and taxes. The outcome of cases in the US courts against Google, Amazon, and Meta may fundamentally change the internet. Also, governments, particularly in developing countries, should provide the enabling environment that would allow their countries to benefit from the digital economy.

In conclusion, globalization's key features are international trade, foreign direct investment (FDI), and the digital economy. Digitalization has changed how we trade; for example, digital platforms have replaced intermediaries, thereby reducing informational asymmetries, enabling upscaling production, and allowing individuals to engage in international trade directly. With robotics and AI capabilities, MNEs can remotely control automated production processes. Information technology has brought benefits to consumers and producers, changed the speed of economic exchange, and pushed the limits of established economic performance. FDI is crucial in economic development. The economic benefits of FDI include an increase in foreign exchange stock and a reduction in unemployment. Foreign direct investment stimulates the growth of exports

from originating countries, and this investment is complementary to trade. Trade liberalization is critical to enabling trade benefits to flow to countries. However, FTAs have created a multi-tier system for global free trade.

APPENDIX A

Table A1 - List of 156 countries in the Chapter II FDI model

Afghanistan 1/	Gabon	Nicaragua
Albania	Gambia 1/	Niger
Angola 1/	Georgia	Nigeria
Antigua and Barbuda	Germany	North Macedonia
Argentina	Ghana	Norway
Armenia	Greece	Oman
Australia	Guatemala	Pakistan
Austria	Guinea 1/	Panama
Bahrain	Guinea-Bissau 1/	Papua-New Guinea
Bangladesh 1/	Guyana	Paraguay
Barbados	Haiti 1/	Peru
Belize	Honduras	Philippines
Benin 1/	Hungary	Poland
Bhutan 1/	Iceland	Portugal
Bolivia	India	Qatar
Botswana	Indonesia	Romania
Brazil	Ireland	Russian Federation
Brunei Darussalam	Israel	Rwanda 1/
Bulgaria	Italy	Samoa
Burkina Faso 1/	Jamaica	Saudi Arabia

Burundi 1/	Japan	Senegal 1/
Cabo Verde	Jordan	Seychelles
Cambodia 1/	Kazakhstan	Sierra Leone 1/
Cameroon	Kenya	Singapore
Canada	Kuwait	Slovakia
Central African Republic 1/	Kyrgyzstan	Slovenia
Chad 1/	Lao PDR 1/	Solomon Islands 1/
Chile	Latvia	South Africa
China	Lesotho 1/	South Korea
Colombia	Lithuania	Spain
Comoros 1/	Luxembourg	Sri Lanka
Democratic Republic of the	Madagascar 1/	Sudan 1/
Congo 1/	Malawi 1/	Suriname
Congo Republic	Malaysia	Sweden
Costa Rica	Maldives	Switzerland
Cote d'Ivoire	Mali 1/	Tajikistan
Croatia	Malta	Tanzania 1/
Cuba	Mauritania 1/	Thailand
Cyprus	Mauritania	Togo 1/
Czechia	Mauritius	Tunisia
Denmark	Mexico	Turkiye
Djibouti 1/	Moldova	Uganda 1/

Dominican Republic	Mongolia	Ukraine
Ecuador	Mongolia	United Arab Emirates
Egypt	Montenegro	United Kingdom
El Salvador	Morocco	United States
Eritrea 1/	Mozambique 1/	Uruguay
Estonia	Myanmar 1/	Venezuela
Eswatini	Namibia	Viet Nam
Ethiopia 1/	Nepal 1/	Yemen 1/
Fiji	The Netherlands	Zambia 1/
Finland	New Zealand	Zimbabwe
France		

Notes:

- (1) Least-developed country
- (2) Countries with missing variables were omitted from the model

Table A2 - Description of policy areas included in FTAs, at end-2017

WTO-plus areas	
FTA Industrial or Customs	Tariff liberalization with regard to industrial goods; elimination of nontariff measures
FTA Agriculture	Tariff liberalization with regard to agriculture goods; elimination of nontariff measures.
Customs	Provision of information; publication on the internet of new laws and regulations; training. Incl. provisions on trade facilitation
Export Taxes	Elimination of export taxes. Examples: Elimination of customs duties on exports, elimination of duties, taxes or other charges on exports.
Sanitary and phytosanitary (SPS)	Affirmation of rights and obligations under the WTO Agreement on SPS; harmonization of SPS measures
Technical Barriers to Trade (TBT)	Affirmation of rights and obligations under WTO Agreement on TBT; provision of information; harmonization of regulations; mutual recognition agreements
State trading enterprises (STE)	GATT Art. XVII. Establishment or maintenance of a state enterprise in accordance with and affirming provisions of GATT. Non-discrimination regarding production and marketing condition; provision of information.

