IntechOpen

IntechOpen Series
Business, Management and Economics,
Volume 7

Global Market and Trade

Edited by Ireneusz Miciuła

Global Market and Trade

Edited by Ireneusz Miciuła

Published in London, United Kingdom

Global Market and Trade
http://dx.doi.org/10.5772/intechopen.104245
Edited by Ireneusz Miciuła

Contributors
Nnadozie Godswill Nnadozie Ndubuaku, Godson Jerry, Lindokuhle Talent Zungu, Lorraine Greyling, Yolanda Nomusa Nkomo, Bongumusa Prince Makhoba, Terver Audu, John Ogonna Okorie, Aminat Orekoya, Strike Mbulawa, Dieudonné Mignamissi, Vladimir Bukvič

First published in London, United Kingdom, 2023 by IntechOpen
IntechOpen is the global imprint of INTECHOPEN LIMITED, registered in England and Wales, registration number: 11086078, 5 Princes Gate Court, London, SW7 2QJ, United Kingdom
Printed in Croatia

British Library Cataloguing-in-Publication Data
A catalogue record for this book is available from the British Library

Additional hard and PDF copies can be obtained from orders@intechopen.com

Global Market and Trade
Edited by Ireneusz Miciuła
p. cm.

This title is part of the Business, Management and Economics Book Series, Volume 7
Topic: Economics
Series Editor: Taufiq Choudhry
Topic Editor: Jaime Ortiz

Print ISBN 978-1-83768-456-4
Online ISBN 978-1-83768-457-1
eBook (PDF) ISBN 978-1-83768-458-8
ISSN 2753-894X

IntechOpen Book Series

Business, Management and Economics

Volume 7

Aims and Scope of the Series

This series will provide a comprehensive overview of recent research trends in business and management, economics, and marketing. Topics will include asset liability management, financial consequences of the financial crisis and covid-19, financial accounting, mergers and acquisitions, management accounting, SMEs, financial markets, corporate finance and governance, managerial technology and innovation, resource management and sustainable development, social entrepreneurship, corporate responsibility, ethics and accountability, microeconomics, labour economics, macroeconomics, public economics, financial economics, econometrics, direct marketing, creative marketing, internet marketing, market planning and forecasting, brand management, market segmentation and targeting and other topics under business and management. This book series will focus on various aspects of business and management whose in-depth understanding is critical for business and company management to function effectively during this uncertain time of financial crisis, Covid-19 pandemic, and military activity in Europe.

Meet the Series Editor

Prof. Choudhry holds a BSc degree in Economics from the University of Iowa, as well as a Masters and Ph.D. in Applied Economics from Clemson University, USA. In January 2006, he became a Professor of Finance at the University of Southampton Business School. He was previously a Professor of Finance at the University of Bradford Management School. He has over 80 articles published in international finance and economics journals. His research interests and specialties include financial econometrics, financial economics, international economics and finance, housing markets, financial markets, among others.

Meet the Volume Editor

Ireneusz Miciuła is an assistant professor at the Institute of Economics and Finance, University of Szczecin, Poland. He is the author of more than 250 scientific publications in economics, finance, management, and information technology. Dr. Miciuła has participated in many international scientific conferences. He holds a scholarship from the Human Capital Operational Program and conducts research at the European University Institute, Italy. He is a visiting researcher at several universities in Germany, Czech Republic, Romania, Albania, Greece, and Portugal. He is a member of the *Journal of Economics and Public Finance* and a reviewer for the Polish-U.S. Fulbright Foundation. He is also a member of the Polish Finance and Banking Association and Polish Economic Society. Dr. Miciuła is an expert at the Polish Agency for Enterprise Development and the Energy Regulatory Office and a scientific expert at the Foundation for Polish Science.

Contents

Preface

Global Market and Trade provides knowledge, recommendations, and practical solutions to new challenges within the contemporary processes of globalization and international trade.

Globalization and world trade management are considered the most crucial factors in the intelligent and sustainable development of knowledge-based economies. The global market is of scientific and technical interest and is related to the interpenetration of processes and phenomena of a technical, organizational, marketing, social, and psychological nature. This is due to the indisputable impact of information technology and the interdisciplinary nature of the organization of the global market on socio-economic development. This affects the competitiveness of enterprises and is subject to previously unknown management processes. Contemporary organizations have faced new realities of management, which have modified management methods both to the dynamically changing environment and to the means of communication used. In this way, the choice of topics in this book is also a reference to future global socioeconomic problems.

The current globalization forces business entities to modify the previously used management concepts or to create them anew according to applicable standards, rules, and even market trends. This book pays special attention to the issues of contemporary foundations of the global market and trade based on the development of information technology and new geopolitical and religious conditions. In addition, it includes empirical models that present detailed practical problems and creative elements of management in the socio-economic system. This book indicates that current knowledge and technology are the basic factors stimulating socioeconomic development, influencing the transformation of the global environment and increasingly stronger competition.

Section 1: "Contemporary Foundations of the Global Market and International Trade" contains three chapters on the general conditions of the functioning of the global economy. Chapter 1: "Rethinking Financial Globalization" discusses the financial phenomena that are so important today in the global market. ITC technology and the rules of financial flows are the most important changes in modern globalization and world trade. Chapter 2: "Trade and Culture: Religion Dynamics" explores the social (cultural and religious) conditions of world markets and trade. Chapter 3: "Utilizing e-Tendering in the Procurement of Construction Project" presents practical solutions for the functioning of global markets with IT devices and applications in the construction industry.

Section 2: "Empirical Models of Detailed Assumptions and Conditions in the Global Market" contains three chapters on empirical research. Chapter 4: "The Nonlinear Dynamic Impact of Development-Inequality in the Prudential Policy Regime in Emerging Economies: A Bayesian Spatial Lag Panel Smooth Transition Regression

Approach" presents the impact of development inequality on policy in emerging economies and how it translates into functioning in the global trading world. Chapter 5: "The EFQM Model as an Exquisite Tool for the Analysis of Business Excellence and Its Use in the Healthcare Industry" shows the possibilities of using specific methods to assess business models in the modern economy, using the health industry as an example. Chapter 6: "The Dynamic Effects of Monetary Arrangements on Bilateral Trade in the African Franc Zone" presents an analysis of the functioning of monetary arrangements based on a selected currency and their effects on trade in the global market.

We would like to thank all those who contributed to the creation of this publication, especially the chapter authors for their inspiring scientific considerations. As the editor of this monograph, I hope that many of the presented issues will motivate the reader to become interested in the subject matter, which will translate into undertaking their own investigations and developing innovative solutions to the discussed research problems.

Ireneusz Miciuła
Department of Sustainable Finance and Capital Markets,
Institute of Economics and Finance,
University of Szczecin,
Szczecin, Poland

Section 1

Contemporary Foundations of the Global Market and International Trade

Chapter 1

Rethinking Financial Globalization

Strike Mbulawa

Abstract

This chapter introduces the concept of financial globalization and examines the factors driving financial globalization in emerging and developing market economies. The role of financial globalization in driving development and strengthening of the financial sector, sustainable economic growth, and the nature of innovations are explored. On a broader scale, there is a need to understand the developments in global financial innovation and implications for developing and emerging markets. The chapter explores the challenges, and risks and benefits of financial globalization to emerging and developing markets and how they will shape future behavior and interactions by economic agents in these markets. Financial globalization can lead to different outcomes that include but not limited to domestic capital flight and potential effects on net capital flows, investment, and growth; capital inflows and higher investment and growth; or volatile capital flows and unstable domestic financial markets. The chapter discusses the measurement issues on financial openness. These all need to be explored in this context and considering the rise in innovations in the financial sector.

Keywords: financial globalization, regulation, developing and emerging markets, financial risk, financial globalization impact

1. Introduction

> *"No generation has had the opportunity, as we now have, to build a global economy that leaves no-one behind. It is a wonderful opportunity, but also a profound responsibility." – Former U.S. President Bill Clinton*

> *"Our global economy is out of control and performing contrary to basic principles of market economics." – David Korten, Economist and Former Professor at the Harvard School of Business*

> *"The lack of monetary discipline has become a hallmark of unfettered globalization. Central banks have failed to provide a stable underpinning to world financial markets and to an increasingly asset-dependent global economy." – Stephen Roach, Former Chairman for Asia and Chief Economist for Morgan Stanley [1]*

Financial globalization encompasses the increase in global connections created through cross-border financial flows. It has been on the increase among developed

nations in the last four decades. These movements have been on the rise between industrialized and developing countries. Economic growth rates have been high in those countries that experienced huge capital flows but in others adverse results have been experienced. There has been a rise in the effects of the financial crises due to the increase in financial flows and consequently, huge macroeconomic and social costs have been experienced. Debate has been on the rise to rethink on the outcomes of financial globalization in the context of developing countries. Countries with huge financial flows have experienced high growth though literature fails to agree on the nature of the relationship between financial globalization and growth. As an extension, it has been challenging for past studies to explain the link between consumption and growth as the former is deemed to be a better driver of welfare by working through the latter. Countries that can register stable growth in consumption levels experience stable growth.

It is noteworthy to say that financial globalization has a positive effect on growth. This receives support from the past studies [2–4], which found a positive linkage between growth, investment, and financial development. As developed countries receive capital, they are bound to improve on their profitability levels on capital invested and more so, capital accumulation increases. However, it is important to point out that countries need to avoid being heavily indebted as this may harm growth. Literature brings a distinction between investment-globalization and indebtedness-globalization. The former is experienced as developing countries receive more loans that increase the burden of repayments with high interest rates in foreign currency. The latter is experienced when capital moves around the world in search of good returns. Most developing countries are caught up in debt which is retrogressive. This has caused such countries to rethink of a possible way out. For example, import substitution industrialization has failed to pay dividends and it contrasts with export-oriented industrialization experienced by the countries in Asia [5]. This is also supported by Gaies et al. [6] who show that growth is improved by both financial and investment globalization, while indebtedness globalization causes financial instability that has adverse effects on growth.

Discussions of its impact on growth through trade are widespread. For example, Balcilar and Gungor [7] show that globalization has enhanced growth prospects of nations as it works through financial development. The immediate effect of globalization is to improve the financial services sector. There is a marked improvement in domestic financial flows as savings rise. It leaves policy makers with the need to draft and implement policies that improve access to funding and the usage thereof. Abraham and Schmukler [8] also show the importance of focusing on risk and not only the potential growth as failure to do leave the country exposed. There is still possibility that the economy is susceptible to global risks. This requires an effective support that comes from strong institutions within the economy. High-quality institutions are vital for effective and positive developments in the economy. The expectation is that as financial globalization increases, there are positive effects on the economy information of improved diversification and improved allocative efficiency of credit as entrance of foreign institutions deters government interventions in the economy [9]. The coming sections discuss the key concepts underlying financial globalization, brings clarity on the issues of definitions and measurement, sheds light on developments in financial globalization, its persistence and context in developing economies, its perceived impact, costs, and benefits.

2. The key concepts

Financial globalization and financial integration are taken to represent the same thing. In principle, the latter is experienced as countries are connected to international capital markets. In this context, financial globalization and financial integration are connected as a rise in the former leads to an increase in the latter. In most cases, the two terms are used interchangeably and hence, there is no need for confusion when that happens. More so, financial openness is the extent to which the financial market of a country is accessible by others and is synonymous with financial integration [10]. Financial globalization entails increasing capital account liberalization and having unhindered capital flows. This has been considered essential as a means for upgrading from lower- to middle-income status. It enhances stability of developed nations. On the other hand, it has been considered to bring global financial instability [11–13]. Financial globalization is a decision that policy makers should make seeing its importance. It requires policy makers to take care on how such decisions are made as hasting them may pose threats to their economic systems as they leave them exposed. What makes this debate interesting are the varying results, country experiences, and the speed with which they applied financial liberalization. Results have remained inconclusive as they are country specific, and they depend on the data and methodology employed leaving policy makers in different contexts with no direction. The aim is to focus on literature and bring out country experiences that could help developing and emerging market economies to rethink about this phenomenon and how they can adjust and use the same in their context.

The extent to which countries leave their markets open to financial flows determines the level and quality of capital inflows. Surprisingly, countries in Africa do not have strict policies hindering capital flows but they have experienced low financial flows. Pull and push factors help to understand these dynamics. The former arises from changes made to policies and other areas that seek to open markets like liberalization of capital accounts, privatization, and increasing flexibility in stock markets. The latter involves changes experienced in industrialized countries like changes in business cycles and other macroeconomic policies. The perceived increase in global financial risks has reshaped the behaviors in the financial system. The amount of global financial flows has fallen by more than 50% in absolute terms compared to their pre-global financial crisis levels. This fall has been explained by a slowed down in participation in foreign markets of financial institutions in the developed countries. Financial institutions in the Eurozone have made a retreat from foreign markets. There has been concern on the stability of financial institutions, their profitability, risk, and speed with which they respond to proposed regulations to strengthen their capital base [14].

However, there has been an increased presence in foreign markets by financial institutions from developing and developed countries such as China and Japan. China's prominence in global financial transactions can be traced back to the late 1970s when the financial and real sectors were liberalized. This opened the economy to foreign trade, which resulted in a rise in exports and growth of the manufacturing sectors. Inward FDI increased as firms got interested in the market to take advantage of the large population. FDI was critical in creating competition and advancing technology. Excess revenues from exports became a source of funds for building foreign currency reserves. The relaxation of restrictions on capital flows helped the Chinese economy to maintain a diversified role in global financial system. This was supported

by the government and central bank's decision to diversify their foreign holdings. The Chinese Renminbi is gaining momentum as widely a used currency in international transactions and it is now recognized by the International Monetary Fund as one of the currencies in its basket of special drawing rights. There is still need for the Renminbi to become a true international currency by becoming fully convertible at any time by market participants.

More so, unconventional monetary policies have been employed to support financial institutions in advanced economies. This shows the rise in risks and not necessarily an end of financial globalization. Such changes signal a move toward less risk financial positions. There has been a move toward correcting the causes of exposures in the pre-financial crisis period in which financial institutions held excess balances in their books. As much as financial globalization is becoming more inclusive, there is challenge of disruptions emanating from new financial technologies such as block chain and machine learning. They can ensure flexibility and increase in speed with which financial transactions are done across borders.

3. Measuring financial openness

Measuring financial openness has been a challenge. Basically, there are two ways of measuring financial openness. The traditional approach uses measures of legal restrictions on cross-border cash flows. These controls can be in form of those on inflows, outflows, on price, and quantity. An alternative approach is to measure the extent of a country's financial system's integration into the international capital markets. Quantitative measures have been generated to determine capital account openness and these have been changing depending on the authors and country information being applied. None of the generated measures is without shortcomings. It has been observed that most measures fail to explain the degree of financial openness with accuracy as they are generated using restrictions associated with foreign exchange transactions that may reduce the capital movements. They fail to gauge the extent at which capital controls are enforced as this tends to be dynamic. As explained, they fail to show the exact level of integration of a country into international markets. It can be possible that a country institute capital controls, but we can still see a surge in capital flows. It is also difficult to account for controls into the measures of financial openness as some may not be recognized as such by those who construct such indexes. Moreover, the measures of openness may be theoretical and not truly reflect the reality. Economists have attempted to measure openness using the price-based measures that look at common prices of similar financial instruments across the nations. However, these measures suffer setbacks when applied in developing countries as it has become difficult to quantify risk and other liquidity measures in these jurisdictions. It is possible to use measures like the investment saving correlations, but they also encounter problems of interpretation and how to apply them over long durations or periods. It has been argued that quantity-based measures are correct and reflect a true measure of capital account openness. An alternative measure of capital openness is to use either net or gross capital flows. This provides a measure that is less variable, which accounts for both types of capital flows reflecting countries' degree of accounting for and sharing risks efficiently. It is expressed as total gross inflows and outflows as percentage of gross domestic product (GDP). This is the standard measure of trade openness, which combines exports and imports.

Usually, this measure may provide measurement error, which is handled by using a measure of total of foreign assets and liabilities as a percentage of GDP. In the context of risk sharing, this measure including others of similar nature is considered as appropriate [15–17]. It is critical that emerging and developing markets think on the best measure of financial openness that explains the impact of financial globalization in their context.

4. Developments in the financial globalization

The changes in behavior of banks in developing countries are explained by an array of factors. As a result of heavy losses incurred during and after the crisis, financial institutions needed to rebalance their portfolios. The coming of Basel III meant that banks would need to raise capital through selling of existing assets to reduce the balance sheet size. The exiting of foreign markets by banks in developed countries was based on the realization that they earned lower margins in portfolios in those markets compared to earnings in domestic markets. This culminated in maintaining lean business lines, non-renewal of foreign loans at maturity time. The fear of exposure to high risk caused banks to hold less assets. More so, the coming in of new regulations in financial institutions in foreign markets meant that it became less attractive to maintain huge portfolios in those markets. Again, keeping large balance sheets would suggest increased size and complexity of managing such portfolios and hence huge commitment by financial institutions. However, banks in China, Japan, and Canada did not have much choice as they experienced a saturated home market. This meant the ideal option would be to expand activities in foreign markets. For example, banks in China have nearly 10% of their assets in foreign markets. However, this remains lower than the 20% foreign holdings of other developed countries.

In support of financial institutions post-crisis period, central banks have increased their balance sheets as a percent of GDP. For example, the combined total of balance sheets for central banks in Japan, England, Eurozone, and United States was more than 35% of GDP. The assets for the Central Bank of Japan are almost reaching 100% of GDP. The involvement of central banks in financial markets has become a necessity as they need to intervene to ensure enough liquidity and mitigate against chances of bankruptcy. There has been enhanced credit support in countries that have financial systems that are bank oriented. The central banks, in the Eurozone, had to fill in the gap created by the reduction in cross-border financial flows. The financial systems in United States and United Kingdom are predominantly capital oriented and as such central banks make targeted interventions in the money and capital markets. Withdrawal of the current support by central banks may result in bring unforeseen instability in financial markets. The current scenario of having less foreign holding, in foreign markets, by banks in the developed markets is a complete opposite of what happened during and after the Asian Financial Crisis in 1997/98. During that time, central held large assets bases in developing countries, which was underpinned by rising exports in commodities and manufacturing products. Central banks used the excess reserves from sale of these products to acquire safe and liquid assets abroad, which increased their holdings in treasury bills and other government bonds. Post the global financial crisis, receipts from sale of commodities and manufacturing exports to developing countries dwindled and as such central banks in developed countries have no excess funds.

5. The persistence of financial globalization

The retreat by foreign financial institutions may cause one to conclude that financial globalization has stagnated which is not true. There is still a strong link between the markets in the developing and developed countries. It is true that the rapid growth of the value of foreign investments as % of GDP has declined. However, the most integrated financial systems are still found in the developed countries that include the United States and those in the Eurozone. Developing countries and some emerging market economies are still lagging in the extent to which their domestic markets are deepened and ready to absorb and intermediate foreign capital flows. But China has been more aggressive in the growth in foreign investments and liabilities between 2005 and 2017. The country is currently a major investor in most developing countries compared to other developed nations. It appears the country is on a drive to make its currency to lead in global trade ahead of the United States dollar. According to Prasad [18], the dominance of China in global finance is expected to rise. On other fronts, we have noted the growth in holdings of foreign stocks and other investments in countries such as South Africa, Russia, and Mexico. Their collective holding in foreign markets now accounts of more than 14% of the global portfolio, which is double their holding in 2007. Their economies and role that they will play in global financial markets are expected to grow. Furthermore, we are witnessing the growth and establishment of international global hubs in countries such as Mauritius, Hong Kong, Ireland, and Luxembourg among others. Their global foreign investments have been on the rise since the 2007 crisis. These countries are supported by strong institutions and policies that include low tax rates, excellent regulations, and strong and vibrant banking systems. These hubs attract foreign capital and invest it abroad, which have implications on how we measure global financial flows and avoiding double counting.

More stability is expected in the global financial markets due to the increased regulation and strong capital bases driven by the Basel III accord. Monitoring has increased as banks are subject to stringent stress tests, and they are expected to hold a strong capital base and a certain amount of liquid assets. In addition, the share of flows in foreign direct investment (FDI) and equity in cross-border financial flows is increasing. Their level has reached more than 60% of cross-border flows which almost double their 2007 level. The rise in flows is expected to increase stability in international flows. Bank lending is short term and most volatile, while FDI is long term and regarded as stable. There has been a rise in remittances from migrants back to their families in the developing countries. These remittances are more than 60% of private capital flows, and it is more that thrice the level of official development assistance. We are still witnessing a fall in global financial imbalances, which are reflected by narrow deficits and surpluses. The financial and capital accounts for countries help to understand their net capital positions. For example, there are countries that have net outflows, which reflects that they are accumulating foreign assets and they are classified as suppliers of capital in the global financial system. There are countries in net capital inflows, which are, to larger extent, net borrowers and, hence accumulating foreign liabilities. Such deficits and surpluses have declined from 2.6% of GDP in 2007 to 1.7% of GDP in 2017. China stands out as one of the countries with a net capital inflow position with the likes of Germany and Japan. There is still high volatility in capital flows in form of cross-border lending in both developing and advanced economies. Such changes affect the exchange rates movements and cause adverse effects in the macroeconomy. This has implications on the required policies and strategies to cope with this increase in volatility. Systematic risk still exists due to poor

regulatory frameworks in the developing economics. This requires further action to develop policies on managing financial risks [19].

The risk of financial contagion still exists as financial markets are strongly interwoven and depend on each other. Contagion represents the spread of economic distress from one country to another. This is strengthened by the fact that countries have the same weaknesses as poor export demand or uncompetitive prices. Countries experience the flow of capital even with no changes in the underlying market conditions. The real and financial sectors interact with each other making it difficult to separate real from financial contagion. Financial contagion is seen in three dimensions. First, it shows the behaviors of investors who are trying to rebalance their portfolio whenever they experience a financial shock. Second, economies with weak institutions feel the adverse effects of investors' change in their portfolios. Third, the global economy is deeply integrated as such all economies are susceptible to the same shocks.

The advent of the Fourth Industrial Revolution has posed challenges and opportunities in the global financial system. For example, several applications have been developed, which affect the way financial institutions operate. Their monopoly in movements of money has been reduced as customers seek for online solutions. Online systems have proved to be cheaper, efficient, and convenient compared to traditional ways of moving finance. Thus, more global financial flows are expected to increase growth. There has been an increase in platforms that create new markets for financial flows. For example, lending platforms have been widened and other financial flows are being mediated by online platforms. Several digital platforms are being employed to raise and distribute funds that have created new ways of managing global finance. Blockchain is now on board to ensure quick, cheap, and safe global financial transactions and this is envisaged to cut transactions costs. Furthermore, other avenues have been created using artificial intelligence and smart machines, which increase efficiency. These platforms have potential impacts that can be felt on both domestic and international markets. In view of this, financial institutions need to look closely at the impact of these new online products on the way they operate. The implications thereof can guide on the development of new products or modernizing the traditional ways.

It is critical that financial institutions integrate ways of managing risk domestically and those applied internationally. As opportunities for international lending dwindle it is important for global banks to have an inward-looking strategy and make use of local liquidity. More so, overreliance on foreign operations is being hampered by increased regulations. In addition, foreign operations are becoming less profitable as international bank's market share fall. Banks are further deterred from foreign operations by increased strategic uncertainty. Performance has not improved despite efforts by financial market players to restructure their portfolios. This calls for new strategies to gain share in international markets. The financial reporting structure of banks must change as they find it more appropriate to combine balance sheets for local and foreign entities and not having to report their financials separately. Reporting separately has implications in the raising of funding by such standalone entities as they would need to show proof that they can sustain themselves. Banks will need to manage risks effectively and efficiently being supported by digital technology. Receiving high returns covering risks creates competitive advantages for such institutions. It may prove difficult for banks to cope with the demands to become digital players in international markets. More resources are required, and few banks have managed to secure digital transformation. Monitoring risks by financial

institutions requires more than just putting regulations, checking on systematic risk, and conducting stress tests. Basel III is still to be adopted and applied by several countries, which leaves banks, locally and internationally, exposed. There is need for making dynamic changes in the risk management architecture to cope with changes. This is driven by the continued volatile markets, which requires finding ways of coping with macroeconomic results of such fluctuations. As much as digital platforms can be useful in bringing efficiency in international financial transactions, they bring new risks such as money laundering and others related to terrorism. It is not clear how countries will respond not only to risk management but how they do monetary policy activities.

6. Developing and emerging market economies and globalization

Emerging markets account for a huge share of capital inflows to developing economies. For example, between 1980 and 1984 the share of gross stocks of foreign assets and liabilities has been 75% of GDP, while between 2000 and 2004 it stood at 59% for advanced economies. On the other hand, emerging market economies have accounted for 13% and 37% respectively in the same periods. This is explained by their level of financial integration into financial markets. Thus, there are notable differences across different country groupings on the types of capital flows. It is important to note the shift from debt to FDI and equity flows as forms of financing. Few developing countries participate in the process of financial globalization. Capital flows into developing economies are mainly in the form foreign direct investment (FDI) and equity. In emerging markets, such measures of capital flows (FDI and equity) are referred to as being less volatile compared to debt flows.

It is generally agreed that debt flows, including portfolio bond flows and commercial loans, come with more risk from financial openness. They result in inefficient allocation of capital, generate moral hazard, and fail to solve the problem of agency. Their high level of volatility means they can be easily reversed during time of crisis. Such reversals are experienced by countries that rely mainly on portfolio debt flows. Short-term debt is affected by business cycles as it rises with booms and falls with recessions. Thus, opening to debt flows increases a country's vulnerability to global shocks. Financial institutions tend to overborrow where there is weak supervision. Disaster comes with increased moral hazard and unrestricted capital movements. In the event of having an undeveloped financial sector, a country will suffer heavily from shocks after borrowing short-term debt denominated in foreign currency. The connection between short-term debt and financial crisis is evident. This is supported by the existence of currency and maturity mismatches of debt structures. This does not mean that a country would benefit by avoiding such debt flows. Rather countries can still borrow short and finance illiquid projects. The existence of illiquidity is the one that poses high risks and not borrowing short. However, by borrowing short a country commits to develop effective macroeconomic policies. For developing market economies, debt levels are raising, which pose threats to a new debt crisis. This could be averted by creating the right policies and attracting the right financing instruments [20].

There is concern on the effects of financial globalization on emerging markets. The role finance in brewing several crisis periods is generally agreed. For example, in the 1930s finance played a role in the economic depression, and developing countries have experienced debt problem early 1970s and 1980s. The role finance in

the currency crisis has been witnessed in several countries particularly in Asia and Latin America. There are imperfections in the emerging market economies that have increased the level of vulnerability to economic agents. Most countries have been adversely affected due to the contagion effect. More so, the main challenge in the global front is the asymmetry between markets that are sophisticated and dynamic and the non-availability of regulations. Countries have tried to develop tools for handling a crisis caused by such challenges, but evidence shows that they have fallen short. The economies have continued to show deflationary tendencies despite adjustment programs being put in place. Some economies have suffered a blow as investors tended to shy away from them due to loss of confidence [21, 22].

It is still critical that countries develop institutional frameworks for managing financial globalization. The development of an institutional framework for financial globalization will help to stabilize and remove market inefficiencies. This will provide international regulatory and supervisory system. The existing regulatory institutions need to be modernized to allow market players to make informed decisions. The economic systems that govern our decisions need to be flexible and keep abreast with changes in the developed market economies. It is important to say that institutions need to be proactive and give a framework that accommodates effective interaction at political, social, and economic level. All support institutions need to be consistent with the market operations as well as globalization. Pressure falls on existing systems to reform due to the increased systematic risk.

7. The impact of financial globalization

Financial globalization affects economic growth, volatility, and comovement. The contribution to growth is evidenced by the development of emerging market economies in recent years, particularly in countries such as India and China. But still, there is no agreement on the effects of financial globalization on growth as some studies argue that it has no effect while others argue that it drives growth. The different conclusions are a result of the different measures of financial openness applied [11, 15]. It is critical that the best proxy for financial openness be employed to examine its effects on growth. The types of inflows and outflows employed have a bearing on the outcomes obtained in growth. The effect of financial openness on growth has been limited in the developing countries [23], while it has been positive in advanced and emerging market economies [24]. Variations on the impact of financial openness on growth are explained by the period of analysis. Studies carried out over longer durations tend to be accurate in predicting the impact of financial globalization. The starting period also matters in explaining differences in findings [11, 24]. More so, differences in methodologies employed bring varying conclusions.

Though belief says so, there is no evidence suggesting that capital account liberalization causes financial crisis. Instead, financial globalization has improved the way in which risks are shared across countries. The crisis periods are a result of poor macroeconomic fundamentals. It is argued that capital controls cannot prevent a country from experiencing a crisis. But Edwards [23] indicates that higher capital mobility does not result in higher incidence of currency crises. Rather, it is found that capital account liberalization increases the incidence of banking crises, which tends to be more disruptive compared to currency crises. Hence, there is little evidence that financial crises are caused by financial globalization. There is no evidence linking financial globalization and volatility in output. As much as financial openness rises with volatility in consumption, it is better to keep markets open than to close the economy. As the degree

of financial openness increases, countries benefit from improved risk sharing and better consumption smoothing. This is mainly experienced by advanced economies compared to emerging and developing economies. The former has already passed this threshold, and this requires that the latter groups increase the level of openness to realize benefits of doing so. There has been an increase movement of business cycles and global factors. Correlations between output and consumption have been experienced in advanced economies because of financial openness. However, findings on comovement of output and consumption support those on the effects of financial openness on consumption and output volatility. Results need to be interrogated further using different datasets and ways of defining variables across and within countries. Lumping data across countries mean dealing with different capital flows that give misleading results and hence, a different approach may be needed. The benefits of financial globalization seem to be hidden in macroeconomic data but revealed in microeconomic data, which allows for more disaggregated analyses. At times it can be difficult to single out effects of financial openness from other variables. It should be noted that all measures and composition of capital flows are not the same. Flows such as FDI and equity are stable and do not easily experience reversals. More so, they bring indirect benefits such as managerial and technological expertise transfers. Thus, as we discuss the impact of financial globalization, there is need to consider changes of this variable over time in terms of measurement and composition. These data can be examined at both macro- and micro-level giving different results and statistical inferences.

8. Costs of financial globalization

Globalization results in sudden inflow and outflow of capital, which may bring instability to a country's development process. Capital account liberalization makes a country more vulnerable to sudden shifts in investor sentiments. There can be high costs of reversals of short-term flows of international capital. International flows of capital limit the national choices of effective monetary and fiscal policies. For example, it is not possible to, simultaneously, keep a fixed exchange, open the market, and follow monetary policy to attain desired aims. A country with a rigid exchange rate is vulnerable to crises when it opens its capital markets. Developing countries normally lack deep financial sectors and sudden changes in the direction of capital flows may cause boom bust cycles. Financial sector liberalizations need to be well managed; otherwise, they create crisis periods. It is also argued that trade integration must be put first ahead of capital account liberalization as it improves the cost benefit trade-off associated with financial integration. It reduces the probability of a crisis associated with financial openness and reduces such costs once they happen.

9. Benefits of financial globalization

As much as financial globalization comes with costs, we need to take note of the benefits. Foreign capital contributes to the development of the local economy and its flow helps to integrate international markets. The latter promotes improved allocative efficiency due to increased inter-temporal and inter-sectoral allocation of resources. It also removes limitations on a country's investment potential due to having inadequate savings. The benefits of opening capital flows are obtained on condition that such monies are used to expand the investment capacity of the country. Foreign

capital removes liquidity constraints, allows inter-temporal reallocation of consumption and savings, improves the efficiency of local financial institutions, and causes policy makers to desist from following policies that create speculative tendencies that affect capital movements and interest rates. The quality of domestic macroeconomic policies influences the level and composition of capital inflows. Benefits of financial liberalization are quickly realized where there are sound fiscal and monetary policies. Institutional quality determines both outcomes and the actual level of financial integration. They influence the composition of inflows to a developing country and its capital structure may be moved toward FDI and receiving of equity flows. It is also agreed that capital mobility is on the rise and therefore cannot be stopped. The benefits outweigh the costs and capital flows will continue. For example, the advent of technology means small changes in interest rates would trigger movements of capital across countries within the shortest period. Countries are still prone to boom-bust episodes of huge capital flows to emerging markets. This could be followed by huge reversals and capital outflows. Badly managed booms create crisis periods thereafter.

Financial globalization comes with potential collateral benefits. There is greater widening of the domestic market, and it promotes efficiency gains for domestic firms as they get exposed to competition from foreign entrants. It acts as a catalyst for domestic financial market development as shown in the improved size of the banking sector and equity markets. Financial services are more likely to improve in a country with foreign banks than in a country without. Foreign entrants improve efficiency in equity markets. Stock markets tend to be more liquid and increase in size. Countries also adjust their corporate governance systems in response to increased globalization. Financial globalization influences growth through its indirect channels. Channels that are formed through building institutions, enhancing market discipline, and deepening the financial sector take time to be realized. This explains the reason why economists would quickly detect costs as benefits are realized over the long term.

It can be argued that countries meet with several complications as they adjust from less to more integrated financial market systems. Financial globalization comes with several benefits among them growth in the long-term and welfare gains. The failure of a country to provide support conditions leaves it exposed to shocks upon opening its capital account. Expected benefits tend to be delayed due to sudden stops in capital flows. The tension between benefits and costs of financial globalization always exists. The bone of contention is on whether to leave the country exposed to risks while expecting the collateral benefits to accrue. More so, it is important to check if a country must improve the domestic policies and quality of institutions while protecting itself from external forces. It is critical to note that risks cannot be avoided but they can be managed. Policies that work effectively in one country may not be of benefit to another. In other words, initial country conditions must be met before certain changes in the capital account can be entertained. A framework that generates benefits from opening a capital account while reducing risks is designed depending on a country's circumstances.

10. Exercises

- Describe the support infrastructure required by developing and emerging market economies before opening their capital accounts

- Outline the challenges and benefits of financial globalization in the context of emerging and developing economies

- Discuss how financial globalization poses risks and opportunities for driving growth
- Highlight the channels through which financial globalization affects developing economy
- Compare and contrast the different measures of financial openness.

