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IntechOpen Book Series

Business, Management and Economics

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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



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Contents

Preface	XIII
Chapter 1 Water Management in Public Policies Based on the Sustainable Logistics Plan <i>by Soraya Giovanetti El-Deir and Evaldo Dantas Silva</i>	1
Chapter 2 Corruption in Public Finance and Open Government in Mexico <i>by Marcela Astudillo Moya and Raúl Porras Rivera</i>	15
Chapter 3 International Price Shocks and Financial Soundness: The Impact of Government Policies – A Systematic Review <i>by Phan Bao Trung and Dao Le Van</i>	27
Chapter 4 Financial Aid Distribution amid Covid-19 in Lebanon: Ministerial Executive Relief Initiative <i>by Martin Raad, Karim Mrad, Nour Doumani and Mohamed el Cheikh</i>	39
Chapter 5 Public Accounting and Governmental Accounting in the United States: Evolution, Core Services, and Regulatory Frameworks <i>by Nizar Mohammad Alsharari</i>	55
Chapter 6 Remodeling Public Finance: Shifting from Cash Accounting to Accrual Accounting <i>by Awwad Alnesafi</i>	77
Chapter 7 Using the Government Blockchain in Cryptocurrency: Present and Future <i>by Jacob Habashi</i>	95

Preface

This Edited Volume is a collection of reviewed and relevant research chapters concerning the developments within the field of Public Finance and Accounting. The book features scholarly contributions from various authors, edited by an expert in Public Finance and Accounting. Each contribution comes as a separate chapter, complete in itself but directly related to the book's topics and objectives.

The book includes the following chapters:

1. Water Management in Public Policies Based on the Sustainable Logistics Plan
2. Corruption in Public Finance and Open Government in Mexico
3. International Price Shocks and Financial Soundness: The Impact of Government Policies – A Systematic Review
4. Financial Aid Distribution amid Covid-19 in Lebanon: Ministerial Executive Relief Initiative
5. Public Accounting and Governmental Accounting in the United States: Evolution, Core Services, and Regulatory Frameworks
6. Remodeling Public Finance: Shifting from Cash Accounting to Accrual Accounting
7. Using the Government Blockchain in Cryptocurrency: Present and Future

The target audience comprises scholars and specialists in the field.

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Water Management in Public Policies Based on the Sustainable Logistics Plan

Soraya Giovanetti El-Deir and Evaldo Dantas Silva

Abstract

Public policies play a crucial role in mitigating the environmental impacts of human activity. To address the pressing issue of water scarcity, governments worldwide, including Brazil, have implemented various strategies. The Brazilian judiciary, through the Sustainable Logistics Plan, provides a notable example of a sector-specific initiative aimed at increasing water efficiency and effectiveness. This article analyzes the interplay between public policies and legal mechanisms in promoting water sustainability, focusing on the Sustainable Logistics Plan as a case study. The methodology involves a critical review of international and national legal instruments, including treaties, laws, and regulations. While international agreements, particularly those led by the UN, have set important global standards, national laws and regulations have been adapted to local contexts. The Pernambuco Court of Justice's Sustainable Logistics Plan, though promising, still requires further development to fully integrate environmental, social, and governance considerations.

Keywords: international agreements, governance, legislation, public agency, water security

1. Introduction

Approximately one-third of the world's population faces water scarcity. To ensure future water security, we must improve human-water interactions and prioritize water valuation. Balancing water consumption with environmental conservation is crucial, especially considering the interconnectedness of the water-energy-food nexus. Similar to energy, optimizing water use requires addressing conflicts arising from multiple demands. By acknowledging the water-energy nexus, policymakers can develop strategies to promote efficient water use. One of the most water-intensive sectors is agriculture, which often competes with other water users. Widespread waste, a lack of reuse systems, and the pursuit of alternative water sources contribute to resource depletion. To address this issue, global environmental regulations are necessary to conserve water resources. This requires a collaborative effort involving public policies and individual actions. Water is not merely essential for survival but also plays a vital role in human flourishing, enabling us to achieve our full potential.

This article aims to analyze public policies related to water management, focusing on the Sustainable Logistics Plan (SLP) of the Brazilian Court of Justice. To achieve this, we conducted a comprehensive review of international and national legal instruments, including treaties, laws, and regulations. By examining these documents, we sought to understand the relationship between public policies and legal mechanisms that can enhance water efficiency and effectiveness. The SLP serves as a valuable case study to illustrate how specific institutions can contribute to broader water sustainability goals. Our analysis contributes to the ongoing discourse on water management, advocating for the development and implementation of effective policies to improve water quality and quantity, particularly for public buildings.

2. The sustainability of water issue

Recent data from the United Nations [1] highlights the growing global water crisis, exacerbated by severe droughts and increasing human demand. This crisis poses a significant threat to sustainable development [2]. Recognizing water as a fundamental human right [3], it's imperative to implement effective public policies and individual actions to ensure water security. By 2050, global water demand and usage are projected to increase by 20–30%, particularly in developing and emerging economies. This, coupled with the impact of climate change, will exacerbate water stress, affecting 55% of global water resources within the next decade. Currently, 25% of large cities worldwide already face water shortages [4].

Currently, 31 countries in North Africa and the Middle East face severe water scarcity, while two-thirds of the world's population experiences water scarcity for at least one month per year [5, 6]. Droughts, responsible for 5% of natural disasters, and floods, accounting for 43% between 1995 and 2015, have devastating consequences, including loss of life and significant economic damage. The increasing frequency and intensity of these events, exacerbated by climate change, will further intensify the global water crisis [6]. To secure water for future generations, it's essential to explore innovative solutions and implement water valuation strategies [7–13]. Some authors [6, 14] argue that the water crisis stems from inefficient management and use, exacerbated by local and global environmental changes. Additionally, electricity sector policies can significantly impact the availability of water for other uses.

Agriculture, livestock, and aquaculture account for approximately 70% of global water withdrawals, while industry and energy generation consume around 20%, and domestic use represents 12% [15, 16]. To meet the growing demands for energy and food, it's imperative to prioritize water efficiency [17] and address conflicts arising from competing water uses [18–20].