Anti-dumping	Retention of antidumping rights and obligations under the WTO Agreement (Art. VI GATT).
Countervailing measures (CVM)	Retention of countervailing measures rights and obligations under the WTO Agreement (Art VI GATT).
State Aid	Assessment of anti-competitive behavior; annual reporting on the value and distribution of state aid given; provision of information
Public Procurement	Progressive liberalization; national treatment and/or non-discrimination principle; publication of laws and regulations on the internet; specification on public procurement regime.
Trade-Related Investment Measures (TRIMS)	Provisions concerning requirements for local content and export performance on FDI. Applies only to measures that affect trade in goods.
General Agreement on Trade in Services (GATS)	Liberalization of trade in services
Trade-Related Aspects of Intellectual Property Rights (TRIPS)	Harmonization of standards; enforcement; national treatment, most-favored nation treatment. International treaties referenced in TRIPS: Paris Convention, Berne Convention, Rome Convention, IPIC Treaty

WTO-X areas

Anti-Corruption	Regulations concerning criminal offence measures in matters affecting international trade and investment.
Competition Policy	Chapter/provision on competition policy in general, could include prescriptions as regards anticompetitive business conduct; harmonization of competition laws; establishment or maintenance of an independent competition authority, among others.
Environmental Laws	Development of environmental standards; enforcement of national environmental laws; establishment of sanctions for violation of environmental laws; publications of laws and regulation.
IPR	Accession to international treaties not referenced in the TRIPs Agreement.
Investment	Information exchange; Development of legal frameworks; Harmonization and simplification of procedures; National treatment; Establishment of mechanism for the settlement of disputes
Labour Market Regulation	Regulation of the national labour market; affirmation of International Labour Organization (ILO) commitments; enforcement
Movement of Capital	Liberalization of capital movement; prohibition of new restrictions.
Consumer Protection	Harmonization of consumer protection laws; exchange of information and experts; training.
Data Protection	Exchange of information and experts; joint projects.
Agriculture	Technical assistance to conduct modernization projects; exchange of information.
Approximation of Legislation	Application of international legislation in national legislation. Any form of legislation that provides for approximation of laws. [Appears mainly in customs unions.]
Audio Visual	Promotion of the industry; encouragement of co-production.
Civil Protection	Implementation of harmonized rules

Innovation Policies	Participation in framework programmes; promotion of technology transfers
Cultural Cooperation	Promotion of joint initiatives and local culture.
Economic Policy Dialogue	Exchange of ideas and opinions; joint studies.
Education and Training	Measures to improve the general level of education.
Energy	Exchange of information; technology transfer; joint studies.
Financial Assistance	Set of rules guiding the granting and administration of financial assistance
Health	Monitoring of diseases; development of health information systems; exchange of information
Human Rights	Respect for human rights
Illegal Immigration	Conclusion of re-admission agreements; prevention and control of illegal immigration
Illicit Drugs	Treatment and rehabilitation of drug addicts; joint projects on prevention of consumption; reduction of drug supply; information exchange
Industrial Cooperation	Assistance in conducting modernization projects; facilitation and access to credit to finance
Information Society	Exchange of information; dissemination of new technologies; training. Cooperation and exchange of information (often in the context of other policies).
Mining	Exchange of information and experience; development of joint initiatives

Money Laundering	Harmonization of standards; technical and administrative assistance.
Nuclear Safety	Development of laws and regulations; supervision of the transportation of radioactive materials
Political Dialogue	Convergence of the parties' positions on international issues
Public Administration	Technical assistance; exchange of information; joint projects; training.
Regional Cooperation	Promotion of regional cooperation; technical assistance programmes
Research and Technology	Joint research projects; exchange of researchers; development of public-private partnership
SMEs	Technical assistance; facilitation of access to finance.
Social Matters	Coordination of social security systems; non-discrimination regarding working conditions
Statistics	Harmonization and/or development of statistical methods; training
Taxation	Assistance in conducting fiscal system reforms
Terrorism	Exchange of information and experience; joint research and studies
Visa and Asylum	Exchange of information; drafting legislation; training. Incl. international movement of persons.