11. Conclusions

This chapter has shown that financial globalization is not ending but rather it is changing the form. Benefits are both direct and indirect and they boost economic growth. The latter may turn out to be more important than the former in many ways. Increased growth comes with well-developed financial sectors, good quality of institutions, and good-quality macroeconomic policies. The magnitude and extent of the effect of financial globalization on the economy differs across jurisdictions and is explained by measurement issues, data quality, and methods applied in the analysis. When analyzing the effect of financial globalization, one needs to appreciate the channels, direct and indirect, that it works through. It is critical to understand the extent of a country's integration into the global space though this is not easy to do due to differences in measurement of key variables explaining financial openness. Measures that capture differences in legal and regulatory environment pose problems as such variables are operationalized differently across nations. There is still no concrete evidence that suggests that financial globalization causes financial crisis. More so, evidence on the composition of capital flows and their effect on growth are still inconclusive and require more research. Micro-data can better detect gains in productivity and growth emanating from financial openness compared to macro-data. Countries that meet desired thresholds levels on market development, quality of institutions, macroeconomic policies, and corporate governance do benefit more from financial globalization. It is critical that a country develop support infrastructure before opening its capital account to benefit from financial globalization. Identifying the types of reforms that a country should go through and correct timing are needed to generate the benefits of capital account opening, while mitigating against financial risk.

12. Implications

In view of the above, it is important that countries promote trade while putting in place effective tools for monitoring global developments that have spillover effects. This will help them to reduce contagion effect as well. Opening of trade and financial markets will improve efficiency in the domestic sectors of the economy. It is possible that as globalization increases, companies should improve production processes or rather develop new processes that help them to remain competitive. This will lower production costs and subsequently reduce prices on the global front. Subsequently, consumers will benefit as their welfare improves. On the other hand, countries need to develop effective tools for monitoring illicit financial flows that increase with globalization. Countering terrorism remains a priority and consumers will be adversely affected as currencies fluctuate and as job insecurity increases. This also calls for

governments, through the central banks, to come up with flexible but firm monetary policies that stabilize exchange systems and bring price stability. From a policy maker's point of view, it is critical to understand the channels through which financial globalization affects the economy. This helps in understanding its impact and the time it may take before such effects are felt. More so, this will help to design tailored policies that work effectively in each economy. Correct timing of policy implementation, improvements, and withdrawal is critical for the benefits of globalization to be realized.

Objectives

At the end of this topic, you should be able to:

- Define financial globalization
- Compare and contrast the different measures of financial globalization
- Discus the risks and opportunities brought by opening the capital account
- Examine the impact of financial globalization on growth
- Discuss the benefits and costs of financial liberalization

Author details

Strike Mbulawa
Botho University, Botswana

*Address all correspondence to: smint50000@gmail.com

References

[1] Farfan B. Inspirational Pro and Anti-Globalization Quotes from Economy Experts. 2018. Retrieved from: https://www.liveabout.com/inspirational-globalization-quotes-2892499. [Accessed 15 September 2022]

[2] Eichengreen B, Leblang D. Capital account liberalization and growth: was Mr. Mahathir right? International Journal of Finance & Economics. 2003;**8**(3):205-224

[3] Gündüz M. Financial globalization and economic growth: Panel causality analysis for EU. In: Handbook of Research on Social and Economic Development in the European Union. Pennsylvania, USA: IGI Global, International Academic Publisher; 2020. pp. 99-116

[4] Iamsiraroj S. The foreign direct investment–economic growth nexus. International Review of Economics & Finance. 2016;**42**:116-133

[5] Gaies B, Goutte S, Guesmi K. FDI, banking crises and growth: direct and spillover effects. Applied Economics Letters. 2019a;**26**(20):1655-1658

[6] Gaies B, Goutte S, Guesmi K. What interactions between financial globalization and instability?—growth in developing countries. Journal of International Development. 2019b;**31**(1):39-79

[7] Balcilar M, Gungor H, Olasehinde-Williams G. On the impact of globalization on financial development: a multi-country panel study. European Journal of Sustainable Development. 2019;**8**(1):350-350

[8] Abraham F, Schmukler SL. Financial globalization: A glass half empty? In: Handbook of Finance and Development. United Kingdom, Cheltenham: Edward Elgar Publishing; 2018. pp. 338-368

[9] Bruno V, Hauswald R. The real effect of foreign banks. Review of Finance. 2014;**18**(5):1683-1716

[10] Yu N. The measurement of financial openness: From the perspective of G20 countries. Journal of Chinese Economics. 2014;**2**(2):59-72

[11] Rodrik D. Who Needs Capital-account Convertibility? Havard University: Essays in International Finance; 1998. pp. 55-65

[12] Summers LH. International financial crises: causes, prevention, and cures. American Economic Review. 2000;**90**(2):1-16

[13] Tovar García ED. Financial globalization and financial development in transition countries. Economics Theory and Practice. 2012;**36**:155-178

[14] Lund S. The New Dynamics of Financial Globalization. USA: McKinsey Global Institute, University of Pennsylvania; 2017

[15] Edison HJ, Warnock FE. A simple measure of the intensity of capital controls. Journal of Empirical Finance. 2003;**10**(1-2):81-103

[16] Lane PR, Milesi-Ferretti GM. Exchange Rates and External Adjustment: Does Financial Globalization Matter? 2006. IIIS Discussion Paper No. 129. Available from: SSRN: https://ssrn.com/abstract=923770. DOI: 10.2139/ssrn.923770

[17] Prasad E, Wei SJ. The Chinese approach to capital inflows: patterns

and possible explanations. In: Capital Controls and Capital Flows in Emerging Economies: Policies, Practices, and Consequences. Chicago. USA, University of Chicago Press; 2007. pp. 421-480

[18] Prasad ES. A Middle Ground: The Renminbi is rising but will not rule. Finance & Development. 2017;**54**(001)

[19] Kose MA, Prasad E, Rogoff K, Wei SJ. Financial globalization: A reappraisal. IMF Staff Papers. 2009;**56**(1):8-62

[20] Rogoff K, Kose A, Prasad E, Wei SJ. Effects of Financial Globalization on Developing Countries: Some Empirical Evidence. Washington D.C. USA: International Monetary Fund; 2003

[21] Ffrench-Davis R, Pietrobelli C, Zamagni S, Ocampo JA. Financial Globalization and the Emerging Economies. Santiago. Chile: Economic Commission for Latin America and the Carribbean; 2000

[22] Yeyati EL, Williams T. Financial globalization in emerging economies: Much ado about nothing? Economía. 2014;**14**(2):91-131

[23] Edwards S. Financial openness, sudden stops, and current-account reversals. American Economic Review. 2004;**94**(2):59-64

[24] Quinn D. The correlates of changes in international financial regulation. American Political Science Review. 1997;**91**:531-551

Chapter 2

Trade and Culture: Religion Dynamics

Terver Audu, John Ogonna Okorie and Aminat Orekoya

Abstract

The study seeks to understand the implications of cultural indices like language and religion on international trade. Using data compiled on the three most religious states and the three least religious states in the world, we reviewed the trading activities of these countries alongside their trading partners to find out if they are culturally connected or not. The research controls for colonialism and geographical distance. This is to isolate the effects of common colonial heritage and geographical proximity of countries on the trade between such countries. The study concludes that trade of cultural goods in the most and least religious countries in the world is not significantly determined by cultural layers of religion and language but other factors such as reciprocity trading and economic factors.

Keywords: culture, cultural layers, trade, religious, language

1. Introduction

Culture is the sum total of an individual's experience, knowledge, value, attitude, innovation and entrepreneurship, gained as a member of society. Culture comprises of many layers and a number of areas which include language, religion, material culture, art, education and relationships amongst others that make an individual a complex whole. The foregoing implies that culture is an important informal institution that can strongly impact the way people think, feel, make decisions, and act; influencing behavior of firms and individuals by providing guidelines regarding acceptable and unacceptable behaviors in a society. Culture is one of the most salient forces influencing human behavior, decisions and, correspondingly, economic performance of nations and companies competing therein.

The relationship between trade and culture has lead to the emanation of a long aged debate. National culture has a significant bearing on financial decision making and facilitates international trade [1, 2]. Opine that concerns have been expressed in many circles on possible detrimental effects of international trade on cultural goods due to the diversity in the trade of cultural goods which may lead to the loss of national culture and values especially in the audio-visual products.

This study seeks to understand how cultural layers such as religion and language affect international trade. The task is difficult due to the diversity and complexity of the trade and culture debate that has been on for decades. The remainder of the paper is organized as follows; the next section comprises the literature review on trade and

culture. Section 3 shows the methodology adopted for this study while Section 4 presents results and analysis. Finally, Section 5 completes the study with conclusion.

2. Literature review

For years, the debate on the interaction between culture and trade has extensively gained the interest of researchers and policy makers in the academic economic literature. This debate has been ongoing since the Uruguay round-GATT and North American Free Trade Agreement (NAFTA), General Agreement on Tariffs and Trade (GATT) [3]. Many cultural layers such as ethnic background, religion, ideological orientation, and art amongst others [4], have become very important factors influencing the economic and trading activities of several economies.

Studies have shown the nexus between economies with similar ancestry and cultural layers [5]. Establish that, countries with fewer cultural differences will most likely have a close trade relationship. Similarly, [6] reveals that countries with weaker cultural links and ancestry relationships are less likely to trade with each other and if they do, they exchange fewer goods and smaller volumes [7]. However notes that cultural dissimilarities will tend to retard trade especially in the poorer countries and regions of the world.

The dual role of culture implies that culture is a double edged sword in its effect on trade and the economy. On the one hand, culture promotes and positively influences businesses, trade credit, international trade and economic growth. It is so important that it can bring about a fall in trade cost which facilitates the international exchange of goods and services [8, 9]. Finds that an increase in cultural export increases the economic growth of a country while an increase in cultural imports decreases the economic growth of a country. Culture has been shown to positively relate to trade credit provision. The study by [10] reveals that trade credit provision is higher in countries with higher collectivism, power distance, uncertainty avoidance and masculinity scores. Culture has a positive association between Confucianism and the usage of trade credit in china where it was found that firms with stronger Confucianism atmosphere can obtain more trade credit than their peers elsewhere [11].

On the other hand, culture may not always be trade promoting. For instance, Linguistic dissimilarity due to cultural differences may pose as a major barrier to international transactions as it results in breakage in communication and increase in trade cost [8] as well as a fall in trade volumes [7, 8]. Opines that learning a language has economies of scale and smaller countries will tend to spend more on learning and as such subsidizing the learning of another culture can be welfare enhancing in the long run. Furthermore, the large importation of cultural goods such as audio visuals may harm the national identity and cultural values of a country. Affirming to this finding is a study on U.S and Canada [12], shows that even though the US and Canada trade in cultural goods more than any other country in the world, Canadians consider their culture to be susceptible to US influence due to similarities with US in language and heritage and as such culture should be kept separate from international trading rules.

Using a standard gravity model in a study of 172 countries [13], while examining the impact of cultural differences on trade in the cold war period and the post cold war period concludes that the negative influence of cultural differences on trade is more prominent in the post cold war period than in the cold war period and as such culture dissimilarity is a huge barrier to trade. Other studies such as [14] using gravity model investigates whether the relationship between intentional trade and cultural difference is nonlinear and find that the trade-culture relationship is one that is non-linear in

nature. This shows that trade decreases with cultural distance once cultural distance has surpassed a certain threshold. Some scholars focus on the optimal policy in settling the trade and culture debate. The debate over how to reconcile cultural policy with trade liberalization is one that has also been long-standing [3]. There is great difference in how countries have navigated this debate [15]. Aims at understanding how cultural policies intersect with trade policies in Latin America revealing that Latin America countries traditionally prefer to resort to multilateral and regional organizations for advancing cultural policies and programs for cultural industry promotion and exchange. He adds that, culture has received united support within the different integrated schemes embraced by Latin American countries and has therefore advanced smoothly in international and regional organizations. The trade-culture debate rages on with no clear-cut conclusion yet and this study is an addition to the trade and culture debate and literature.

3. Methodology and data

The study employs the observation technique of secondary data obtained from valid sources and presented in tabular form. The tabulated data are for the top three most religious countries [16] and the top three least religious/most secular countries [17] in the world. Data were sourced on the following variables: top five import partners and top five export partners of the most and least religious countries in the world [18], official languages of all countries, official religions of all countries [19], colonialists of all countries [20], distances between countries and trading partners [21], and nearby countries to selected countries [22]. This research employed the simple technique of observing the tabulated data, their patterns and interactions, and drawing analysis and consequent inference from them. This study adopts a qualitative approach.

4. Presentation and analysis

4.1 Religious distribution of countries

Most religious countries	Least religious/most secular countries
Israel	China
Saudi Arabia	Japan
India	Sweden

Source: washingtonpost.com, 2022.

4.2 The three most religious countries in the world

The top five import partners of Israel are China, the USA, Germany, Turkey, and Switzerland according to **Table 1** above. Israel is a Hebrew speaking Judaist country, colonized by the British, and maintains geographical proximity to Palestine, Jordan, Lebanon, Cyprus and Syria. Israel maintains neither language similarity nor religious similarity with its import partners. None of the Israeli importing partners maintain geographical proximity to the Israeli state. Only the USA maintains a common colonial heritage with Israel as both countries were colonized by the British. In essence, Language, Religion, colonial heritage, and geographical proximity were not determinant factors in the Israeli choice of import partners.

Israel					
Imports					
Import partners	**Language**	**Religion**	**Colonialists**	**Distance to Israel**	**Nearest countries to Israel**
China ($9.01B)	Mandarin—Hebrew	Liberal secular—Judaism	Never—British	6, 316 km	Palestine (701 km)
USA ($8.03B)	English—Hebrew	Liberal secular—Judaism	British & co—British	10, 853 km	Jordan (141.9 km)
Germany ($5.11B)	German—Hebrew	Liberal secular—Judaism	Never -British	4, 197.8 km	Lebanon (326.2 km)
Turkey ($4.67B)	Turkish—Hebrew	Secular—Judaism	Greek - British	1, 321.3 km	Cyprus (472.3 km)
Switzerland ($3.36B)	German—Hebrew	Liberal secular—Judaism	Holy Roman Empire—British	4, 141.3 km	Syria (568.8 km)
Exports					
Export partners	Language	Religion	Colonialists	Distance to Israel	Nearest countries to Israel
USA ($14.1B)	Hebrew—English	Judaism—Liberal secular	British—British and co	10, 853 km	Palestine (701 km)
China ($4.64B)	Hebrew—Mandarin	Judaism—Liberal secular	British—Never	6, 316 km	Lebanon (326.2 km)
Palestine ($3.34B)	Hebrew—Arabic	Judaism—Islam	British—Ottoman empire/British	107 km	Lebanon (326.2 km)
Netherlands ($2.28B)	Hebrew—Dutch	Judaism—Liberal secular	British—Spanish	4, 610.7 km	Cyprus (472.3 km)
Germany ($2.01B)	Hebrew—German	Judaism—Liberal secular	British—Never	4, 197.8 km	Syria (568.8 km)

Source: Compiled by authors, 2022.

Table 1.
Language and religious dimensions of the Israeli trade.

The top export partners of Israel are the USA, China, Palestine, Netherlands and Germany. Israel maintains neither language similarity nor religious similarity with its export partners. Israel maintains common colonial heritage with the USA and Palestine as both countries are former British colonies. Israel maintains geographical proximity to Palestine alone. There are no evidences that language, religion, colonial heritage or geographical proximity determine the Israeli export destinations. Therefore, even though Israel is perceived as the most religious country in the world, Culture does not affect its trade with the rest of the world.

Table 2 shows Saudi Arabia as the second most religious country in the world by perception, with Islam as its official religion, Arabic as its official language, and the following as its import partners; China, UAE, USA, Germany, and India. Saudi Arabia was colonized by the former Ottoman Empire, now Turkey, and is geographically in proximity to Bahrain, Qatar, Kuwait, UAE and Yemen. Saudi Arabia maintains

Saudi Arabia					
Imports					
Import partners	**Language**	**Religion**	**Colonialists**	**Distance to Saudi Arabia**	**Nearest countries to Saudi Arabia**
China ($31.8B)	Mandarin—Arabic	Liberal secular—Islam	Never—Ottoman empire	5, 763 km	Bahrain (604.4 km)
UAE ($18B)	Arabic—Arabic	Islam—Islam	British—Ottoman empire	1, 022.9 km	Qatar (637.8 km)
USA ($10.8B)	English—Arabic	Liberal secular—Islam	British & co—Ottoman empire	12, 082 km	Kuwait (648.4 km)
Germany ($6.79B)	German—Arabic	Liberal secular—Islam	Never—Ottoman empire	5, 405.2 km	UAE (893.8 km)
India ($6.37B)	English—Arabic	Liberal secular—Islam	British—Ottoman empire	3, 496 km	Yemen (993.2 km)
Exports					
Export partners	Language	Religion	Colonialists	Distance to Saudi Arabia	Nearest countries to Saudi Arabia
China ($33.4B)	Arabic—Mandarin	Islam—Liberal secular	Ottoman empire—Never	5, 763 km	Bahrain (604.4 km)
India ($16.8B)	Arabic—English	Islam—Liberal secular	Ottoman empire—British	3, 496 km	Qatar (637.8 km)
Japan ($16.3B)	Arabic—Japanese	Islam—Liberal secular	Ottoman empire—Never	8, 730 km	Kuwait (648.4 km)
South Korea ($14.4B)	Arabic—Korean	Islam—Liberal secular	Ottoman empire—Japanese	7, 848 km	UAE (893.8 km)
UAE ($9.21B)	Arabic—Arabic	Islam—Islam	Ottoman empire—British	1, 022.9 km	Yemen (993.2 km)

Source: Compiled by authors, 2022.

Table 2.
Language and religious dimensions of the Saudi Arabian trade.

language and religious similarities with only the UAE out of all its top five import partners. The country shares no colonial heritage with any of its import partners. It only shares geographical proximity to the UAE. Hence, none of language, religion, colonial heritage, and geographical proximity acts as determinants of the Saudi Arabian top five import partners.

The Saudi Arabian export partners are China, India, Japan, South Korea, and the UAE. Of all five export partners, Saudi Arabia maintains language similarity, religious similarity, and geographical proximity to only the UAE. However, Saudi Arabia failed to maintain similar colonial heritage to any of its export partners. Hence, language, religion, colonial heritage, and geographical proximity do not determine Saudi Arabia's export destinations. Therefore, culture does not affect the Saudi Arabian trade with the rest of the world. The third most religious country in the world by perception is India as presented in **Table 3**.

India's official language is English, colonized by the British, a liberal secular state, that is geographically in proximity to Nepal, Bangladesh, Bhutan, Sri Lanka and

India					
Imports					
Import partners	**Language**	**Religion**	**Colonialists**	**Distance to India**	**Nearest countries to India**
China ($64.2B)	Mandarin—English	Liberal secular—Liberal secular	Never—British	3, 776.63 km	Nepal (1, 011.km)
USA ($26.6B)	English—English	Liberal secular—Liberal secular	British & co—British	12, 045.09 km	Bangladesh (1, 221.5 km)
UAE ($22.1B)	Arabic—English	Islam—Liberal secular	British—British	2, 316.41 km	Bhutan (1, 393 km)
Saudi Arabia ($16.8B)	Arabic—English	Islam—Liberal secular	Ottoman empire—British	3, 053.39 km	Sri Lanka (1, 426.8)
Iraq ($14.4B)	Arabic—English	Islam—Liberal secular	British—British	3, 160.85 km	Pakistan (1, 451.9 km)
Exports					
Export partners	Language	Religion	Colonialists	Distance to India	Nearest countries to India
USA ($49.7B)	English—English	Liberal secular—Liberal secular	British—British & co	12, 045.09 km	Nepal (1, 011.km)
China ($18.5B)	English—Mandarin	Liberal secular—Liberal secular	British—Never	3, 776.63 km	Bangladesh (1, 221.5 km)
UAE ($18.1B)	English—Arabic	Liberal secular—Islam	British—British	2, 316.41 km	Bhutan (1, 393 km)
Hong Kong ($9.18B)	English—Mandarin	Liberal secular—Liberal secular	British—China	3, 759.93 km	Sri Lanka (1, 426.8)
Germany ($8.8B)	English—German	Liberal secular—Liberal secular	British—Never	5, 779.38 km	Pakistan (1, 451.9 km)

Source: Compiled by authors, 2022.

Table 3.
Language and religious dimensions of the Indian trade.

Pakistan. India's top five import partners are China, USA, UAE, Saudi Arabia and Iraq. India maintains a similar language with only USA while maintaining a similar religion with China and the USA and; maintaining a common colonial heritage with the UAE, the USA, and Iraq. The country does not maintain geographical proximity to any of its import partners. Colonial heritage likely plays a role in the choice of the Indian import partners. However, the cultural indices of language and religion played no roles in the choice of the Indian import partners.

The Indian top five export partners are the USA, China, the UAE, Hong Kong and Germany. India has a language similarity with only the USA while maintaining religious similarity with the USA, China, Hong Kong, and Germany. India maintains similar colonial heritage with the USA and the UAE. The country maintains no geographical proximity to any of its export partners. Culture (Religion) likely determines the export destinations of India. Culture does not determine the import partners of India. Culture determines the export partners of India. Holistically, Culture does not determine the Indian trade with the rest of the world.

4.3 The Three least religious/most secular countries in the world

The top five import partners of China are Japan, South Korea, USA, Germany, and Chinese Taipei according to **Table 4** above. China is a Liberal secular country with no official religion and Mandarin as its official language, never colonized by any other country, and maintains geographical proximity to Mongolia, Bhutan, Myanmar, Macao, and Hong Kong. China maintains language similarity with only Chinese Taipei while maintaining religious similarity with all its import partners as all are secular states that separate religion from the state. None of the Chinese import partners maintain geographical proximity to the Chinese state. None of the Chinese import partners maintain a common colonial heritage with China as the Chinese state was never colonized by any other state. In essence, Language, Religion, colonial heritage, and geographical proximity were not determinant factors in the Chinese choice of import partners.

The top export partners of China are the USA, Hong Kong, Japan, Germany and South Korea. China maintains language similarity with only Hong Kong of all its export partners. China also maintains religious similarity with all of its export

China					
Imports					
Import partners	**Language**	**Religion**	**Colonialists**	**Distance to China**	**Nearest countries to China**
Japan ($133B)	Japanese—Mandarin	Liberal secular—Liberal secular	Never—Never	2, 099.47 km	Mongolia (1, 222.8 km)
South Korea ($131B)	Korean—Mandarin	Liberal secular—Liberal secular	Japanese—Never	956.30 km	Bhutan (1, 595.3 km)
USA ($122B)	English—Mandarin	Liberal secular—Liberal secular	British & co—Never	11, 144.93 km	Myanmar (1, 743.1 km)
Germany ($106B)	German—Mandarin	Liberal secular—Liberal secular	Never—Never	7, 353.56 km	Macao (1, 766.9 km)
Chinese Taipei ($104B)	Mandarin—Mandarin	Liberal secular—Liberal secular	Japanese—Never	1, 724.83 km	Hong Kong (1, 776.5 km)
Exports					
Export partners	Language	Religion	Colonialists	Distance to China	Nearest countries to China
USA ($438B)	Mandarin—English	Liberal secular—Liberal secular	Never—British and co	11, 144.93 km	Mongolia (1, 222.8 km)
Hong Kong ($262B)	Mandarin—Mandarin	Liberal secular—Liberal secular	Never—China	1, 973.70 km	Bhutan (1, 595.3 km)
Japan ($151B)	Mandarin—Japanese	Liberal secular—Liberal secular	Never—Never	2, 099.47 km	Myanmar (1, 743.1 km)
Germany ($112B)	Mandarin—German	Liberal secular—Liberal secular	Never—Never	7, 353.56 km	Macao (1, 766.9 km)
South Korea ($110B)	Mandarin—Korean	Liberal secular—Liberal secular	Never—Japanese	956.30 km	Hong Kong (1, 776.5 km)

Source: Compiled by authors, 2022.

Table 4.
Language and religious dimensions of the Chinese trade.

partners as all are secular states who are tolerant of religious associations. China does not maintain common colonial heritage with any of its export partners as the country was never colonized by another. China maintains geographical proximity to Hong Kong alone of all its export partners. There are no evidences that language, religion, colonial heritage or geographical proximity determines the Chinese export destinations. Therefore, even though China is perceived as the least religious country in the world, Culture does not affect its trade with the rest of the world.

The **Table 5** above shows Japan, the second least religious country in the world by perception. Japan is a secular state that is tolerant of religious association, has Japanese as its official language, and the following as its top five import partners; China, USA, Australia, South Korea, and Chinese Taipei. Japan was never colonized by any other country and is geographically in proximity to South Korea, North Korea, Chinese Taipei, Northern Mariana Island, and Hong Kong. Japan maintains language similarity with none of its import partners as none of them speak the Japanese language. Japan maintains religious similarity with all its import partners as they are all secular states who separate religion from the state. The country does not share a colonial heritage with any of its import partners as it was never colonized by any

Japan					
Imports					
Import partners	**Language**	**Religion**	**Colonialists**	**Distance to Japan**	**Nearest countries to Japan**
China ($151B)	Mandarin—Japanese	Liberal secular—Liberal secular	Never—Never	2, 099.7 km	South Korea (942.1 km)
USA ($63.1B)	English—Japanese	Liberal secular—Liberal secular	British & co—Never	10, 903.32 km	North Korea (1, 042.8 km)
Australia ($31.8B)	English—Japanese	Liberal secular—Liberal secular	British—Never	7, 950.93 km	Chinese Taipei (2, 162.4 km)
South Korea ($25.1B)	Korean—Japanese	Liberal secular—Liberal secular	Japanese—Never	1, 156.04 km	Northern Mariana Island (2, 211.6 km)
Chinese Taipei ($24.3B)	Mandarin—Japanese	Liberal secular—Liberal secular	Japanese—Never	2, 102.84 km	Hong Kong (2, 785.1 km)
Exports					
Export partners	Language	Religion	Colonialists	Distance to Japan	Nearest countries to Japan
China ($133B)	Japanese—Mandarin	Liberal secular—Liberal secular	Never—Never	2, 099.7 km	South Korea (942.1 km)
USA ($112B)	Japanese—English	Liberal secular—Liberal secular	Never—British & co	10, 903.32 km	North Korea (1, 042.8 km)
South Korea ($42.9B)	Japanese—Korean	Liberal secular—Liberal secular	Never—Japanese	1, 156.04 km	Chinese Taipei (2, 162.4 km)
Chinese Taipei ($42.7B)	Japanese—Mandarin	Liberal secular—Liberal secular	Never—Japanese	2, 102.84 km	Northern Mariana Island (2, 211.6 km)
Hong Kong ($27.2B)	Japanese—Mandarin	Liberal secular—Liberal secular	Never—China	2, 887.80 km	Hong Kong (2, 785.1 km)

Source: Compiled by authors, 2022.

Table 5.
Language and religious dimensions of the Japanese trade.

other country. It only shares geographical proximity to South Korea and Chinese Taipei. Hence, none of language, religion, colonial heritage, and geographical proximity acts as determinant of the Japanese import partners.

The top five Japanese export partners are China, USA, South Korea, Chinese Taipei, and the Hong Kong. Of all five export partners, Japan maintains language similarity with none as none of the countries speak Japanese. Japan maintains religious similarity with all five top export partners as all are secular states who separate religion from the state. It maintains geographical proximity to South Korea, Chinese Taipei, and Hong Kong. However, Japan failed to maintain similar colonial heritage to any of its export partners. Hence, language, religion, and colonial heritage, do not determine the Japanese export destinations. Apparently, geographical proximity is a factor that influences trade in Japan. Therefore, culture does not affect the Japanese trade with the rest of the world (**Table 6**).

Sweden is the third least religious country in the world by perception. The country's official language is Swedish, was never colonized by anybody, and is a liberal secular state that is geographically in proximity to Estonia, Finland, Latvia,

Sweden					
Imports					
Import partners	**Language**	**Religion**	**Colonialists**	**Distance to Sweden**	**Nearest countries to Sweden**
Germany ($25.2B)	German—Swedish	Liberal secular—Liberal secular	Never—Never	810.27 km	Estonia (398.7 km)
Netherlands ($11.6B)	Dutch—Swedish	Liberal secular—Liberal secular	Never—Never	1, 125.48 km	Finland (431.1 km)
Denmark ($9.45B)	Danish—Swedish	Liberal secular—Liberal secular	Never—Never	522.27 km	Latvia (499.6 km)
Norway ($9.1B)	Norwegian—Swedish	Liberal secular—Liberal secular	Never—Never	416.73 km	Norway (560.9 km)
China ($9.02B)	Mandarin—Swedish	Liberal secular—Liberal secular	Never—Never	6, 704. 85 km	Lithuania (632.5 km)
Exports					
Export partners	Language	Religion	Colonialists	Distance to Sweden	Nearest countries to Sweden
Germany ($15.9B)	Swedish—German	Liberal secular—Liberal secular	Never—Never	810.27 km	Estonia (398.7 km)
Norway ($14.2B)	Swedish—Norwegian	Liberal secular—Liberal secular	Never—Never	416.73 km	Finland (431.1 km)
USA ($12.7B)	Swedish—English	Liberal secular—Liberal secular	Never—British & co	6, 635.86 km	Latvia (499.6 km)
Denmark ($11.6B)	Swedish—Danish	Liberal secular—Liberal secular	Never—Never	522.27 km	Norway (560.9 km)
Finland ($9.44B)	Swedish—Finnish	Liberal secular—Liberal secular	Never—Sweden	395.92 km	Lithuania (632.5 km)

Source: Compiled by authors, 2022.

Table 6.
Language and religious dimensions of the Swedish trade.

Norway, and Lithuania. Sweden's top five import partners are Germany, Netherlands, Denmark, Norway, and China. Sweden maintains a similar language with none of its import partners. The country maintains a similarity in religion with all its import partners as all countries are liberal secular states. Sweden fails to maintain a common colonial heritage with any of its import partners as the country was never colonized. The country maintains geographical proximity to only Norway of its top five import partners. Language, Religion, Colonial heritage and Geographical proximity do not play any roles in the choice of the Swedish import partners. Hence, culture played no roles in the choice of the Swedish import partners.

The Swedish top five export partners are Germany, Norway, USA, Denmark, and Finland. Sweden has no language similarity with any of its export partners. The country maintains religious similarity with all its export partners as secular states who separate religion from the state. Sweden does not maintain similar colonial heritage with any of its top export partners as the country was never colonized. The country maintains geographical proximity to Norway and Finland of its top export partners. Culture does not determine the export destinations of Sweden. Culture does not determine the Swedish trade with the rest of the world.

5. Conclusion

Trade in the least and the most cultural countries in the word are basically not determined by the pronounced culture in Language and Religion. It is basically determined by other factors aside pronounced culture. In the countries discussed above, they all traded more with countries they were neither religiously nor linguistically tied to. We observe the existence of reciprocity trading where countries tend to import highly from countries they export to. A major trend we also notice is that countries trade for economic reasons. Every country we discussed traded with the two biggest economic powers—China and the USA. This type of trade helps these countries establish stronger economic ties with the USA and China. A strong economic tie with the both countries results in economic gains in aids and Foreign Direct Investments (FDIs).

Conflict of interest

The authors declare that there is no conflict of interest for this article.