Moreover, 80% of wastewater is discharged untreated, contributing to water pollution and health risks. In Asia and the Pacific, 29 countries face water insecurity due to unsustainable groundwater extraction [1]. To prevent water depletion, it's crucial to adopt sustainable water management practices [21–23]. Several studies [6, 15, 16, 24, 25] highlight the increasing demand for water resources driven by rapid urbanization, population growth, and water pollution. In 2015, 65% of the Latin American and Caribbean population had access to safe drinking water, with urban areas achieving 96% coverage. However, these regions rely heavily on rainfall for food production, with 60% of their food and 80% of arable land in other continents dependent on precipitation [26]. To ensure water security, global environmental regulations are crucial

for water resource conservation [27]. Water shortages have become a global concern, affecting regions like the United States [28], Latin America [29], and Europe [30].

The National Water Agency [31] reports that Brazil possesses 12% of the world's freshwater resources, amounting to approximately 260,000 cubic meters per second. Despite this abundance, economic activities, both private and public, have led to increased water consumption without adequate safeguards [32]. However, water availability in Brazil is unevenly distributed, similar to other continents.

To address these challenges in Brazil [14, 33, 34], it is crucial to enhance our understanding of water scarcity and develop effective public policies. While some regions, like the Brazilian semi-arid region, face severe water stress, others, such as the North, have abundant water resources. In the South and Southeast, economic factors, household size, and education level influence water use [35, 36]. According to the Brazilian Institute of Geography and Statistics [37], 63.7% of Brazilian municipalities rely on deep wells for water supply, and 40.5% of Northeastern municipalities implement water rationing. To effectively manage water resources, a comprehensive approach is necessary, involving both public policies and individual actions. International agreements play a vital role in shaping national water policies and promoting sustainable water management practices.

3. International agreements for sustainability

The Universal Declaration of Human Rights, adopted by the UN in 1948, recognized access to water as a fundamental human right. This landmark declaration aimed to reduce historical social inequalities and promote human dignity. Subsequently, the 1972 United Nations Conference on the Human Environment in Stockholm highlighted the importance of ensuring access to water for all. Recommendation No. 10 of the conference emphasized the need to "... development assistance agencies should give higher priority, where justified in the light of the social benefits, to supporting Governments in financing and setting up services for water supply, disposal of water from all sources, and liquid-waste and solid waste disposal [26, p. 8].

The 1987 Brundtland Commission defined sustainable development in its landmark report, "Our Common Future." Subsequently, the 1992 Earth Summit in Rio de Janeiro produced Agenda 21, which outlined a global action plan for sustainable development. Chapter 18 of Agenda 21 specifically addresses water management, emphasizing the need for integrated approaches to water collection, management, and use. In this direction, have some multilateral agreements and initiatives relevant to water management. The Convention on Biological Diversity (CBD) promotes the conservation of biodiversity, sustainable use of biological resources, and the fair and equitable sharing of the benefits arising from their utilization. Water resources, particularly those associated with aquatic ecosystems, are integral to biodiversity conservation. The United Nations Framework Convention on Climate Change (UNFCCC) recognizes that climate change has a significant impact on water availability and quality. BRICS nations are active participants in UNFCCC negotiations and implement various climate mitigation and adaptation measures, including water management strategies. The last is the UN Convention to Combat Desertification (UNCCD), just because desertification and land degradation can lead to water scarcity. BRICS nations, particularly those in arid and semi-arid regions, are involved in UNCCD efforts to combat desertification and promote sustainable land management practices [38].

Developing countries, including the original BRICS nations (Brazil, Russia, India, China, and South Africa), have experienced an 87% increase in environmental pressures, leading to a significant expansion of the global water footprint and the generation of gray water [13], but the BRICS nations as a group (Brazil, Russia, India, China, and South Africa) do not have specific multilateral agreements solely focused on water management; their cooperation often touches on water-related issues within broader frameworks.

The UN's Sustainable Development Goals (SDG) aim to address these challenges by promoting sustainable development across three dimensions: economic, social, and environmental. SDG 6, specifically, focuses on ensuring water and sanitation for all [39]. Zhao et al. [13] identify 24 indicators linked to SDG 3, 4, 6, 7, 8, 9, and 11, which collectively address education, employment, public health, and infrastructure. Barbier and Burges [40] and Howe [41] highlight the difficulty of achieving a balanced approach to economic, social, and environmental factors due to the complex and interconnected nature of these systems. To effectively develop sustainable policies, a clear understanding of the underlying principles is essential. While a strong strategy is crucial for implementing sustainable actions, it's equally important to consider the specific context and challenges involved.

4. Brazilian public policies

The first significant legislation addressing water management in Brazil, Decree No. 24,643 of 1934, primarily focused on the economic value of water as a mineral resource. While it was named the "Water Code," it lacked a strong environmental focus. Instead, its primary goal was to reorganize the electricity sector and increase federal government involvement. The UN's recognition of water as a fundamental human right, coupled with the World Bank's emphasis on governance for environmental efficiency [42], has sparked global discussions on water management. The legal nature of water remains a subject of debate, with some considering it a global common good and others viewing it as a private commodity. Brazilian legislation, such as Law No. 9433/77, has recognized water as a public good.

The establishment of state-level water management plans has been crucial in addressing regional water challenges. These plans aim to identify and address specific issues within each state, contributing to a more comprehensive understanding of water management challenges. To support the implementation of the National Sustainability Plan, political opportunities were leveraged to promote successful sustainable development programs and projects tested in other regions of Brazil. The National Sustainability Plan prioritizes the preservation of water quantity and quality in hydrographic basins. Brazil has committed to the UN's SDG, specifically SDG 6, which focuses on ensuring access to clean water and sanitation for all. To monitor progress toward these goals, the IBGE tracks several indicators, including:

- Proportion of treated wastewater.
- Proportion of water bodies with good environmental quality.
- Water use efficiency.
- Proportion of water abstraction relative to available water.

- Community participation in water and sanitation management.
- Existence of local policies and procedures for community participation in water and sanitation management.

These indicators provide insights into the current state of water management in Brazil and can help inform future policies and strategies. The 1988 Brazilian Constitution designated water resources as the property of the states and emphasized the importance of environmental education. This marked a significant step toward environmental protection in Brazil.

The National Environmental Policy of 1981 established key principles for environmental protection, laying the foundation for subsequent environmental legislation. The National Water Resources Policy of 1997 further solidified the concept of the hydrographic basin as the fundamental unit of water management. This policy emphasizes integrated water resource management, considering factors such as quantity, quality, and the diverse socio-economic and environmental conditions of different regions. The National Water Resources Policy aims to ensure the availability of water for current and future generations, promote rational and integrated water use, prevent and mitigate hydrological disasters, and encourage rainwater harvesting.