Source: (Hofmann, Osnago, & Ruta, 2017)

Table A3 - List of Free Trade Agreements (FTAs) as of December 2022

FTA Name	Coverage	Type	Date of entry into force
EU Treaty	Goods & Services	CU & EIA	01/01/1958
Central American Common Market (CACM)	Goods	CU	04/06/1961
EU – Overseas Countries and Territories (OCT)	Goods	FTA	01/01/1971
EU - Switzerland - Liechtenstein Protocol on Trade Negotiations (PTN)	Goods	FTA	01/01/1973
EU - Iceland	Goods	FTA	01/04/1973
EU - Norway	Goods	FTA	01/07/1973
Australia - Papua New Guinea (PATCRA)	Goods	FTA	01/02/1977
EU - Syria	Goods	FTA	01/07/1977
South Pacific Regional Trade and Economic Cooperation Agreement (SPARTECA)	Goods	PSA	01/01/1981
Latin American Integration Association (LAIA)	Goods	PSA	18/03/1981
Ecuador - Mexico	Goods	PSA	01/05/1983
Mexico - Paraguay	Goods	PSA	01/01/1984
United States - Israel	Goods	FTA	19/08/1985
Argentina - Mexico	Goods	PSA	01/01/1987
Panama - Dominican Republic	Goods	PSA	08/06/1987
Andean Community (CAN)	Goods	CU	25/05/1988
Global System of Trade Preferences among Developing Countries (GSTP)	Goods	PSA	19/04/1989
Lao People's Democratic Republic - Thailand	Goods	PSA	20/06/1991
EU - Andorra	Goods	CU	01/07/1991
Economic Cooperation Organization (ECO)	Goods	PSA	17/02/1992
EFTA - Israel	Goods	FTA	01/01/1993
Russian Federation - Azerbaijan	Goods	FTA	17/02/1993

Russian Federation - Uzbekistan	Goods	FTA	25/03/1993
Russian Federation - Turkmenistan	Goods	FTA	06/04/1993
Namibia - Zimbabwe	Goods	FTA	30/04/1993
Faroe Islands - Norway	Goods	FTA	01/07/1993
Melanesian Spearhead Group (MSG)	Goods	PSA	01/01/1994
European Economic Area (EEA)	Services	EIA	01/01/1994
Georgia - Russian Federation	Goods	FTA	10/05/1994
Common Market for Eastern and Southern Africa (COMESA)	Goods	CU	08/12/1994
Commonwealth of Independent States (CIS)	Goods	FTA	30/12/1994
Colombia - Mexico	Goods & Services	FTA & EIA	01/01/1995
Faroe Islands - Switzerland	Goods	FTA	01/03/1995
Economic Community of West African States (ECOWAS)	Goods	CU	23/08/1995
Kyrgyz Republic - Armenia	Goods	FTA	27/10/1995
Ukraine - Turkmenistan	Goods	FTA	04/11/1995
Kyrgyz Republic - Kazakhstan	Goods	FTA	11/11/1995
South Asian Preferential Trade Arrangement (SAPTA)	Goods	PSA	07/12/1995
Armenia - Moldova, Republic of	Goods	FTA	21/12/1995
Ukraine - Uzbekistan	Goods	FTA	01/01/1996
EU - Türkiye	Goods	CU	01/01/1996
Georgia - Ukraine	Goods	FTA	04/06/1996
Armenia - Turkmenistan	Goods	FTA	07/07/1996
Georgia - Azerbaijan	Goods	FTA	10/07/1996
Ukraine - Azerbaijan	Goods	FTA	02/09/1996
Kyrgyz Republic - Moldova, Republic of	Goods	FTA	21/11/1996
Armenia - Ukraine	Goods	FTA	18/12/1996

EU - Faroe Islands	Goods	FTA	01/01/1997
Canada - Israel	Goods	FTA	01/01/1997
Türkiye - Israel	Goods	FTA	01/05/1997
EU - Palestine	Goods	FTA	01/07/1997
Canada - Chile	Goods & Services	FTA & EIA	05/07/1997
Russian Federation - Belarus - Kazakhstan	Goods	CU	03/12/1997
Pan-Arab Free Trade Area (PAFTA)	Goods	FTA	01/01/1998
Kyrgyz Republic - Ukraine	Goods	FTA	19/01/1998
EU - Tunisia	Goods	FTA	01/03/1998
Kyrgyz Republic - Uzbekistan	Goods	FTA	20/03/1998
Ukraine - Kazakhstan	Goods	FTA	19/10/1998
Georgia - Armenia	Goods	FTA	11/11/1998
Economic and Monetary Community of Central Africa (CEMAC)	Goods	CU	24/06/1999
EFTA - Palestine	Goods	FTA	01/07/1999
Georgia - Kazakhstan	Goods	FTA	16/07/1999
Chile - Mexico	Goods & Services	FTA & EIA	01/08/1999
EFTA - Morocco	Goods	FTA	01/12/1999
Georgia - Turkmenistan	Goods	FTA	01/01/2000
EU - South Africa	Goods	FTA	01/01/2000
West African Economic and Monetary Union (WAEMU)	Goods	CU	01/01/2000
India - Sri Lanka	Goods	FTA	01/03/2000
EU - Morocco	Goods	FTA	01/03/2000
EU - Israel	Goods	FTA	01/06/2000
Israel - Mexico	Goods	FTA	01/07/2000