Trade and Culture: Religion Dynamics
DOI: http://dx.doi.org/10.5772/intechopen.108371

Author details

Terver Audu*, John Ogonna Okorie and Aminat Orekoya
University of Ibadan, Ibadan, Nigeria

*Address all correspondence to: terveraudu@gmail.com

References

[1] Tan G, Seng CC, Ralf Z. National culture and individual trading behavior. Journal of Banking and Finance. Elserver. 2019;**106**(C):357-370. DOI: 106.1016/jbankfin.2019.07.007

[2] Bala V, Long N. International trade and cultural diversity with preference selection. European Journal of Political Economy, Elservier. 2004;**21**(1):143-162

[3] Goff PM. Trade and culture: The ongoing debate. International Journal of Cultural Policy. 2019;**25**(5):547-551. DOI: 10.1080/10286632.2019.1626850

[4] Keith A, Christopher M. Culture in international trade. Handbook of the Economics of Art and Culture. 2006;**1**(33):1142-1182. DOI: 10.1016/S1574-0676(06)01033-7

[5] Zhang T, Luoa J, Zhanga CY, Lee CKM. The joint effects of information and communication technology development and intercultural miscommunication on international trade: Evidence from China and its trading partners. Industrial Marketing Management. 2020;**89**:40-49. DOI: 10.1016/j.indmarman.2020.01.010

[6] Fensore I, Legge S, Schmid L. Ancestry and international trade. Journal of Comparative Economics, Elservier. 2021;**50**(1):33-51. DOI: 10.1016/j.jce.2021.05.002

[7] Guo R. How culture influences foreign trade: Evidence from the U.S. and China. The Journal of Socio-Economics. 2004;**33**(2004):785-812

[8] Kónya I. Modeling cultural barriers in international trade. Review of International Economics. 2006;**14**(3):494-507. DOI: 10.1111/j.1467-9396.2006.00626.x

[9] Scavia J, la Reguera D, Fenandez P, Olson JE, Nahuel P, Werner K. The impact of cultural trade on economic growth. Applied Economics, Taylor and Francis Journals. 2021;**53**(38):4436-4447. DOI: 10.1070/00036846.2021.1904112

[10] Sadok EG, Xiaolan Z. Trade credit provision and national culture. Journal of Corporate Finance, Elservier. 2016;**41(C)**:475-501. DOI: 10.1016/j.jcorpfin.2016.07.002

[11] Li W, Xu X, Long Z. Confucian culture and trade credit: evidence from Chinese listed companies. Research in International Business and Finance, Elservier. 2020;**53**(C):101232, pp. 1-17. DOI: 10.1016/j.ribaf.2020.101232

[12] Devlin J. Canada and international trade in culture: beyond national interests. Minnesota Journal of International Law. 2005;**14**:177-216. Available from: https://scholarship.law.umn.edu/mjil/216

[13] Gokmen G. Clash of civilizations and the impact of cultural differences on trade. Journal of Development Economics, Elservier. 2017;**127(C)**:449-458. DOI: 10.1016/j.jdeveco.2016.12.008

[14] Lankhuizen MBM, de Groot HLF. Cultural distance and international trade: A non-linear relationship. Letters in Spatial and Resource Sciences. 2014;**9**:19-25. DOI: 10.1007/s12076-014-0129-8

[15] Jaramillo G. Latin America: Trade and culture at a crossroads. International Journal of Cultural Policy. 2019;**25**(5):602-614. DOI: 10.1080/10286632.2019.1626847

[16] Trimble M, Austin S. The 10 Most Religious Countries, Ranked by

Perception. The Yahoo Finance; 2020, Jan 15. Available from: https://finance.yahoo.com/news/10-most-religious-countries-ranked-050100080.html

[17] Noack R. Map: "These are the World's least religious countries". The Washington Post. 2019. Available from: https://www.washingtonpost.com/news/worldviews/wp/2015/04/14/map-these-are-the-worlds-least-religious-countries/

[18] OEC. Country Exports. In: Imports, and Trade Partners. Observatory of Economic Complexity (OEC); 2020. Available from: https://oec.world/en/profile/country/

[19] U.S. Government. 2019 Report on International Religious Freedom. U.S. Department Of State; 2020. Available from: https://www.state.gov/reports/2019-report-on-international-religious-freedom/

[20] Encyclopedia. (2022). "Independence, Decolonization, Middle East". Available from: Encyclopedia.com. https://www.encyclopedia.com/history/encyclopedias-almanacs-transcripts-and-maps/independence-and-decolonization-middle-east

[21] DistanceFromTo. (2022). "Distance Between Cities on Map". Available from: Distancefromto.com. https://www.distancefromto.net/

[22] Gomapper. (2022). "List of Countries Near...". Available from: Gomapper.com. http://www.gomapper.com/travel/list-of-countries-near/israel.html

Chapter 3

Utilizing e-Tendering in the Procurement of Construction Projects

Nnadozie Godswill Ndubuaku and Godson Jerry

Abstract

The growth of any developing and even developed country can be traced or ascertained by the myriad of standard, sophisticated, and profit-oriented projects that have been executed and others still under construction. Many countries in the world, especially Nigeria has suffered huge deficit in the procurement of construction works, since the procurement segment of the construction industry is the largest segment and, holds the promise of efficient and successful project delivery, coupled with client expectations being met adequately. This book chapter is to address the pitfalls or backdrops in the procurement process, viz.; bulky paper-work, corruption, poor assessment of tender documents, human errors, etc. Therefore, Utilizing the e-tendering system will foster transparency, accountability, proper documentation and also to encourage competitiveness among various class of contractors, which are the main findings in the book. The authors, prepared a myriad of questions that portray the tendency of enhancing quality projects delivery. The authors shared 30 copies of the questionnaires, and the 30 copies were received with feedback. The data filled in the questionnaire were examined, using the SPSS software, that is usually adopted for data analysis. After the results of the questionnaire were examined, it was discovered that all the factors highlighted in the questionnaire were required to be in the contractor's portfolio.

Keywords: e-tendering, procurement, construction projects, information communication technology (ICT), tender approach

1. Introduction

Nowadays, the construction industry ranks as one of the most informative-based industries. It is considered as a crucial industry in almost all advanced/advancing nations that are on the trajectory of speedy development. Sadly, the industry has also suffered huge deficit of knowledge in its operations and lags significantly behind in the applications of information communication and technology (ICT), internet of things (IOT), internet of service (IOS), artificial intelligence (AI) big data, and machine learning, which are the main drivers of the fourth industrial revolution. The

aforementioned innovative technologies are the disruptive forces, that are rapidly increasing the efficiency and productivity of several manufacturing and non-manufacturing firms in the engineering and management fields. However, the application of these technologies, will enhance the procurement of construction projects and increase visibly, project delivery quality. In recent times, particularly in Nigeria it has been observed by the monitoring and control department of Government projects, that most public or government projects has recorded a lot of lapses in the contracting processes. Consequently, the lapses that have been identified in the contracting process has given rise to the emergence of an e-tendering system, which will promote transparency and accountability among the various contracting stakeholders.

All the contracting stakeholders, whether governments, institutions, an entity, individual or a coalition will be required to carry out their contracts in the e-tendering system. Thus, information of the tender will be published on the e-tendering system in anticipation that tenderer or contractors will view and submit bids for the projects. This will demonstrate positive infrastructural growth on investment, because of the healthy contracting milieu.

The concept of Utilizing e-tendering in the procurement of construction projects is not abruptly dived into, but research shows that, nations like Malaysia and Korea, are Utilizing e-tendering in the procurement of construction projects, which has proven successfully over a considerable period of time, even till date. However, the Utilization of e-tendering in procurement, is to help minimize bulky paper work involved in the tendering process, poor process review, delay in tendering process, high processing cost, and to eradicate corruption. Meanwhile, promoting transparency and accountability, aggressively embracing the applications of innovative technologies in order to gain greater efficiency and cost cutting throughout various institutions and Governments, which are the main rationale of this book chapter. Again, people and the processes involved in e-tendering are likely to impart negatively or positively on its applications or use.

The application of e-tendering, will offer great opportunities among institutions and companies. The book chapter reveals the requisite conditions to select the most appropriate contractor, and some of these conditions are unchanged, whereas, some are changed, and these conditions may likely be altered depending on the peculiarity of the project to be handled.

1.1 Tendering: traditional perspective

Tendering has been popularly recognized across the globe as one of the most significant approaches of awarding public and private contracts and the approach guarantees a desired outcome between public or private institutions. An effective bid management and tender process provides a positive evaluation approach and leads not only to the appointment of appropriate contractors, but to also ensure that the ongoing relationship is mutually beneficial. A tender is a submission made by a prospective contractor in response to an invitation to bid. It makes an offer to supply goods and/or services. As the procurement routes have become more complex, tenders may seek for wide range of goods and services (for example, on construction management contract, works are constructed by a myriad of different brand of contractors, each sub-contracted to a client) and the contractors may continue in additional roles such as designs, supply, and management. However, the comparison between types of tendering in international countries with their meaning, are explained below:

Open tender:

- Nigeria
- Malaysia

Restricted tender (selective tender):

- Turkey

Negotiated tender:

- Kenya
- India

Single-stage and two-stage tender:

- Iraq

Furthermore, the reason of tendering is to evaluate and analyze the technical ability, competency of a tenderer or a contractor in an uncompromised means. Hence, to select the best tenderer or contractor, there are a number of traditional tendering approaches utilized in the construction industry. Based on the nature of the project, the clients can choose what type of tender will be used. Enlisted below are a number of them with lucid discussions.

2. Open tender approach

Open tendering is the main tendering approach employed by both government and private sectors. Open tender allows anyone to make supply of goods and services required and offers equal opportunity to any organization to submit their bids. This offers the highest form of competition among contractors and holds the promise of creating new opportunities for new or emerging contractors. Hence, is the most widely used tendering approach for government projects. They make use of adverts, displaying the type of project, scope and some important information in an attractive manner. The tenderers or contractors who are attracted by the advert, will then apply by submit a bid for it. The steps have a number of issues and it does not provide assurance of good quality job. Meanwhile, in preparing this particular type of tender, a lot of losses is usually incurred. This has greatly discouraged it usage by so many stakeholders in the construction industry.

Advantages of Open Tendering Approach

- Open tender promotes transparency and competition in the process.
- Open tender also creates equal opportunities for all logical contractors.
- The clients are usually fine affordable price, to minimize competition.

Disadvantages Of Open Tendering Approach

- Tracking of reliable contractors is usually difficult.
- The tender process is usually time consuming.
- The competition involve here, is most times very unhealthy.

3. Restricted tender (selective tender) approach

The restricted tender or selective tender only permits contractors to submit tender, strictly by invitation. These contractors are those who are known by their track records to be suitable for a contract of that size, nature, and complexity required. Selective tender gives greater confidence to clients, that their requirement will be satisfied. Hence it could exclude upcoming contractors or those trying to establish themselves in the business. Furthermore, the contractor is usually saddled with two major responsibilities, viz.: all the necessary designs and the execution of the project. The services here, are rendered with high professional prowess. Again, there's usually a consultant hired by the employer, to ensure that proper constructing measures are observed, including health and safety measures. However, a certain amount of money must be paid in order to execute the project till the finishing stage, based on the terms and conditions of the contracting parties.

Advantages Of Selective Tendering

- The selective tender will ensure proper review of the designs to be executed.
- The selective tender gives clients greater confidence that their design expectations will be met.

Disadvantages Of Selective Tendering

- The cost of handling projects here are relatively too high.
- New contractors coming up may not have the opportunity to handle project within this context.

4. Negotiated tender

The negotiated tender is mostly utilized in the engineering and construction industry, starting from tendering, until all disputes are resolved. Negotiating with a single contractor may be appropriate for highly specialist contracts. Cost is usually mitigated and it permits early contractor engagement. However, since the contractor is part of the project team at the beginning stage of the project, this will guarantee seamlessness in communication and information flow among the contracting parties. This approach of tendering, is more radical, when compared with the other approaches. Here, the negotiation cuts across the traditional processes and it best suits with procurement strategies. They are mostly used for specialized works such as

unmanned aerial vehicle (UAV), elevators, and special access control systems. Hence, these kinds of works can only be done by unique contractors.

Furthermore, in such a contract, the clients demands that the tenderers or contractors gets to submit bids for the contract. The price of executing the contract is negotiated before its approval and awarding. If the contractor succeeds in getting the job, and the client is impressed with the quality of work done, more works will be awarded to the contractor based on the agreed price. This approach focuses on developing a good working relationship between the contracting parties, which will be good for the project.

Advantages Of Single-Stage Selective Tendering

- It requires highly specialized contractors.
- Contractors are being retained for more projects, when previous projects carried out by them, were done satisfactorily.

5. Single-stage selective tendering approach

In the single-stage selective tendering approach, just a few tenderers or contractors are chosen by the client. If the client is a type that builds frequently, he will have an approved list of contractors except he wants to use other contractors outside his usual list, of which their work profile speaks volume to their competence and abilities.

Advantages of Single-stage selective tendering

- The single-stage selective tendering time consumption is relatively slow, hence mistakes in the process is minimal.
- In the single-stage selective tendering, experienced contractors are easily identified.

Disadvantages of Single-Stage Selective Tendering

- The single-stage selective tendering, there's little or no competition.
- A lot of sentiment is involved in the single-stage selective tendering.

6. Two-stage selective tendering approach

The two-stage selective tendering is also considered as negotiated tendering. In this approach, the client takes the contractor's service as advice instead awarding the design and project for him to execute. The two-stage selective tendering comprises of two stages.

1st: This step involves the selecting of a competent contractor and determining the price levels using the collected information. Hence, the information should be viable enough to make any informed decision.

2nd: Here, the chosen contractor will be mobilized to commence with the production of the working drawings. The documentation process of the contract is done after all necessary bills has been agreed upon.

Advantages of Two-Stage Selective Tendering Approach

- The two-stage selective tendering time consumption is relatively slow, hence mistakes in the processes is minimal.
- The two-stage selective tendering, experienced contractors are easily identified.

Disadvantages of Two-Stage Selective Tendering Approach

- The risk involved in two-stage selective tendering is relatively high.

6.1 Tendering processes

Across the globe, public institutions, are the major clients in the construction sector. A client is considered as one who has the seal of ownership of a project. The contractor is considered as the one who provides technical services or the tenderer. While, the consultant is considered as an information buffer. Conceptualization is the first stage is taken into account, when a client has in mind to carry out a construction project. Here, the client gets to brainstorm; on the kind of project, he will want to embark on, after which, he now mobilizes a consultant to adequately prepare the tender requirement/specification by carrying out a lucid feasibility study of the project. The first approach deployed is the pronouncement made by the client within a particular time-frame, by means of online adverts, magazine/publications, including the mass media. Furthermore, the contractor who get interested in the advertisement, then proceeds to purchase the tender document, thus submitting the requisite information needed, on or before the deadline for submission. Below, is an overview of tendering process in the construction industry, with respect to clients, consultant and contractor perspectives.

Figure 1 above shows a representation on how the traditional tendering process in the construction industry operates. The traditional tendering process is usually carried out between the client (s), consultant, and the contractor (s). The blue boxes displayed, represent the sequential steps or procedures directed by the arrows for an effective tendering process, while the boxes displayed in white, either indicate the interest of tenderers after viewing the tender document (yes or no) or if they prequalify or qualify to be shortlisted for the awarding of the contract after they have submitted their bids. The aforementioned tendering approaches explained and processes demonstrated in **Figure 1**. from project conceptualization to project awarding, is being practiced in so many countries of the world today.

However, the speedy rate at which the world is changing, with a lot of uncertainties, the construction industry and its participants have to be innovative in their thinking, having an understanding of the changing environment, identifying the opportunities, and increasing its chances of relevance through digitalization and automation, so as to expand the efficiency and productivity of the industry. Thus, the Utilization of e-tendering to disseminate the information of a project - from inception, design, bill of quantity (BOQ), and project schedule, through construction, and into operation of the project – will serve as the compass to great efficiency being gained for all the contracting parties.

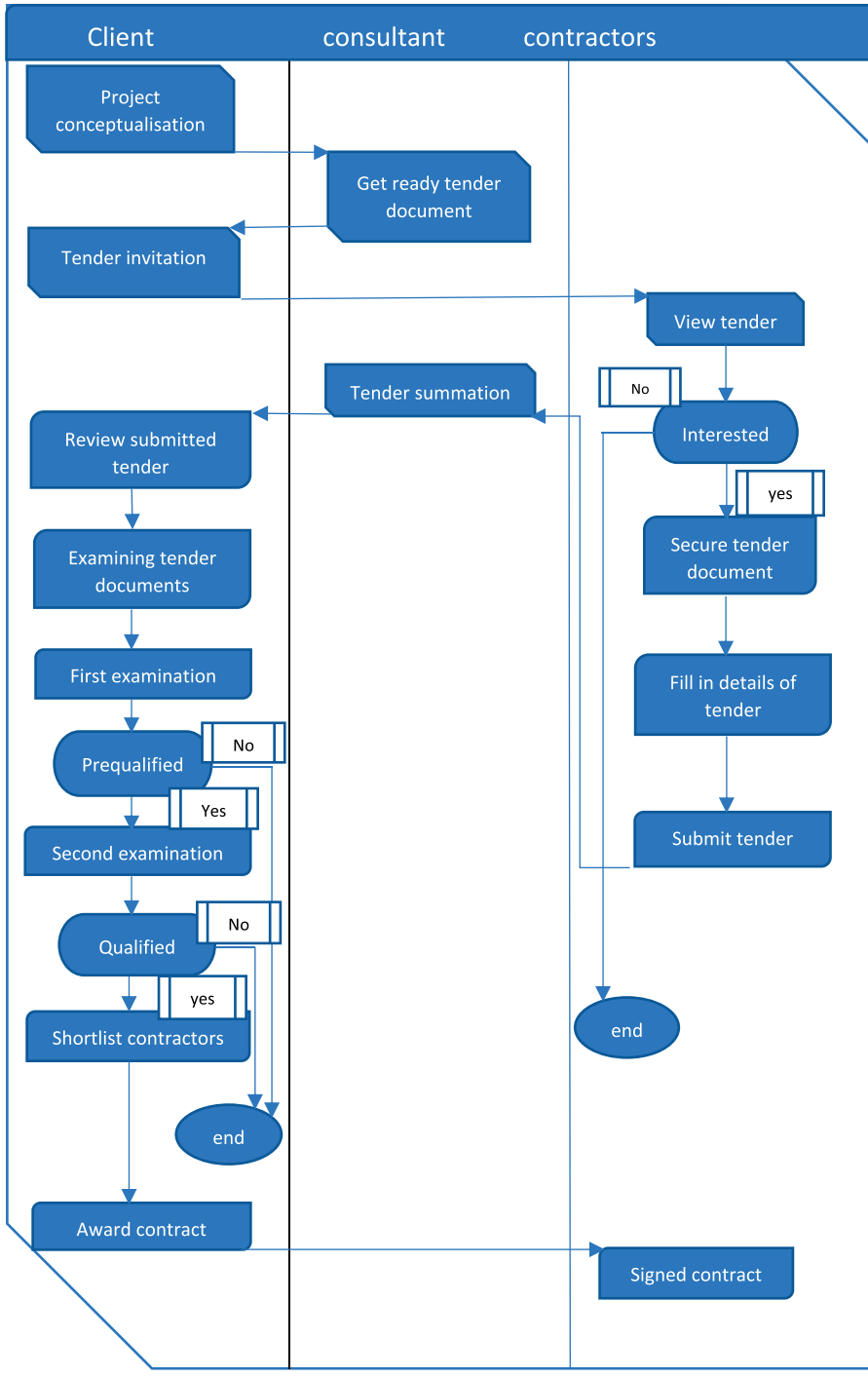

Figure 1.
Overview of tendering process in the construction industry, with respect to clients, consultant and contractor perspectives.

7. Electronic tendering

Technology is rapidly disrupting all spheres of endeavors. The most likely limitation to this disruptive technological force could be the people and the processes themselves. Adopting ICT in practice and day-to-day endeavor will help boost employees' technical capacities. However, upon critical examination and practicable observations in the construction industry, there is need to integrate the actions of the entire construction tendering into an electronic system in order to achieve optimality in project tenders, efficient time management, reliable procurement scheme, and seamlessness in overhead operations. Other benefits involved the reduction in printing and copying costs, halved the total costs on telephone between the owner and contractors. According to [1] they concluded that use of electronic system explains nearly 69% of the variance in transparency, 87% in service performance, 79% in efficiency and 67% in information quality. Thus, it can be concluded that the highest success in achievements is on the improvement of service performance, followed by efficiency, transparency and information quality. The results also show that user attitude has a direct influence on the system usage. Thus, the electronic tendering system will increase the profitability index of organizations, more efficient for all expert in the industry, and reliability will be guaranteed. However, electronic tendering is a unique methodology of dispatching a demand for relevant information and costs to tenderer and getting replies through utilizing the technology of the Internet or the preparation, publishing and receipting of tender information, getting tender documents, indicating interest in tendering, and willingness to purchase tender documents and finally selecting of a tenderer through the application of the internet is termed electronic tendering.

The Construction industry and its professionals should be acquainted with the robust benefits and the advantages of e-tendering through many legendary success records. Howbeit, when novel processes are launched in organizations, it is only normal for employees to panic because the security of their jobs may no longer be guaranteed; employees will shy from responsibility and during process alterations [2, 3].

Moreover, [4] studied e-tendering in China and discovered that the understanding of e-tendering among management team, political and institutional support, are required for e-tendering implementations, but are not the only factors needed to achieve success. The extent of development in e-tendering within the public sector does not necessarily measures up with the extent of development of these countries. [5] aimed to establish the e-tendering practices employed by Kenya Revenue Authority (KRA), and to establish the factors influencing application of e-tendering at KRA. He arrived at the result that understanding the e-tendering concept was a bit uneasy for senior management staff and team members. The issues range from fear of making errors, a lack of confidence, lack of technology and innovation champions within the organizations, in terms of factors, he found that the factors considered to affect e-tendering implementation at KRA include organization readiness, the capacity of the firm, and the risk implication.

The reason for the increasing degree of systems collapse, could be traced from employers and employees technical background and IT exposure. They are more related with the organization's 'Digitech' abilities: which includes thorough grasp of complex machines operations, and software application etc. Therefore, the deficit in Digitech abilities will impede the potentials of the organization to flourishingly assimilate IT into its oeuvre operations. IT being an enviable tool, in many domains, is considered by various management class or stakeholders of organizations as a means of reducing cost and handling time overrun, which is usually championed

and supervised by IT professionals. Organizations should eschew adopting novel technology into the present processes, but should rather give space for the already available technology to be assimilated into the present organizational processes. Sudden process alterations could override existing organizational processes, hence, impeding the organizations' growth. They will be a need for employees to adjust in the way they have previously carried their work in order to cope with novel technologies. On the process of adjusting, employees may grow weary; leading to job dissatisfaction and discontentment, low morale and little or no motivation etc. [6]. This provides an insight that organizations are to possess the requisite technical competencies to man the challenges that competes with easy assimilation of IT-enabled innovations and business improvement into its oeuvre practices. People will be major determinant in determining the success or failure of the utilization of e-tendering in procurement. When employees become receptive to change, there will be great enthusiasm and aspiration to harness new opportunities. The altitudes of employees towards e-tendering can be mirrored into the Maslow's hierarchy of needs [7] – the individual process; the interpersonal process; the organizational structure and dynamics.

Possible advantages that can be drawn from utilizing electronic tendering in the procurement process viz:

- It will aid in providing a well improved and safe access to tender information.
- It will also aid providing remote accessibility to the system.
- They will be easy accessibility in controlling and tracking of applications done with e-tendering.
- Employees involvement will be reduced in tendering process and other work-related services.
- The e-tendering system has the potentials to increase transparency and efficiency in government departments, and corrupt practices will be largely curtailed.
- The e-tendering system will help in reduces the cost of paper-heavy printing and assessment which saves time and resources up to 80% in getting tender document available.
- They will be fairness in the tendering process, that permit all logical contractor to access tender documents easily.
- E-T system has minimized the tender life cycle by about 38 days, and this results in increasing the document flow speed by about 58.5% [8].

Utilizing e-tendering, poses a strong stimulation to advance from the traditional system of tendering operations to a virtual system of tendering operations, where employees are going to be thoroughly equipped with digital skills and system functionalities, so as to produced optimal results from the e-tendering services and operations.

7.1 Statistical analysis of the questionnaire data

We adopted, the problem-solving approach of data collections. The research was design to state clearly some specific factors with respect to the contractor's portfolio. The research strategy used for this book chapter was a combination of both quantitative and qualitative research along with attitudinal research strategy. The population comprised of registered construction professionals such as Architects, Builders, Quantity surveyors and Civil Engineers, based on their financial capacity and random sampling. These contractors are selected as a result of the book chapter's main aim of utilizing e-tendering in the procurement of construction projects. For this purpose, the data were collected through questionnaire, we also had series of interviews on e-tendering in construction with other contractors. The questionnaire was divided into two (2) sections. Section A contained personal information of respondents,

	Factor	N	Mean	Std deviation	Coefficient Alpha
1.	Contractor's acceptance to the novel practice on e-tendering	30	7.3	0.901	1.898
2.	Contractor's technical and IT background	30	7.09	0.887	1.211
3.	Employees technical and IT background	30	7.05	0.885	1.334
4.	Employees response to technical issues and specifications	30	7.05	0.885	1.334
5.	Description of previous and present financial status	30	7.03	0.883	1.325
6.	Project conformity to client's quality specification	30	7.03	0.883	1.483
7.	Achievement of previous projects carried on time and within expected budget	30	7.01	0.882	1.200
8.	Adoption system for risk forecasting	30	7.00	0.881	1.322
9.	Availability of a lead specialist with team members	30	6.53	0.851	1.125
10.	Awareness in management system of the project	30	6.50	0.849	1.306
11.	Patterns of risks management system applied	30	6.47	0.847	1.382
12.	Measures utilized in health and safety policy	30	6.10	0.823	1.147
13.	The contractor's present portfolio	30	5.90	0.809	1.142
14.	Possession of machine and tools by contractor's	30	5.73	0.797	1.208
15.	Having technical trainings on complex machines	30	5.52	0.783	1.033
	Factors summation list.			**30**	

Table 1.
Shows results of the questionnaire.

Section B factors to be considered in the contractor's portfolio in Utilizing e-tendering in the procurement of construction projects. A total of 30 questionnaires were distributed and were returned, fully completed without mistake, which is sufficient for this book chapter. The questionnaire was analyzed using SPSS v21.0. which has been described as a software package used in the statistical analyzes of data. The e-tendering system being developed will be a web application that can be accessed from online browsers connected to the internet **(Table 1)**.

8. Results and findings

This section reveals the result and findings from the returned questionnaires from the construction professionals namely: Architects, Builders, Quantity surveyors and Civil Engineers. The stated specific factors with respect to the contractor's portfolio are justified as follows:

From the feedback gathered, the construction professionals focused on the most critical issues that should be taken into cognizant in the process of e-tendering in the contractor's portfolio. The first twelve (12) respondents had similar points of view, having stated, that the company is supposes to maintain a positive financial stand and avoid all potential losses in factor five (5). Meanwhile, the second respondents, which were nine in number (9), commented on factor 6 and 7 as an effective means for tracking successful project delivery. The third respondents had an insightful view on factor 14 and 15, stating that some of the major construction machines and equipment, may not necessarily be owned by the contractors, but can be rented, when needed. Generally, apart from the fact that factors 1,2,3,4,5,6 and 8 are the constant or are the permanent criteria in the small bid document, the construction professionals were in full agreement with these factors as part of the contractor's portfolio. Again, the factors 9,10,11, and 12 are flexible or non-permanent conditions, which slightly have mean values less than 7, are to be use in the design of the e-tendering system, depending on the kind of project to be handled. Moreover, factors 13,14, and 15 that has mean values <6, were also considered by the authors to be adopted the e-tendering system, as they were conditions in the small bid document.

8.1 The e-tendering system

The e-tendering system will consist of four different levels or stages, which are further grouped into the permanent and non-permanent sections. The levels involved in the permanent section for all the necessary projects and tenders, viz.; the first and third levels, whereas the non-permanent section viz. the second and fourth level, which is subject to change depending on the kind project to be handled (**Figure 2**).

8.2 The e-tendering system procedures

The e-tendering will consist of five levels which are:

- Registration and prequalification of the contractors.
- Here, for every logical contractor or tenderer that must submit bid for any project, must register with any of the institutions that has adopted the e-tendering system for their contracting processes as prerequisite.

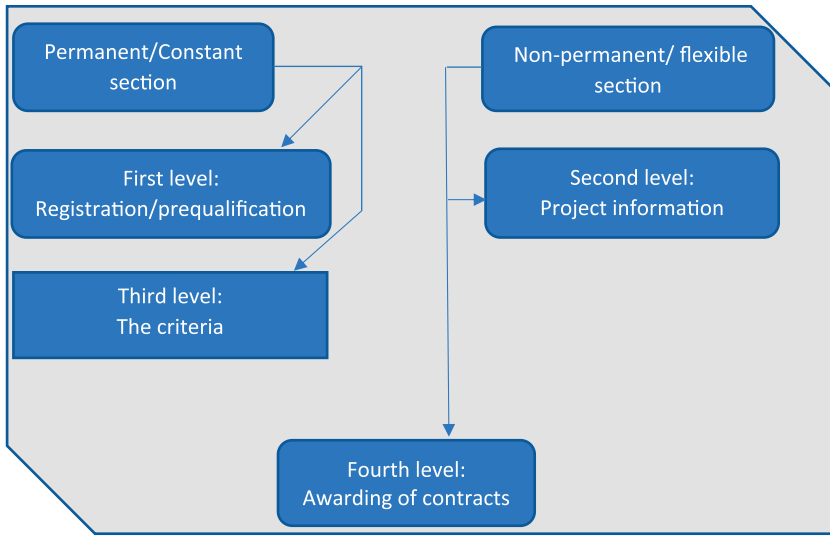

Figure 2.
Various arms of the programme.

- Here, the organization provides project information such as name, expected project duration, tender number, type of budget, the name of the client [e.g., Government] and the e-mail address of the responsible official, etc.

- when the contractor scales through the aforementioned permanent level in the small SBDs, he will be moved to the next stage.

- the fourth step is the non-permanent condition that is capable of changing, depending on the project to be handled. It usually changed base on the requirements of the client.

- Awarding of contract to the most appropriate contractors.

8.3 Standard bidding documents

The authors, considered rendering an insightful perspective to their readers about the standard bidding document, before continuing with the program explanation, as it has significant roles to play in the program development.

The SBDs are controlled steps or procedures of arranging the procurement process, which are used to obtain a unified and easy-to-filter tenders, and determine the most appropriate in terms of technical offer and the lowest in terms of financial offer.

The standard documents are 18 in number. Therefore, each of the document is utilized for a particular type of project, requested by a client. But in peculiar cases, like projects in the construction sector, the public works document (PWD) is utilized a lot, which is broken down into three kinds of sub-documents:

- Works document for small projects, with budgets within 1 trillion naira.

- Works document for medium projects, with budgets of 3 trillion naira.

- Works document for large projects for projects with a budget 6–10 trillion of and above.

In this book, the authors considered the first type of documents. The small document consists of necessary 7 parts, with brief definition of each part **(Table 2)**.

8.4 Basic components for the levels

A. The first level component viz:

- Registration and prequalification of the contractors.

B. The second level components viz:

- Information about the project and the client.
- Information about the tender.

C. The third level components viz:

- the criteria that are needed in the SBDs for small oeuvre which are to be handled by the client according to his specifications and requirements under the limitation of the tender, and these criteria viz.:

No.	Section Nomenclature	Section Description
1	Registration and prequalification for bidder	This part is permanent. Here, for every logical contractor or tenderer that must submit bid for any project, must register with any of the institutions that has adopted the e-tendering system for their contracting processes as prerequisite.
2	Instructions for bidders	This part is permanent, not flexible or modifiable. It contains all the necessary guidelines for the bidders to adhere to.
3	Tender information sheet	This section contains information that are filled by the client. The client requirements and specification are grouped in this section. Uncleared information by the client is handled in this section.
4	Evaluation and qualification criteria	statutory criteria are to be stated by the client for examining the contractors and choosing the most appropriate among them, thus; filling of these criteria varies according to each project and its requirements.
5	works requirements	This section is filled by the client, it consists of the specifications and requirements of the client to the contractor. However viz.; the architectural drawings, bill of quantities, milestones schedule, contingency funds. The contractor fills the fourth section, having this section in view.
6	General terms and Conditions of Contract.	This section is permanent, not flexible or modifiable.
7	Private terms and Conditions of Contract	This section is filled by the client, The general terms and conditions are spelt out clearly, while the client could put his personal terms and conditions for the project in this section.

Table 2.
Sections of the small bidding document (SBDs).

- The experience;

  A minimum number of at least (2) similar contracts specified that has been satisfactorily and substantially completed as a prime contractor, joint venture member, management contractor or subcontractor, within the last two or three years, according to the form*.

- Financial situation:

  The financial status of the contractor will reflect the funds required to have been gotten by the contractor in order to champion the proposed project. Furthermore, the minimum average annual returns to have been generated by a prime contractor, joint venture member, management contractor or a subcontractor is a minimum of 50,000,000 million naira, calculated as total certified payments received for contracts in progress or completed with the last three years, still according to the form*.

- Machines and work tools

  Here, contractors will authenticate their ownership of capital-intensive machines and work tools or upload scanned receipts of the hired machines and tools that will be use; these machines and work tools is to be shown in table containing the machines and work tools, type, specifications, and required number. Contractors will also have to give extra info of the intended machines and tools that are to be use during the execution stage of the contract in the tender form*.

- Work force/staffing

Here, contractors will give explicit details of the workforce to be deployed in the execution of the contract, thus stating, their past work experiences and where it was done, according to the forms*.

D. The fourth level component viz;

- Contract awarding

The fourth level represent the report of awarding the contract which will be mailed to the merited contractor or contractors. Mails will also be sent to other contractors, suppliers who did not merit the awarding of the contract, so as to pacify them, in hope that they stand another chance of meriting subsequent projects as the need for development arises within institutions, Governments etc.

The e-tendering system is being modeled particularly for projects with a budget within a trillion (1000000000000) naira. However, if the contractors do not adequately prepare and upload complete tenders, the e-tendering system will instantly disqualify the contractors and exonerate tender documents at the second and third level. The success or pass of any tender is dependent on the fulfillment of the criteria and factors which have been derived from the technical offer. However, the e-tendering system is to choose one offer from many successful tenders, and the tender that is chosen will be the tender with the least financial offer, and with the shortest possible duration to complete the project.

9. Conclusion

Summarily, the book chapter shows the importance of Utilizing e-tendering system for tendering purposes in the procurement of construction works. The importance of electronic tendering needs not be over emphasized. Though country like Saudi Arabia introduced it but failed to complete at a particular point, countries like Korea and Malaysia were successful and are progressing.

The book chapter was set to promote faster tendering process, reduction in the use of paper, ease of documenting transactions, increased level of accountability, ease of accessibility to tendering documents, increased level of transparency in processing, reduction in cost of tendering, increased competition among tenders, increased innovation and creativity and above all to reduced corruption. Again, the book chapter was able to determine the requirements needed in the contractor's portfolio.

It has been well examined that, migrating to e-tendering of project procurement, will reduce the cost implication of tender, therefore mitigating the time consumed in the process because the system should function within 24 hours. Again, to effectively adopt the e-tendering system, organizations must be ready to change, the employees should have enough courage to adopt the system, and there is a need to have at least one person to play the defining role of a champion. Finally, the features of the e-tendering system and its terms of reference is being developed and will soon be practice in the Federal University of Technology Owerri (FUTO), a Nigerian university. We recommend adoption of the e-tendering system for other organizations operation, and confirm that the data taken and analyzed are correct, precise and obtainable with the reality of present demands.

Acknowledgements

Recognition and thanks are given to Dr. Ibeawuchi Echeme, Mrs. Chinwe C. Ezirim, Mrs. Pauline. C. Ndubuaku my mum, Mr. Richard Okefiena (Editor) Fredrick Jonathan, okwuobasi Christian and Onwuta Kingsley my colleagues for their support and guidance in the preparation of this study.

Conflict of interest

The authors declare no conflict of interest.

Notes/thanks/other declarations

The authors, implores construction practitioners to be innovative and to possess an evolving mind-set in the industry so as to influence the world positively. Let us consciously deploy operation "think and birth forth inventions". The authors are immensely grateful for the opportunity of contributing to the fourth industrial revolution: applications and perspectives. The authors which to contribute more. It's a thing of joy making significant impact globally. Thanks!