The National Environment Council Resolutions 357 [43] and 430 [44] provide guidelines for water quality monitoring and effluent discharge standards. While Brazil has a comprehensive legal framework for water management, effective implementation and long-term planning are crucial to ensuring the sustainable use of water resources. Resolution No. 54 of the National Water Resources Council established guidelines for non-potable water reuse, aiming to promote sustainable water management. Subsequently, Resolution 121 further expanded the scope of non-potable water reuse to include agricultural and forestry sectors. These national regulations provide a strong foundation for states to implement water reuse practices, contributing to sustainable water resource management in Brazil.

5. Sustainable logistics plan

Following the CNJ's Recommendation No. 11 [45], the Pernambuco State Court of Justice (TJPE) established a Sustainability Nucleus to promote sustainable practices within the institution [46, 47]. The Nucleus aims to:

- Promote social responsibility and sustainability initiatives.
- Conduct educational campaigns.
- Systematize information related to social responsibility assessments.
- Develop and implement a sustainability evaluation model.

A Sustainable Logistics Plan (SLP) for the Brazilian Federal Court should be a comprehensive framework that integrates environmental, social, and economic considerations into its logistics operations. This plan has a vision: "To be a leader in sustainable practices within the judiciary, ensuring efficient and environmentally

responsible logistics operations,” and a mission: “To implement sustainable logistics strategies that minimize environmental impact, optimize resource use, and contribute to a greener future.” This SLP uses some Key Performance Indicators (KPI) in some areas:

- Environmental KPI: Reduction in greenhouse gas emissions; reduction in energy consumption; reduction in water consumption; waste reduction and recycling rates
- Social KPI: Employee satisfaction and well-being; community engagement and social responsibility initiatives
- Economic KPI: Cost savings from efficient logistics operations; increased operational efficiency

For implementation of SLP, the Core Strategies for Sustainable Logistics are Sustainable Procurement: Prioritize eco-friendly suppliers and materials; Energy Efficiency: Optimize energy use through efficient systems and practices; Water Conservation: Implement water-saving measures and technologies; Waste Reduction: Minimize waste and maximize recycling efforts; Sustainable Transportation: Prioritize eco-friendly modes of transport; and Sustainable Packaging: Reduce packaging materials and promote reuse.

The management and implementation of the SLP within the Brazilian Federal Court is a collaborative effort involving various departments and individuals. While there is not a specific centralized department solely dedicated to SLP management, several key players are involved in its implementation and oversight:

Key Stakeholders:

- Administrative departments: These departments are responsible for day-to-day operations and often play a crucial role in implementing sustainable practices, such as energy and water conservation, waste reduction, and procurement.
- Human resources department: This department can contribute by promoting awareness and training programs on sustainability, encouraging eco-friendly behaviors among employees, and incorporating sustainability criteria into recruitment and performance evaluation processes.
- Financial department: This department can play a role in budgeting for sustainable initiatives, analyzing the cost-benefit of various sustainability measures, and identifying potential funding sources for green projects.
- IT department: This department can contribute by implementing energy-efficient IT infrastructure, promoting paperless processes, and securing data to minimize environmental impact.
- Judicial councils and committees: These bodies oversee the overall strategic direction of the court and can play a crucial role in setting sustainability goals and allocating resources for their implementation.

Specific roles and responsibilities:

- Developing and implementing the SLP: This task often involves a cross-functional team comprising representatives from various departments.
- Monitoring and evaluation: Tracking progress toward sustainability goals and identifying areas for improvement.
- Reporting and communication: Sharing information about sustainability initiatives with employees, stakeholders, and the public.
- Procurement: Ensuring that procurement practices align with sustainable principles.
- Facility management: Managing the physical infrastructure of the court buildings, including energy-efficient operations and waste reduction.

It's important to note that the specific roles and responsibilities may vary depending on the size and structure of the court. However, a collaborative approach involving multiple departments is essential for successful implementation of the SLP.

In 2015, the TJPE's Social Responsibility and Sustainability Center outlined specific objectives, including encouraging rational resource consumption, and promoting the reuse of materials [46, 47]. The TJPE's 2018/2019 Strategic Plan included a focus on water conservation, aiming to reduce water consumption per square meter of constructed area by 2%. To achieve this goal, the plan outlined several strategies, including:

- Expanding awareness campaigns on water conservation.
- Inspecting units with significant increases in water consumption.
- Monitoring individual water consumption.
- Implementing water-saving measures, such as efficient fixtures.
- Conducting regular water quality tests.
- Monitoring hydraulic installations.

By implementing these strategies, the TJPE aims to promote sustainable water use within the institution. The TJPE's 2018/2019 Strategic Plan outlined several strategies to improve water efficiency, including:

- Periodic evaluation of water consumption to identify high-consumption areas.
- Awareness campaigns to promote water conservation.
- Production of educational videos on water conservation.
- Deployment of multidisciplinary teams to address water-related issues.

These initiatives align with SDG 6, which aims to ensure access to clean water and sanitation for all. By implementing these measures, the TJPE can serve as a model for other institutions in promoting sustainable water management. While the TJPE's Sustainable Logistics Plan has made significant strides in addressing water consumption within the institution, it could further enhance its impact by incorporating a broader perspective [46, 47]. While the focus on economic efficiency is important, there is potential to address environmental and social aspects of water management more comprehensively.

By implementing telemetric management systems, monitoring water usage and quality, and adopting cleaner technologies like greywater reuse and rainwater harvesting, the TJPE can further reduce its water footprint. Additionally, by raising awareness among employees and promoting a culture of water conservation, the institution can foster a deeper understanding of water scarcity and encourage responsible water use. Despite these limitations, the TJPE's initiatives in sustainable building practices and water conservation represent a significant step forward. By continuing to prioritize water sustainability and aligning with the SDGs, the TJPE can serve as a model for other institutions and contribute to a more sustainable future.

6. Conclusions

Water scarcity, exacerbated by climate change and unequal distribution, poses a significant global challenge. Economic activities, driven by growing populations, contribute to increased water consumption and pollution. To address this issue, international organizations have implemented policies aimed at ensuring equitable access to water for all and preserving water resources for future generations. These policies promote sustainable development by balancing economic, social, and environmental considerations.