Türkiye - North Macedonia	Goods	FTA	01/09/2000
New Zealand - Singapore	Goods & Services	FTA & EIA	01/01/2001
Mexico - Cuba	Goods	PSA	28/02/2001
EFTA - Mexico	Goods & Services	FTA & EIA	01/07/2001
Ukraine - North Macedonia	Goods	FTA	05/07/2001
Dominican Republic - Central America	Goods & Services	FTA & EIA	04/10/2001
United States - Jordan	Goods & Services	FTA & EIA	17/12/2001
Armenia - Kazakhstan	Goods	FTA	25/12/2001
Chile - Costa Rica (Chile - Central America)	Goods & Services	FTA & EIA	15/02/2002
EU - San Marino	Goods	CU	01/04/2002
EU - Jordan	Goods	FTA	01/05/2002
EFTA - North Macedonia	Goods	FTA	01/05/2002
Chile - El Salvador (Chile - Central America)	Goods & Services	FTA & EIA	01/06/2002
Ukraine - Tajikistan	Goods	FTA	11/07/2002
EFTA - Jordan	Goods	FTA	01/09/2002
Canada - Costa Rica	Goods	FTA	01/11/2002
Japan - Singapore	Goods & Services	FTA & EIA	30/11/2002
Gulf Cooperation Council (GCC)	Goods	CU	01/01/2003
EFTA - Singapore	Goods & Services	FTA & EIA	01/01/2003
EU - Lebanon	Goods	FTA	01/03/2003
Panama - El Salvador (Panama - Central America)	Goods & Services	FTA & EIA	11/04/2003
Pacific Island Countries Trade Agreement (PICTA)	Goods	FTA	13/04/2003
Brazil - Mexico	Goods	PSA	02/05/2003
India - Afghanistan	Goods	PSA	13/05/2003
China - Hong Kong, China	Goods & Services	FTA & EIA	29/06/2003

Türkiye - Bosnia and Herzegovina	Goods	FTA	01/07/2003
Morocco - United Arab Emirates	Goods	FTA	09/07/2003
Singapore - Australia	Goods & Services	FTA & EIA	28/07/2003
China - Macao, China	Goods & Services	FTA & EIA	17/10/2003
GUAM	Goods & Services	FTA & EIA	10/12/2003
Panama - Chinese Taipei	Goods & Services	FTA & EIA	01/01/2004
United States - Singapore	Goods & Services	FTA & EIA	01/01/2004
United States - Chile	Goods & Services	FTA & EIA	01/01/2004
Korea, Republic of - Chile	Goods & Services	FTA & EIA	01/04/2004
Common Economic Zone (CEZ)	Goods	FTA	20/05/2004
EU - Egypt	Goods	FTA	01/06/2004
Mexico - Uruguay	Goods & Services	FTA & EIA	15/07/2004
Southern African Customs Union (SACU)	Goods	CU	15/07/2004
India - Thailand	Goods	PSA	01/09/2004
EFTA - Chile	Goods & Services	FTA & EIA	01/12/2004
Thailand - Australia	Goods & Services	FTA & EIA	01/01/2005
United States - Australia	Goods & Services	FTA & EIA	01/01/2005
Japan - Mexico	Goods & Services	FTA & EIA	01/04/2005
Ukraine - Moldova, Republic of	Goods	FTA	19/05/2005
Türkiye - Palestine	Goods	FTA	01/06/2005
EFTA - Tunisia	Goods	FTA	01/06/2005
Pakistan - Sri Lanka	Goods	FTA	12/06/2005
Thailand - New Zealand	Goods & Services	FTA & EIA	01/07/2005
Türkiye - Tunisia	Goods	FTA	01/07/2005
India - Singapore	Goods & Services	FTA & EIA	01/08/2005

Jordan - Singapore	Goods & Services	FTA & EIA	22/08/2005
EU - Algeria	Goods	FTA	01/09/2005
South Asian Free Trade Agreement (SAFTA)	Goods	FTA	01/01/2006
Türkiye - Morocco	Goods	FTA	01/01/2006
United States - Morocco	Goods & Services	FTA & EIA	01/01/2006
Dominican Republic - Central America - United States Free Trade Agreement (CAFTA-DR)	Goods & Services	FTA & EIA	01/03/2006
Korea, Republic of - Singapore	Goods & Services	FTA & EIA	02/03/2006
Trans-Pacific Strategic Economic Partnership	Goods & Services	FTA & EIA	28/05/2006
Russian Federation - Serbia	Goods	FTA	03/06/2006
Guatemala - Chinese Taipei	Goods & Services	FTA & EIA	01/07/2006
Japan - Malaysia	Goods & Services	FTA & EIA	13/07/2006
Panama - Singapore	Goods & Services	FTA & EIA	24/07/2006
India - Bhutan	Goods	PSA	29/07/2006
United States - Bahrain	Goods & Services	FTA & EIA	01/08/2006
EFTA - Korea, Republic of	Goods & Services	FTA & EIA	01/09/2006
Iceland - Faroe Islands	Goods & Services	FTA & EIA	01/11/2006
Ukraine - Belarus	Goods	FTA	11/11/2006
Türkiye - Syria	Goods	FTA	01/01/2007
EFTA - Lebanon	Goods	FTA	01/01/2007
Egypt - Türkiye	Goods	FTA	01/03/2007
Agadir Agreement	Goods	FTA	27/03/2007
Central European Free Trade Agreement (CEFTA) 2006	Goods	FTA	01/05/2007
EFTA - Egypt	Goods	FTA	01/08/2007
Chile - India	Goods	PSA	17/08/2007
Chile - Japan	Goods & Services	FTA & EIA	03/09/2007