Author details

Nnadozie Godswill Ndubuaku* and Godson Jerry
Federal University of Technology Owerri, Imo State, Nigeria

*Address all correspondence to: ndubuakugodswill@gmail.com

IntechOpen

References

[1] Suzila KE, Hussin H. A success model for the Malaysian government e-procurement system. International Journal of Electronic Government Research. 2013;**9**(1):1-18. DOI: 10.4018/jegr.2013010101

[2] Blayse AM, Manley K. Key influences on construction innovation. Construction Innovation: Information, Process, Management. 2004;**4**(3):143-154

[3] Neupane A, Soar J, Vaidya K, Yong J. Willingness to adopt e-procurement to reduce corruption. Transforming Government: People, Process and Policy. 2014;**8**(4):500-520. DOI: 10.1108/tg-03-2014-0007

[4] Bulut C, Yen BPC. E-procurement in public sector: A global overview. Electronic Government, an International Journal. 2013;**10**(2):189. DOI: 10.1504/eg.2013.052601

[5] Dominic O. Factors Influencing E-Procurement Application at Kenya Revenue Authority. A Research Project for the Award of the Degree of Master of Business Administration. Kenya: To- Business Electronic Procurement, Communications of the IIMA; 2014;**5**(1):15-24

[6] Beise CM. IT project management and virtual teams. In: Proceedings of the 2004 SIGMIS Conference on Computer Personnel Research: Careers, Culture, and Ethics in a Networked Environment, Special Interest Group on Computer Personnel Research Annual Conference. New York: ACM Press; 2004. pp. 129-113

[7] Maslow AH. A theory of human motivation. Psychological Review. 1943;**50**:394-395

[8] Elias EM, Mahidin N, Shiratuddin N. E-tendering system for construction projects. In: Proceedings of International Conference on E-Commerce. Baghdad, Iraq: Razaq Abdul Hilmi; 2005

Section 2

Empirical Models of Detailed Assumptions and Conditions in the Global Market

Chapter 4

The Nonlinear Dynamic Impact of Development-Inequality in the Prudential Policy Regime in Emerging Economies: A Bayesian Spatial Lag Panel Smooth Transition Regression Approach

Lindokuhle Talent Zungu, Yolanda Nomusa Nkomo, Bongumusa Prince Makhoba and Lorraine Greyling

Abstract

A panel data analysis of the nonlinear dynamics of economic-development in a macroprudential policy regime was conducted in a panel of 25 emerging markets who were grouped together based on their regions: 10 African countries, 8 Asian countries, and 7 European countries covering the period 2000–2019. The paper explored the validity of the Kuznets hypothesis in a prudential policy regime as well as the threshold level at which economic-development reduces inequality, using the Bayesian Spatial Lag Panel Smooth Transition Regression model. This model was adopted due to its ability to address the problems of endogeneity, heterogeneity, and time and spatial-varying in a nonlinear framework. We found evidence of a nonlinear effect between the two variables, where the threshold was found to be US $15,900, above which reduces inequality in the African emerging markets; while for emerging Asian and emerging European markets, we documented a U-shape relationship with an optimal level of economic-development estimated at US$17,078 and US$19,000, respectively. Unconventional and macroprudential policies were found to trigger development-inequality relationships. The result supported the S-curve relationship in these regions. Our evidence largely suggests that policymakers ought to formulate policies aiming at increasing agricultural productivity through land redistribution, investment, trade, and promoting human development. Policymakers should also be cautious when implementing macroprudential and unconventional monetary policies.

Keywords: economic-development, emerging markets, income inequality, BPSTR model, macroprudential policies

1. Introduction

The effect of economic development on income inequality has been a debated subject for the past decades. To date, there have been controversies in both the theoretical predictions and empirical literature on identifying the role played by economic development in income inequality. Theories, such as the Kuznets hypothesis, postulate that there is nonlinearity between economic development and income inequality, stating that inequality tends to escalate during the early phase of development, as labour migrates from the low-paying sector, agriculture, to the high-paying sector, urban and non-agricultural economic activities [1]. The Kaldor theory states that, if capitalists save more than workers, fast rates of growth are associated with a higher share of the profits [2]. After 41 years of the Kuznets hypothesis, Tribble [3], became famous as the Tribble S-shape hypothesis. Tribble [3] posits that the Kuznets inverted U-shape was not premised on the data relating to the agricultural to manufacturing (ATM) structural transition, as the study by Kuznets mentions the first critical turning point, where the economic integration of the modern sector of manufacturing with the traditional sector had started in earnest. The extant literature on the development-inequality relationship is vast and has capitulated extensive conflicting outcomes. The contradiction that emerged in the literature is mostly due to, but not limited to, different model specifications, data sets and estimation techniques, or the levels of the economies being studied when examining the development-inequality relationship. For instance, studies that believe in nonlinearity contradict each other, as portrayed by those who support the existence of the Kuznets inverted U-shape [4–9] or no U-shape [5, 10, 11], or the S-shape [12, 13]. There are also studies that find this relationship to be inconclusive [14, 15] or a mixed relationship [12].

The current study seeks to extend the existing literature on this subject matter, following the seminal work of Zungu et al. [9], whose study adopted the PSTR in a panel of 15 emerging economies. Their study tested the existence of the Kuznets hypothesis during the prudential and non-prudential policy regimes in emerging economies. To capture economic development, their study used GDP per capita at constant prices (US$), while income inequality was captured by the Gini coefficient at market price. Their study controlled for house prices, government expenditure, investments and macroprudential policy, using capital-related and borrower-related instruments. The current work aims to extend the study documented by Zungu et al. [9], As it is argued in their study and others, those monetary policies, especially the macroprudential policies, may have a direct or indirect impact on income inequality. However, in their study, they focus mainly on two macroprudential policy instruments, namely the capital and borrower-related instruments, conversely neglecting the potential impact of other macroprudential policy measures in the system such as FX and/or countercyclical reserve requirements, and a general countercyclical capital buffer/requirement.

We believe that it would be quite interesting to control for other policy instruments that were not captured in their study, as they might play a significant role in triggering the development-inequality correlation when these countries switch from the era of a non-prudential policy regime to a prudential policy regime. As it has been noted in the literature, the estimation techniques or the level of the economy being studied when examining the development-inequality relationship also triggered the documented results in this subject matter. Moreover, in the estimation techniques, studies on this subject, especially those that have investigated this problem in a

panel-data framework, have introduced time and cross-sectional effects to represent individual heterogeneity, which then satisfies the assumption that the coefficients of the explanatory variables are assumed to be constant for all section units and periods. However, in practice, this assumption is sometimes unreasonable. For example, the model adopted by Zungu et al. [9] actually allows coefficients to change with different cross sections and times, which is a sufficient relaxation of the heterogeneity assumption in panel-data models. Let us consider a scenario where the local equilibrium prices of all local markets are correlated in the general equilibrium model; individuals in the network model are interconnected; and in a competitive market, one participant's decision is influenced by the decisions of other participants, and so on. The classic econometric model would no longer be applicable when dealing with the aforementioned study areas. The spatial method plays a significant role in such a problem instead.

To address these issues, we separated countries based on their regions and continued to focused on those that are emerging countries from Africa (Burkina Faso, Ghana, Mali, Botswana, Namibia, South Africa, Tanzania, Mozambique, Uganda, and Eswatini), emerging Asian economies (China, India, Indonesia, Korea, Malaysia, the Philippines, Taiwan, and Thailand), and emerging European economies (Czech Republic, Hungary, Poland, Romania, Russia, Turkey, and the Ukraine). The primary objective behind categorizing these countries by their respective regions is to compare and track if the correlation between the variables of interest is substantially impacted by the country's location. Therefore, we establish a model for the emerging markets by extending the PSTR model developed by González et al. [16] to account for spatial correlation between variables, and we also construct a Bayesian inference for the PSTR model. The Bayesian method has the advantage of completely utilizing priori and posteriori information, resulting in improved estimation accuracy and resilience. Considering the model, the group of countries being studied and the variable adopted in the model, we believe that this will provide new insights into the emerging literature.

The main advantage of the standard PSTR model is that it can handle time heterogeneity and cross-sectional data. This approach, however, cannot handle spatial data with cross-sectional correlation. To combine the benefits of the spatial model with the PSTR model, we incorporate spatial correlation into the PSTR model and develop a spatial lag panel smooth transition regression (SLPSTR) model that can adequately account for heterogeneity and spatial correlation simultaneously. We then propose a Bayesian inference method for our model, in contrast to the frequentist estimation methods widely used in the econometric literature, such as the Generalized Moment Method (GMM), the (Quasi) Maximum Likelihood Method, the Instrumental Variable (IV) Method for estimating spatial econometric models, and the Nonlinear Least Squares Method for estimating PSTR models. The utilization of information is the most essential element of a Bayesian estimate when compared to the frequentist approach. The Bayesian method determines both sample and prior information, whereas the frequentist method just considers sample information. We combined the Bayesian method with spatial correlation, following Li et al. [17]. The linear model has been used in the current literature on the spatial model, with the assumption that the influence of the independent variables on the dependent variable is linear and the marginal effects are constant throughout space and time. However, our paper differs from the above assumption in that we introduce a nonlinear influence form of "regime transition" into the spatial econometric model and obtain the Bayesian spatial panel smooth transition model, which allows the influence of independent variables

on the dependent variable to change with some transition variables Li et al. [17]. Our argument is that, because the transition variable often varies across time and space, the effect of the independent variables can also be time and spatial-varying, which weakens the linear model's assumption that the coefficients of independent variables are constant.

The remaining portion of the paper is organized as follows. Section 2 briefly surveys the related literature. Section 3 presents an overview of the model. Section 4 discusses the results of the SLPSTR models. Section 5 provides concluding remarks and discusses policy implications.

2. Literature review

2.1 Theoretical debate on economic development and income inequality

There is a theoretical controversy in the literature on the development-inequality relationship. The following section briefly discusses both the Kuznets and the Tribble hypotheses. According to the Kuznets theory, Kuznets [1], development-inequality is characterized by two regimes with one threshold of development, where in the early stage of development, income inequality increases as labor migrates from the low-paying sector, agriculture, to the high-paying sector, urban and non-agricultural economic activities. Kuznets [1] made the following assumption and formulated the following function:

$$GINI = \beta_0 + \beta_1 ECD - \beta_2 ECD^2 + \mu, \tag{1}$$

The Kuznets theory highlights two phases of the economy, with the first represented by the coefficient $\beta_1 ECD$ (economic development), which emphasizes that, during the first stage, industrial growth creates inequality as the weight of the non-agricultural sector expands. The second phase of the economy, develops when the agricultural sector's proportion of the labor diminishes, a threshold is achieved, and inequality begins to reduce (due to the agricultural and rural sectors' very low weight), as evidenced by the coefficient $\beta_2 ECD^2$ (economic development). Following Kuznets' theory, we utilized GDP per capita as a proxy for economic progress in our analysis.

After the intervention suggested by Kuznets [1] in this subject matter, fourth 1 years later, Tribble [3] tested the validity of Kuznets's hypothesis, and found that the Kuznets inverted U-shape was not premised on the data relating to an agricultural to manufacturing (ATM) structural transition, as the study based on the Kuznets hypothesis mentions the first critical turning point, where the economic integration of the modern sector of manufacturing with the traditional sector had initiated in earnest. This might be due to the fact that the data employed by Simon Kuznets did not aptly define the structural shift in sectoral development, but merely presumed that the shift had been made.

However, the recent data embrace not only the period beyond the first critical turning point, which Kuznets predicted correctly, but also the second critical turning point related to the manufacturing to services (MTS) transition, which may not have been anticipated as a structural shift in economic development. Therefore, Tribble [3] defined a shift that embraces numerous structural turning points in the development process, leading to the formulation of the S-curve which can be mathematically expressed as follows:

$$GINI = \beta_0 + \beta_1 PGNP - \beta_2 PGNP^2 + \beta_3 PGNP^3 + \mu, \beta_1 > 0, \beta_2 < 0, \beta_3 > 0, \quad |\beta_1| > |\beta_2| > |\beta_3| \tag{2}$$

Tribble [3] defines the model above as the phases that distinguish the S-curve as follows: Phase 1 (ATM) $\acute{f}(PGNP) > 0$ income-inequality and $\ddot{f}(PGNP) > 0$; increase at a cumulative rate. Phase 2 $\acute{f}(PGNP) > 0$ income-inequality and $\ddot{f}(PGNP) < 0$; increase at a decreasing rate. Therefore, the turning point is where $\acute{f}(PGNP) = 0$, and the first critical turning point has been archived at $\ddot{f}(PGNP) < 0$. Phase 3 $\acute{f}(PGNP) < 0$ income-inequality and $\ddot{f}(PGNP) > 0$ increase at a cumulative rate. For Phase 4 $\acute{f}(PGNP) < 0$ income-inequality and $\ddot{f}(PGNP) > 0$ surge upwards at a decreasing rate. The turning point $\acute{f}(PGNP) = 0$, where the second critical turning point archived will be $\ddot{f}(PGNP) < 0$. For the MTS, phase 1 $\acute{f}(PGNP) > 0$, income-inequality $\ddot{f}(PGNP) > 0$ increases at a cumulative rate.

2.2 Empirical review

After scrutinizing the existing literature on this subject matter, we found that there are two strands of literature that explain the relationship between economic development and income inequality. The first strand is based on the seminal work document by Kuznets [1], of an inverted U-shape [4–9, 13, 18, 19], or no U-shape [5, 10, 11]. The second strand is based on the extension of the Kuznets curve, which is known as the S-shape, established by [3, 12, 13]. Apart from these two strands, there are studies that find the relationship in this subject matter to be inconclusive [14, 15], or a mixed relationship [12].

After reviewing the literature, we found one relevant paper on this subject matter by Zungu et al. [9], who introduced an adaptation of a macroprudential policy regime in their model. Their findings make a significant contribution to the literature and help to establish a connection between development and inequality in a macroprudential policy area. To control for macroprudential instrumental channels, their study adopted borrower-related and capital instruments. We believe that their study faced two constraints in producing a clear understanding of the developmental-inequality relationship in the macroprudential policy regime, as their study focused on a group of macroprudential instruments, ignoring the potential impact of the other macroprudential instruments. Their study further suffers from model weaknesses to account for spatial problems in variables.

Going as far back as Robinson [8], who tested, and indeed confirmed the Kuznets hypothesis, this contradicts with the finding documented by Ahluwalia [14], as the results show no support of the Kuznets hypothesis in a cross-country. The results documented by Robinson [8] were supported by the study conducted by Papanek and Kyn [18] using panel data of 83 countries over the period 1952–1978. In their model, income inequality was captured by the Gini coefficient, while economic development was captured by GDP per capita. The argument was taken forward by Jha [20] in a panel of 76 countries over the period 1966–1992, using pool regression. In their model the share of total income accruing to the poorest 20% of the population was adopted to capture income inequality, while per capita GDP was used to capture economic development while controlling for years of schooling and economic growth. They asserted that the data utilized for inequality caused a serious issue, potentially leading to an inaccurate result and/or nullifying the estimations which support the arguments made

by Saith [21] in a case of 60 countries, that studies conducted in the 70s were found to be based on defective statistics and questionable methodological premises.

After 45 years of the argument on the nonlinear relationship between economic development and income inequality since the seminal work by Kuznets [1], the study by Barro [15] emerged with some strong criticism against the Kuznets hypothesis that it did not fully explain the impact of economic development on inequality over time. Barro's model includes controls for education, trade openness, the rule of law, and the democracy index. In the same year as Barro [15], a U-shape relationship was documented by Savvidesa and Stengos [11] in a panel of 95 countries. This contradicts the findings reported by Robinson [8], Ahluwalia [14], Papanek and Kyn [18], Jha [20]. The study by Savvidesa and Stengos [11] utilized the data from Deininger-Squire [22] to capture income inequality, with per capita income used as a proxy for economic development. On the other hand, the study by Shahbaz [12] supported the argument made by Barro [15]. The study by Shahbaz [12] was investigated in Pakistan using the ARDL bounds-testing approach on time-series data over the period 1971–2005. The development inequality in the case of Pakistan was found to be explained by the S-shape relation. This then further supported the Tribble hypothesis [3]. Although the study by [10] contradicts the findings reported by Robinson [8], Ahluwalia [14], Papanek and Kyn [18], Shahbaz, [12], and [8, 23] their study in a panel of 32 countries supports the results documented by Savvidesa and Stengos [11].

Following the seminal work documented by Tribble [3], which became popular as the Tribble S-shape hypothesis, the development-inequality relationship seems to change the paradigm, as studies that support the existence of the Tribble hypothesis emerge in the literature. Theyson and Heller [13] tested the Kuznets hypothesis in a panel of 147 countries from 1992 to 2007, utilizing a panel fixed-effect technique. Their finding supported the Tribble hypothesis. and were in line with the findings documented by Savvidesa and Stengos [11] and Angeles [10]. The U-shape relationship, which was first demonstrated by Savvidesa and Stengos [8], was further supported by the study documented by in a panel of 162 countries, covering the period 1960–2011. The study by Chiu and Lee [5], investigated the Kuznets hypothesis in a panel of 59 countries over the period 1985–2015, where these countries were classified into low-income (27) and high-income (32) countries. Their discovery made a significant contribution to the literature because it demonstrated that the Kuznets hypothesis holds true for low-income countries, while a U-shape explains the relationship in high-income countries. Kavya and Shijin [6] studied the impact of economic development on income inequality in a panel of 85 countries, where 16 were low-income, 28 were high-income and 41 were middle-income countries over the 1984–2014 period, using a GMM model. The findings reveal that the Kuznets curve holds for high-income countries.

Recently, Lee et al. [7] investigated the same subject matter in a panel of 68 countries from 2001 to 2018. Their findings supported the Kuznets hypothesis. Previous income inequality enhances current inequality in a regime with low economic development, while this effect is the opposite in a regime with high development. The argument was taken further by Zungu et al. [9], who investigated the development-inequality relationship in macroprudential and non-prudential policy regimes in a panel of 15 emerging markets covering the period 1985–2019. Their model accounts for borrower-related and capital-related instruments. Their finding documented two significant results for emerging markets, as they found a nonlinear relationship between the two variables, with the threshold being US $13,800, above which economic development reduces inequality. They further supported the argument that a macroprudential policy instrument increases inequality. Their study supported the

empirical studies documented by Robinson [8], Ahluwalia [14], Papanek and Kyn [18], Jha [20], Kavya and Shijin [6], Lee et al. [7]. As the current study aims to introduce the impact of macroprudential policy regulations on development-inequality, this section explains the empirical relationship between a macroprudential policy and income inequality in a nutshell. The empirical research on the distributional impact of macroprudential policies indicates that the increased adoption of these regulations increases income inequality. There are seven significant empirical papers in the literature that explore the impact of macroprudential regulations on inequality [23–30]. These studies have adopted the borrower-related instruments, such as the loan-to-value limit and debt-to-income ratio. Macroprudential policies were found to have a redistributive effect on wealth and income inequality through these measures [23, 26, 28, 30]. The study by Frost and van Stralen [26] further adopted the concentration and interbank exposure limits in their model, and this was found to increase inequality. However, the studies by Carpantier et al. [25] and Konstantinou et al. [27] argue that these macroprudential policies, through these measures, are helpful in reducing income inequality.

3. Research methods and data adopted for this study

The current study utilizes data covering the years 2000 to 2019. The main objective of the current study is to analyze the non-linear impact of economic development and income inequality in a group of 25 emerging markets that are grouped together based on their regions: 10 African countries, 8 Asian countries, and 7 European countries due to data unavailability in other countries. We focused on the period 2000–2019 in order to analyze how macroprudential instruments triggered the development-inequality relationship in these countries. Following Zungu et al. [9], we use GDP per capita in constant prices (US$) to capture economic development (ECD), while for income inequality, unlike in the study above, we take the argument into consideration that the Gini coefficient per country usually records small variations across time and is considered to be a relatively stable measure of inequality. Therefore, we use the pre-tax income held by the top 40% (PTII40%) and further pre-tax income held by the top 10% (PTII10%) collected from the World Inequality Database (Alvaredo et al.) [31] as a robustness model. Apart from those macroprudential policy instruments adopted by Zungu et al. [9], we control for FX and/or countercyclical reserve requirements (FXCRR), general countercyclical capital buffer/requirements (GCCBR), and a macroprudential index (0–12) (MI-12) in the model. We then control for capital-related (CRI) and borrower-related (BRI) instruments. Considering the ongoing debate on the inequality issue, some schools of thought further point to unconventional monetary policy as another source of income inequality. We then control for income composition, using an equity index (ICEI) and portfolio composition channels through house prices (PCCHP). The model controls for investments (INV), government expenditure (GE), trade openness (TRD) and tourism development (TORD). The variables were extracted from SWIID [32, 33] and Cerutti data (Cerutti et al.) [34].

3.1 Spatial lag panel smooth transition regression model

To evaluate the development-inequality relationship the SPSTR model, which is as an extension of the PSTR developed by González et al. [16], was used. The SPSTR model developed in this paper has been formulated as follows:

$$Gini40_{it} = \rho(WK)_{\mathrm{it}} + \beta_0 \mathrm{X}'_{it} + \beta_1 X'_{it} \mathrm{g}(\mathrm{q}_{it}; \gamma, \mathrm{c}) + \beta_2 \mathrm{A}_{it} + \mu_i + \varepsilon_{it} \qquad (3)$$
$$i = 1, \ldots, N, \text{and } t = 1, \ldots, T$$

where the subscript i, t indicates a $i-th$ cross-section and $i-th$ period, respectively, $GiniT40_{it}$ is the dependent variable, $K = (k_{11}, k_{21}, \ldots, k_{\mathrm{N1}}, k_{12}, \ldots k_{\mathrm{NT}})'$ is an $NT \times 1$ vector of dependent variables and W is a $NT \times$ NT spatial weight matrix, A_{it} is a $k \times 1$ vector of independent variables (ECD, FXCRR, GCCBR, MI-12, CRI, BRI, ICEI, PCCHP, INV, GE, TRD and TORD), and β_0, β_1, β_2 are $k \times 1$ vectors of coefficients, whereas, μ_i represents the individual fixed effects, and the random errors term is denoted by ε_{it}. Following Granger and Teräsvirta [35], González et al. [16], we introduce the follows equation:

$$\varepsilon_{\mathrm{it}} \sim N(O, \sigma^2), g(\mathrm{q}_{it}; \gamma, c) = \left(1 + \exp\left(-\gamma \prod_{j=1}^{m} (\mathrm{q}_{it} - cj)\right)\right)^{-1} \qquad (4)$$

where Eq. (4) is a transition function and evidently, we have $0 < g(\mathrm{q}_{it}; \gamma, c) < 1)$ where $c_j = (c_1, \ldots, c_m)'$, $e = (1, 1, \ldots 1)'$, is the $m \times 1$ vector of location parameters, and $\gamma > 0$ is a scale parameter. Without loss of generality, we set $m = 1$ to simplify mathematical deduction. Given i, the SLPSTR model can also be written as:

$$Y_i = \rho(WK)_{\mathrm{i}} + \beta_0 \mathrm{X}'_i + \beta_1 G_i X'_i + \mu_i e + \varepsilon_i \qquad (5)$$

where $Y_i = (y_{11}, y_{21}, \ldots, y_{\mathrm{iT}}, \mathrm{e} = (1.1, \ldots 1)'$ is a $T \times 1$ vector with all elements valued $1, X_i = (x_{\mathrm{i1}}, x_{\mathrm{i2}}, \ldots, y_{\mathrm{iT}}, G_i = \mathrm{diag}(g(\mathrm{q}_{it}; \gamma, c), \ldots, g(\mathrm{q}_{iT}; \gamma, c))$, and $\varepsilon_i = (\varepsilon_{i1}, \varepsilon_{i2}, \ldots, \varepsilon_{iT},)'$. Assuming that $Y = (Y'_1, Y'_2, \ldots, Y'_N,)'$, $X = (X_1, X_2, \ldots, X_N)'$, $E = (E'_1, E'_2, \ldots, E'_N,)'$, where $E_i = (0, e, 0)$ is the $T \times N$ matrix in which the elements of the $i-th$ column are 1 and the other elements are 0, $G_i = \mathrm{diag}(\mathrm{G}_1, \mathrm{G}_2, \ldots, \mathrm{G}_N))$, $Z = (\mathrm{E} \vdots \mathrm{X} \vdots \mathrm{GX})$, $\Theta = (\mu_1, \mu_2, \ldots, \mu_N, \beta'_O, \beta'_1)'$, and $\varepsilon = (\varepsilon'_1, \varepsilon'_2, \ldots \varepsilon'_N)'$, then the two regimes of the SLPSTR model can be simplified as:

$$Y = \rho WK + \mathrm{Z}\Theta + \varepsilon, \varepsilon \sim N(O, \sigma^2 I) \qquad (6)$$

In the next section we will discuss the Bayesian estimation approach for model (6).

3.1.1 Building a Bayesian estimation for the PSTR model

We first construct the Bayesian analytical framework of model (4) before proceeding to the particular estimate phase. Given (γ, c), let $A = (I - \rho W)$, then the likelihood function of model (5) is:

$$L(Y|\Theta, \gamma, c, \sigma^2) \propto \sigma^{-NT} |A| \, exp\left\{-\frac{1}{2\sigma^2}(AY - Z\Theta)'((AY - Z\Theta)\right. \qquad (7)$$

The prior distribution of parameter ρ is usually assumed to be a uniform distribution with probability density function $\pi(\rho) = \frac{1}{\lambda_{max}^{-1} - \lambda_{min}^{-1}}$, where λ_{max}, λ_{min} are the maximum and minimum eigenvalues of a spatial weight matrix W, respectively, which

indicates the $\rho \sim \left(\lambda_{min}^{-1}, \lambda_{max}^{-1}\right)$. The prior distribution of parameter Θ is set to be a multiple normal distribution $N(\mu_0, \Sigma_0)$, where μ_0 and Σ_0 are the prior expectation and covariance. We also assume the prior distribution of parameter σ^2 to be an inverse gamma distribution $IG(\mu_0, \Sigma_0)$, and set prior γ and c as gamma distribution and normal distribution, that is $\gamma \sim G(a, b)$,$(c \sim N(\mu_c, \Sigma_c)$. Combining all the priors with a likelihood function, we can obtain the joint distribution of all variables as follows:

$$P\left(Y, \rho, \Theta, \gamma, c, \sigma^2\right) = L\left(Y|\rho, \Theta, \gamma, c, \sigma^2\right).\pi(\rho).\pi(\Theta).\pi(\gamma).\pi(c).\pi\left(\sigma^2\right) \tag{8}$$

where $\pi(.)$ denotes the prior probability density function of each parameter. According to the Bayesian theorem, the joint posterior distribution of all parameters is given by:

$$P\left(\rho, \Theta, \gamma, c, \sigma^2\right) \triangleq P\left(\rho, \Theta, \gamma, c, \sigma^2|Y\right) \tag{9}$$

On the basis of a joint distribution and joint posterior distribution, we can get the conditional posterior distribution of each parameter as follows:

$$P\left(\Theta|\rho, \gamma, c, \sigma^2\right) \propto N(\mu, \Sigma) \tag{10}$$

where $\mu = \left(Z'Z + \sigma^2\sum_0^{-1}\right)^{-1}\mu = \left(Z'AY + \sigma^2\sum_0^{-1}\mu_0\right)$ It can be seen from Eq. (10) that the conditional posterior distribution of Θ is a multiple normal distribution when given other parameters. Similarly, the conditional posterior distributions of other parameters are as follows

$$P\left(\sigma^2|\rho, \Theta, \gamma, c\right) \propto IG\left(\frac{NT}{2}\right) \propto, \frac{(AY - Z\Theta)'(AY - Z\Theta)}{2} + \beta) \tag{11}$$

$$P\left(\Theta|\rho, \gamma, c, \sigma^2\right) \propto |A\ (\rho)|\, exp\left\{ -\frac{1}{2\sigma^2}(A(\rho)Y - Z\Theta)'(A(\rho)(Y - Z\Theta).\frac{1}{\lambda_{max}^{-1} - \lambda_{min}^{-1}}\right. \tag{12}$$

$$P\left(\gamma, c|\Theta, \rho, \sigma^2\right) \propto exp\left\{ -\frac{1}{2\sigma^2}(AY - Z\Theta)'((AY - Z\Theta).\pi(\gamma).\pi(c)\right. \tag{13}$$

where $A(\rho) = (I—\rho W)$. From the conditional posterior distributions of all parameters, we can see that the probability density functions of γ,c and ρ are more complex, and these parameters cannot be directly sampled. Therefore, we use the Metropolis-Hastings algorithm to deal with this problem. Assuming that the current value of ρ is ρ_t, that meets $P(\rho_t|\Theta, \gamma, c, \sigma^2) > 0$, and the candidate value ρ^* is generated from the proposed distribution $F(\rho^*|\rho_t) = f(\rho^* - \rho)$, where $f(.)$ is the probability density function, the transfer process is $\rho^* = \rho_t + \lambda z$, where $z \sim N(0, I)$, and λ is a transfer parameter. Then the reception ratio of ρ^* *is* $A_i(\rho^*|\rho_t) = \min\{1, R_1\}$, where

$$R_1 = \frac{P(\rho^*|\Theta, \gamma, c, \sigma^2)F(\rho_t|\rho^*)}{P(\rho_t|\Theta, \gamma, c, \sigma^2)\ F(\rho^*|\rho_t)} \tag{14}$$

Similarly, assuming that the current values of (γ, c) are (γ_t, c_t), and the candidate values (γ^*, c^*) are generated from the proposed distribution $\gamma^* \sim N\left(\gamma_t, \sigma^2{}_y\right)$ and $c^* \sim N(c_t, \sigma^2{}_c I)$, respectively, then the reception ratio of (γ^*, c^*) is $A_2((\gamma^*, c^*)|\gamma_t, c_t)) = \min\{1, R_2\}$, where in:

$$R_2 = \frac{P((\gamma^*, c^*|\rho, \Theta, \sigma^2) f_\gamma\left(\gamma_t|\gamma^*, \sigma_y^2\right)\right)\left(f_c(c_t|c^*, \sigma_c^2)\right)}{P((\gamma_t{}^*, c_t{}^*|\rho, \Theta, \sigma^2) f_\gamma\left(\gamma^*|\gamma_t, \sigma_y^2\right)\right)\left(f_c(c^*|c_t, \sigma_c^2)\right)} \tag{15}$$

$f_\gamma\left(\gamma_t|\gamma^*, \sigma_y^2\right)\right)$ represents the normal distribution probability density function of $\gamma_t$with mathematical expectation γ^* and variance $\sigma_y^2 f_c\left(\left(c_t|c^*, \sigma_c^2\right)\right)$ denoting the normal distribution probability density function of c_t with mathematical expectation c^*, and variance σ_c^2. σ_c^2 and σ_y^2 are adjustment parameters. Z^* and Z_t indicate the value of Z at a corresponding time, when the value of $(\gamma, c)$are(γ^*, c^*) and γ_t,c_t, (respectively)

Firstly, we employ the Gibbs sampling method to generate parameters $\boldsymbol{\Theta}$ and σ^2 based on their conditional posterior distributions. Then we sample parameters ρ,γ and $\boldsymbol{c}$ by using the Metropolis-Hastings algorithm. Specifically, the Bayesian estimation procedure of the SLPSTR model is as follows: (1) Set the initial values of parameters $(\rho, \Theta, \gamma, c, \sigma^2)$ to be $(\rho_0, \Theta_0, \gamma_0, c_0, \sigma_0{}^2)$, and let $(\rho_t, \Theta_t, \gamma_t, c_t, \sigma_t{}^2)$ be the results of *t—th* sampling. (2) Sample Θ_{t+1} from the conditional distribution $P(\Theta|\rho_t, \gamma_t, c_t, \sigma_t{}^2)$. (3) Sample $\sigma^2{}_{t+1}$from the conditional distribution $P(\sigma^2|\rho_t, \gamma_t, c_t, \Theta_{t+1})$;. (4) Generate random number r from uniform distribution $U(0, 1)$, firstly, and then generate (ρ^*, γ^*, c^*) from the following random process: $\rho^* = \rho_t + \lambda z$, the normal distribution $N(\gamma_t, \sigma^2{}_y)$ and the normal distribution $N(c_t, \sigma^2, {}_cI)$, respectively, based on which we obtain $(\rho_{t+1}, \gamma_{t+1}, c_{t+1})$ defined as:

$$\rho_{t+1} = \begin{cases} \rho^*, & \textit{if } r < A_1 = \min\{1,\ R_1\} \\ \rho_t, & \textit{others} \end{cases} \tag{16}$$

$$(\gamma_{t+1}, c_{t+1}) = \begin{cases} (\gamma^*,\ c^*), & \textit{if } r < A_2 = \min\{1,\ R_2\} \\ (\gamma_t,\ c_t), & \textit{others} \end{cases} \tag{17}$$

5) Let $t = t + 1$ and repeat step (ii)—(iv) until convergence. The convergence criterion

$$\frac{\|\rho_t, \gamma_t, c_t, \sigma_t{}^2\|}{\|\rho_{t-1}, \Theta_{t+1}, \gamma_{t-1}, c_{t-1}, \sigma_{t-1}{}^2\|} < \alpha \tag{18}$$

is used in the process of estimation, where $\|.\|$ represents the Euclidean norm and a is an accuracy requirement.