Given the unequal distribution of water resources within Brazil, certain regions are more vulnerable to water scarcity. To address this issue, Brazil has implemented robust environmental legislation inspired by international agreements. These regulations aim to ensure the availability and quality of water for all, recognizing water as an essential resource for life and sustainable development. States and municipalities have also enacted complementary legislation to further refine water management practices.

While the Pernambuco State Court of Justice's Sustainable Logistics Plan has made significant strides in addressing water consumption, it could further enhance its impact by incorporating a broader focus on environmental and social aspects. To reduce the institution's water footprint, strategies such as water reuse and rainwater harvesting should be implemented. By deepening its understanding of international and national water management policies and regulations, this court can take more decisive action to improve water security. Additionally, by demonstrating effective water management practices, the Pernambuco State Court of Justice's Sustainable Logistics Plan can inspire other institutions and raise awareness among the public.

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Chapter 2

Corruption in Public Finance and Open Government in Mexico

Marcela Astudillo Moya and Raúl Porrás Rivera

Abstract

In Mexico, one of the main concerns of citizens is corruption. This is a major problem given the scarcity of public resources and the lack of resources to finance the budget. The objective of this chapter is to determine whether open government has addressed budget transparency, accountability, and citizen participation. To this end, due to the lack of previous research, this work is exploratory and documentary in nature. Data were obtained from the official websites of the institutions in charge of fiscal policy in Mexico. It was found that although important steps have been taken in terms of the digitalization of government and achievements are reported regarding the openness of government, so far, there has not been an effective fight against the problem of corruption, and the indices of perception of corruption have not been sufficiently reduced. Citizen participation, which is the other necessary element for open government to contribute to the functioning of democracy, has yet to be promoted.

Keywords: open government, corruption, open budget, public revenue, transparency

1. Introduction

Corruption is an evil that has been present in humanity since time immemorial and is still one of the pending issues in most societies. Mexico is no exception, as it is one of the main concerns of citizens. According to the National Survey on Government Quality and Impact (ENCIG) [1], 83.1% of those surveyed considered corruption to be frequent and 14% experienced it when carrying out formalities. The Organization of American States estimates that corruption is equivalent to 10% of the Gross Domestic Product (GDP) [2]. Mexico is even considered by some organizations to be one of the most corrupt countries in Latin America.

In the area of public finance, it is very important that the resources collected by the government actually have an impact on the welfare of the population [3]. Corruption in this field negatively affects investment, the environment, productivity, and the right of millions of people to receive quality services in education, health, and housing, among many others.

In a scenario where public resources are scarce [4] and are not sufficient to cover budgetary programs, in addition to common practices such as evasion, the increase in public debt, and the poor results of policies to reduce poverty and inequality, the transparent management of resources is of great importance [5]. One tool for improving public administration is open government, which is based on transparency in all its aspects.

The objective of this chapter is to determine whether open government has been oriented to cover budget transparency, accountability, citizen participation, and oversight. To this end, the first section deals with the definition of corruption, as it is a complex issue whose conception has varied over time and era. This is followed by an analysis of the possible effects of corruption on public finances in terms of both public revenues and expenditures. The third section refers to the measurement of corruption, specifically as measured by the budget openness index, and finally, the conclusions are presented.

This work is of an exploratory and documentary nature given the absence of previous research. In addition, data was obtained from the official websites of the institutions in the field of public finance that report on the degree of openness of the Mexican government.

2. Is there a solution to corruption?

Corruption is a very old and complex problem in which different aspects converge. Different conceptions can even be found in different societies and times. There is no consensus on the meaning of corruption; Rose [6] points out the difficulty to consider a behavior as corrupt. Moreover, corruption occurs both in public bodies and in a significant number of social actors who carry out actions to benefit their particular interests [5]. In addition, it is very important to note that corruption is complemented by impunity [7].

Since this chapter focuses on corruption in public finance, Rose's definition of corruption "corruption is the abuse of public power for private gain" is useful. Another way of defining corruption is the illegal use of the state for private gain [8]. There is agreement that it is a cause of persistent poverty in some regions. Even when it becomes systemic, it is difficult to punish the corrupt because those who have to do so are also corrupt. On the other hand, in Mexico, corruption has been considered to be multifactorial, with impunity and weak regulatory frameworks being the most important factors [2].

The importance of corruption in public finances is due to the fact that, on the one hand, it can reduce the amount of resources collected by favoring tax evasion and avoidance. This can be, for example, the reduction of the amount of taxes to be paid in exchange for a gift given to the collecting agency. A similar situation often arises when the exploitation of natural resources is concessioned far below its real value due to agreements between businessmen and officials. The same can occur in the privatization of state-owned companies. Corruption is linked to the informal economy, when a gift is not registered as a taxpayer and therefore no taxes are paid.

On the other hand, in terms of public spending, it can lead to the diversion of resources in favor of personal interests without considering the needs of society. In this area, corruption in public investment stands out, since the large amounts of money required for infrastructure works sometimes arouse the interest of private agents to pay "a commission" to be awarded the works. In addition, public investment

spending can be inefficient (prohibited practices, delays, and overpricing) [9]. Government procurement is one of the largest expenditure items, even in some countries representing more than 10% of gross domestic product [10].

All of the above lead to a deficit in public finances with a consequent increase in public debt, which can sometimes benefit individuals or groups. Public debt is a fertile ground for corruption, especially when there is no reporting of what it is used for or when there is no limit to the amount of debt.

Given the magnitude of corruption in the world, one of the Sustainable Development Goals of the UN 2030 Agenda is to reduce corruption and bribery and to create transparent and accountable public institutions [8].

3. Mechanisms to tackle corruption in public finances

Due to the negative effects of corruption on the economy and, in particular, on public finances, it has been a constant concern of the states to combat it by means of various instruments. In the current era, the use of information technologies, aimed at achieving transparency in the decisions taken by states, stands out. Transparency is a concept that refers to the way of proceeding of the actors of public institutions; it has been defined as an act of transparency when it seeks to guarantee the right of access to public information [11]. It is a key issue of democratization as it allows for the control of political power and guarantees efficient government [4].

Transparency in the field of public finances is fundamental for their good management and implies reporting on the collection of revenues as well as the destination of these resources. Thus, among the instruments to prevent corruption are transparency, accountability, the right of access to information, and citizen participation. To put any of these tools into practice, open government is key. But what is open government?