Japan - Thailand	Goods & Services	FTA & EIA	01/11/2007
Mauritius - Pakistan	Goods	PSA	30/11/2007
Pakistan - Malaysia	Goods & Services	FTA & EIA	01/01/2008
El Salvador - Honduras - Chinese Taipei	Goods & Services	FTA & EIA	01/03/2008
Panama - Chile	Goods & Services	FTA & EIA	07/03/2008
EFTA - SACU	Goods	FTA	01/05/2008
Türkiye - Albania	Goods	FTA	01/05/2008
Japan - Indonesia	Goods & Services	FTA & EIA	01/07/2008
Chile - Honduras (Chile - Central America)	Goods & Services	FTA & EIA	19/07/2008
Brunei Darussalam - Japan	Goods & Services	FTA & EIA	31/07/2008
China - New Zealand	Goods & Services	FTA & EIA	01/10/2008
Türkiye - Georgia	Goods	FTA	01/11/2008
Panama - Costa Rica (Panama - Central America)	Goods & Services	FTA & EIA	23/11/2008
Japan - Philippines	Goods & Services	FTA & EIA	11/12/2008
EU - CARIFORUM States	Goods & Services	FTA & EIA	29/12/2008
China - Singapore	Goods & Services	FTA & EIA	01/01/2009
United States - Oman	Goods & Services	FTA & EIA	01/01/2009
Panama - Honduras (Panama - Central America)	Goods & Services	FTA & EIA	09/01/2009
United States - Peru	Goods & Services	FTA & EIA	01/02/2009
Peru - Chile	Goods & Services	FTA & EIA	01/03/2009
Australia - Chile	Goods & Services	FTA & EIA	06/03/2009
Chile - Colombia	Goods & Services	FTA & EIA	08/05/2009
Southern Common Market (MERCOSUR) - India	Goods	PSA	01/06/2009
Panama - Guatemala (Panama - Central America)	Goods & Services	FTA & EIA	20/06/2009
EFTA - Canada	Goods	FTA	01/07/2009
Canada - Peru	Goods & Services	FTA & EIA	01/08/2009
Peru - Singapore	Goods & Services	FTA & EIA	01/08/2009
Japan - Switzerland	Goods & Services	FTA & EIA	01/09/2009
Japan - Viet Nam	Goods & Services	FTA & EIA	01/10/2009
India - Nepal	Goods	PSA	27/10/2009
Colombia - Northern Triangle (El Salvador, Guatemala, Honduras)	Goods & Services	FTA & EIA	12/11/2009

Panama - Nicaragua (Panama - Central America)	Goods & Services	FTA & EIA	21/11/2009
EU - Pacific States	Goods	FTA	20/12/2009
Southern Common Market (MERCOSUR) - Israel	Goods	FTA	23/12/2009
Korea, Republic of - India	Goods & Services	FTA & EIA	01/01/2010
ASEAN - Australia - New Zealand	Goods & Services	FTA & EIA	01/01/2010
Türkiye - Montenegro	Goods	FTA	01/03/2010
Peru - China	Goods & Services	FTA & EIA	01/03/2010
Chile - Guatemala (Chile - Central America)	Goods & Services	FTA & EIA	23/03/2010
Mexico - Bolivia, Plurinational State of	Goods	PSA	07/06/2010
New Zealand - Malaysia	Goods & Services	FTA & EIA	01/08/2010
EFTA - Serbia	Goods	FTA	01/10/2010
EFTA - Albania	Goods	FTA	01/11/2010
Hong Kong, China - New Zealand	Goods & Services	FTA & EIA	01/01/2011
Türkiye - Chile	Goods	FTA	01/03/2011
EFTA - Colombia	Goods & Services	FTA & EIA	01/07/2011
India - Malaysia	Goods & Services	FTA & EIA	01/07/2011
EU - Korea, Republic of	Goods & Services	FTA & EIA	01/07/2011
EFTA - Peru	Goods	FTA	01/07/2011
China - Costa Rica	Goods & Services	FTA & EIA	01/08/2011
India - Japan	Goods & Services	FTA & EIA	01/08/2011
Peru - Korea, Republic of	Goods & Services	FTA & EIA	01/08/2011
Canada - Colombia	Goods & Services	FTA & EIA	15/08/2011
Peru - Mexico	Goods & Services	FTA & EIA	01/02/2012
Chile - Malaysia	Goods	FTA	25/02/2012
Japan - Peru	Goods & Services	FTA & EIA	01/03/2012
Korea, Republic of - United States	Goods & Services	FTA & EIA	15/03/2012
Panama - Peru	Goods & Services	FTA & EIA	01/05/2012
EU - Eastern and Southern African States	Goods	FTA	14/05/2012
United States - Colombia	Goods & Services	FTA & EIA	15/05/2012
EFTA - Ukraine	Goods & Services	FTA & EIA	01/06/2012