4. Analysis of the study

4.1 The results of the testing procedure of the BSPSTR model

We considered all variables (ECD, FXCRR, GCCBR, MI-12, CRI, BRI, ICEI, PCCHP, INV, GE, TRD and TORD) as candidates for determining the suitable transition variable, following González et al. [16]. The results of all the testing stages of the BSPSTR for all regions are reported in **Table 1**. The first column of **Table 1** shows the results of the appropriate transition for our model. The results for all regimes signify that ECD is the best suitable choice of transition variable, as the p-values of both the LM_X (4.583e−10, 7.968e−18 and 8.167e−17), and LM_F (5.897e−9, 7.450e−12 and

Region	Test	Transition Variable ECD			Results of the H_0	Selecting Order m		
		$m = 1$	$m = 2$	$m = 3$	$m = 1$	$m = 1; H_{01}^{*}$	$m = 1; H_{02}^{*}$	$m = 1; H_{03}^{*}$
AEM	LM_F	15.06	13.58	12.04	15.06	0.88	7.01	12.50
		4.583e−10	3.192e−05	2.062e−06	4.583e−10	7.302e−05	0.9978	1.226e−03
	LM_χ	28.30	20.88	15.96	28.30	3.59	40.86	30.81
		5.897e−16	4.123e−7	2.347e−12	5.897e−9	2.564e−110	0.5986	2.678e−9
	WB	—	—	—	0.00	3.12	7.84	10.59
	WCB	—	—	—	0.00	0.00	0.6060	0.00
EAM	LM_F	30.40	10.70	14.28	30.40	20.89	4.01	14.60
		7.968e−18	0.00	4.998e−18	7.968e−18	4.142e−15	0.700	0.00
	LM_χ	60.90	41.38	20.98	60.90	20.59	6.86	30.81
		7.450e−12	5.675e−08	3.296e−06	7.450e−12	2.237e−10	0.896	4.678e−7
	WB	—	—	—	0.00	14.35	0.76	6.90
	WCB	—	—	—	0.00	0.000	0.00	0.00
EEM	LM_F	44.90	15.65	10.30	44.90	32.54	0.54	13.09
		8.167e−17	3.945e−05	4.698e−08	8.167e−17	8.997e−07	0.879	2.112e−04
	LM_χ	20.18	14.89	12.12	20.18	20.86	0.70	19.84
		6.258e−13	5.567e−09	3.479e−06	6.258e−13	6.790e−09	0.956	3.926e−10
	WB	—	—	—	0.00	9.70	0.80	9.60
	WCB	—	—	—	0.00	0.00	0.60	0.00

The PTII40% is the dependent variable. Using the LM-type test, all variables as mentioned in section 4.1 were considered as possibilities for determining the proper transition variable. The p-values are denoted by p-v, while the F-statistic is denoted by Fs. AEM stands for African Emerging Markets, while EAM stands for Emerging Asian Markets and EEM stands for Emerging European Markets.
Source: *Author's calculation based on World Development Indicators [33] data.*

Table 1.
Results of the testing stages of the BSPSTR model.

7.450e−12), respectively, are smaller compared to other variables included as candidates. The homogeneity test results are then provided in the second column. To test the null hypothesis of the linearity, we calculate F-statistics corresponding with their p-values for both LM_F and LM_X. For a robustness check of the nonlinearity test, the p-values of both the WCB and WB were generated. The rejection of the null hypothesis of linearity was confirmed as the p-value of both the LM_F (4.583e−10, 7.968e−18, 8.167e−17), and LM_X (5.897e−9, 7.450e−12, 6.258e−13) confirmed the evidence of the nonlinearity between economic development and income inequality in all regions included in this study, respectively. The results were further supported by the WB and WCB as they indicated the existence of the remaining non-linearity between the two variables. The findings on homogeneity are consistent with those of [4, 6, 8, 9, 13, 17–19, 36].

Finally, the third column of **Table 1** contains the sequence for selecting order m in BSPSTR, which is critical for this study because it aims to determine whether the nature of the development inequality relationship is characterized by one transition,

as explained by the Kuznets hypothesis, or by more than two transitions, as explained by the Tribble hypothesis. The results for all regions show the feasibility of the second transition of economic development as the results of both the LM_F and LM_X rejected H_0, indicating that, when ECD was chosen as the optimal transition variable, our model was characterized by two transitions, those divided by high and low levels of economic development for these regions. Our findings are in line with results documented by Shahbaz, Theyson and Heller [12, 13]. However, to avoid misleading results, validating the results of the order of the transition is crucial for BSPSTR using the WCB and WB, as in Teräsvirta [37].

4.2 Model evaluation and the estimated threshold of the BSPSTR model

The results of the model evaluation and the estimated threshold of our model are reported in this section. Following Eitrheim and Teräsvirta [38], we first examined the reliability of choosing $m = 2$ for all regions as the optimum transition variable for our model, using two kinds of misspecification tests: no remaining non-linearity (NRN) and parameter consistency (PC) [16]. **Table 2** displays the results of the NRN, PC, and the projected threshold. The p-values of the LM_F and LM_χ for parameter constancy indicate that the parameters are constant, while the second section of **Table 2** displays the results of both the WB and WCB tests, which account for both heteroskedasticity and possible within-cluster dependence, indicating that the estimated model with two transitions is adequate as our model. Finally, the last portion of **Table 2** presents the estimated threshold for our first and second transition.

Region	Test	Parameter Constancy	No Remaining Nonlinearity	Transition two	
					Second threshold
AEM	LM_F	10.918 (0.00)	—	c	US$15900*** (20.99)
	LM_χ	20.573 (0.00)	—	γ	13.23^{***} (3.01)
	WB		1 (p-va)		—
	WCB		1 (p-va)		—
EAM	LM_F	15.121(0.00)	—	c	US$17078*** (9.94)
	LM_χ	32.998 (0.00)	—	γ	15.98^{***} (1.54)
	WB	1 (p-va)	1 (p-va)		—
	WCB	1 (p-va)	1 (p-va)		—
EEM	LM_F	9.987 (0.00)	—	c	US$16,800*** (10.23)
	LM_χ	39.209 (0.00)	—	γ	18.89^{***} (3.76)
	WB		1 (p-va)		—
	WCB		1 (p-va)		—

*The PTII40% is the dependent variable. *** representing the 1% level of significance. AEM is an abbreviation for African emerging markets, EAM is an abbreviation for emerging Asian markets, and EEM is an abbreviation for Emerging European Markets.*
***Source:** Author's calculation based on World Development Indicators [33] data.*

Table 2.
Results of the evaluation test and the estimated threshold.

The current study adds a very significant contribution to the literature as it shows that all these regions are experiencing the second transition of economic development. The results show that these regions are at the beginning of the second transition with an estimated economic development threshold found to be US$15900 for AEM, US $17,078 for EAM and US$19,000 for EEM. However, the nature of the relationship in these regions varies as per the region. For instance, AEM is characterized by the inverted U-shape, while EAM and EEM are characterized by a U-shape relationship.

The estimated threshold for AEM illustrates that, in the first regime of the second transition of development, when the degree of economic development is below US $15,900, it tends to benefit a few individuals in the economy, which raises income inequality. Thus, during periods of poor economic development and high inequality, growing inequality may reduce the professional opportunities available to society's most disadvantaged groups, diminishing social mobility and the economy's growth potential. However, when the degree of development exceeds US$15,900, strong economic development implies an improvement in human capital, such as skills, education, and training, as well as increased investment in physical capital, such as machinery, factories, and roads. This will result in less economic inequality. For EAM and EEM, on the other hand, it illustrates that once the level of economic development is above the estimated threshold (US$17,078 and US$19,000) for these regions, it will no longer benefit everyone in the economy, but it will tend to increase inequality by benefiting only some individuals. These findings can be interpreted as follows: A high level of development goes hand in hand with high investment in both physical capital and skills. Thus, if these kinds of investments are channeled to only certain individuals, that would raise income inequality. Moreover, those counties below the estimated threshold could attain a high level of development through investing more in technology, the banking system, trade, foreign investments, loans to the region and a strong labor market.

To obtain a clear picture of which countries within these regions are at the lower/higher ends of the Tribble hypothesis of economic development and income inequality, the mean GDP per capita was calculated as a proxy for economic development. **Figure 1** illustrates that, with the exception of Korea, Republic., which has a mean of US$24967 in EAM, practically all the countries are at the lower end of economic development in the second transition below the estimated threshold.

Several factors that might drive these regions to be in the second transition of economic development, but at the lower end of the Tribble curve, for example, are distinguished by rapid growth, which is fueled by factors such as technology, the banking system, trade, foreign investment, loans to the region, a strong labor market, and improvements in the services and agricultural sectors. Improvements abound to reduce poverty and income inequality.

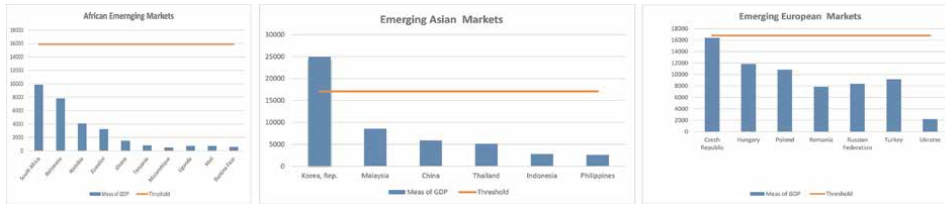

Figure 1.
The mean Gini coefficient for emerging economies. Source: Author's calculation based on SWIID data [32].

4.3 Empirical results of the BSPSTR for all regions

The generated results for all regions are reported in **Table 3**. The results differ based on the region in which the countries are located, so the results reported in AEM differ from those of EAM and EEM. The BSPSTR model reveals that, for the AEM, the direct economic development effect on income inequality, as measured by β_{0j}, is positive and significant; while for both the EAM and EEM, the impact in the low regime β_{0j}, is negative and significant. As reported in **Table 1**, the results confirm the homogeneity test: the effects of economic development on income inequality seem to be strongly non-linear. In fact, the coefficient of the non-linear component of the model, β_{1j}, for AEM is positive and highly significant, while for EAM and EEM it is negative and highly statistically significant.

As a result, the influence of economic development on income inequality is conditional to the degree of development. As the level of economic development varies from low to high, this suggests that changes in inequality with reference to economic development vary from $\beta_{0j} + \beta_{1j}$. The transition between these extreme regimes occurs at the endogenous location parameter c. The magnitude coefficient of ECD is found to have a massive impact on income inequality during a high level of development above the threshold, in AEM and EEM, while for EAM it is found to have a massive impact below the threshold. For AEM and EEM it is found to be 7.03 and 5.40 respectively. While for EAM it is found to be 5.30.

The results make a very significant contribution towards understanding the dynamic impact of development inequality in emerging economies, especially during the macroprudential policy regime. As our study builds on the argument documented by Chiu and Lee [5], who classified 59 countries into 32 high-income countries and 27 low-income countries, and Zungu et al. [9], who built a panel of 15 emerging countries. Both of these studies claim that the nature of development inequality in emerging economies is explained by the inverted U-shape relationship. However, after combining the advantage of the PSTR with spatial correlation and a Bayesian approach, following Li et al. [17], we found that emerging economies are in the second phase of the transition, as is evident by the LM_F and LM_X results in **Table 1** (row 3). The explanation of our findings could be that the results from the existing studies were triggered by the estimation techniques and the level of the countries included in the model. Moreover, this could also be due to the fact that studies on this subject matter, especially those that investigated this problem in a panel-data framework, having introduced time and cross-sectional effects to represent individual heterogeneity, then satisfy the assumption that the coefficients of explanatory variables are assumed to be constant for all section units and periods. The results further support the evidence that the locations of the countries might also have impacted the existing literature, as the results for AEM and EEM are different from those for EAM. This finding is consistent with previous empirical studies that demonstrated a substantial positive and negative effect of economic development on income inequality, such as [5–7, 9, 13, 19]; as well as those that found a negative and positive effect [5, 10, 11] and those studies that found the existence of two transitions of economic development [12, 13] that support the existence of a Tribble S-shape. The explanation underlying the AEM results could be that income growth promotes inequality in a low-development regime, but economic prosperity increases inequality among individuals in a high-development regime. For EAM and EEM, on the other hand, income growth generates inequality in a high-development regime, while when the economic

Vari	Model I: Africa Emerging Markets (AEM)		Model II: Emerging Asian Markets (EAM)		Model III: Emerging European Markets (EEM)	
	$LR\beta_{0j} \times 100$	$HR\left(\beta_{0j}+\beta_{1j}\right) \times 100$	$LR\beta_{0j} \times 100$	$HR\left(\beta_{0j}+\beta_{1j}\right) \times 100$	$LR\beta_{0j} \times 100$	$HR\left(\beta_{0j}+\beta_{1j}\right) \times 100$
ECD	3.90(0.19)***	−7.03(0.19)***	−1.30(0.99)**	5.30(0.99)***	−5.40(0.81)**	1.98(0.10)**
CRR	1.18(0.46)**	0.71(0.23)**	1.18(0.46)**	0.71(0.23)**	1.18(0.46)**	0.71(0.23)**
GBR	5.72(1.13)**	1.80(2.00)	5.72**(1.13)	0.10(0.67)	5.72**(1.13)	2.01(0.09)***
CRI	1.18(0.46)**	−0.71(0.23)**	−1.59(0.30)**	0.89(0.15)**	−0.71(0.23)**	−0.71(0.23)**
BRI	−5.00(1.10**	2.20(0.99)**	−3.70(0.99)***	1.98(0.20)**	−2.20(0.43)	4.20(1.88)
ICEI	1.23(0.37)**	2.19(0.70)**	1.89(0.80)**	2.57(0.50)**	−2.98(1.21)**	3.10(0.40**
PCHP	1.09(0.10)***	0.11(0.02)**	2.29(0.99)**	1.39(0.69)**	0.70(0.90)	−2.70(0.70)**
INVM	−0.31(0.02)***	−0.62(0.03)***	−2.93(0.99)***	1.45(0.49)**	−2.20(1.01)**	−4.05(0.90)**
TOD	−1.30(0.12)**	5.11(0.12)***	−2.29(0.99)**	−3.39(0.69)*	0.70(0.09)**	−2.70(0.70)**
GE	−2.10(0.15)***	0.11(0.02)**	−2.29(0.99)**	−1.39(0.69)**	−0.70(0.90)**	2.70(0.70)**
Dum	Yes	No	No	No	Yes	No
γ	US$15900*** (20.99)		US$17078*** (9.94)		US$19,000*** (10.23)	
c	13.23** (3.01)		15.98*** (1.54)		18.89** (3.76)	
Stand d	0.01456		0.08950		0.02101	
# of obs.	200		120		140	
# of cou	10		6		7	

*Note: The dependent variable is the Gini coefficient. The numbers in brackets denote the standard errors obtained by using the cluster-robust and heteroskedasticity-consistent covariance estimators, allowing for error dependency within individual countries. ***, **, and * reflect the 1, 5, 10% levels of significance, respectively. ESD denotes the estimated standard deviation (residuals), p-v are the p-values, and H is Hansen. LR and HR stand for low regime and high regime, respectively.*
***Source:** Author's calculation based on World Development Indicators [33] data.*

Table 3.
Development inequality; BSPSTR, for African, Asian and European emerging markets.

development is within the projected threshold in the second transition, inequality among the population in these regions decreases. This might be because policy action in the two regimes (low and high) favors different groups. During a recession, for example, government intervention through spending may promote consumer consumption, but in the higher regime it may benefit investors. One of the main objectives of this study was to find out how macroprudential policy instruments triggered the development inequality relationship in three adopted emerging economies, following Zungu et al. [9]. Unlike the policy instruments adopted in their study, the current study extended their model by including countercyclical reserve requirements, general countercyclical capital buffer/requirements, and a macroprudential index (0–12). Countercyclical reserve requirements (CRR) in all regions have a statistically positive impact on income inequality in both regimes. This shows that policy tightening in CRR requirements is bad for income inequality at both the high and low levels of development. Similar to CRR, the General countercyclical capital buffer/requirement (GCCBR) was found to increase income inequality in all regions in both the low and high regimes of development.

For AEM and EAM, capital-related instruments (BRI) have a statistically positive impact on income inequality in the low regime of development, while for EEM they have a negative impact. Then, in the high regime, it is negative in AEM and EEM and statistically significant, while for EAM it has a positive impact. The results are supported by Frost and Stralen [26]. A borrower-related instrument (BOR) has a statistically positive effect on income inequality in all regions during the low regime of development, but has a negative impact during the high regime. This demonstrates that tightening loan-to-debt and debt-to-income ratios is detrimental to income disparity at low levels of development, but beneficial at high levels of development.

Following the argument documented by Zungu and Greyling [39] and others, we extended the development-inequality arguments by controlling for monetary policy through unconventional tools. We incorporated two unconventional monetary policy channels in our model: income composition captured by the equity index (ICEI) and portfolio composition captured by housing prices (PCCHP). Unconventional monetary policy in both channels was shown to raise income inequality in all regions, at both the low and high levels of development. Our findings show that rising house prices laid the path for a housing affordability problem, while also increasing homeowners' wealth. This backs up the findings of Gibson et al. [40], Gibson et al. [40] and Filandri and Olagnero [41]. In terms of income distribution, investment appears to be a significant indicator. This is because INVM has a negative and statistically significant influence on income inequality in both regimes in all regions. The findings confirmed those of Blonigen and Slaughter [42] for the United States and Figini and Görg [43] for 100 developed and developing economies. Theoretically, the argument for the negative impact is that an increase in capital investment causes some goods to be produced that are not immediately consumed, but are instead used to produce other goods as capital goods, leading to an increase in economic growth and, consequently, a decrease in inequality [44].

Considering the nature of the countries being examined in this study and tourism that might trigger the development-inequality relationship, we then extended the development-inequality relationship by controlling for tourism development (TOD), as captured by the number of arrivals of international tourists. Incera and Fernández [45] expanded on this even further by stating that high-income households enjoy a higher benefit from tourism than low-income ones. This was thought to trigger development-inequality, as high levels of tourism development are linked to high

levels of growth and economic development. In all regions, TOD has a negative and statistically relevant impact on income inequality, while at a high level of development, it becomes positive and statistically significant, showing that it promotes inequality in all regions, except for EAM. The results are empirically plausible, with results documented by Incera and Fernández [45] for Galicia, Alamand and Paramati [46] for a panel of developing economies, and Fang et al. [47] for a panel of developed and developing countries.

Finally, we then controlled for the redistribution of income by including government expenditure as a fiscal policy instance. Across all the adopted regions the fiscal policy instance through government expenditure was found to have a negative impact on income inequality, at the low level of economic development, while at the high level of economic development GE was found to have a positive impact on inequality, except for Emerging European Markets where it is negative and statistically significant. This empirical result is consistent with the findings of Zungu et al. [48] in the SADC area. They also emphasize in their paper that there is a serious debate over whether government spending plays a significant role in declining/increasing income inequality; as they point out, Tanzi [49] argues that government spending does nothing to reduce income inequality, but may even worsen it.

4.4 Sensitivity analysis and robustness checks

The data indicates that the impact of economic development on income inequality is non-linear in the three emerging regions investigated, regardless of the variable used to measure the inequality. We used the pre-tax income of the top 10% (PTI10%) from the World Inequality Database Alvaredo et al. [31] to measure income inequality. The variables are defined in the same way as in the baseline methodology. In this part, we provide further evidence of the robustness of these results. **Table 4** contains the findings of the robustness assessments for all the regions covered in this study. Again, all of the models' testing methods were followed. We further tested whether our findings were sensitive to additional control variables. We controlled for a macroprudential index (0–12) (MI-12) given the availability of the combination index of 12 macroprudential regulations.

Model IV: AEM	**PTII10% = 4.00ECD*** + 3.89CRR** + 0.65GBR**-3.33CRI*** + 5.74MI-12**-3.44BRI* + 5.68ICEI + -5.65PCHP**-2.00PINV**-4.10TOD**-2.00GE**** **[15.00$_{\gamma}^{**}$,14 800$_{C}^{***}$]- 3.02ECD*** + 3.89CRR** + 3.65GBR + 3.33CRI*-5.74MI-12** + 2.02BRI** + 3.11ICEI** + 2.34PCHP**-1.09PINV** + 0.10TOD** + 2.30GE****
Model V: EAM	PTII10% = −2.24ECD*** + 2.12CRR** + 0.98GBR**-1.23CRI*-3.89MI-12** + 4.91BRI** + 2.30ICEI**-4.86PCHP***-3.20PINV**-2.32TOD**-2.02GE** [11.25$_{\gamma}^{**}$,17 500$_{C}^{***}$]+ 4.10ECD*** + 3.90CRR** + 1.65GBR + 2.01CRI* + 2.12MI-12**-2.04BRI**-1.92ICEI**-3.00PCHP**-0.92PINV**-1.22TOD** + 2.02GE**
Model VI: EEM	PTII10% = −1.02ECD*** + 2.811RR*** + 0.65GBR**-2.44CRI**-4.20MI-12**-2.19BRI** + 0.92ICEI**-3.34PCHP**-2.92PINV**-1.02TOD** + 3.03GE** [14.04$_{\gamma}^{**}$,18 400$_{C}^{***}$]+ 2.11ECD*** + 4.94CRR* + 2.91GBR**-2.01CRI* + 2.92MI-12**-0.88BRI +3.73ICEI**-4.00PCHP**-2.30PINV**-2.77TOD** + 0.90GE***

*The ***/**/* denote the levels of significance at 1, 5 and 10%, respectively.*
***Source**: Author's calculation results based on [33].*

Table 4.
Development inequality: Robustness checks model.

This was undertaken to see whether the results obtained in the baseline methodology were sensitive to the variables used as control variables. The estimated results indicated that the non-linear impact of economic development on income inequality was unaffected by the inequality-measurement or control variables utilized. Indeed, the results were remarkably comparable to those obtained initially. We find that when controlling for macroprudential policy instruments, the macroprudential index (0–12) (MI–12) enhances income inequality at low levels of development while decreasing income inequality at high levels of development in all regions.

5. Conclusion and policy recommendations

The existing empirical literature is marked by controversy surrounding the nature of the development-inequality relationship in both advanced and emerging markets. The current paper seeks to fill the existing inconclusive situation in both theoretical and empirical ways by examining the current subject in emerging economies, focusing on the prudential policy region; in a nutshell, by examining how the adopted macroprudential and unconventional monetary policies during the financial crisis triggered the development-inequality relationship in these regions. As it has been noted in the literature, the estimation techniques or the level of the economy being studied when examining the development-inequality relationship were believed to trigger the existing results in these subject matters. Studies that have investigated this problem in a panel data framework, have introduced time and cross-sectional effects to represent individual heterogeneity, which then satisfy the assumption that the coefficients of the explanatory variables are assumed to be constant for all section units and periods. However, in practice, this assumption is sometimes unreasonable. For instance, the model adopted by Zungu et al. [9] actually allows coefficients to change with cross sections and times, which is a sufficient relaxation of the heterogeneity assumption in panel data models. Consider a scenario in which the local equilibrium prices of all local markets are correlated in the general equilibrium model; individuals in the network model are interconnected; and in a competitive market, one participant's decision is influenced by the decisions of other participants, and so on. The classic econometric model will no longer be applicable when dealing with the aforementioned study areas. Then the spatial method plays a significant role in such a problem.

The current study seeks to address these issues by separating countries based on their region, focusing on those that are emerging countries from Africa, Asian and European economies. The primary objective behind categorizing these countries by their respective regions was to compare and track if the correlation between the variables of interest is substantially impacted by the country's location. We therefore establish a model for the emerging market by extending the PSTR model developed by González et al. [16] to account for spatial correlation between variables, and we also construct a Bayesian inference for the PSTR model. The estimation results strongly support the presence of non-linearity in the relationship between economic development and income inequality in these regions. The current study adds a very significant contribution to the literature as it shows that all these regions are experiencing the second transition of economic development. The results show that these regions are at the beginning of the second transition, with an estimated economic development threshold found to be US$15900 for AEM, US$17078 for EAM, and US$19000 for EEM. However, the nature of the relationship in these regions varies as per the region.

For instance, AEM is characterized by the inverted U-shape, while EAM and EEM are characterized by a U-shape relationship.

We further seek to find out how macroprudential policy instruments trigger the development-inequality relationship in these regions by cooperating with five types of macroprudential policy instruments; countercyclical reserve requirements, a general countercyclical capital buffer/requirement, and a capital-related, borrower-related, and macroprudential index (0–12) in the model. Adopting macroprudential policies, such as countercyclical reserve requirements and a general countercyclical capital buffer/requirement, was found to improve inequality in all regions for both regimes, while the second group of these policy instruments was found to improve inequality in the lower regime in AEM, while for EAM and EEM, it was found to decrease inequality; then decreasing income inequality in the high regime in AEM and EEM while increasing inequality in EAM countries. At low levels of development, capital-related and borrower-related instruments were found to improve income inequality at low levels of development while reducing inequality above a certain threshold. While borrower-related instruments were found to reduce inequality in low regimes, they improved inequality above the estimated threshold. Considering the argument made by Zungu and Greyling [39], we included unconventional monetary policies in our model to trace how the adoption of these policies triggered the development-inequality relationship in these regions. Unconventional monetary policy was found to improve income inequality in these regions. More interestingly, investment, tourism, and trade openness were found to reduce income inequality in these regions.

From a policy standpoint, our findings may have a variety of policy ramifications. Firstly, the presence of the second transition of development-inequality and the economic development threshold calls into question the effectiveness of distribution policies and the effects of GDP per capita on reducing inequality. Secondly, macroprudential regulation, particularly foreign exchange and/or countercyclical reserve requirements, as well as general countercyclical capital buffer requirements, should be monitored when implemented in these regions as they appear to increase income inequality. Thirdly, policy-makers should be cautious when implementing unconventional monetary policies as they are found to contribute to high inequality by reducing per capita income. Fourthly, government policies to increase agricultural productivity through land redistribution, investment, trade, subsidies, the provision of public goods for agriculture, promoting a successful labor market regime, and for human development are significant for these countries. Fifthly, all these countries are situated below the estimated threshold except for Korea, Republic are encouraged to work towards formulating policies that aim to increase agricultural productivity through land redistribution, attract investment, improve trade, provide public goods for agriculture, promote successful labour market regimes, and for human development. That will trigger an increase in the level of GDP per capita and reduce inequality.

Author details

Lindokuhle Talent Zungu[1*], Yolanda Nomusa Nkomo[1], Bongumusa Prince Makhoba[1] and Lorraine Greyling[2]

1 Department of Economics, University of Zululand, Kwadlangezwa, South Africa

2 Faculty of Commerce, Administration and Law, University of Zululand, Kwadlangezwa, South Africa

*Address all correspondence to: zungut@unizulu.ac.za; talent.nomsa@ymail.com

IntechOpen

References

[1] Kuznets S. Economic growth and income inequality. The American Economic Review. 1955;**45**:1-28

[2] Kaldor N. Alternative theories of distribution. The Review of Economics Studies. 1955;**23**:83-100

[3] Tribble R. A restatement of the S-curve hypothesis. Review of Development Economics. 1999;**3**:207-214

[4] Anand A, Kanbur SMR. Inequality and development a critique. Journal of Development Economics. 1993;**14**:19-43

[5] Chiu Y, Lee C. Financial development, income inequality, and country risk. Journal of International Money and Finance. 2019;**93**:1-18

[6] Kavya TB, Shijin S. Economic development, financial development, and income inequality nexus Borsa Istanbul. Review. 2020;**20**:80-93

[7] Lee JP, Binger C, Harrington N, Evelyn S, Kent-Walsh J, Gevarter C, et al. Aided language measures: Establishing observer agreement for communicators in early language phases. American Journal of Speech-Language Pathology. 2022;**31**:1394-1411

[8] Robinson S. A note on the U hypothesis relating income inequality and economic development. The American Economic Review. 1976;**66**: 437-440

[9] Zungu LT, Greyling L, Mbatha N. Nonlinear dynamics of the development-inequality nexus in emerging countries: The case of a prudential policy regime. Economies. 2022;**10**:120

[10] Angeles L. An alternative test of Kuznets' hypothesis. The Journal of Economic Inequality. 2010;**8**:463-473

[11] Savvides A, Stengos T. Income inequality and economic development: evidence from the threshold regression model. Economics Letters. 2000;**69**: 207-212

[12] Shahbaz M. Income inequality-economic growth and non-linearity: A case of Pakistan. International Journal of Social Economics. 2010;**37**:613-636

[13] Theyson KC, Heller LR. Development and income inequality: A new specification of the Kuznets hypothesis. The Journal of Developing Areas. 2015;**49**:103-118

[14] Ahluwalia MS. Income distribution and development: Some stylized facts. The American Economic Review. 1976; **66**:128-135

[15] Barro RJ. Inequality and growth in a panel of countries. Journal of Economic Growth. 2000;**5**:5-32

[16] González A, Teräsvirta T, van Dijk D, Yang Y. Panel smooth transition regression models. CREATES Research Paper No. 2017;36, Department of Economics and Business Economics, Aarhus University, Denmark

[17] Li XW, Du JG, Long HY. Dynamic analysis of international green behavior from the perspective of the mapping knowledge domain. Environmental Science and Pollution Research. 2019;**26**: 6087-6098

[18] Papanek GF, Kyn O. The effect on income distribution of development, the growth rate and economic strategy. Journal of Development Economics. 1986;**23**:55-65

[19] Tirado DA, Díez-Minguela A, Martinez-Galarraga J. Regional

inequality and economic development in Spain, 1860-2010. Journal of Historical Geography. 2016;**54**:87-98

[20] Jha SK. The Kuznets curve: A reassessment. World Development. 1996;**24**(773–2011):780

[21] Saith A. Development and distribution. A critique of the cross-country U-hypothesis. Journal of Development Economics. 1983;**13**:367-382

[22] Deininger K, Squire L. A new data set measuring income inequality. The World Bank Economic Review. 1996;**10**: 565-591

[23] Acharya VV, Pedersen H, Philippon T, Richardson M. Measuring systemic risk. The Review of Financial Studies. 2017;**30**:2-47

[24] Acharya V, Katharina B, Matteo C, Tim E, Fergal M. The anatomy of the transmission of macroprudential policies. IMF Working Papers. Washington, DC: IMF.2020: 58

[25] Carpantier J, Olivera J, Van Kerm P. Macroprudential policy and household wealth inequality. Journal of International Money and Finance. 2018; **85**:262-277

[26] Frost J, Stralen R. Macroprudential policy and income inequality. Journal of International Money and Finance. 2018; **85**:278-290

[27] Konstantinou P, Rizos A, Stratopoulou A. Macroprudential policies and income inequality in former transition economies. Economic Change and Restructuring. 2021;**55**:1005-1062

[28] Tzur-Ilan N. The effect of credit constraints on housing choices: The case of LTV limits. Paper presented at Bank of Israel, Hebrew Universit, Research Department Conference, December 2016.

[29] Viral V, Acharya VV, Bergant K, Crosignani M, Eisert T, Johns C. The anatomy of the transmission of macroprudential policies. IMF working paper. Working Paper No. 20/58. 2020. p. 57.

[30] Zinman J. Restricting consumer credit access: Household survey evidence on effects around the Oregon rate cap. Journal of Banking & Finance. 2010;**34**: 546-556

[31] Alvaredo F, Chancel L, Piketty T, Emmanuel Saez E, Zucman G. The elephant curve of global inequality and growth. AEA Papers and Proceedings. 2018;**108**:103-108

[32] Solt F. Measuring income inequality across countries and over time: The standardized world income inequality database. Social Science Quarterly. 2020; **101**:1183-1199 SWIID Version 9.2, December 2021

[33] World Development Indicators. World Bank, Washington, D.C. Available from: http://data.worldbank.org/data-catalog/world-development-indicators (accessed 10 March 2022)

[34] Cerutti E, Claessens S, Laeven L. The use and effectiveness of macroprudential policies: New evidence. Journal of Financial Stability. 2017;**28**:203-224

[35] Granger CWJ, Teräsvirta T. Modelling Non-linear Economic Relationships. OUP Catalogue: Oxford University Press, UK; 1993

[36] Paukert F. Income distribution at different levels of development: A survey of evidence. International Labour Review. 1973;**108**:97-125

[37] Teräsvirta T. Specification, estimation, and evaluation of smooth transition autoregressive models. Journal of the American Statistical Association. 1994;**89**:208-218

[38] Eitrheim Ø, Teräsvirta T. Testing the adequacy of smooth transition autoregressive models. Journal of Economics. 1996;**74**:59-75

[39] Zungu LT, Greyling L. Investigating the asymmetric effect of income inequality on financial fragility in South Africa and selected emerging markets: A Bayesian approach with hierarchical priors. Asian Journal of Economics and Banking. 2022

[40] Gibson M, Petticrew M, Bambra C, Sowden AJ, Wright KE, Whitehead M. Housing and health inequalities: A synthesis of systematic reviews of interventions aimed at different pathways linking housing and health. Health & Place. 2011;**17**:175-184

[41] Filandri M, Olagnero M. Housing inequality and social class in Europe. Housing Studies. 2014;**29**:977-993

[42] Blonigen B, Slaughter M. Foreign–affiliate activity and US skill upgrading. Review of Economics and Statistics. 2001;**83**:362-376

[43] Figini P, Görg H. Does foreign direct investment affect wage inequality? An empirical investigation. The World Economy. 2011;**34**:455-1475

[44] Bhandari B. Effect of inward foreign direct investment on income inequality in transition countries. Journal of Economics. Integration. 2007;**22**:888-928

[45] Incera AC, Fernández MF. Tourism and income distribution: Evidence from a developed regional economy. Tourism Management. 2015;**48**:11-20

[46] Alamand S, Paramati SR. The impact of tourism on income inequality in developing economies: Does Kuznets curve hypothesis exist? Annals of Tourism Research. 2016;**61**:111-126

[47] Fang J, Gozgo G, Paramati SR, Wu W. The impact of tourism growth on income inequality: Evidence from developing and developed economies. Tourism Economics. 2021;**27**(8):2021

[48] Zungu LT, Greyling L, Sekome MS. Government expenditure and economic growth: Testing for nonlinear effect among SADC countries, 1994-2017. African Journal of Business and Economic Research. 2020;**15**:37-69

[49] Tanzi V. Redistributing income through the budget in Latin America. Banca Nazionale del Lavoro (Rome). Quarterly Review. 1974;**26**:65-87

Chapter 5

The EFQM Model as an Exquisite Tool for the Analysis of Business Excellence and Its Use in the Healthcare Industry

Vladimir Bukvič

Abstract

The author links together business analysis and business excellence as an ideal that all well-performing organisations wish to achieve while attaining and continuously maintaining superior levels of business performance. He leans on the EFQM model and uses it as an excellent tool for analysing the business of an organisation throughout all the phases defined by traditional business analysis. This entails setting up hypotheses and testing them by applying appropriate measures. After a short introduction, the author makes first a thorough literature review on business excellence in the last two decades. Further, the author presents the basic concepts and elements of the EFQM model of business excellence, with a particular emphasis on the RADAR matrix. He also presents the use of the model for analysing and assessing the business excellence of organisations in the public sector, specifically in the healthcare industry (hospitals). He presents the key attributes (select healthcare aspects) that define the quality of healthcare services for its key participants, i.e., patients and the payers of these services. The author rounds off his paper with a couple of recommendations regarding the identification of strengths and areas for continuous improvement, which he considers as the most important aspect of business excellence analysis.