3.1 Open government and information technologies

Open government has been defined as a governance model based on citizen participation, which requires the use of information and communication technologies to create public value. Digital technology has modified the processes of tax administrations in the collection of taxes, in the fight against tax evasion, and in transparency in the management of public resources [9]. In recent decades, there have been important reforms in the management of public services; administrative processes have been simplified and interaction with citizens has improved [12], facilitating the exchange of information between public administrators and citizens [7].

Thanks to digital technology, consultation and dialogue can reach a larger number of citizens, regardless of physical barriers and distance. Such a government harnesses the potential of mass collaboration. In open government, it is necessary to involve society in decision-making, which is why it is necessary to make government-held information transparent, in order to facilitate social control and thus its participation in the solutions to public problems [11]. Hence, it is a means to face the challenges of democratic governments.

In open government, the relationship with citizens is at the heart of public decision-making. In other words, in open government, they work for and with the people. It is important to underline that one of the principles of open government is that it has databases that can be used easily and free of charge, that is, what is known as open data, which is becoming increasingly important due to technological progress.

But what is the origin of open government? Some authors place the origin of this concept in England in the 1970s, with the aim of avoiding opacity in public administration [13]. In 2011, the Open Government Partnership (OGP) was created during the 66th General Assembly of the United Nations, and in this year, Mexico joined the OGP along with seven other countries [2]. Since then, organizations such as the Latin American and Caribbean Institute for Economic and Social Planning (ILPES) have been responsible for providing tools that contribute to transparency in public affairs.

In accordance with Goal 16 of the United Nations 2030 Agenda for Sustainable Development, 193 countries set out to fight social inequalities by engaging the public and private sectors, specifically by reducing corruption and bribery and creating transparent and accountable institutions. To this end, e-government and open government are being implemented [7]. For the Economic Commission for Latin America and the Caribbean (ECLAC), through open government or the opening of public institutions, it is possible to achieve relations of trust with citizens, leading to more informed participation and involvement in public affairs [11].

In the case of Mexico, as a federal country with three levels of government (federal, state, and municipal), the opening up of subnational governments is of great importance due to its enormous potential; however, Sánchez Ramos and Castillo de la Rosa [2] in a study carried out in 2018 found that there are significant differences in the institutionalization of open government at the state level, which do not respond to a standardized policy. In subnational governments, direct citizen collaboration is more feasible, so it is necessary that these levels of government promote the creation of mechanisms for participation, transparency, and accountability [11].

The legal framework underpinning open government is found in the 2015 General Law on Transparency and Access to Public Information. This establishes the obligation of transparency bodies to support public institutions and citizens in establishing collaborative policies. It also establishes that the open government model concerns state governments, municipalities, the executive, legislative, and judicial branches.

The National Plan to Fight Corruption, Impunity and Improve Public Administration 2019–2024 [14], SEGOB [15] proposes an open government. It aims to promote efficiency in public administration by improving the delivery of public services. The E-Government Development Index in 2008 was 0.59; while in 2018, it was 0.68, which is above the average of Latin American countries.

In 2016 at the Open Government Partnership Global Summit in Paris, France, the Mexican government received the Regional Open Government Award for the initiative “Open Spending: Public Works.” This recognition is due to the commitment of the Ministry of Finance and Public Credit [16] to report on public works financed with federal resources, through two public platforms. In the platform of federal entities, it is possible to consult their infrastructure spending financed with federal resources, and in the platform of federal government agencies, it is possible to consult the infrastructure projects carried out by them, including their location, justifications, and the physical and financial progress of each project. Both platforms are available at

- *Federal*: http://www.transparenciapresupuestaria.gob.mx/es/PTP/Obra_Publica_Abierta
- *Federal entities and municipalities*: <http://www.transparenciapresupuestaria.gob.mx/es/PTP/EntidadesFederativas>

Another of the strategic axes of open government is accountability, which refers to the obligation of the authorities to justify and assume responsibility for their decisions and to report on the management of public resources and the results obtained. It is practically an action of transparency [11]. Accountability should provide regular and frequent, timely, up-to-date, and evidence-based information that is understandable, truthful, and widely disseminated about the administration and management of governments.

In Mexico, the Budget and Fiscal Accountability law and Law and the General Law of Governmental Accounting outline the means of accountability. The following documents are available on the SHCP's transparency portal:

- a. National Development Financing Program (PRONAFIDE). It outlines the means to finance the National Development Plan.
- b. Economic Package and Budget. It contains the General Economic Policy Criteria, the Budget, the Annual Financing Plan and the Revenue Law.
- c. Reports to the Congress of the Union. The following reports can be consulted under this heading:

Monthly periodicity

Shares paid to states and municipalities Public finance and debt information.

Bimonthly

Federal revenues and expenditures and progress on programme targets.

Quarterly periodicity

Reports on the economic situation, public finances and public debt.

Annual periodicity

Budget for tax expenditures/collection refunds.

Distribution of tax payments and receipt of public spending.

Authorized Donor Reports.

- d. Public accountability. In Mexico, accountability is associated with auditing in the Federal Auditing and Accountability Law. This activity is carried out on the basis of the Public Accounts, which are prepared by the Ministry of Finance and Public Credit (SHCP) and audited by the Chamber of Deputies, and contain budgetary information on the entire public sector, available on the SHCP platform (2024), for the years 1996 to 2023.

The institution in charge of reviewing the federal public account is the Federal Supreme Audit Office (ASF), which annually submits a Report on the Results of the Supreme Audit of the Public Account to the Chamber of Deputies. This report is available in open format from 2000 to 2023 on the ASF platform [17]. Also presented are individual reports, basic data matrix, and simplified audit reports.

On the other hand, the ASF administers the SICAF platform [18] for the registration of public works and acquisitions financed with federalized expenditure resources carried out by federal entities, municipalities, and mayors' offices. It is important to mention that a study on the effectiveness of supreme audit found that, despite increased spending to tackle corruption, corruption is perceived to be higher in the public sector than in the private sector [5]. This sug-

gests that while oversight is important, it is not enough, and impunity remains to be tackled.

- e. Timely public finance statistics. Fiscal indicators for the federal government, nonfinancial parastatals, financial parastatals entities, as well as federal transfers to states and municipalities can be found here.
- f. Investor relations. The investor relations office was created in 1995 to disseminate accurate economic data on the general economic environment and to support investors and analysts in their relations with the Mexican financial authorities.