El Salvador - Cuba	Goods	PSA	01/08/2012
Mexico - Central America	Goods & Services	FTA & EIA	01/09/2012
EFTA - Montenegro	Goods	FTA	01/09/2012
Treaty on a Free Trade Area between members of the Commonwealth of Independent States (CIS)	Goods	FTA	20/09/2012
Canada - Jordan	Goods	FTA	01/10/2012
EFTA - Hong Kong, China	Goods & Services	FTA & EIA	01/10/2012
Chile - Nicaragua (Chile - Central America)	Goods & Services	FTA & EIA	19/10/2012
United States - Panama	Goods & Services	FTA & EIA	31/10/2012
Malaysia - Australia	Goods & Services	FTA & EIA	01/01/2013
Ukraine - Montenegro	Goods & Services	FTA & EIA	01/01/2013
EU - Colombia, Ecuador and Peru	Goods & Services	FTA & EIA	01/03/2013
Canada - Panama	Goods & Services	FTA & EIA	01/04/2013
Costa Rica - Peru	Goods & Services	FTA & EIA	01/06/2013
Türkiye - Mauritius	Goods	FTA	01/06/2013
Costa Rica - Singapore	Goods & Services	FTA & EIA	01/07/2013
EU - Central America	Goods & Services	FTA & EIA	01/08/2013
Indonesia - Pakistan	Goods	PSA	01/09/2013
Gulf Cooperation Council (GCC) - Singapore	Goods & Services	FTA & EIA	01/09/2013
New Zealand - Chinese Taipei	Goods & Services	FTA & EIA	01/12/2013
Chile - Viet Nam	Goods	FTA	01/01/2014
Singapore - Chinese Taipei	Goods & Services	FTA & EIA	19/04/2014
EU - Ukraine	Goods & Services	FTA & EIA	23/04/2014
EFTA - Gulf Cooperation Council (GCC)	Goods & Services	FTA & EIA	01/07/2014
Iceland - China	Goods & Services	FTA & EIA	01/07/2014
Switzerland - China	Goods & Services	FTA & EIA	01/07/2014
EU - Cameroon	Goods	FTA	04/08/2014
EFTA - Central America (Costa Rica and Panama)	Goods & Services	FTA & EIA	19/08/2014
EU - Georgia	Goods & Services	FTA & EIA	01/09/2014
EU - Moldova, Republic of	Goods & Services	FTA & EIA	01/09/2014
Canada - Honduras	Goods & Services	FTA & EIA	01/10/2014
Hong Kong, China - Chile	Goods & Services	FTA & EIA	09/10/2014