Keywords: business excellence, EFQM model of excellence, financial ratios, quality of healthcare services, business analysis

1. Introduction

We know from economic theory that business analysis is basically a term for the scientific research and explanation of the economic reality, its phenomena, relationships, processes and development tendencies [1]. We also know from logic and science that analysis is actually also a general cognitive method, which itself includes a process, method and goal. The mission of business analysis is primarily related to the economic aspect, as this knowledge should help us improve the economic

performance of a specific organisation. Although it is also defined from an organisational and user point of view, the purpose of business analysis is primarily economically determined. According to Bergant [2], in general, analysis can be defined as the process of getting to know (studying) a certain phenomenon in order to make expedient decisions about it and thereby improve the achievement of one's goal. This means that we analyse with the intention of making a decision, and this decision should be followed by a targeted improvement in performance.

In this paper, we connect the analysis of an organisation's operations with business excellence as the ideal to which all good organisations aspire. Excellent organisations achieve and permanently maintain excellent levels of operations that meet or exceed the expectations of all their stakeholders [3].[1]

If organisations are to realise the scope in which they are commercially excellent, or how far they are from this desired target, they must approach the analysis of their operations comprehensively. Business analysis begins with observing facts, diagnosing problems, setting hypotheses and testing them logically and practically. This also implies the definition of measures to improve operations, which leads the management of the organisation to plan the organisation's operations. In this paper, we try to follow these stages by analysing business excellence.

First, let us present the concept of business excellence in greater detail and learn about the most widespread tools for analysing or evaluating business excellence. In the following section, we will focus on the use of the EFQM model of excellence and highlight its main features through literature review. A fairly extensive literature review on business excellence is made for the period of the last two decades. The basis of the logic of the EFQM model, i.e., its throughline, is grounded in the connection between the organisation's purpose and strategy and how it is used to create sustainable value for its most important stakeholders in order to achieve exceptional results [3].

We use the RADAR matrix, which is a dynamic evaluation framework and a powerful tool that provides a structured approach to analysing organisational performance. Here we are interested in both the factors, or enablers, and the results of the EFQM model of excellence. When presenting the methodological work, we limit ourselves to only a few select criteria, such as, among enablers, to assets and resource management and, among results, to results related to customers and business results.

In order to more easily understand this approach to the analysis of business excellence and how to analyse the business excellence of a certain business system, we chose the case of healthcare organisation X (a rather big clinical centre) and, due to the limited scope of this contribution, only partially applied to it the abovementioned criteria from the EFQM model.

At the end of the paper, we provide a brief outline of the RADAR matrix as an excellent tool and methodological aid used in the analysis of business excellence and highlight the phase of defining opportunities for improvement as demanding great mental effort, since it should orient the organisation/user in question in the direction of action leading to business excellence.

[1] A stakeholder is a person, group or organisation that has an interest or is directly or indirectly involved in the activities of the organisation and/or in its success and can influence the organisation or is influenced by it. The stakeholders are owners, customers, suppliers, partners, government agencies and representatives of communities and employees [3].

2. What is business excellence: literature review

Aristotle wrote that excellence is not an individual act, but an attitude. Excellence is a special quality, a characteristic of what counts as excellent. Excellence is much more than performance, if we look at it as a characteristic of an organisation that achieves the desired, expected results [4]. A legal entity that surpasses others in terms of quality is excellent. When judging the excellence of an organisation, it is necessary to start from the point of view of others who are in contact with it in one way or another. The only thing that matters is how others feel about it [4]. While quality means meeting the demands and expectations of customers, excellence in business means exceptionality, exceeding the expectations of all stakeholders (employees, customers, society, etc.) in a global competitive environment [5]. Quality and excellence are concepts that cover the functioning of the organisation and its parts in the public and private sectors [6]. Today, we demand quality at every step and at every moment. We no longer understand it only as compliance with specific requirements, but as excellent performance that increases customer satisfaction [7].

According to Kern Pipan [5], excellence is not a theory. It is about the tangible achievements of what the organisation does and how it does it, the results achieved and the belief that it will sustainably achieve such results in the future. Instilling confidence in the sustainability of results also requires evidence that what the organisation does and how it does it is well-designed, systematic and constantly reviewed and improved [8]. According to Marolt and Gomišček [9], excellence can be defined as exceeding the average and finding the best possible, both in terms of customer satisfaction, resource efficiency, environmental protection and in terms of the organisation's business results. According to Bajc [10], excellence is not just a choice of one or another model. Excellence means a conscious decision to work perfectly every day and to do every, even the smallest step, as well as possible. The European Foundation for Quality Management (EFQM) in Brussels defines excellence as the excellent practice of managing an organisation and achieving results based on fundamental principles, such as [11]: results orientation, customer focus, leadership and stability of purpose, management based on processes and facts, employee involvement, continuous improvement and innovation, mutually beneficial partnerships and the social responsibility of the organisation.

When assessing organisations according to the EFQM excellence model, we consider the following fundamental principles of excellence [12]:

- adding value for clients,
- creating a sustainable future,
- developing organisational skills,
- encouraging creativity and innovation,
- leadership with vision, inspiration and integrity,
- agile management,
- achieving success with the talent of employees,
- sustainable achievement of excellent results.

Let us take now a quick walk through the literature on the topic of business excellence in the last two decades with an emphasis on the EFQM Model. Here, we are particularly interested in the assessment and critical attitude of individual authors who have been engaged in research on this topic.[2]

Most companies have attempted a significant number or improvement initiatives such as total quality, re-engineering, restructuring and teams, with very mixed successes. According to Samson and Challis [13], in many cases these initiatives have been adopted without being part of an improvement strategy, but a part of a series of *ad hoc* decisions. The authors explored the deeper 'pre-conditions' that explain the variance in success of such improvement attempts and resulting performance changes. They illustrated a holistic management system and set of guiding principles that are common to the world's best companies. The system comprises closely connected elements of the integrated improvement strategy, action plans, performance management, external benchmarks and rewards for all employees. This approach to management is different in kind to the *ad hoc* approach, and executives can assess themselves against the system and the principles framework. An action plan can then be set up to permanently change the state of their company and achieve that improvement initiatives will work sustainably.

Rusjan [14] assessed the usefulness of the EFQM Excellence Model for decision-making on organisational improvement activities. He studied the procedures of the model in practice. He discussed some methodological issues related to the use of the EFQM model. These procedures are studied in order to analyse their appropriateness for identification of problematic situations (what is also the first stage of business analysis) and, based on that, for identification of problems. The author is critical in the sense that the model does not offer any specific guidelines regarding problem identification. Thus, the model offers no structured approach about how to exploit strengths or about how to classify or prioritise areas for improvement. He is concerned about the conceptual issue, about the clarification of the relationship between decision made on the basis of the EFQM model self-assessment results and other strategic, business, organisational, etc. decisions.

A group of researchers [15] used an integrative literature review methodology to explore the diversity of studies being conducted concerning the EFQM model. The results of their review indicate that the majority of papers are focused on too few research topics (e.g., performance measurement) with limited methodologies (e.g., case study).[3]

At the beginning of the previous decade, Asif et al. [16] explored the adequacy of business excellence models to address corporate sustainability, which is conceptualised in terms of economic, social and environmental bottom lines. They also investigated how organisations may manage corporate sustainability in the absence of a comprehensive sustainability management system standard. Thus, the EFQM excellence model and the Baldrige Criteria for Performance Excellence are analysed with regard to their considerations of sustainability. Their findings revealed that the models *per se* do not comprehensively address sustainability issues and economic prosperity remains a dominant consideration. They proposed an integrated quality-sustainability framework. Sustainability indicators, such as those provided in the Global Reporting

[2] Considering that two and a half years have passed since the adoption of the renewed model of business excellence (EFQM 2020), there are still not many articles that would provide a qualitative assessment of its usefulness and advantages compared to the previous model (EFQM 2013).

[3] This was also one of the reasons why the author as a many years' leading assessor decided to write this article focusing on the application of the business excellence model to a short case study from healthcare industry.

Initiative framework, could be integrated with core business processes using the structures and infrastructure provided by business excellence models.[4]

In their research, Asif et al. [17] discussed an interesting topic »service excellence".[5] This issue is recognised as a means to delight customers, enhance coustomer loyalty and build long-term customer relationships. According to the authors, the existing service excellence models focus on the perspective of customers but fail to provide a systematic approach to implementation. The purpose of their study was to investigate what service excellence can learn from the business excellence models. Their study mutually compares the three most prominent models.[6] The findings show that Johnston's model provides basic steps for achieving service excellence, while the EFQM and BCPE models can provide a systematic approach to service excellence implementation. The authors identified room for improvement in the current service excellence approaches.

Some Spanish researchers [18] investigated whether there is a specific approach to the adoption of best management practices embedded in the EFQM Excellence Model. They were interested in those practices within EFQM's enablers which predict high performance. They used the actual criteria and sub-criteria scores attained by organisations, which were assessed in the period from March 2011 to March 2013. The findings based on factor and regression analyses show that Spanish organisations adopt the best practices encompassing the EFQM model in a similar fashion: organisations on average follow parallel trends in the scores received per criterion, and there are no significant differences in the importance attributed to enablers. Their study contributes to the management literature on best practices, by highlighting a consistent trend in the use of the EFQM model, and also provides insights to managers on how to better allocate resources within Business Excellence Models.

In 2017, a Greek group of researchers [19] offered a descriptive analysis of TQM and business excellence measurement by synthesising the relevant literature. They made a thorough review. Their target was to advance a concrete understanding of relevant literature and to assess whether the temporal trends in business excellence measurement literature help position firms for the emerging business excellence context.[7] The articles were classified and analysed according to business sector, framework used and methodology applied. The trends in each of the three axes and key research areas were proposed.

Ahn et al. [20] first introduced the EFQM model, which has facilitated the transformation towards an integral management approach, including openings to corporate social responsibility. The companies' ability to grow and to improve continuously is namely also determined by its social competences, ethical responsibility an environmental contributions. This shift of focus leads to a reorientation of the concept of business excellence. The authors emphasised that at first, quality management focused on the quality improvement of products and services, later on the processes providing these products and services. Quality was renamed into business excellence when corporations oriented themselves on the quality of the organisation and the chain (or network) in which it operates. Confronting with the present challenges, companies are beginning to focus on the quality of society while taking care of their core businesses.

Fonseca [21] analysed the EEQM 2020 Model, supported by a literature review and content analysis, to identify its theoretical foundations and the more relevant

[4] Sustainability has been adequately considered and included within the last revision of the EFQM model.

[5] This issue is especially relevant for this paper dealing with business excellence in the healthcare industry.

[6] Baldrige Criteria for Performance Excellence, EFQM model and Johnston's service excellence model.

[7] A total of 139 papers were identified from 39 refereed management journals published from 1990 to 2016.

novelties compared with the 2013 version. The EFQM 2020 Model is based on the link between an organisation's purpose and strategy, aligned with the United Nations Sustainable Development Goals, to simultaneously deliver performance and ensure transformation, creating enduring value for its key stakeholders and achieving remarkable results. The model adopts a strategic management lens and fits well in the Business Model description. The term excellence is no longer explicitly present, replaced by "outstanding« (the best it can be). Last but not least, the model is less prescriptive compared to the 2013 version and comprises seven criteria grouped in three dimensions.[8] Nevertheless, on a theoretical level, several management theories support the EFQM 2020 Model. Although restricted to conceptual and theoretical analysis, his analysis can help academics and business leaders understand this novel model and support future empirical research.

In 1992, the EFQM Excellence Model was created to help organisations – regardless of size or sector – develop and implement their strategies to increase the competitiveness of European organisations. Since then, the model has adapted and evolved over time to reflect changes in the global market place. The 2020 model is the latest EFQM Excellence Model, and it has changed fundamentally since the previous (2013) one. The latest model has shifted from being a simple assessment tool to one that offers 'a framework and methodology to help with the changes, transformation and disruption that individuals and organisations face every day [22].

How about business excellence related to public and service sectors, like healthcare?[9] The traditional Business Excellence approach has been increasingly regarded as inward looking, inefficient and unable to drive appropriate actions for improvement in organisations, thus being of limited value for their stakeholders. This critical statement was made towards the end of the previous decade by Kanji [23], who set up an architecture of Business Excellence. This architecture deals with a set of systems, stakeholders, critical success factors and Structural Equation Modelling to create a holistic, reliable and comprehensive measurement model. The main advantage of the Global Excellence Measurement Systems is in providing integration and alignment among the various organisational subsystems and measures. Such integration comes from two main features. In his paper, the author first demonstrates the System Architecture of global excellence measurement system and then, with the help of empirical evidence from public and service sectors displays the integration and alignment among the various organisational subsystems and measures for the improvement of the organisation.

Naylor [24] was one among the first researchers who examined the appropriateness of the Business Excellence Model in developing a strategy for Bolton Hospitals NHS Trust to measure organisational performance. By utilising the conceptual framework, which consisted of the EFQM Model, it became evident that, although tools were in existence within Bolton Hospitals to measure organisational performance, several critical areas needed addressing. By addressing these key areas, the organisation could begin to work towards its goal of business excellence.

On the other hand, Jackson [25] described the inception of self-assessment and the EFQM Model. The author demonstrates how one clinical directorate in an NHS Trust used the principles of both to secure a culture of continuous improvement. The

[8] Direction (why), Execution (how), and Results (what), supported by 23 Criterion Parts and 2 Results Criterion, plus 112 guidance points, and the RADAR assessment tool.

[9] The author of this paper was also a leading assessor for one of the biggest clinical centres in Europe (two assessments in a row), for one big regional hospital and for one big Slovenian health insurance company.

journey from a mainly hieararchical, bureaucratic, individualist culture to one where the norms, values and beliefs reflected teamwork, involvement and empowerment is described. The highs, lows and learning points are all included, in an attempt to enlighten other healthcare organisations considering the benefits and pitfalls of using the business excellence model to improve the quality of their healthcare delivery.

At the turn of this century, defining quality of healthcare and determining how to improve organisational performance in developed countries was still an unresolved issue among healthcare professionals. However, given that it is an important area of responsibility and accountability, it is, according to Ruiz et al. [26], no longer acceptable to view the issue as discretionary. These authors advocate a thesis that an increasingly acceptable operative option for achieving continuous improvement and excellence seems to be the self-assessment of an organisation, based on the principles of knowledge management and total quality management. They provide an explanation of a two-level self-assessment approach for implementing TQM within the Spanish healthcare system. The first level integrates a client-centred approach using classical healthcare accreditation criteria along with ISO 9000 standards, the aim being to establish quality assurance systems in the whole organisation. The second level uses the EFQM Model as a road map for self-assessment and continuous improvement towards excellence.

2.1 A brief insight into the history of total quality management

Total quality management shows that more developed countries began to systematically promote quality improvement already in the middle of the last century. In 1951, a national prize – the Deming Prize – was awarded for the first time in Japan. The award recognises the achievements of individuals and companies, and the award ceremony is also broadcast on national TV. A few decades later, in 1988, the United States established its national Malton Baldrige Award, which is the only American official award for promoting excellence in public and private organisations. Both awards have an established (self-)evaluation mechanism based on well-structured methodologies that contain quite demanding criteria. All three above mentioned awards are based on a prescribed protocol of systemic elements of assessment (structure of the award, weightings of individual criteria), the self-assessment of employees in the organisation, an external assessment using standardised criteria, a final value assessment, which is a measure of global business excellence, and a competitive comparison [5].

The greatest advantage of the model of business excellence is the Europe-wide comparable business evaluations, which deal with all key areas of management [27].

More than 25 national quality and excellence awards operate in Europe, based on the EFQM excellence model, the criteria and practice of the European Excellence Award (EEA). In the world, there are a total of more than 77 national awards for quality and business excellence in 69 countries [28].

2.2 The EFQM model

Europe systematically promoted the competitive quality of its economy in 1989 with the establishment of The European Foundation for Quality Management. The European Business Excellence Model (EFQM model) was created by a large interdisciplinary group of experts from various sectors and academic institutions. The first version was presented in 1992 as a framework for evaluating applications for the European Quality Award. The first prize was also awarded at that time. In the modern

VUCA era of Volatility, Uncertainty, Complexity and Ambiguity, the updated EFQM model was published in autumn 2020. It is mainly intended for the (self-)assessment of progress in transformations in all areas of operation. The model enables checking and comparing one's own policies, as well as implementation and results on a global scale, as this tool is used by more than 30,000 global organisations.

We cannot ignore the fact that various countries are also making progress by establishing their national awards for excellence. Awarding institutions are usually government departments, ministries or government-affiliated non-profit organisations.

By actively improving the entire business, this tool allows organisations to identify where they are on their journey of transformation, helps them identify gaps and learn about additional approaches to improve their own business compared with the world's greatest organisations. The 2020 model enables a more unified understanding of the links between approaches and results and between performance perception and business performance indicators. It helps organisations in strengthening the definition of purpose, strengthening the appropriate collaborative and inclusive culture, providing strong leadership, promoting agility and transformation in various areas of operation and providing databases and information for forecasting business trends.

The latest model has shifted from being a simple assessment tool to one that offers 'a framework and methodology to help with the changes, transformation, and disruption that individuals and organisations face every day' [3].

The 2020 EFQM Model (structured very differently from the 2013 one) is based on asking three questions: 'Why', 'How' and 'What'.

- Why does this organisation exist? What purpose does it fulfil? Why this particular strategy? (Direction)
- How does it intend to deliver on its Purpose and its Strategy? (Execution)
- What has it actually achieved to date? What does it intend to achieve tomorrow? (Results).

This drives the three key sections of the new framework, Direction, Execution and Results, as can be seen in **Figure 1**.

Each one of these is supported by two or three criteria – there are seven in total – each of which is supported by a series of guiding principles. The positioning statements for each criterion are set out below, not the full guiding principles:

2.2.1 Direction

- **Criterion 1: Purpose, Vision and Strategy** – An outstanding organisation is defined by a Purpose that inspires, a Vision that is aspirational and a Strategy that delivers.
- **Criterion 2: organisational Culture and Leadership**
  - Organisational Culture is the specific collection of values & norms that are shared by people and groups within an organisation that influence, over time, the way they behave with each other and with Key Stakeholders outside the organisation.

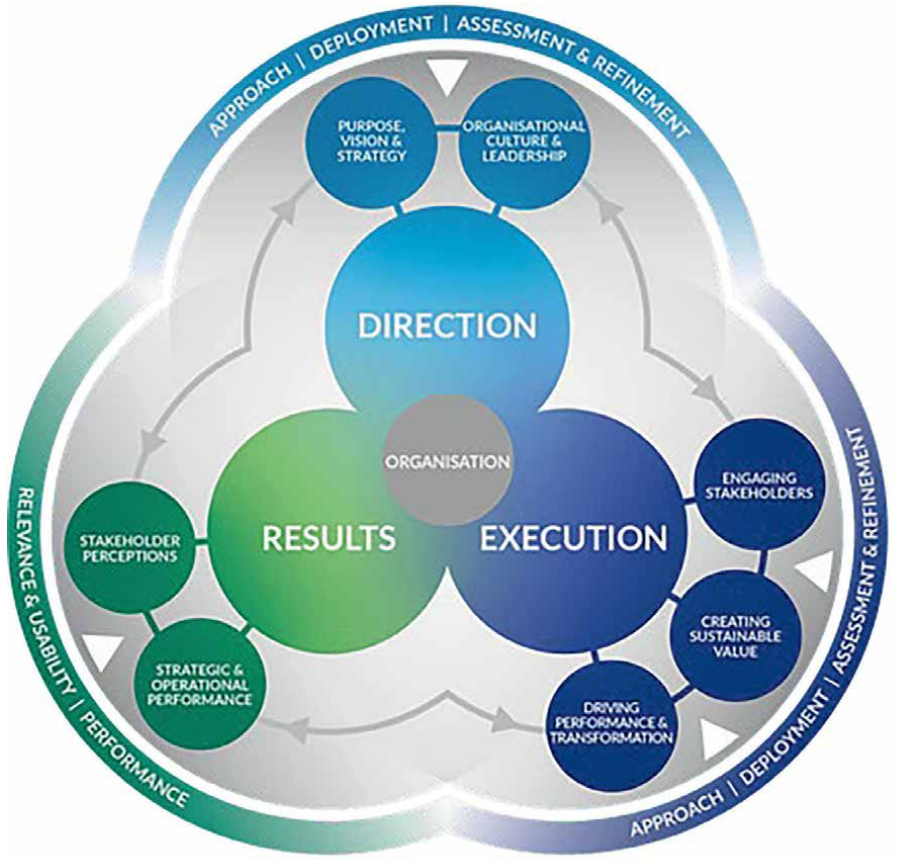

Figure 1.
The guiding principles that shaped the EFQM model ([3], p. 6). Source: EFQM ([3], p. 6).

- Organisational leadership relates to the organisation as a whole rather than any individual or team that provides direction from the top. It is about the organisation acting as a leader within its ecosystem, recognised by others as a role model, rather than from the traditional perspective of a top team managing the organisation.

2.2.2 Execution

- **Criterion 3: Engaging Stakeholders** – Having decided which Stakeholders are the most important to the organisation, i.e., its Key Stakeholders, and independent of the specific groups identified, it is highly likely that there is a degree of similarity in applying the following principles when engaging with Key Stakeholders.

- **Criterion 4: Creating Sustainable Value** – An outstanding organisation recognises that Creating Sustainable Value is vital for its long-term success and financial strength.

- **Criterion 5: Driving Performance & Transformation** – Now and in the future, an organisation needs to be able to meet the following two important requirements at the same time to become and remain successful.

2.2.3 Results

- **Criterion 6: Stakeholder Perceptions** – This criterion concentrates on results based on feedback from Key Stakeholders about their personal experiences of dealing with the organisation – their perceptions.

- **Criterion 7: Strategic & Operational Performance** – This criterion concentrates on results linked to the organisation's performance in terms of:

  - the ability to fulfil its Purpose, deliver the Strategy and Create Sustainable Value;

  - its fitness for the future.

The 2020 EFQM Model aims to give organisations the opportunity to take a holistic perspective and appreciate that each organisation is a complex but, at the same time, organised system.

3. Analysis of the organisation's operations based on the EFQM business excellence model

The use of the business excellence model means a comprehensive systemic approach to management, as it basically enables a relatively objective analysis of the situation, the identification of weak areas in the organisation's operation and continuous improvement based on the information obtained [5].

When the organisation decides to apply for the call for national recognition[10], it thereby, among other things, takes responsibility for preparing an application or its own assessment of business excellence according to the EFQM model. This work is basically an analysis of the business excellence of the organisation (self-assessment), which, as already mentioned, follows seven criteria (two for Direction, three for Execution and two for Results). The first five relate to enablers and the last two to outcomes – results. A large working group of professional employees of the organisation, responsible for individual areas, participates in the preparation of this self-assessment document. The subject of the analysis is basically the assessment of the organisation's operations through the prism of various aspects. It definitely involves a complex business analysis. The authors of the application, each considering an individual area (criterion), present the organisation or its operations in a specific area. Thus, for example, under sub-criterion Drive Innovation & Utilise Technology, the implementation of this strategy consists of presenting the organisation as it follows trends in the introduction of modern technologies of work and equipment. Technical experts in health organisation X (a clinical centre), which applied for the PRSPO tender, describe how new technologies contribute to better patient treatment, modern and less invasive treatment methods and, as a result, shorter treatment, lower hospitalisation rates and greater patient and employee safety. They support these claims with concrete facts, arguments where appropriate and, if necessary, with numbers. From these statements, external assessors then try to extract and meaningfully shape the

[10] PRSPO as an example of the national recognition or award of the Republic of Slovenia for Business Excellence.

advantages of the organisation in the chosen field. However, the process of assessing and analysing business excellence does not end there.

As we already mentioned in the introduction, the analysis of an organisation's operations, according to theory, goes through several phases. First, there is the phase of observing facts, then the phase of defining problems, the phase of setting hypotheses and finally, the phase of testing hypotheses, both logical and practical. If we map these phases onto the analysis of the organisation's business excellence, then the record of the organisation's strengths is the result of observing the facts in this organisation, and the identification of problems could be identified with the record of opportunities for improvement.

If the organisation is assessed and analysed according to the EFQM model, these opportunities for improvement will be recognised by the authors of the written assessment application of the organisation themselves. If it is assessed by external assessors, who are not burdened with the organisation's operations, the opportunities for improvement identified in the final report to the organisation/applicant can be more objective and aimed at solving the real problems of the organisation. For the organisation, the suggested opportunities for improvement are the right guidelines for improving operations in a specific area. On their basis, the organisation can prepare measures that, according to the theory of business analysis, are considered as setting hypotheses; checking these, we then arrive at a model or a concrete solution. According to Pučko [1], this second part is already the planning phase. Thus, the analysis of business excellence is essentially a process of analysis, i.e., monitoring and assessing the organisation, as we know it from business analysis as a traditional science. It is based on the EFQM model of business excellence, and the process itself begins with writing the organisation's assessment application document and continues with the work of external assessors, who first extract the organisation's advantages from the written application document and interviews conducted with the organisation's employees (this happens in the observation of facts phase) and then, by defining opportunities for improvement, indicate problematic situations or problematic positions of the organisation (this happens in the phase of defining the organisation's problems).

By identifying the problems present in the organisation's operations, the first part of the analysis of the organisation's operations is concluded. The business analysis process continues in the second part, where the organisation's management and its professional team prepare, based on the final report to the applicant prepared by the external assessors, a proposal for concrete measures to improve business in each area. It should be noted that external assessors can also be consultants to a certain extent, although this was not a case in the previous 2013 EFQM model; therefore, in their final report to the applicant, especially by identifying opportunities for improvement, they may advise the organisation and point out some feasible solutions. Of course, with a good and clear definition of opportunities for improvement, the organisation is already offered high-quality guidelines for action. Choosing and adopting appropriate measures, which form the basis of the proposed solutions to problems in individual areas, already means moving on from business analysis to business planning.

3.1 Analysis of the business excellence of an organisation from the point of view of enablers

The Execution category contains three criteria. Each of them has several factors or enablers. Let us take only one example from the Engaging Stakeholders criterion: Partners & Suppliers. These are the external parties that the organisation chooses to

work with to fulfil its Purpose, achieve its Vision, deliver its Strategy and reach shared objectives that benefit both parties [3].

Let us also take one example from the Creating Sustainable Value criterion: Deliver the Value. In practice, we find that an outstanding organisation implements effective and efficient ways to create value, making sure it can consistently deliver on its Purpose and value propositions, etc. [3].

As a matter of fact, there are plenty more enablers which have to be taken into account when assessing the business excellence of an organisation according to the EFQM model.

3.2 Analysis of the business excellence of an organisation from the point of view of results

In this paper, we look at both criteria provided under the heading Results: 6) Stakeholder Perceptions and 7) Strategic and Operational Performance. Within the scope of the first one, we highlight only the sub-criterion Customer Perception Results. Thus, we are interested in what customer perceptions are about, for example, the overall experience of the customer, the culture of the organisation regarding the attitude and level of commitment to the client, the brand and reputation of the organisation, products, services and solutions, the use of innovations to improve processes, the use of technologies, etc. [3].

Within the scope of the second criterion, we focus only on Business Results. These indicators may include achieving purpose and creating sustainable value, financial results, meeting the expectations of key stakeholders, meeting strategic objectives, achievements in delivering transformations, predictive measures for the future, etc.

The definition of both criteria reads: excellent organisations achieve and permanently maintain exceptional results that satisfy or exceed the needs and expectations of their customers or their stakeholders.

For our example of the selected organisation X in the field of healthcare, we are also interested in its business performance. There are several indicators which help monitor, understand, predict and improve the likely business results of the organisation. These performance indicators can be: financial indicators, project costs, performance indicators of key processes, successful operation with partners and suppliers, technology, information and knowledge.

4. How to analyse and measure the business excellence of an organisation?

The EFQM excellence model relies on the use of the RADAR matrix, which is a dynamic assessment framework and a powerful tool that provides a structured approach to investigating an organisation's performance. **Figure 2** illustrates this framework.

RADAR is the EFQM's diagnostic tool. The name RADAR derives from the belief that an organisation needs to:

- determine the Results it is aiming to achieve as part of its strategy;
- have in place a number of Approaches that will deliver the required results, both now and in the future;
- Deploy these approaches appropriately;

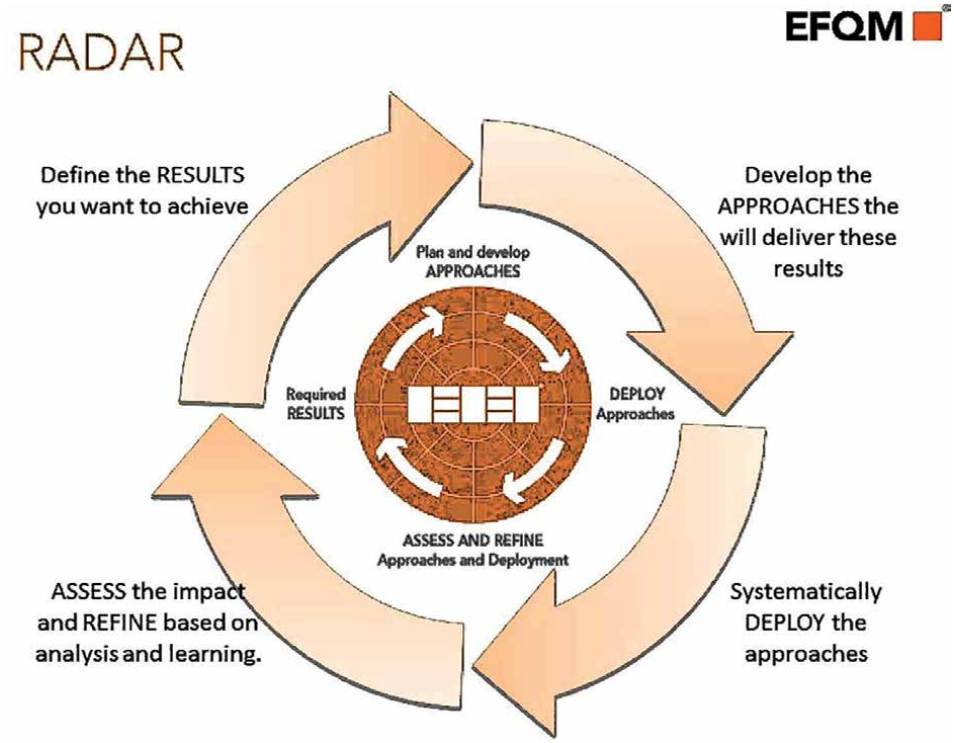

Figure 2.
RADAR matrix. Source: EFQM ([3], p. 39).

- Assess and Refine the deployed approaches to learn and improve.

Organisations applying for EFQM recognition are scored out of 1000 points, which are divided across the seven criteria.

According to the EFQM excellence model [12], the RADAR logic generally states that the organisation must:

- determine in its strategy what results it wants to achieve;
- plan and develop an integrated set of reasoned approaches to achieve the desired results in the present and the future;
- systematically implement and spread approaches to ensure their introduction; evaluate and improve the implemented and extended approaches based on the monitoring and analysis of the achieved results and continuous learning activities.

For the purpose of a good and reliable analysis, each element of the RADAR matrix is broken down into a series of attributes, as shown in **Tables 1–3**.

The applicant (that is, the organisation that participates in the PRSPO process for an individual year) prepares a written application. This is basically a special document, a presentation of the organisation according to all seven criteria. The authors of individual contents are professionals in the organisation with relevant knowledge and experience and competences.

Elements	Attributes	Description
Approach	Sound	The Approach has a clear rationale, aims to fulfil and respond to Key Stakeholder needs, is described appropriately and is designed to be fit for the future.
	Aligned	N.B. Not applied to Direction
Deployment	Implemented	The Approach is Deployed in relevant areas in an effective and timely manner.
	Flexible	N.B. Not applied to Direction
Assessment & Refinement	Evaluated & Understood	Feedback on the effectiveness & efficiency of the approach and its deployment is collected, understood and shared.
	Learn & Improve	Findings form emerging trends analysis, measurement, learning and benchmarking are used to inspire creativity and generate innovative solutions to improve performance in appropriate timescales.

Table 1.
Analysis of direction [3].

Elements	Attributes	Description
Approach	Sound	The Approach has a clear rationale, aims to fulfil and respond to Key Stakeholder needs, is described appropriately and is designed to be fit for the future.
	Aligned	The Approach supports an organisation's Direction and is integrated with other relevant approaches.
Deployment	Implemented	The Approach is Deployed in relevant areas in an effective and timely manner.
	Flexible	The Execution enables flexibility and adaptation.
Assessment & Refinement	Evaluated & Understood	Feedback on the effectiveness & efficiency of the approach and its deployment is collected, understood and shared.
	Learn & Improve	Findings form emerging trends analysis, measurement, learning and benchmarking are used to inspire creativity and generate innovative solutions to improve performance in appropriate timescales.

Table 2.
Analysis of execution [3].

4.1 How to analyse and evaluate business excellence organisations in the field of healthcare

When we analyse business excellence in a chosen organisation, we rely primarily on the quality of its products or services. Thus, for the automotive industry, the number of ppm (the number of bad products per million of all manufactured products) will be a very important quality indicator, as will just-in-time deliveries (JIT)

Elements	Attributes	Description
Relevance & Usability	Scope and Relevance	A set of results that clearly link to the Purpose, Vision & Strategy of the organisation are identified. The selected set of Results is reviewed and improved over time.
	Usability of the Data	Results are timely, reliable, accurate and appropriately segmented to provide meaningful insights that support performance improvement and transformation.
Performance	Trends	Positive trends or sustained outstanding performance over the strategic period/cycle.
	Targets	Relevant targets are set in line with the Strategy and are consistently achieved.
	Comparisons	Relevant external comparisons suitable to position own performance in line with the strategic direction are made and are favourable.
	Future Focus	Based on current cause & effect relationships, analysis of data sets, performance patterns & predictive measures, the organisation understands the drivers for outstanding performance in the future.