In 2019, another accountability instrument was developed, the National Digital Platform [19], managed by the Executive Secretariat of the National Anticorruption System, which aims to make public data accessible, comparable and usable. It is an interoperability platform that consults information from various sources; in 2024, there are 31 connected entities. It is not a repository and does not generate data. The NDP is made up of six systems:

- a. Of the evolution of assets, declaration of interests and proof of submission of tax returns.
- b. Public servants involved in public procurement procedures.
- c. Of public servants and individuals sanctioned. The term, type of misconduct, cause and details of the sanctioned public servant are reported.
- d. Information and communication of the National Anti-Corruption System and the National Auditing System. Still under development.
- e. Public reporting of administrative misconduct and corruption. It is still in the process of development.
- f. Public procurement information. On this platform you can browse and view public sector procurement.

To facilitate the connection with the systems that make up the NDP, the Anti-Corruption Digital Marketplace (MDA) was created, a website where free tools developed by various institutions can be found. The objective of the MDA is to promote technological capacity building in public institutions [20].

Access to information, for its part, is considered a fundamental right in any democracy, as recognized in Article 19 of the 1948 Universal Declaration of Human Rights. It is based on the principle of “maximum disclosure,” that is, the right to request information held by the government and to obtain a timely response [11].

In the 2017 Institutional Diagnosis of Obligated Entities at the national level, it was reported that of the 278 federal obligated entities, 71% had problems managing requests, nor did they have any formal procedure to carry out the required search. There is also insufficient technological infrastructure, so they do not have computer systems for the management of requests. For 2024, this diagnosis is found only at the federal entity level.

As of 2018, the National Institute of Statistics and Geography (INEGI) conducts the National Census on Transparency, Access to Public Information and Protection of Personal Data. This census reports that 49.4% of the population aged 18 and over do not know where or how to obtain information and do not trust government information. In addition, only 71.7% of households have an internet connection.

Another instrument for tackling corruption is citizen participation, which is also a right enshrined in the 1948 Universal Declaration of Human Rights. Like the right of access to information, it is fundamental to the functioning of democracy [11]. In open government, citizens play a very important role in combating corruption. Moreover, open government without means for citizens to participate would not be democratic.

Citizen participation consists of their involvement in public affairs that concern them. There is a great diversity of means of citizen participation, for example, plebiscites, referendums, participatory budgeting, and among others.

Citizen participation is a civic responsibility of citizenship [11]. Such participation should be practiced at all stages, that is, from the design to the evaluation of public policies. It can be carried out through the temporary or permanent institutionalization of organizations, or to address specific objectives such as participatory budgeting.

Mexico lacks mechanisms for citizen participation such as neighborhood assemblies, and consultative councils, among others. There is a lack of websites related to citizen forums and surveys. Since 2017, the Open Government Metric has been developed every two years to measure two characteristics of government openness from the citizens' experience: the feasibility of knowing what their governments do and whether they can influence their decisions. In other words, transparency and citizen participation. In 2023, 2043 federal, state, and municipal institutions were evaluated. Overall, they scored 0.6 for transparency and 0.32 for citizen participation, on a scale of 0 to 1, where 0 corresponds to a government that is not open and 1 to a government that is fully open to participation. The average of these scores gives the Open Government Index 2023, which was 0.46. In the area of transparency, both the government's information on its actions and the possibility of obtaining requested information are rated. In the case of citizen participation, what is considered are the mechanisms in the hands of citizens to influence public policies.

The Global Initiative for Fiscal Transparency has promoted the "Data on the Street Rally" to engage citizens in monitoring the use of public resources. Participants individually or in teams of up to three people take to the streets, document the public works contained in the open data, and compare them with what they see. The findings are published on social media. In Mexico, in 2023, the Center for Economic and Budgetary Research [21] and the Ministry of Finance and Public Credit (SHCP) called for participation in the 7th edition of the rally.

4. Measuring corruption

In systematic studies on corruption, there has been an interest in measuring corruption, although due to its hidden nature it is very difficult to do so [7]. A large part of the measurements is based on opinion surveys, even when it comes to measuring the opposite of corruption, such as good governance, accountability mechanisms, and others. **Table 1** describes four measurement methods and the application procedure.

Method	Features
Expert assessment	<ul style="list-style-type: none"> • Corruption trends in institutions are assessed. • Questionnaires with open and closed questions to the population are used for the evaluation.
Composite indices	<ul style="list-style-type: none"> • Countries are ranked in order to compare their indicators developed with data from different sources of information.
Records on reported cases of corruption	<ul style="list-style-type: none"> • This method records misdemeanors and crimes related to the misuse of power. • The sources used are very diverse, such as specialized prosecutors' offices, citizen observatories and others. • The state's response to acts of corruption, as well as the possibility of sanctioning them, is recorded here.
Surveys	<ul style="list-style-type: none"> • Surveys measure perceptions and experiences of corruption to characterize the phenomenon. • Surveys aim to determine the profile of victims and institutions associated with corruption

Source: taken from Gutiérrez and Jiménez [5].

Table 1.
Corruption measurement methods.

4.1 Open budget index

In the area of public finance, the International Budget Partnership conducts the Open Budget Survey, using documentary evidence to measure whether the public can consult eight key budget documents (general economic policy criteria, both the draft and approved budget, citizens' budget, half-yearly and annual reports, and audit report), which must be online and the information provided must be comprehensive and useful.

The Open Budget Index uses 109 of the 228 questions from the Open Budget Survey (2023). It measures transparency in the countries evaluated, making it possible to make comparisons between them. The civil society institution that implements the survey in Mexico is Fundar. **Figure 1** shows the results of the ninth edition conducted in 2023.

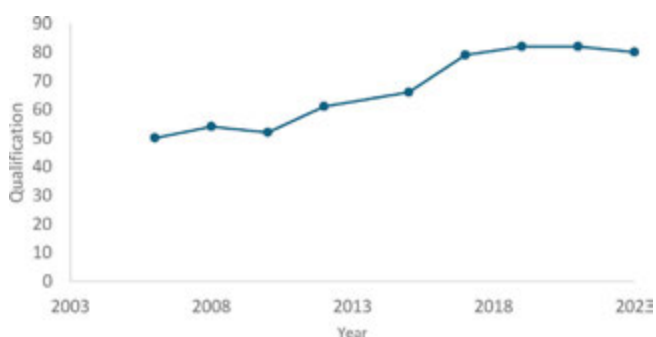


Figure 1.
Results in transparency, percentage achieved. Source: Own elaboration with data from International Budget Partnership [22].