Korea, Republic of - Australia	Goods & Services	FTA & EIA	12/12/2014
Canada - Korea, Republic of	Goods & Services	FTA & EIA	01/01/2015
EFTA - Bosnia and Herzegovina	Goods	FTA	01/01/2015
Eurasian Economic Union (EAEU)	Goods & Services	CU & EIA	01/01/2015
Japan - Australia	Goods & Services	FTA & EIA	15/01/2015
Mexico - Panama	Goods & Services	FTA & EIA	01/07/2015
Türkiye - Malaysia	Goods	FTA	01/08/2015
Chile - Thailand	Goods & Services	FTA & EIA	05/11/2015
Korea, Republic of - Viet Nam	Goods & Services	FTA & EIA	20/12/2015
China - Korea, Republic of	Goods & Services	FTA & EIA	20/12/2015
Australia - China	Goods & Services	FTA & EIA	20/12/2015
Korea, Republic of - New Zealand	Goods & Services	FTA & EIA	20/12/2015
Southern Common Market (MERCOSUR) - Southern African Customs Union (SACU)	Goods	PSA	01/04/2016
Pacific Alliance	Goods & Services	FTA & EIA	01/05/2016
Japan - Mongolia	Goods & Services	FTA & EIA	07/06/2016
Korea, Republic of - Colombia	Goods & Services	FTA & EIA	15/07/2016
Costa Rica - Colombia	Goods & Services	FTA & EIA	01/08/2016
EU - Côte d'Ivoire	Goods	FTA	03/09/2016
Eurasian Economic Union (EAEU) - Viet Nam	Goods & Services	FTA & EIA	05/10/2016
EU - SADC	Goods	FTA	10/10/2016
Türkiye - Moldova, Republic of	Goods	FTA	01/11/2016
EU - Ghana	Goods	FTA	15/12/2016
Peru - Honduras	Goods & Services	FTA & EIA	01/01/2017
Canada - Ukraine	Goods	FTA	01/08/2017
Southern Common Market (MERCOSUR) - Egypt	Goods	FTA	01/09/2017
EFTA - Georgia	Goods & Services	FTA & EIA	01/09/2017
EU - Canada	Goods & Services	FTA & EIA	21/09/2017
Türkiye - Faeroe Islands	Goods	FTA	01/10/2017
Türkiye - Singapore	Goods & Services	FTA & EIA	01/10/2017
Hong Kong, China - Macao, China	Goods & Services	FTA & EIA	27/10/2017
El Salvador - Ecuador	Goods	PSA	16/11/2017

China - Georgia	Goods & Services	FTA & EIA	01/01/2018
EU - Armenia	Services	EIA	01/06/2018
EFTA - Philippines	Goods & Services	FTA & EIA	01/06/2018
Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP)	Goods & Services	FTA & EIA	30/12/2018
EU - Japan	Goods & Services	FTA & EIA	01/02/2019
Hong Kong, China - Georgia	Goods & Services	FTA & EIA	13/02/2019
ASEAN - Hong Kong, China	Goods & Services	FTA & EIA	11/06/2019
Chile - Indonesia	Goods	FTA	10/08/2019
Türkiye - Kosovo	Goods	FTA	01/09/2019
Korea, Republic of - Central America	Goods & Services	FTA & EIA	01/10/2019
Eurasian Economic Union (EAEU) - Iran	Goods	FTA	27/10/2019
EU - Singapore	Goods & Services	FTA & EIA	21/11/2019
Hong Kong, China - Australia	Goods & Services	FTA & EIA	17/01/2020
Peru - Australia	Goods & Services	FTA & EIA	11/02/2020
United States-Mexico-Canada Agreement (USMCA/CUSMA/T-MEC)	Goods & Services	FTA & EIA	01/07/2020
Indonesia - Australia	Goods & Services	FTA & EIA	05/07/2020
EU - Viet Nam	Goods & Services	FTA & EIA	01/08/2020
Colombia - Israel	Goods & Services	FTA & EIA	11/08/2020
EFTA - Ecuador	Goods & Services	FTA & EIA	01/11/2020
Pacific Agreement on Closer Economic Relations Plus (PACER Plus)	Goods & Services	FTA & EIA	13/12/2020
EU - United Kingdom	Goods & Services	FTA & EIA	01/01/2021
Ukraine - Israel	Goods	FTA	01/01/2021
United Kingdom - SACU and Mozambique	Goods	FTA	01/01/2021
China - Mauritius	Goods & Services	FTA & EIA	01/01/2021
United Kingdom - Japan	Goods & Services	FTA & EIA	01/01/2021
United Kingdom - Colombia, Ecuador and Peru	Goods & Services	FTA & EIA	01/01/2021