Table 3.
Analysis of results [3].

and excellent process control with the help of tools such as Six Sigma, FMEA analysis, R&D analysis, Control Plan, etc.

The business excellence of healthcare organisations can be analysed with a number of indicators, such as wait times, length of stay (number of days), number of less invasive interventions, number of safety complications (hospital infections, patient falls, etc.) [29].

The business excellence of healthcare organisations is manifested in particular through the quality of healthcare services. These can be described with quite a few attributes, but first we need to know well who the key stakeholders in the healthcare field are. These are medical staff, patients and health insurance companies – the payers of health services. All of them attribute different importance to individual attributes, which is why they also define the quality of healthcare services differently, as shown in **Table 4**.

If we want to illuminate the attributes shown above from the point of view of business excellence criterion 6, Customer Perception Results (in which case we connect with the clients to measure results), **Table 4** shows two groups that are to be taken into consideration when measuring satisfaction, namely patients and the payers of health services (in our case ZZZS, the Institute of Health Insurance of Slovenia).

Let us now take a look at the individual attributes that were defined many years ago by renowned experts, are still used today to define the quality of healthcare services and form the basis for the evaluation and measurement of the business excellence of healthcare organisations in the eyes of their customers (patients). The quality of technical achievements is related to the question of how well current scientific medical knowledge (expertise) and technology are used and exploited in given conditions. Usually, this quality, and thus the excellence of an organisation in the field, is

Key stakeholder	Technical achievements	Interpersonal relations	Comfort and access	Patient's wishes	Efficiency	Cost effectiveness
Physician	+++	+	+	+	+	—
Patient	++	++	++	+++	+	—
Payer	+	+	+	+	+++	+++

Source: Ransom et al. [30].

Table 4.
Stereotyped differences in the importance of the quality of health services to key stakeholders.

assessed by the timeliness and accuracy of diagnosis, the appropriateness of therapy and the knowledge used in procedures and other medical interventions [31].

When managing interpersonal relationships, the patient is put in the foreground and needs to be treated safely, in a quality manner, efficiently and on time. The quality of interpersonal relationships depends on how well the clinician treats the patient on a human level. A good interpersonal relationship with the patient is established by the doctor taking an interest in the patient's concerns, reassuring the patient and encouraging positive thinking, rather than simply treating the patient [32]. The same applies to the nurses who receive and care for the patients.

The quality of treatment comfort and access to treatment is not defined and measured by what the clinician does during the treatment of the patient, but by the characteristics of the environment in which the clinician treats the patient, such as comfort, convenience and readiness and privacy [33, 34]. Comfort and access to treatment, such as a sufficiently large parking lot, appropriate signposts, comfortable waiting rooms, tasty hospital food, etc. are all direct values for patients. Comfort can contribute several direct benefits. For example, if the environment is pleasant and provides privacy and makes the patient feel relaxed, then it can significantly contribute to a faster and more accurate diagnosis. Access to treatment, i.e., how quickly the patient gets to the doctor and how often he can visit him in the clinic, is very important.

Although patient wishes and preferences have long been recognised as very important factors in achieving high-quality healthcare services, they have not been singled out as a factor in their own right until recently. In early definitions, responsiveness to patient preferences was only one of the factors determining the quality of the interpersonal relationship between patient and physician. On the contrary, responsiveness to the patient's wishes played a prominent role in how the relationship between doctor and patient was established in the form of economic agency theory [35]. According to this definition, the patient, who definitely lacks the necessary knowledge to understand the medical profession, turns to the doctor, who, of course, has this knowledge to act as the patient's agent. In this role, the doctor is expected to make appropriate treatment decisions on behalf of the patient, which the patient would otherwise have to make if he or she had the necessary specialist knowledge. To be a 'great agent', a physician must make decisions that are consistent with the patient's goals and wishes. Although in the past, this aspect of mediation theory had little real effect on how the quality of treatment was defined, the importance of responsiveness to the patient's wishes regarding the quality of treatment has now become increasingly recognised, for example, according to Donabedian [36] under the rubric 'acceptability' and according to the Institute of Health as 'respect for the patient's values, preferences and expressed needs' [37].

By efficiency, we mean how well resources are used/utilised to achieve the planned result. Efficiency always improves when the resources used to produce a given output decrease. Although economists usually (typically) treat efficiency and quality as separate concepts, today there are many arguments that support the thesis that separating them in healthcare is not easy or even meaningful. Because ineffective treatment consumes more resources than necessary, it is wasteful. Treatment that is wasteful is deficient, incomplete and therefore of inferior quality, no matter how good it is in other respects, or as Donabedian [30] puts it, 'wasteful treatment is either injurious to health or harmful to it because it prevents more beneficial treatment'.

The cost-effectiveness of a specific medical service, for example, a surgical intervention, can be defined by how much benefit such a medical intervention brings for a certain amount of expenditure, which is typically measured in improvements in health status. In general, as the amounts spent to provide services under certain conditions increase, returns begin to decline; each additional unit of expenditure yields diminishing benefits until a point is reached where no benefits flow from further increases in the inputs to treatment [38]. The idea that resources should be used to the limit as long as benefits are still flowing has been accepted as a 'maximalist aspect' of treatment quality. In this respect, the elements can be consumed as long as there are benefits, regardless of their size. As an alternative to this maximalist idea, the idea of the 'optimal aspect' developed, which states that spending should be stopped earlier, at the point when the additional benefits are too small to be worth the additional costs [30], known as the marginal principle of managerial economics.

4.2 The RADAR matrix: an underutilised but excellent analytical tool for improving processes and business performance

Based on the author's many years of experience as a leading assessor (including in the healthcare industry), we can assert that when writing an assessment application document, applicants do not follow the RADAR matrix, which directs us to the following questions: Do the results derive from the measures? What is the spread of the approach and the breakdown of the results (deployment)? To what extent are the results verified and measured? For example: strategy implementation. What are the strategic goals and how does the organisation achieve them? With this, we can also determine the sustainable development of the organisation. The organisations, i.e., the applicants themselves, should pay close attention to this and provide as much evidence as possible, especially during the assessors' visit to the location.

Applicants do not write everything in their assessment application document (leaving the suggestion box empty, for example), while interviews with employees reveal that they can be very innovative, often proposing improvements through teamwork and interactive work. So, the real picture is much different. Therefore, facts and evidence found at the location must be taken into account when completing an assessment. Benchmarking is also a very common problem, so it is difficult to benchmark organisations.

If an organisation has implemented a modern computer-based information system (SAP, for instance), this does not necessarily mean that it is excellent in this area. It in fact remains questionable to what extent it knows how to use the information for the purpose of internal reporting to management or for the needs of decision-making at various levels in the organisation, for instance, as it pertains to the daily cash-flow, the up-to-date daily balance of receivables and liabilities by maturity (collection period), including by class maturities, when the organisation has available business results and

calculated key financial ratios for the previous month, and how the implementation of a certain measure is evaluated as an economic effect, as having an impact on the improvement of a certain indicator.

We would go beyond the permitted scope of this paper if we undertook a more detailed critical assessment of the current analysis and assessment of the business excellence of organisations using financial ratios. In general, in their written assessment applications, organisations showcase their business performance only according to a few simple indicators. The presentation of pure (nominal) accounting categories is otherwise the presentation of accurate numbers, but these do not have the expressive power to be convincing [39]. Thus, for example, it would be highly desirable if the authors of the application assessed the financial position of the organisation, which is defined by the Code of Business and Financial Principles [40] as the state of the organisation in relation to its past achievement of financial goals and in relation to the ability to achieve future goals. The presentation of the financial position is thus necessarily linked to information about the organisation's solvency from both the short-term and the long-term perspective. In terms of analysing and assessing organisational excellence, the long-term aspect is of course the most relevant.

There is insufficient emphasis on risk management, which relates to organisations being aware of the different types of risks and how to 'manage' them, say, investment risks. If the investment project is sound, the net present value (NPV) positive, and the organisation has the necessary competence and investment ability to implement the project in accordance with its budget, timeline and planned results, the investment risk has been managed well.

The owners' point of view is considered insufficiently. It would seem that the application should include interviews with representatives of the most important owners of the organisation. Today, value-based management theory, which is basically a relatively simple framework for setting goals that follow the increase of added value for owners, has already taken hold. Thus, according to this theory, one of the main factors influencing corporate value is the organisation's ability to generate returns that are greater than the cost of capital provided by the owners [41].

When it comes to the question of how to measure the excellence of an organisation from the perspective of the owners, we face several problems. According to Turk [4], differences in judgement may appear even among owners who have obtained their capital in different ways. Avoiding this issue in this paper, we could associate the excellence of an organisation with a greater growth in the market value of its shares than is common for others.

We should strive to make the EFQM model (using the RADAR matrix) increasingly objective; the approaches it involves should be clear, tangible and measurable, and applicants should take this into account when writing their assessment application document.

While visiting the applicants, it is often found that there is no real coordination between individual departments (purchasing, production, finance).

The collection of relevant data and information is extremely important for the analysis of business excellence, especially for criterion 7, Strategic & Operational Performance. According to Bergant [37], at least the following types of knowledge are necessary: knowledge of accounting data and financial statements, knowledge of handling data to calculate certain ratios and indicators (analysing), knowledge of an adequate and simple explanation of the ratios and indicators, and knowledge of information presentation and reporting (communication). Relevance and reliability are the key characteristics that any accounting information must possess if it is to be

useful. When we identify information as relevant and reliable, this information will be best presented to users in this way if it increases comparability and ensures that a rational and diligent user will be able to understand it [42]. Therefore, the expressive power and message value of indicators based on the quality of the organisation's operations are key to assessing the business excellence of the organisation. This issue is especially important when the authors of the assessment application document for the purpose of business excellence evaluation want to present the organisation according to its business results (Operational Performance).

Among all the aspects listed above, we cannot ignore the ethical one, especially if we highlight the social responsibility of the organisation, on which the model of business excellence is also built. A socially responsible organisation regulates its behaviour towards owners, employees, business partners, its narrower and wider social and business environment, and nature in accordance with the principles of sustainable behaviour [43]. In this framework, according to Bergant [43], we must also position the responsibility of management, which, among other things, is obliged to manage the risk of insolvency not only on the basis of professional principles, but also on the basis of ethical ones. Therefore, it would be necessary for the authors to upgrade their assessment application in the part that refers to criterion 7, Strategic & Operational Performance – for example, based on a model of the organisation's comprehensive financial policy, which is based on the organisation's capital adequacy as a starting point [43].

During the visit to the applicant's location, we often find that the processes are poorly managed, although everything is well defined in the ISO standards and in the applicant's internal documents (quality management), for example, which activities contribute to the creation of value and which do not (the ABC method, value analysis, etc.).

What methods, techniques, approaches (for example, the balanced scorecard system, BSC) are used by organisations to improve their business – we should be able to assess this with the RADAR matrix. In some organisations, they are very familiar with modern methods and techniques, but either do not use them enough or do not use them at all to improve their business activities. It is difficult to assess the extent to which they know how to use the most modern technologies, equipment, etc. It is one thing for them to openly say so and admit it; where this is not the case, if you are not an expert, it is difficult to assess.

5. Strengths and opportunities for improvement as the conclusion of business excellence analysis

As already mentioned, writing the assessment application document in the process of applying for the business excellence award call for tender basically involves a comprehensive, complex analysis of the organisation's operations, in the preparation of which practically all of the organisation's functional staff participate. This process of analysing and assessing the organisation ends with a final report to the applicant, the authors of which are external assessors led by the leading assessor. This is certainly one of the most difficult tasks in business excellence analysis. It requires a certain mental effort from all the assessors, who are professionally trained in individual areas: assessor A is responsible for strategy, assessor B for leadership, assessor C for human resources (enablers and results), assessor D for resources and partnerships, assessor E for processes, assessor F for marketing and customers, assessor G for the area of

the social responsibility of the organisation and assessor H for business results. The assessing group therefore consists of different professional profiles.

The difficulty of writing the final report to the applicant lies primarily in identifying and creating meaningful opportunities for improvement, since it is in this part of the final report that the applicant expects useful suggestions from the assessors and their added value. These opportunities for improvement arise on the basis of the content written in the applicant's assessment application and on the basis of a three-day visit of the assessing group to the organisation, where a lot of data and information are collected, with the help of which, on the one hand, problems are identified (the first phase in business analysis), and on the other hand, by citing opportunities for improvement, appropriate solutions are offered (setting and logically testing the hypotheses), which are practically implemented by the organisation on the basis of taking concrete measures. Here, however, as already mentioned, the business analysis moves on to the planning phase for the organisation.

When business excellence assessors study the organisation's assessment application document and try to assess it according to this criterion, they first focus on the advantages that the organisation should have in the field under consideration. Their task is to identify and extract some key advantages according to which the organisation should be a role model for others, so that good practices in this area (knowledge sharing) can be transferred both internally to other organisational units as well as externally, more widely, to other business environments, to other business systems.

In order to present this aspect, which is also extremely important for the scoring itself (i.e., the final assessment of the organisation) to be more persuasive, let us first state one of the claims of the external assessors of organisation X, which is active in the field of healthcare (a clinical centre). The claim was made based on the prepared application document of the organisation and the assessors' visit to it as a priority in the draft of the final report to the applicant. It relates to criterion 7, Strategic & Operational Performance: *'In terms of the quality of medical services, the organisation ranks among the most successful medical institutions in Europe.'* This is an example of a poorly written advantage that sounds rather anecdotal and has a low indicative value. If what the assessors want to convey with this statement is true, then, of course, this is a really big advantage for both the healthcare organisation and the business system, which brings it a relatively high ranking in the overall scoring according to this criterion and in general. What is actually wrong with this statement? The assessors wrote it down on the basis of a broader interpretation of the results in the assessment application document and on the basis of the information they received from the management during the visit to the clinical centre. Both in the assessment application document and during the visit to the organisation, it was emphasised that the medical staff in this organisation is overburdened, that surgeons perform an inappropriately higher number of operations per year than their colleagues in comparable clinical centres in Central Europe, etc. However, the advantage in italics above is not formulated satisfactorily, as it is necessary to indicate the source of the information, as well as provide a precise definition of the indicator and a comparison with the average and the best healthcare organisations in Europe. It is necessary to know how many hospitals were compared and which of them are still among the most successful. What is needed is a real comparative analysis of the organisation according to this criterion, based on the method of rectifiers (benchmarking).

Thus, this would be an advantage that falls under the criterion Strategic & Operational Performance. Business performance indicators are much better written like this: *'In terms of the quality of medical services, the organisation is ranked among the*

most successful medical institutions in Europe, as it achieves better results than the average IQM hospital in most of the presented aspects of IQM quality medicine according to the methodology of the "international comparison of hospital mortality due to certain medical conditions and surgical interventions with the IQM hospital association".' Since we have added an appropriate justification to the newly written advantages with the help of comparatively analysed indicators, we have obtained a fully reasoned claim, which can now also be better assessed according to the RADAR matrix. The organisation is able to prove that it is really that good according to this indicator.

Author details

Vladimir Bukvič
Faculty of Entrepreneurship, GEA College, Ljubljana, Slovenia

*Address all correspondence to: vladimir.bukvic.ce@gmail.com

IntechOpen

References

[1] Pučko D. Business Analysis. Study Book. Ljubljana: Faculty of Economics University of Ljubljana; 2006

[2] Bergant Ž. Fundamentals of Business Analysis. Ljubljana: Institute for Managerial Accounting; 2010

[3] EFQM. The EFQM Model. Revised 2nd edition. Brussels: European Foundation for Quality Management. 2019. ISBN: 978-90-5236-870-2

[4] Turk I. On Personal and Business Excellence. Economic Library. Ljubljana: Association of the Economists of Slovenia; 2010

[5] Kern Pipan K. The impact of continuous improvement and human capital on organisational business excellence [Doctoral dissertation]. Kranj: Faculty of Organisational Sciences Kranj University of Maribor; 2010

[6] Kovač P. The development of quality and excellence as a common denominator of reforms in the public sector in Europe. In: Professional Material. GV - EFQM Conference. Winners Conference and SFPO Forum 2006. Professional Material. Ljubljana: Planet GV; 2006

[7] Gomišček B, Maletič D, Maletič M. Review of the situation in the field of quality management in Slovenian organisations. In: Proceedings of the 26th International Conference on the Development of Organisational Sciences. Portorož: Creative Organisation; 2007

[8] MIRS 2. Fundamental Principles of Excellence. Ljubljana: Ministry of Education, Science and Sports. Office of the Republic of Slovenia for Metrology; 2007

[9] Marolt J, Gomišček B. Total Quality Management. Moderna Organizacija. Kranj: Faculty of Organisational Studies University of Maribor; 2005

[10] Bajc Z. Krka on the path of excellence to success. In: 20th Forum of Excellence and Mastery. Otočec 2008. Conference of EFQM Winners and SFPO Forum. "Universal Excellence as a New Paradigm of Successful Cooperation between Countries and as Motivation for a Healthy Life and Successful Work." Proceedings. Novo Mesto: Association of Economists of Dolenjska and Bela Krajina; 2008

[11] MIRS 1. EFQM Excellence Model. Ljubljana: Ministry of Education, Science and Sports. Office of the Republic of Slovenia for Metrology; 2007

[12] MIRS 3. EFQM Excellence Model. EFQM Publications. Shares What Works. Ljubljana: Republic of Slovenia Ministry of Economic Development and Technology. Bureau of Metrology; 2013

[13] Samson D, Challis D. Patterns of business excellence. Measuring Business Excellence. 2002;**6**(2):15-21

[14] Rusjan B. Usefulness of the EFQM excellence model: Theoretical explanation of some conceptual and methodological issues. Total Quality Management & Business Excellence. 2006;**16**(3):363-380

[15] Kim DY, Kumar V, Murphy SA. European foundation fro quality management business excellence model: An integrative review and research agenda. International Journal of Quality & Reliability Management. 2010;**27**(6):684-701

[16] Asif M, Searcy C, Garvare R, Ahmad N. Including sustainability in

business excellence models. Total Quality Management & Business Excellence. 2011;**22**(7):773-786

[17] Asif M, Gouthier MHJ. What services excellence can learn from business excellence models. Total Quality Management & Business Excellence. 2014;**25**(5-6):511-531

[18] Escrig AB, de Menezes LM. What characterizes leading companies within business excellence models? An analysis of "EFQM recognized for excellence" recipients in Spain. International Journal of Production Economics. 2015;**169**:362-375

[19] Metaxas IN, Koulouriotis DE. Business excellence measurment: A literature analysis (1990-2016). Total Quality Management & Business Excellence. 2017;**30**(11-12):1189-1218

[20] Ahn JS, Assaf AG, Josassen A, Baker MA, Lee S, Kock F, et al. Narcistic CEOs and corporate social responsibility: Does the role of an outside board of directors matter? International Journal of Hospitality Management. 2020;**85**(102350):1-8

[21] Fonseca L. The EFQM 2020 model. A theoretical and critical review. Total Quality Management & Business Excellence. 2021;**33**(9-10):100-1038

[22] Harris E. What Is the EFQM Excellence Model and How Useful Is it for you. London: Triaster Ltd; 2021. Available from: https://blog.trisaster.co.uk

[23] Kanji GK. Architecture of business excellence in the public and service sectors. Total Quality Management & Business Excellence. 2008;**19**(49):399-415

[24] Naylor G. Using the business excellence model to develop a strategy for a healthcare organisation. International Journal of Health Care Quality Assurance. 1999;**12**(2):37-45

[25] Jackson S. Achieving a culture of continuous improvement by adopting the principles of self-assessment and business excellence. International Journal of Health Care Quality Assurance. 1999;**12**(2):59-64

[26] Ruiz U, Simon J, Molina P, Jimenez J, Grandal J. A two-level integrated approach to self-assessment in healthcare organisations. International Journal of Health Care Quality Assurance. 1999;**12**(4):135-142

[27] Kovač B. Dimensions and challenges in management. In: Možina S et al., editors. Management: New Knowledge for Success. Radovljica: Didakta Publishing House; 2002. pp. 803-880

[28] Calingo LMR. National Quality and Business Excellence Awards: Mapping the Field and Prospects for Asia: Report of the Symposium on Quality and Business Excellence Awards Held in Nadi, Fiji from 18 to 20 September 2001. ISBN: 92-833-2332-7. Fiji: Asian Productivity Organization; 2002. pp. 3-23

[29] Assessment application document of the organisation X for PRSPO, Award of the Republic of Slovenia for Business Excellence for the year 2014 (accessible only with the agreement of the Organisation X)

[30] Ransom ER, Joshi MS, Nash DB, Ransom SB. The Healthcare Quality Book: Vision, Strategy, and Tools. 3rd edition. Chicago, Illinois: Health Administration Press; 2014

[31] Donabedian A. The quality of care. How can it Be assessed? JAMA. 1988;**260**(12):1743-1748

[32] Cassell EJ. The nature of suffering and the goals of medicine. PubMed. US

National Library of Medicine. National Institutes of Health. The New England Journal of Medicine. 1982;**306**(11):639-645

[33] Donabedian A. Explorations in Quality Assessment and Monitoring. Vol. I. the Definition of Quality and Approaches to its Assessment. Ann Arbor: Health Administration Press; 1980

[34] Wyszewianski L. The emphasis on measurement in quality assurance: Reasons and implications. Inquiry. 1988;**25**:424-433 US National Library of Medicine. National Institutes of Health

[35] Arrow KJ. The economics of agency. V J. W. Prat in R. J. Zeckhauser, Principals and Agents: The Structure of Business. Boston: Harvard Business School Press; 1985. pp. 37-51

[36] Donabedian A. An Introduction to Quality Assurance in Health Care. Oxford: Oxford University Press; 2003

[37] Wolfe A. Crossing the Quality Chasm: A New Health Care System for the 21st Century. Institute of Medicine 2001. Policy Politics & Nursing Practice. 2001;**2**(3):233-235

[38] Donabedian A, Wheeler JR, Wyszewianski L. Quality, cost, and health: An integrative model. Medical Care. 1982;**20**(10):975-992

[39] Bergant Ž. Financial Ratios and Quality Indicators. Ljubljana: ITEO; 1998

[40] Code of Business and Financial Principles. Slovenian Institute for Auditing, paragraph 1.2. 1998

[41] Bukvič V. Value based management with an empirical case. In: Proceedings. 1st International Scientific Conference Knowledge and Business Challenges of Globalisation in 2009. Celje: FKPV (full paper is recorded on CD); 2009

[42] Bukvič V. Professional foundations of general principles of organizing (preparation for implementation) accounting for internal reporting. In: Bergant Ž, editor. General Principles of Internal Reporting. Proceedings. Ljubljana: Association of Economists of Slovenia; 2011. pp. 171-205

[43] Bergant Ž. Social responsibility and Corporate's solvency. In: Proceedings 11th. International Conference Social Responsibility and Time Challenges. Maribor: Institute for Development of Social Responsibility; 2015

Chapter 6

The Dynamic Effects of Monetary Arrangements on Bilateral Trade in the African Franc Zone

Dieudonné Mignamissi

Abstract

In this chapter, I estimate the dynamic effects of the sharing of the CFA franc on bilateral exports of member countries of the African Franc Zone (AFZ), distinguishing the results according to its two monetary unions, namely the Central African Economic and Monetary Community (CAEMC) and West African Economic and Monetary Union (WAEMU). While the overall and average effects are well identified in the recent literature, no study has focused on the dynamic effects of monetary integration in Africa. Using data from the World Bank, UNCTAD, and CEPII, I adopt a gravity specification estimated by ordinary least squares (OLS) and the Poisson pseudo-maximum likelihood (PPML) estimator. Our analysis leads to the following results: (i) in CAEMC, the dynamic effects of the CFA franc on bilateral trade of its member countries are delayed, as they are observed from 2010 onward; (ii) in WAEMU, the CFA franc has permanent dynamic effects throughout the study period; and (iii) these results, robust to the use of the PPML, are partially explained by the detour of trade caused by the fact that most of the partner countries belong to other regional groupings. All of these results call for a deep analysis of the future of the AFZ, which requires relevant reforms to ensure its viability and optimality.

Keywords: dynamic effects, common currency, bilateral trade, African Franc Zone, gravity model

1. Introduction

This chapter contributes to the debate on the future of the Franc Zone by assessing the dynamic effects of monetary integration on the trade intensity of countries in this African space. Created in 1939 by France in order to preserve its political pre-square in the world on the eve of World War II, the Franc Zone can be understood as one of the oldest monetary zones in the world. It is made up of geopolitical zones where currencies that were once linked to the French Franc (former colonies or overseas territories) are used and have been linked to the Euro since 1999 by a fixed parity system guaranteed by the French Treasury. These currencies are the result of the monetary cooperation policy of the Banque de France and the Central Banks of the former colonies, which are bound by agreements. The Franc Zone is made up of France (and

its overseas territories), the countries of the Economic and Monetary Community of Central Africa—CAEMC (Cameroon, Congo, Central African Republic, Gabon, Equatorial Guinea, and Chad), the countries of the West African Economic and Monetary Union—WAEMU (Benin, Burkina Faso, Ivory Coast, Guinea Bissau, Niger, Mali, Senegal, and Togo), and the Comoros. These countries and groups of countries each use their own currencies.

A unique feature of both currency unions was the involvement of France as the anchor currency country in the monetary policy of the central banks of the WAEMU and CAEMC. France guaranteed the convertibility into their own currency and participated in the executive boards of the central banks with veto power and thus the ability to block any decisions until the adoption of the Euro. In fact, the CFA Franc Zones went beyond the features of a regular currency union. With the devaluation imposed by France in 1994, very similar rules of macroeconomic surveillance to those established in the EMU were introduced and gradually implemented. Nevertheless, while monetary integration is well established, economic integration is still incomplete in the WAEMU and CAEMC areas.

The need to study the effect of the CFA franc on trade in the countries of the African Franc Zone (AFZ) can be justified by the fact that this monetary zone is one of the oldest in the world. This issue has been mainly studied by referring to the Optimum Currency Area (OCA) criteria. However, those studies have been unable to draw clear-cut conclusions on the optimality of the CFA zone. This can be obviously linked to the limitations of the OCA framework in explaining the actual formation of monetary unions. The authorship of the work on the link between the single currency and market integration goes back to Rose [1]. In his analysis, the author demonstrates the explanatory power of the sharing of a single currency on bilateral trade. This path opened by Rose has generated a very fertile field of research. But in Africa, little attention has been paid to the link between the single currency and bilateral trade. However, some recent works confirm globally the existence of the endogenous effects of a single currency on bilateral trade [2, 3].

The major contribution of this paper is to consider the dynamic analysis of the effects of monetary integration on bilateral trade in the AFZ. Unlike previous approaches that focus on the average effect, I adopt an approach that allows this effect to be broken down over time. This makes it possible to identify the periods for which the common monetary history was an essential factor of market integration in the AFZ in order to constitute a rational memory for the future.

Following this introduction, the rest of the paper is organized as follow. Section 2 presents a brief literature review. Section 3 describes the methodology. Section 4 analyses the main findings. Section 5 addresses their sensitivity and Section 6 their robustness. In Section 7, I draw some concluding remarks.

2. Literature review

2.1 The costs/benefits analysis

According to Bean's [4] seminal analysis, joining or belonging to a monetary union is a decision resulting from an optimization of the related benefits and costs. Theoretically, the costs of a monetary union are assessed in terms of loss of national sovereignty, political independence, and cultural authenticity [5]. Furthermore, Belke and Wang [6] identify relative instability as another potential cost. In this regard,

rebalancing and stabilization of production and the labor market become difficult to achieve due to the loss of control of the monetary instrument in the conduct of overall economic policy. The abandonment of exchange rate policy [7] and monetary policy as instruments of macroeconomic adjustment by a country exposes it to shocks whose magnitude is proportional to its degree of integration in the union, with the subsequent costs depending on the country's specific characteristics.

As for the benefits, they are diverse and varied, without claiming to be exhaustive. The direct benefits of a monetary union are related to the cancelation of exchange rate risk and the reduction of hedging costs against this risk [7]. Indirect benefits relate to the synchronization of cycles, which leads to a better response to macroeconomic shocks [8], but also to the intensification of trade [1]. Monetary union can also create a framework that is favorable to the mitigation of inflationary bias [9] and thus ensure price stability [10]. Adopting a typology specific to currency unions, Grubel [5] distinguishes between static gains in terms of reduced exchange costs, lower interest rates and exchange rate risk, and increased welfare and stability, and dynamic gains in terms of expanded trade, better labor market performance, and improved adjustment of economic structures.

2.2 Dynamic and scale effects

According to Rose [1], there has been little work on the dynamic effects of currency unions on trade. They were interested in the nature of the link between the two variables, without addressing the question of the dynamics of this link over time. On the basis of this observation, Katayama and Melatos [11], using the panel dataset constructed by Glick and Rose [12] that covers 217 countries from 1948 to 1997, demonstrate the nonlinear impact of the single currency on bilateral trade. Thus, they show that, contrary to previous studies, the sharing of a single currency does not influence the level of bilateral trade in the same proportion. After him, De Sousa's [13] study, based on a theoretical gravity model covering a large period (1948–2009), proves that the effect of sharing a single currency on bilateral trade is eroding over time because of the existence of other channels that are commercial and financial globalization.

This result remains robust and confirmed by Miron et al. [14]. The authors restate the result of Rose [1] on the differentiated effects of sharing of single currency and the reduction in volatility of the exchange rate. Moreover, they confirm the hypothesis of the continuous declining effect of currency union on bilateral trade. According to Larch et al. [15], the monetary union effects on trade are dimensional and could be dynamic. Using a structural gravity model, the authors distinguish in the case of the euro zone, bilateral and multilateral effects. They discover that both effects are positive and statistically significant. Globally, this set of results remains consistent with that previously established by Bergin and Lin (2012).

3. Empirical strategy

3.1 Model specification

The empirical framework used in this chapter is the gravity model. This model is based on the Newtonian physics postulate that the force of attraction between two bodies is proportional to the product of their relative masses and inversely

proportional to the square of the distance between them. Although this model was introduced by Tinbergen [16], it is Anderson [17], and in particular Anderson and van Wincoop [18], who are responsible for its theoretical foundations, which have been the subject of considerable debate among economists. The analytical framework is a monopolistic model applied to international trade, i.e. a context that assumes increasing returns to scale and product differentiation. This framework is underpinned by three fundamental assumptions: profit maximization by firms in monopolistic competition, utility maximization by consumers, and specialization of the supply of goods between countries [19].

Empirically, the economic formulation of this equation is as follows:

$$X_{ijt} = \phi_0 \frac{Y_{it}^{\phi_1} . Y_{jt}^{\phi_2}}{D_{ij}^{\phi_3}} e^{\varepsilon_{ijt}} \tag{1}$$

X_{ijt} is the bilateral trade flow between two countries in time t, Y_{it} and Y_{jt} are the GDPs, and D_{ij} is the distance between the two countries. The $\phi^{'}$s are coefficients.

In light of Head and Mayer [19] who systematized the foundations and specifications of the gravity equation (naive form, structural form, and multiplicative form), I adopt the following multiplicative general form:

$$X_{ijt} = \phi_0 Y_{it}^{\phi_1} . Y_{jt}^{\phi_2} \theta_{ij}^{\gamma} M_{i(n)(j)} e^{\varepsilon_{ijt}} \tag{2}$$

where θ_{ij} is the common characteristics of i and j, and M is a proxy for multilateral resistances, which are generally captured by origin country fixed effects, destination country fixed effects, or by time fixed effects [20].

By explicitly noting the effect of sharing the single currency, I retain the following semi-log-linear specification:

$$ln\, X_{ijt} = \left\{ \begin{matrix} \phi_0 + \phi_1 ln\, Y_{it} + \phi_2 ln\, Y_{jt} + \phi_3 ln\, Pop_{it} + \phi_4 ln\, Pop_{jt} \\ + \phi_5 ln\, Dist_{ij} + \phi_6 CFA_{ij} + \phi_7 Dum_{ij} \end{matrix} \right\} + \mu_i + \gamma_j + \xi_t + \varepsilon_{ijt} \tag{3}$$

CFA_{ij} is the dummy variable equal to 1 if countries i and j belong simultaneously to the Franc Zone and its subregions (respectively XAF_{ij} for CAEMC, XOF_{ij} for WEAMU, and CFA_{ij} for the consolidated zone), and 0 otherwise. Dum_{ij} is the vector grouping the dummy variables related to the simultaneous openness to the sea ($Open_{ij}$), the sharing of a common language (CL_{ij}), the sharing of a common land border (CB_{ij}), and the sharing of a common colonizer (CC_{ij}). μ_i, γ_j, and ξ_t are, respectively, exporter fixed effects, importer fixed effects, and time fixed effects, considered as proxies for multilateral resistances [21]. To avoid perfect multicollinearity between the bilateral dummy variables (CFA_{ij} and Dum_{ij}) and time-invariant variables like distance (D_{ij}) with bilateral fixed effects, I decide to omit the latter by adopting the country and time fixed effects according to the specifications. ε_{ijt} is the random term.

3.2 Estimation technique, data, and sample

Gravity models can have two types of specifications, namely a linear specification typically using OLS and a nonlinear specification using multiple estimators. I will

initially, for preliminary results, apply OLS and for robustness apply a nonlinear approach, namely the Poisson pseudo-maximum likelihood (PPML) developed by Santos Silva and Tenreyro [22].

The data used come from three main sources, namely: UNCTAD, WDI, and CEPII. These data are observed over the period 1995–2019. Given the number of member countries (6 in CAEMC, 8 in WEAMU, and 14 in AFZ), the number of pairs per country (2400 pairs) and the number of partner countries (see sample of partner countries in the appendix), the number of observations is 14,400, 19,200, and 33,600, respectively, for CAEMC, WEAMU, and AFZ. The main characteristics of these data are shown in **Tables A1–A3** in the appendices.