This year Mexico scored 80 out of 100 points for transparency, ranking 5th out of 125 countries surveyed; 30 for citizen participation, above the OECD average of 24; and 65 for budget oversight. Out of 125 countries surveyed, Mexico scored 30 for citizen participation, above the OECD average of 24, and 65 out of 65 for budget oversight.

5. Conclusions

In Mexico, important steps have been taken in terms of government digitalization, and there have been achievements in the area of public finances, as there is a regulatory structure in place for accountability and access to information. In addition, as mentioned above, there are platforms for accessing open data, promoting government openness, which has allowed progress in transparency. However, since the implementation of the National Anti-Corruption System, so far, there has not been an effective fight against this problem, including the corruption perception indexes have not been sufficiently reduced, since according to the Organization for International Transparency, the score obtained in 2020 has remained stable at 31 points out of 100 [7].

Citizen participation needs to be strengthened, given its importance for the functioning of democracy. Only a very low percentage of the population interacts with the authorities through the internet, for example, by consulting government information, obtaining forms, or responding to public consultations. This situation is the result, on the one hand, of a lack of interest on the part of citizens to know what the government is doing, due to a lack of trust in government information. On the other hand, there is a lack of infrastructure necessary for citizen participation; for example, a high percentage of households still do not have an internet connection.

For the benefits of open government to be truly realized, the state needs to publicize the existence of the various platforms for accountability, as well as their use. In addition, the use of tools and automation for mass citizen assistance.


New technologies give rise to innovative and efficient solutions that enable societies to progress. Open government must be linked to the development policies of the territory in order to achieve the well-being of its inhabitants.

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International Price Shocks and Financial Soundness: The Impact of Government Policies – A Systematic Review

Phan Bao Trung and Dao Le Van

Abstract

This chapter further investigates whether a surge in international commodity resources serves as a “godsend” or a “misfortune” for the financial markets of various nations. By using a systematic review approach, we focus on examining the relationship among three factors: (1) the growth of a country’s financial market in response to (2) an international price shock and (3) the government’s role in mitigating these shocks. Our analysis reveals that, even when accounting for institutional quality and the financial system’s capacity, an increase in resource windfall generally improves the overall health of financial markets, though it also introduces certain short-term vulnerabilities. Notably, we evaluate the role of macroprudential policies in response to these shocks and discover that strategies, such as cautious loan restrictions, financial liberalization, and capital preservation, effectively mitigate short-term risks during significant price changes, regardless of whether these changes are favorable or unfavorable. In summary, our findings, which remain robust across multiple tests, align more closely with the “new trade” theory rather than the notion of a “resource curse.”

Keywords: commodity resource windfall, macroprudential policies, financial soundness, government policy, new trade theory

1. Introduction

A growing body of evidence suggests that a strong financial system serves as a key driver of sustainable economic growth. A well-operating financial system bolsters economic stability and resilience by efficiently allocating capital, encouraging savings, and supporting investment in productive sectors [1–3]. However, many nations face challenges in establishing such a system on the basis of domestic resources alone [4, 5]. International trade may offer a viable external solution by enhancing cash flow through the exchange of goods and services [6] or benefiting from commodity resource windfalls [7]. This research concentrates on the impacts of international

price shocks, considering both exports and imports, and their effects on the financial market's health rather than focusing solely on international trade flows.

International price shocks can negatively affect financial stability by increasing market volatility. Economies that are heavily reliant on global commodity markets are particularly vulnerable to price swings. Sharp declines in export prices, for example, can lead to revenue shortfalls, liquidity problems, and financial sector instability [8]. The "resource curse" theory suggests that substantial revenue inflows from resource windfalls can result in poor governance and financial mismanagement. Governments and institutions may become overly dependent on these revenues, leading to weak fiscal discipline, corruption, and rent-seeking behaviors [9]. As Sachs and Warner [10] argue, this weakens the financial system's resilience and heightens risks when prices drop, resulting in credit overexpansion, resource misallocation, and long-term financial instability.

Conversely, favorable international price shocks can strengthen financial stability by attracting capital inflows, fostering financial development, and encouraging improved risk management. Higher export prices can increase foreign exchange earnings, enhancing liquidity and providing opportunities for the financial sector's growth [11]. This capital influx enables financial institutions to expand credit, diversify portfolios, and improve financial intermediation. Moreover, increased revenues from resource exports can be invested in strengthening regulatory frameworks and improving financial sector governance, resulting in greater resilience to future shocks [12]. In resource-rich countries that manage windfalls effectively, these benefits can be reinvested in infrastructure and human capital, leading to more robust and diversified financial systems better equipped to handle economic fluctuations [13].

This study aims to explore the impact of price shocks on the financial system by utilizing Financial Soundness Indicators (FSIs), which assess various aspects of economic health. The paper seeks to reconfirm and fill a gap in the empirical literature by analyzing the impact of commodity resource windfalls on financial soundness. The findings indicate that export shocks have the most significant impact, while import price shocks are less influential. Additionally, increases in net export commodity prices significantly reduce large exposures to capital, slightly decrease non-performing loans to total gross loans and non-interest expenses to gross income, and significantly increase the interest margin to gross income. Although sudden gains from international trade can improve financial aspects, they also increase short-term risks as the financial market becomes more competitive.

This research seeks to integrate the various perspectives, empirical findings, and policy insights that have arisen from the extensive research on the relationship between commodity resource windfalls and financial healthiness. Through a comprehensive analysis of theoretical models, empirical data, regional case studies, and policy debates, the paper aims to offer a well-rounded understanding of this intricate issue, providing valuable insights for both policymakers and academics.

2. Methodology

A structured methodology was employed to systematically review the literature on the relationship between commodity booms, busts, and financial growth. This approach involved an extensive search of academic databases to identify key studies, followed by a multistep screening process. Initial filters based on abstracts and keywords ensured relevance, while a detailed examination of full texts focused on methodologies, findings, and implications. The selected studies were categorized by

themes, such as the impact of commodity price volatility on financial stability and the role of institutional frameworks. This thorough process enabled the identification of patterns, contradictions, and gaps in existing research, providing a nuanced understanding of these economic dynamics. The screening process, illustrated in **Figure 1**, highlights a flow diagram of the screening procedure followed to identify eligible studies.

The research began with an extensive search across various databases, identifying 319 potentially relevant records. An additional 49 records were found through other sources, such as reference lists and expert suggestions. After removing duplicates, 312 unique records were left for initial review. The titles and abstracts were screened, resulting in the exclusion of 125 irrelevant studies. The remaining 187 articles were assessed in full, and 125 were excluded due to criteria like lack of relevance, date, language, or insufficient empirical data. This process resulted in 78 studies for qualitative synthesis [14].