United Kingdom - CARIFORUM States	Goods & Services	FTA & EIA	01/01/2021
United Kingdom - Central America	Goods & Services	FTA & EIA	01/01/2021
United Kingdom - Chile	Goods & Services	FTA & EIA	01/01/2021
United Kingdom - Côte d'Ivoire	Goods	FTA	01/01/2021
United Kingdom - Eastern and Southern African States	Goods	FTA	01/01/2021
United Kingdom - Faroe Islands	Goods	FTA	01/01/2021
United Kingdom - Georgia	Goods & Services	FTA & EIA	01/01/2021
United Kingdom - Israel	Goods	FTA	01/01/2021
United Kingdom - Switzerland - Liechtenstein	Goods	FTA	01/01/2021
United Kingdom - Tunisia	Goods	FTA	01/01/2021
United Kingdom - Ukraine	Goods & Services	FTA & EIA	01/01/2021
United Kingdom - Kosovo	Goods	FTA	01/01/2021
United Kingdom - Lebanon	Goods	FTA	01/01/2021
United Kingdom - Morocco	Goods	FTA	01/01/2021
United Kingdom - Pacific States	Goods	FTA	01/01/2021
United Kingdom - Palestine	Goods	FTA	01/01/2021
United Kingdom - Korea, Republic of	Goods & Services	FTA & EIA	01/01/2021
United Kingdom - Cameroon	Goods	FTA	01/01/2021
United Kingdom - Egypt	Goods	FTA	01/01/2021
United Kingdom - Singapore	Goods & Services	FTA & EIA	01/01/2021
United Kingdom - Türkiye	Goods	FTA	01/01/2021
United Kingdom - Viet Nam	Goods & Services	FTA & EIA	01/01/2021
United Kingdom - Kenya	Goods	FTA	01/01/2021
United Kingdom - Moldova, Republic of	Goods & Services	FTA & EIA	01/01/2021
United Kingdom - North Macedonia	Goods & Services	FTA & EIA	01/01/2021
United Kingdom - Ghana	Goods	FTA	05/03/2021
India - Mauritius	Goods & Services	FTA & EIA	01/04/2021
United Kingdom - Jordan	Goods	FTA	01/05/2021
United Kingdom - Albania	Goods & Services	FTA & EIA	03/05/2021
United Kingdom - Serbia	Goods & Services	FTA & EIA	20/05/2021
United Kingdom - Mexico	Goods & Services	FTA & EIA	01/06/2021
Eurasian Economic Union (EAEU) - Serbia	Goods	FTA	10/07/2021
EFTA - Türkiye	Goods & Services	FTA & EIA	01/10/2021
EFTA - Indonesia	Goods & Services	FTA & EIA	01/11/2021
United Kingdom - Iceland, Liechtenstein and Norway	Goods & Services	FTA & EIA	01/12/2021
India - United Arab Emirates	Goods & Services	FTA & EIA	01/05/2022

Caribbean Community and Common Market (CARICOM)	Goods & Services CU & EIA	01-Aug- 1973(G) / 04- Jul-2002(S)
EU - Albania	Goods & Services FTA & EIA	01-Dec- 2006(G) / 01- Apr-2009(S)
ASEAN - Japan	Goods & Services FTA & EIA	01-Dec- 2008(G) / 01- Aug-2020(S)
EU - Chile	Goods & Services FTA & EIA	01-Feb- 2003(G) / 01- Mar-2005(S)
EU - Serbia	Goods & Services FTA & EIA	01-Feb- 2010(G) / 01- Sep-2013(S)
Australia - New Zealand Closer Economic Relations Trade Agreement (ANZCERTA)	Goods & Services FTA & EIA	01-Jan-1983(G) / 01-Jan- 1989(S) 01-Jan-2005(G)
ASEAN - China	Goods & Services FTA & EIA	/ 01-Jul- 2007(S) 01-Jan-2008(G)
EU - Montenegro	Goods & Services FTA & EIA	/ 01-May- 2010(S) 01-Jan-2010(G)
ASEAN - India	Goods & Services FTA & EIA	/ 01-Jul- 2015(S) 01-Jan-2010(G)
ASEAN - Korea, Republic of	Goods & Services FTA & EIA	/ 01-May- 2009(S) 01-Jan-2021(G)
United Kingdom - Canada	Goods & Services FTA & EIA	/ 01-Apr- 2021(S) 01-Jul-2000(G)
EU - Mexico	Goods & Services FTA & EIA	/ 01-Oct- 2000(S) 01-Jul-2007(G)
Pakistan - China	Goods & Services FTA & EIA	/ 10-Oct- 2009(S)

EU - Bosnia and Herzegovina	Goods & Services FTA & EIA	01-Jul-2008(G) / 01-Jun-2015(S)
EU - North Macedonia	Goods & Services FTA & EIA	01-Jun-2001(G) / 01-Apr-2004(S)
Korea, Republic of - Türkiye	Goods & Services FTA & EIA	01-May-2013(G) / 01-Aug-2018(S)
Chile - China	Goods & Services FTA & EIA	01-Oct-2006(G) / 01-Aug-2010(S)
Southern African Development Community (SADC)	Goods & Services FTA & EIA	01-Sep-2000(G) / 13-Jan-2022(S)
Türkiye - Serbia	Goods & Services FTA & EIA	01-Sep-2010(G) / 01-Jun-2019(S)
European Free Trade Association (EFTA)	Goods & Services FTA & EIA	03-May-1960(G) / 01-Jun-2002(S)
East African Community (EAC)	Goods & Services CU & EIA	07-Jul-2000(G) / 01-Jul-2010(S)
Asia Pacific Trade Agreement (APTA)	Goods & Services PSA & EIA	17-Jun-1976(G) / 17-Sep-2013(S)
ASEAN Free Trade Area (AFTA)	Goods & Services FTA & EIA	17-May-2010(G) / 12-Aug-1998(S)
Southern Common Market (MERCOSUR)	Goods & Services CU & EIA	29-Nov-1991(G) / 07-Dec-2005(S)

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