The sample includes two types of countries (**Table A4** in appendices). The first is the reporting countries (country *i*), which are the member countries of CAEMC, WAEMU, and the AFZ. These countries are linked to partner countries (country *j*) that are part of several regional blocs in Africa and the world, namely SADC, AMU, EAC, EU, ASEAN+, MERCOSUR, and NAFTA.

4. Main findings

The results show that in CAEMC (see **Table 1**), the overall and average effect of the CFA is significant[1]. However, by adopting a dynamic analysis, several salient facts emerge. Indeed, between 1995 and 2010, although the effect associated with the sharing of the single currency by the member countries of this community space is positive overall, it remains insignificant. This result reflects the fact that the CFAF did not generate the economies of scale and dynamic gains expected. Between 2011 and

	Dependent variable: lnX_{ij}						
	Full sample	**1995**	**2000**	**2005**	**2010**	**2015**	**2019**
$Ln(GDP_i)$	0.845***	0.988***	1.685***	0.934***	0.270	0.411	0.375
	(0.0552)	(0.247)	(0.334)	(0.346)	(0.334)	(0.274)	(0.312)
$Ln(GDP_j)$	2.036***	1.729***	1.908***	1.956***	2.132***	2.094***	1.974***
	(0.0311)	(0.159)	(0.143)	(0.159)	(0.156)	(0.159)	(0.168)
$Ln(Pop_i)$	0.843***	0.944***	0.681***	0.786***	1.137***	1.183***	1.401***
	(0.0457)	(0.278)	(0.224)	(0.227)	(0.217)	(0.228)	(0.254)
$Ln(Pop_j)$	−0.0301	0.203	0.155	−0.00305	−0.100	0.00323	−0.147
	(0.0370)	(0.197)	(0.174)	(0.190)	(0.182)	(0.184)	(0.191)
$Ln(Dist_{ij})$	−2.300***	−2.590***	−1.384***	−2.409***	−3.154***	−2.483***	−1.887***
	(0.0794)	(0.427)	(0.385)	(0.411)	(0.386)	(0.390)	(0.411)
XAF_{ij}	**1.515*****	**2.155**	**1.950**	**1.244**	**1.432**	**2.438***	**2.572***
	(0.257)	**(1.345)**	**(1.215)**	**(1.345)**	**(1.258)**	**(1.258)**	**(1.309)**

[1] In relation to the comments, he noted that the results were generated for each year between 1995 and 2019. They have not been reported in full to fit the format of the book. However, they are available upon request

	Dependent variable: lnX_{ij}						
	Full sample	**1995**	**2000**	**2005**	**2010**	**2015**	**2019**
$Openness_{ij}$	2.834***	1.746***	1.228**	3.193***	4.063***	3.779***	3.483***
	(0.110)	(0.539)	(0.575)	(0.594)	(0.554)	(0.553)	(0.594)
CL_{ij}	1.266***	−0.309	1.257**	1.593***	1.238**	0.555	1.350**
	(0.111)	(0.603)	(0.529)	(0.577)	(0.541)	(0.541)	(0.564)
CB_{ij}	0.456	1.304	1.377	1.131	−0.715	−0.213	−0.934
	(0.281)	(1.460)	(1.325)	(1.465)	(1.371)	(1.372)	(1.435)
CC_{ij}	2.776***	3.388***	2.688***	2.451***	3.010***	2.704***	2.562***
	(0.127)	(0.664)	(0.600)	(0.663)	(0.621)	(0.622)	(0.646)
Constant	−56.52***	−54.24***	−79.49***	−55.48***	−42.29***	−52.62***	−55.17***
	(1.317)	(5.360)	(7.270)	(8.443)	(8.125)	(6.802)	(7.141)
μ_i	Yes	Yes	Yes	Yes	Yes	Yes	Yes
γ_j	Yes	Yes	Yes	Yes	Yes	Yes	Yes
ξ_t	Yes	No	No	No	No	No	No
Observations	14,232	552	564	576	576	570	570
R-squared	0.502	0.466	0.527	0.474	0.525	0.528	0.468

Robust standard errors in parentheses.
*** $p < 0.01$.
** $p < 0.05$.
* $p < 0.1$.
Source: Author.

Table 1.
Baseline results of dynamic effects in the CAEMC.

2019, there is a positive impact from the sharing of the single currency in CAEMC. This analysis shows that in CAEMC, the positive effect of the single currency was delayed, with countries experiencing dynamic losses for over more than a decade. These results are discussed in general by Mignamissi [3].

In the WAEMU (see **Table 2**), on the other hand, not only is the average and overall effect perceptible but also the dynamic effects are significant. In other words, the sharing of the single currency has distributive effects over time, indicating the existence of dynamic gains in this region. Moreover, the results obtained in this region can be qualified, as the significant effect is derisory in view of the low share of intra-regional trade in this area, which has barely exceeded 10% for several decades.

From these results, discussing the future of the AFZ presents itself as a highly interesting opportunity. Such a debate could be structured around two main arguments, one political and the other economic. On the political level, the pressures generated by the desire of the WEAMU countries to enter into a new monetary union with the other ECOWAS countries have shifted the positions. This desire also revived recurrent internal debates which founded the legitimate aspiration of the populations of the Franc zone to choose their own economic destiny in general. On the economic level, one could point out the questionable effects of the mechanisms of the Franc

	Dependent variable: lnX_{ij}						
	Full sample	**1995**	**2000**	**2005**	**2010**	**2015**	**2019**
$Ln(GDP_i)$	2.208***	2.909***	2.582***	1.312**	1.330**	2.741***	3.777***
	(0.119)	(0.648)	(0.574)	(0.586)	(0.593)	(0.612)	(0.517)
$Ln(GDP_j)$	1.254***	1.429***	1.344***	1.167***	1.120***	1.111***	1.152***
	(0.0232)	(0.129)	(0.107)	(0.112)	(0.115)	(0.119)	(0.108)
$Ln(Pop_i)$	0.910***	−0.614	0.249	1.883**	2.615***	0.577	−0.737
	(0.159)	(0.817)	(0.765)	(0.785)	(0.788)	(0.829)	(0.711)
$Ln(Pop_j)$	0.371***	0.225	0.539***	0.403***	0.454***	0.398***	0.452***
	(0.0290)	(0.166)	(0.137)	(0.140)	(0.141)	(0.143)	(0.129)
$Ln(Dist_{ij})$	−2.468***	−2.710***	−2.418***	−2.470***	−2.269***	−2.387***	−2.032***
	(0.0551)	(0.318)	(0.261)	(0.269)	(0.267)	(0.270)	(0.246)
XOF_{ij}	**1.784*****	**1.938****	**1.859****	**2.587*****	**1.887****	**1.495****	**1.835*****
	(0.154)	**(0.867)**	**(0.724)**	**(0.756)**	**(0.749)**	**(0.753)**	**(0.682)**
$Openness_{ij}$	1.858***	1.299**	1.170**	2.611***	2.461***	1.932***	1.457***
	(0.0944)	(0.553)	(0.475)	(0.453)	(0.440)	(0.469)	(0.426)
CL_{ij}	1.091***	0.431	1.329**	1.093	0.814	1.251*	0.971
	(0.140)	(0.730)	(0.662)	(0.692)	(0.686)	(0.690)	(0.627)
CB_{ij}	0.699***	0.891	0.500	0.470	0.668	0.367	0.466
	(0.177)	(1.018)	(0.829)	(0.867)	(0.858)	(0.863)	(0.783)
CC_{ij}	2.100***	3.287***	1.829***	1.651**	2.291***	2.065***	1.907***
	(0.148)	(0.788)	(0.701)	(0.732)	(0.724)	(0.728)	(0.660)
Constant	−73.13***	−64.18***	−75.33***	−66.66***	−80.49***	−78.14***	−85.55***
	(0.884)	(5.492)	(4.326)	(4.422)	(4.437)	(4.445)	(4.012)
μ_i	Yes	Yes	Yes	Yes	Yes	Yes	Yes
γ_j	Yes	Yes	Yes	Yes	Yes	Yes	Yes
ξ_t	Yes	No	No	No	Yes	No	Yes
Observations	18,976	736	752	768	768	760	760
R-squared	0.534	0.462	0.565	0.517	0.549	0.539	0.593

Robust standard errors in parentheses.
*** $p < 0.01$.
** $p < 0.05$.
* $p < 0.1$.
Source: Author.

Table 2.
Baseline results of dynamic effects in the WEAMU.

Zone. To this end, it is relevant to question deeply the relevance of the agreements and operating principles of the Franc Zone (guaranteed convertibility, fixed parities, free transferability, and centralization of foreign reserves), the rate of economic cycle's synchronization of the member countries, and the convergence speed of nominal and real indicators, among others.

As for the control variables, I distinguish two cases, namely the case of traditional quantitative variables and the case of bilateral dummies. Our results show that GDP, population, and distance between two countries support the intuition of gravity modeling. While GDP and population act as attractors to bilateral trade, distance acts as a repellent to trade between two countries. In other words, GDP and population are proxies for market size, which is a factor driving bilateral trade when this size reaches a critical level in the partner countries. Moreover, the further apart two countries are, the less they trade, because of the multiplication of transaction costs, especially transport costs. This result is fundamental to all gravity models.

Finally, the sharing of certain historical (common colonizer), geographical (openness to the sea and land border), and cultural (language) characteristics is favorable to market integration. The coefficients associated with the dummies that capture them are in most specifications positive and significant. Indeed, these variables not only help to reduce transaction costs but also strengthen the social and historical ties between peoples, which would be favorable to the mixing of populations and the intensification of exchanges between them.

5. Sensitivity analysis: the effects of partners' regions on bilateral trade

The idea of this test is to see if any of the factors limiting bilateral trade in the AFZ have external origins. To do so, I model through dummies the effect of the membership of partner countries outside the AFZ in their respective communities. I thus capture the effect of partner countries' membership in the Southern African Development Community (SADC), in the Arab Maghreb Union (AMU), in the East African Community (EAC), in the European Union (EU), in the Association of Southeast Asian Nations (ASEAN), in the Mercado Común del Sur (MERCOSUR), and in the North American Free Trade Agreement (NAFTA). By augmenting the gravity model with dummies capturing membership in these integration spaces, two types of results emerge.

In the CAEMC, countries' membership in the African regional economic communities (RECs) (SADC, UMA, and AEC) reduces the bilateral trade (**Table 3**). In other words, countries outside the AFZ contribute to the detour of trade flows within the AFZ member countries. This detour effect is more pronounced in the SADC and EAC. This result could be justified by the multiple memberships of Central African countries in the broader sense of ECCAS in several regional economic communities (RECs). The coexistence of several communities (CEN-SAD[2], CAEMC, ECCAS[3], ECGLC[4], and EAC) in the same integration space, sometimes with similar objectives, results in a waste of resources, which is a brake on integration through the market. Also, the dynamic analysis of these effects shows that they are decreasing for SADC and UMA, but increasing for EAC. This shows a desire for faster commercial integration with the first two mentioned. On the other hand, the membership of CAEMC partner countries in regional economic communities outside Africa (EU, MERCOSUR, ASEAN, and NAFTA) seems beneficial to their trade. Indeed, because of their low level of diversification and product sophistication, CAEMC countries have difficulty gaining consistent market shares in these communities, which tends to amount to an illusory increase in their bilateral trade. Here, the effect of

[2] Community of Sahel–Saharan States.

[3] Economic Community of Central African States.

[4] Economic Community of the Great Lakes Countries.

	Dependent variable: lnX_{ij}						
	Full sample	**1995**	**2000**	**2005**	**2010**	**2015**	**2019**
XAF_{ij}	**1.174****	**1.856**	**1.926**	**0.801**	**0.826**	**2.042**	**1.581**
	(0.262)	**(1.363)**	**(1.228)**	**(1.380)**	**(1.293)**	**(1.278)**	**(1.303)**
$SADC_j$	−1.360**	−0.894	−1.798*	−2.325**	−2.013**	−0.420	−0.761
	(0.154)	(0.791)	(0.718)	(0.811)	(0.763)	(0.764)	(0.781)
UMA_j	−0.401*	1.685	−1.812*	−1.203	−1.297	−0.312	−0.745
	(0.194)	(1.082)	(0.893)	(1.007)	(0.945)	(0.943)	(0.967)
CAE_j	−2.809**	−2.771*	−2.879*	−3.053*	−2.015	−2.621*	−4.510**
	(0.249)	(1.125)	(1.174)	(1.320)	(1.238)	(1.230)	(1.260)
$UE28_j$	0.679**	0.866	1.640*	−0.367	−0.648	0.947	0.00635
	(0.161)	(0.824)	(0.740)	(0.852)	(0.794)	(0.835)	(0.875)
$ASEAN_j$	1.441**	2.011*	−0.316	−0.479	−0.223	2.853**	3.964**
	(0.194)	(1.021)	(0.913)	(1.006)	(0.944)	(0.987)	(1.013)
$ALENA_j$	0.0889	1.721	−0.211	−0.937	0.0141	−0.782	−0.193
	(0.296)	(1.547)	(1.390)	(1.556)	(1.454)	(1.483)	(1.521)
Controls and resistances	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	14,232	552	564	576	576	570	570
R-squared	0.513	0.481	0.550	0.485	0.533	0.544	0.505

Robust standard errors in parentheses.
*** $p < 0.01$.*
** $p < 0.05$.*
Source: Author.

Table 3.
Dynamic effects in CAEMC (augmented gravity model).

	Dependent variable: lnX_{ij}							
	Full sample	**1995**	**2000**	**2005**	**2006**	**2010**	**2015**	**2019**
XOF_{ij}	**1.232*****	**1.081**	**1.455***	**2.241*****	**1.901****	**1.526****	**0.999**	**1.380****
	(0.158)	**(0.895)**	**(0.746)**	**(0.778)**	**(0.860)**	**(0.764)**	**(0.774)**	**(0.698)**
$SADC_j$	1.014***	0.363	1.311**	1.855***	0.556	1.593**	1.614**	1.592***
	(0.128)	(0.721)	(0.606)	(0.630)	(0.696)	(0.619)	(0.637)	(0.575)
UMA_j	−0.907***	−1.089	−1.546**	−0.706	−1.355	−0.449	−0.723	−0.256
	(0.155)	(0.932)	(0.723)	(0.756)	(0.836)	(0.741)	(0.754)	(0.684)
CAE_j	1.634***	1.168	2.597***	2.728***	1.211	0.145	0.527	1.795*
	(0.209)	(1.168)	(0.982)	(1.028)	(1.135)	(1.010)	(1.029)	(0.929)
$UE28_j$	0.420***	0.669	1.011*	0.787	1.022	−0.751	0.199	0.766
	(0.127)	(0.700)	(0.591)	(0.625)	(0.693)	(0.610)	(0.654)	(0.609)
$ASEAN_j$	3.047***	3.717***	1.717**	3.049***	2.115**	3.223***	3.252***	3.708***
	(0.165)	(0.928)	(0.781)	(0.807)	(0.891)	(0.791)	(0.835)	(0.756)

	Dependent variable: lnX_{ij}							
	Full sample	**1995**	**2000**	**2005**	**2006**	**2010**	**2015**	**2019**
$ALENA_j$	0.0360	0.462	−0.256	1.007	0.802	−0.0202	0.609	0.655
	(0.233)	(1.301)	(1.100)	(1.149)	(1.270)	(1.122)	(1.165)	(1.059)
Controls and resistances	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	18,976	736	752	768	768	768	760	760
R-squared	0.547	0.479	0.578	0.531	0.515	0.569	0.554	0.610

Robust standard errors in parentheses.
*** $p < 0.01$.
** $p < 0.05$.
* $p < 0.1$.
Source: Author.

Table 4.
Dynamic effects in WEAMU (augmented gravity model).

creation of trade flows weakens for the EU and NAFTA but consolidates for ASEAN, in particular over the last 7 years.

In WAEMU, only AMU member countries seem to create a diversion effect, the creation effects being globally observed with the rest of the regional economic communities (**Table 4**). In dynamic analysis, I note a high and permanent effect over the entire study period for ASEAN, which is the opposite in NAFTA. The EU has a weak creation effect, noted between 1999 and 2003 according to our estimates.

These controversial results call for debate on the nature of monetary integration in the AFZ, as well as its potential economic effects. Mignamissi's [3] contribution to this debate is more empirical than analytical. The author evaluates the monetary costs/benefits of market integration in the Franc Zone. He defines, starting from the status quo, four scenarios (Cooperation, Aggregation, Consolidation, and Enlargement). Based on an augmented gravity model, he identifies costs and shows that the best scenario for CAEMC is consolidation and for WAEMU is cooperation. In general, this analysis corroborates those of Allechi and Niamkey [23], Masson and Pattillo [24], Beetsma and Giuliodori [25], and Carrere [26].

6. Robustness

Santos Silva and Tenreyro [22, 27] show that the specification in log-linear form of the gravity model yields biased estimators due to the heteroscedasticity of trade levels. The authors also show that the PPML estimator is more efficient than the nonlinear least squares estimator when trade is specified in levels. They also point out that to ensure the consistency of the Poisson estimator of the PPML, the data do not necessarily have to follow a Poisson distribution.[5] This estimator corrects three main biases: (*i*) a bias induced by the log transformation, (*ii*) a bias due to heteroscedasticity, and (*iii*) a bias due to the presence of zeros in the dependent variable.

[5] For this reason, the literature calls it a pseudo-maximum likelihood and not the Maximum Likelihood estimator.

Applying the Poisson specification to the gravity model [28], I obtain

$$Pr(T_{ij} = C|x_{ij}) = \frac{e^{-\mu(x_{ij}\beta)}\mu(x_{ij}\beta)^{Com_{ij}}}{(T_{ij})!} \tag{4}$$

where $T_{ij} = 0,1,2,\ldots$ with $T_{ij}!$ the factorial of bilateral trade. The Poisson model stipulates an egalitarian dispersion and the conditional variance of T_{ij} is equal to its mean $\mu(x_{ij}\beta)$.

Solving the first-order conditions of the log-likelihood of the above expression, I obtain

$$\hat{\beta}_{Poisson} = ArgMax_{\beta}\left\{\sum_{i=1}^{N}\sum_{j=1}^{N}\left[-e^{(x_{ij}\beta)} + Com_{ij}(x_{ij}\beta) - Log(Com_{ij})!\right]\right\} \tag{5}$$

In the presence of heteroscedasticity, this estimator is consistent and more efficient than the previously developed estimators of the gravity model. Finally, because of its multiplicative form, the Poisson estimator offers a natural technique for handling zeros in the dependent variable.

The estimable form of the model is as follows:

$$X_{ijt} = Exp\left\{\begin{array}{c} ln\,\phi_0 + \phi_1 ln\,Y_{it} + \phi_2 ln\,Y_{jt} + \phi_3 ln\,Pop_{it} \\ +\phi_4 ln\,Pop_{jt} + \phi_5 ln\,Dist_{ij} + \phi_6 CFA_{ij} + \phi_7 Dum_{ij} \end{array}\right\} Exp\left(\mu_i + \gamma_j + \xi_t + \varepsilon_{ijt}\right) \tag{6}$$

The results of this robustness test confirm the previously established results (See **Tables 5** and **6**). While in the CAEMC the dynamic effects of the CFA franc on bilateral trade between member countries are delayed, in the WAEMU the dynamic effect is positive, permanent, and significant over the entire study period. Moreover, the analysis confirms that in comparative statistics, the effect of certain years is greater than the overall effect. In other words, the overall average cumulative effect suffers from the specific economic conditions associated with the various events and crises that the region has experienced. This analysis reflects the fact that dynamic gains, when they exist, are not uniformly distributed over time.

	Dependent variable: X_{ijt}						
	Full sample	**1995**	**2000**	**2005**	**2010**	**2015**	**2019**
XAF_{ij}	**0.244*****	**0.377***	**0.251**	**0.244**	**0.265***	**0.328****	**0.305****
	(0.0358)	(0.209)	(0.208)	(0.176)	**(0.158)**	**(0.140)**	**(0.143)**
Controls and resistances	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	14,232	552	564	576	576	570	570
R-squared	0.428	0.397	0.437	0.413	0.444	0.445	0.402

Robust standard errors in parentheses.
$^{***}p < 0.01$.
$^{**}p < 0.05$.
$^{*}p < 0.1$.
Source: Author.

Table 5.
PPML estimates in CAEMC.

	Dependent variable: X_{ijt}						
	Full sample	**1995**	**2000**	**2005**	**2010**	**2015**	**2019**
XOF_{ij}	**0.163****	**0.208***	**0.176****	**0.235****	**0.164****	**0.121***	**0.146***
	(0.0137)	**(0.0899)**	**(0.0657)**	**(0.0636)**	**(0.0624)**	**(0.0618)**	**(0.0589)**
Controls and resistances	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	18,976	736	752	768	768	760	760
R-squared	0.472	0.399	0.492	0.463	0.502	0.488	0.523

Robust standard errors in parentheses.
$^{**}p < 0.01$.
$^{*}p < 0.05$.
Source: Author.

Table 6.
PPML estimates in WEAMU.

7. Concluding remarks

The AFZ has historically been considered one of the oldest currency areas in the world. However, the external economic effects of this currency grouping have rarely been shown to be conclusive. First, the operating principles of the AFZ, such as the fixed exchange rate regime and the centralization of foreign exchange reserves in the French Treasury, are widely debated. Second, the sharing of the CFA franc has not always ensured the synchronization of member countries' cycles, as countries have experienced asymmetric reactions to exogenous shocks (financial crisis, hunger crisis, oil crisis, and COVID 19). This asymmetry in reaction to exogenous shocks slows down the speed of convergence of nominal and real macroeconomic indicators.

Specifically, the macroeconomic effects of the CFA franc on the bilateral trade of AFZ member countries have not been well documented. Thus, the few recent studies [2, 3] take a global approach by estimating an average effect over the study period. The specificity of this chapter is to adopt a dynamic approach by estimating for each year the marginal effect of the CFA franc between 1995 and 2019. Using ordinary least squares and the Poisson pseudo-maximum likelihood estimator, I obtain different results in the two currency unions of the AFZ. In the CAEMC, the dynamic effects of sharing the CFA franc are delayed and begin to be noticeable from the early 2010s. In contrast, the dynamic effects of the CFA franc in the WAEMU are permanent over the entire study period. However, these different effects must be contrasted with the low effective share of intra-zone trade.

Some lessons can be learned from the results obtained. While there is no perfect monetary structure or exchange rate that is good all the time for a country, a profound reflection on the future of the franc zone must be conducted. Moreover, decisive steps have already been taken within WAEMU with the project to create a single currency in ECOWAS, although this has been delayed compared to the initial deadlines. In CAEMC, the project to rationalize with ECCAS is already in place. A High Monetary Authority responsible for setting up a Monetary Union and a Central Bank in the Union/Community through the monitoring of macroeconomic convergence as well as the harmonization of monetary, banking, and financial policies has recently been created. These dynamics are in line with the African Union's desire to eventually move to a single currency on the scale of the continent from the various subregional currencies. This

desire is affirmed by the implementation of the African continental free trade area, which is one of the preliminary steps toward the feasibility of a single currency with proven dynamic potential effects, enhanced tenfold by a large-scale integration zone.

A. Appendices

	CAEMC					WEAMU					Source
	N	Mean	S.D.	Min	Max	N	Mean	S.D.	Min	Max	
lnX_{ij}^{*}	14,352	8.752	6.965	0	22.39	19,136	9.511	6.692	0	21.18	UNCTAD
lnY_{i}^{**}	14,400	22.85	0.960	19.90	24.40	19,200	22.65	1.015	20.25	24.52	WDI
lnY_{j}^{**}	14,280	24.59	2.326	18.62	30.54	19,040	24.59	2.324	18.62	30.54	WDI
$lnPop_{i}^{**}$	14,400	15.19	1.088	13.12	17.07	19,200	16.02	0.806	13.90	17.06	WDI
$lnPop_{j}^{**}$	14,400	16.16	1.717	11.23	21.06	19,200	16.15	1.721	11.23	21.06	WDI
$lnDist_{ij}^{***}$	14,400	8.305	0.757	2.349	9.512	19,200	8.312	0.820	4.656	9.576	CEPII
$Openess_{ij}^{****}$	14,400	0.542	0.498	0	1	19,200	0.508	0.500	0	1	Author
CL_{ij}^{****}	14,400	0.382	0.486	0	1	19,200	0.227	0.419	0	1	Author
CB_{ij}^{****}	14,400	0.0435	0.204	0	1	19,200	0.0533	0.225	0	1	Author
CC_{ij}^{****}	14,400	0.224	0.417	0	1	19,200	0.199	0.399	0	1	Author
CFA_{ij}^{****}	14,400	0.0521	0.222	0	1	19,200	0.0729	0.260	0	1	Author
$SADC_{j}^{****}$	14,400	0.135	0.342	0	1	19,200	0.135	0.342	0	1	Author
AMU_{j}^{****}	14,400	0.0625	0.242	0	1	19,200	0.0625	0.242	0	1	Author
CAE_{j}^{****}	14,400	0.0317	0.175	0	1	19,200	0.0313	0.174	0	1	Author
EU_{j}^{****}	14,400	0.292	0.455	0	1	19,200	0.292	0.455	0	1	Author
$ASEAN_{j}^{****}$	14,400	0.135	0.342	0	1	19,200	0.135	0.342	0	1	Author
$MERCOSUR_{j}^{****}$	14,400	0.0521	0.222	0	1	19,200	0.0525	0.223	0	1	Author
$NAFTA_{j}^{****}$	14,400	0.0313	0.174	0	1	19,200	0.0313	0.174	0	1	Author

Source: Author.

Table A1.
Descriptive statistics.

	lnX_{ij}	lnY_{i}	lnY_{j}	$lnPop_{i}$	$lnPop_{j}$	$lndist_{ij}$	XAF_{ij}
lnX_{ij}	1.0000						
lnY_{i}	0.2913	1.0000					
lnY_{j}	0.5196	0.0343	1.0000				
$lnPop_{i}$	0.1814	0.2453	0.0197	1.0000			
$lnPop_{j}$	0.4222	0.0191	0.7099	0.0046	1.0000		
$lnDist_{ij}$	−0.0002	−0.0204	0.4789	0.0008	0.2117	1.0000	
XAF_{ij}	0.0981	−0.0011	−0.1749	−0.0005	−0.1339	−0.4782	1.0000

Source: Author.

Table A2.
Full correlation matrix (CAEMC).

	lnX_{ij}	lnY_i	lnY_j	$lnPop_i$	$lnPop_j$	$lndist_{ij}$	XOF_{ij}
lnX_{ij}	1.0000						
lnY_i	0.4625	1.0000					
lnY_j	0.3477	0.0252	1.0000				
$lnPop_i$	0.4193	0.9327	0.0224	1.0000			
$lnPop_j$	0.3490	0.0118	0.7111	0.0096	1.0000		
$lnDist_{ij}$	−0.2222	−0.0101	0.4011	−0.0233	0.1896	1.0000	
XAF_{ij}	0.1803	−0.0007	−0.2351	−0.0007	−0.0214	−0.4822	1.0000

Source: Author.

Table A3.
Full correlation matrix (WEAMU).

CAEMC	**Cameroon, Central African Republic, Chad, Congo, Equatorial Guinea, Gabon**
WEAMU	Benin, Burkina Faso, Côte d'Ivoire, Guinea-Bissau, Mali, Niger, Senegal, Togo
SADC without Tanzania	Botswana, Eswatini, Lesotho, Madagascar, Malawi, Mauritius, Mozambique, Namibia, Seychelles, South Africa, Zambia, Zimbabwe
AMU + Egypt	Algeria, Libya, Mauritania, Morocco, Tunisia, Egypt
EAC without Burundi	Kenya, Uganda, Tanzania
EU of 27 + UK	Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, UK
ASEAN + Japan, China, South Korea	Brunei Darussalam, Cambodia, China, Indonesia, Japan, Lao PDR, Malaysia, Myanmar, Philippines, Singapore, South Korea, Thailand, Vietnam
MERCOSUR	Argentina, Brazil, Paraguay, Uruguay, Venezuela
ALENA	Canada, Mexico, USA

Source: Author.

Table A4.
Sample.

Author details

Dieudonné Mignamissi
Faculty of Economics, University of Yaoundé II, Cameroon

*Address all correspondence to: mignamissid@yahoo.fr

References

[1] Rose AK. One money, one market: The effect of common currencies on trade. Economic Policy. 2000;**15**(30): 08-45. DOI: 10.1111/1468-0327.00056

[2] Mignamissi D. Monnaie unique et intégration par le marché en Afrique: le cas de la CEEAC et de la CEDEAO. African Development Review. 2018 Mar; **30**(1):71-85. DOI: 10.1111/1467-8268.12313

[3] Mignamissi D. Coûts/gains commerciaux de l'intégration monétaire dans la Zone Franc africaine: Une analyse à partir de 5 scenarii. African Development Review. 2021;**33**(1): 180-192. DOI: 10.1111/1467-8268.12503

[4] Bean CR. Economic and monetary union in Europe. Journal of Economic Perspectives. 1992;**6**(4):31-52. DOI: 10.1257/jep.6.4.31

[5] Grubel HG. The merit of a Canada-US monetary union. The North American Journal of Economics and Finance. 2000; **11**(1):19-40. DOI: 10.1016/S1062-9408(00)00030-9

[6] Belke A, Wang L. The costs and benefits of monetary integration reconsidered: Towards value-added based openness measures. Journal of Economic Integration. 2006 Mar;**1**: 157-180

[7] Tavlas GS. The benefits and costs of monetary union in Southern Africa: A critical survey of the literature. Journal of Economic Surveys. 2009;**23**(1):1-43. DOI: 10.1111/j.1467-6419.2008.00555.x

[8] Frankel JA, Rose AK. The endogenity of the optimum currency area criteria. The Economic Journal. 1998;**108**(449): 1009-1025. DOI: 10.1111/1468-0297.00327

[9] Clerc L, Dellas H, Loisel O. To be or not to be in monetary union: A synthesis. Journal of International Economics. 2011;**83**(2):154-167. DOI: 10.1016/j.jinteco.2010.11.002

[10] Buigut S, Valev NT. Benefits from mutual restraint in a multilateral monetary union. World Development. 2009;**37**(3):585-594. DOI: 10.1016/j.worlddev.2008.07.003

[11] Katayama H, Melatos M. The nonlinear impact of currency unions on bilateral trade. Economics Letters. 2011; **112**(1):94-96. DOI: 10.1016/j.econlet.2011.03.022

[12] Glick R, Rose AK. Does a currency union affect trade? The time-series evidence. European Economic Review. 2002;**46**(6):1125-1151. DOI: 10.1016/S0014-2921(01)00202-1

[13] De Sousa J. The currency union effect on trade is decreasing over time. Economics Letters. 2012;**117**(3):917-920. DOI: 10.1016/j.econlet.2012.07.009

[14] Miron D, Miclaus P, Vamvu D. Estimating the effect of common currencies on trade: Blooming or withering roses? Procedia Economics and Finance. 2013 Jan;**1**(6):595-603. DOI: 10.1016/S2212-5671(13)00177-9

[15] Larch M, Wanner J, Yotov YV. Bi-and Unilateral trade effects of joining the Euro. Economics Letters. 2018;**171**: 230-234. DOI: 10.1016/j.econlet.2018.08.001

[16] Tinbergen J. Shaping the World Economy; Suggestions for an International Economic Policy, No. HD82 T541962. DOI: 10.1017/S0770451800015967

[17] Anderson JE. A theoretical foundation for the gravity equation. The American Economic Review. 1979;**69**(1): 106-116

[18] Anderson JE, Van Wincoop E. Gravity with gravitas: A solution to the border puzzle. American Economic Review. 2003;**93**(1):170-192

[19] Head K, Mayer T. Gravity equations: Workhorse, toolkit, and cookbook. In: Handbook of International Economics. Vol. 4. Elsevier; 2014. pp. 131-195. DOI: 10.1016/B978-0-444-54314-1.00003-3

[20] Glick R, Rose AK. Currency unions and trade: A post-EMU reassessment. European Economic Review. 2016;**87**: 78-91. DOI: 10.1016/j.euroecorev.2016.03.010

[21] Rose AK. Why do estimates of the EMU effect on trade vary so much? Open Economies Review. 2017;**28**(1): 1-8. DOI: 10.1007/s11079-016-9420-1

[22] Santos Silva JMC, Tenreyro S. The log of gravity. The Review of Economics and Statistics. 2006;**88**(4):641-658. DOI: 10.1162/rest.88.4.641

[23] Niamkey MA. Evaluating the net gains from the CFA Franc Zone membership: A different perspective. World Development. 1994;**22**(8): 1147-1160. DOI: 10.1016/0305-750X(94)90082-5

[24] Masson PR, Pattillo C. The Monetary Geography of Africa. Washington: Brookings Institution Press; 2004

[25] Beetsma R, Giuliodori M. The macroeconomic costs and benefits of the EMU and other monetary unions: An overview of recent research. Journal of Economic literature. 2010;**48**(3): 603-641. DOI: 10.1257/jel.48.3.603

[26] Carrere C. UEMOA, CEMAC: quelle performance en matière de commerce? Revue d'économie du développement. 2013;**21**(1):33-60

[27] Santos Silva JMC, Tenreyro S. On the existence of the maximum likelihood estimates in Poisson regression. Economics Letters. 2010;**107**(2):310-312. DOI: 10.1016/j.econlet.2010.02.020

[28] Wooldridge JM. Econometric Analysis of Cross Section and Panel Data. Cambridge, MA: MIT Press; 2002

Edited by Ireneusz Miciuła

Global Market and Trade provides knowledge, recommendations, and practical solutions to new challenges within the contemporary processes of globalization and international trade. It examines the issues of contemporary foundations of the global market and trade based on the development of information technology and new geopolitical and religious conditions. Chapters address such topics as ITC technology and the rules of financial flows, the cultural and religious conditions of world markets and trade, the impact of development inequality on policy in emerging economies, and much more.

Taufiq Choudhry,
Business, Management and Economics Series Editor

ISSN 2753-894X
ISBN 978-1-83768-458-8

Published in London, UK

IntechOpen