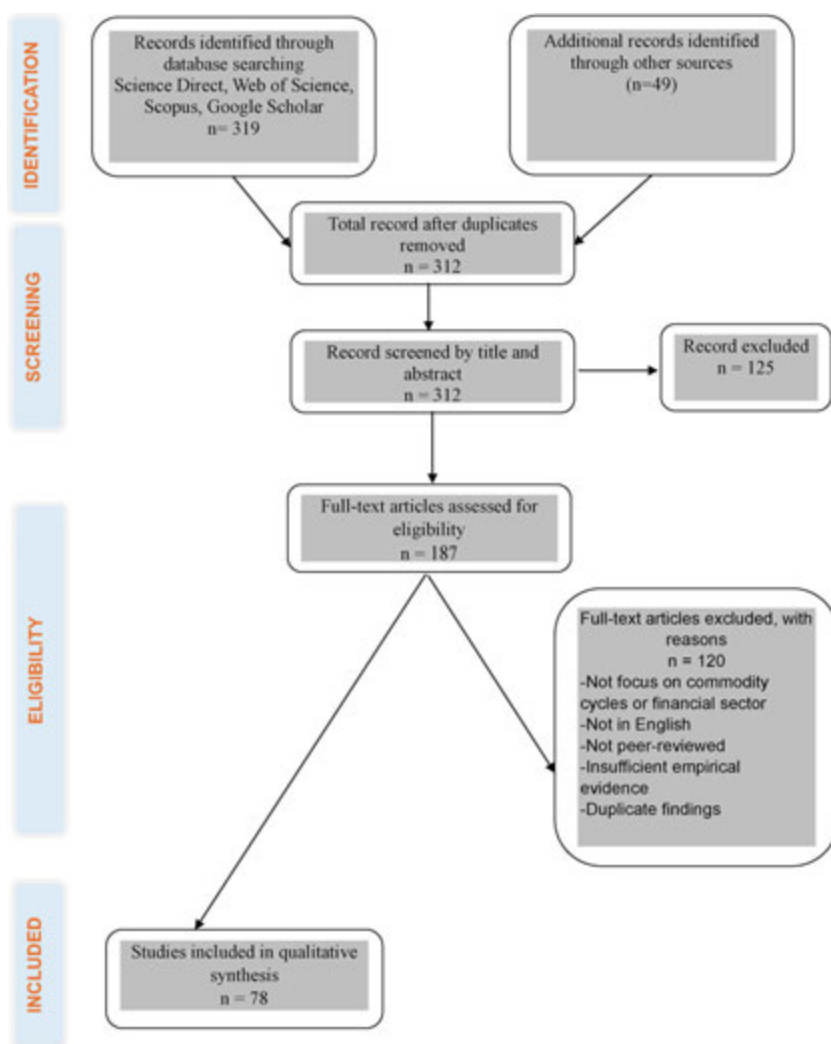


Figure 1. Flow diagram of the screening procedure followed to identify eligible studies. Source: Authors' own work.

Criteria for inclusion required peer-reviewed journal articles, respected institution's working papers, and English-language book chapters. The studies had to focus on the link between commodity price changes and financial soundness or sustainable economic growth, particularly in resource-rich economies and emerging markets depended on resources with developing institutional qualities, to explore hypotheses related to resource windfalls and the "resource curse" theory.

The full texts of these studies were then meticulously reviewed to confirm their suitability for inclusion. Relevant data were extracted using a standardized form, capturing each study's objectives, framework, methodology, and key findings. The results of the review are presented systematically, following guidelines for reporting systematic reviews. This approach aims to offer a transparent, reproducible, and critical evaluation of existing research on the relationship between commodity resource windfalls and financial healthiness, contributing valuable insights for policymakers, researchers, and stakeholders.

3. Findings

3.1 Resource curse theory

The concept of the "resource curse" is central to a significant body of literature that explores the negative consequences of commodity windfalls. According to this theory, countries that experience a surge in revenue from natural resources may encounter an appreciation of their national currency. This currency appreciation can undermine the competitiveness of other export sectors, potentially leading to a decline in industries such as manufacturing [15, 16]. While Corden's analysis [15] focuses on small open economies, Ma and Wang [16] overlook the role of institutional factors and state capacity. Supporting this view, Mlachila and Ouedraogo [17] show that a one standard deviation (SD) increase in price shocks leads to a 0.44% drop in bank deposits relative to gross domestic product (GDP) and a 0.55% decline in bank liquid liabilities across 68 resource-rich nations. Their research also indicates that democratic institutions, as measured by Polity2, can mitigate these adverse effects.

Empirically, rising export commodity prices often introduce significant volatility into financial markets, attracting speculative investment and fostering bubble-like conditions that can ultimately burst, leading to financial instability [7, 18, 19]. Numerous studies focusing on resource-dependent developing countries with weak institutional frameworks and limited state capacity have consistently found that price shocks, whether positive or negative, adversely affect financial markets or the broader economy. For instance, research conducted in Nigeria [20], Venezuela and Angola [21, 22], and 43 developing countries in Sub-Saharan Africa [23] reveal similar outcomes. Specifically, in Venezuela, Satti et al. [24] found that a 10% increase in natural resource abundance results in a 0.934% reduction in economic growth, significantly impacting the financial sector.

These findings suggest that the impact of resource windfalls on a country's financial market is influenced by contextual factors, particularly the strength of the institutional framework and state capacity. This argument is especially relevant in developing countries, where institutions are fragile, and state capacity is weak [7, 25–29]. These scholars confirm that financial institutions may face heightened risks if they become overly dependent on volatile commodity markets, leading to resource misallocation, increased systemic risk, heightened market uncertainty, and

diminished investor confidence. Kinda et al. [30] also observed that these negative effects are more pronounced in countries with poor governance, weak fiscal space, and those lacking a sovereign wealth fund or macroprudential policies.

To mitigate the negative impact of global price shocks on financial markets, the literature suggests several policy measures. One crucial approach is for policymakers to prudently manage capital conservation by establishing reserve or stabilization funds to save and invest surplus revenues, ensuring long-term economic stability and reducing reliance on commodity exports [31–34]. Additionally, imposing loan restrictions, such as tightening limits or preventing excessive borrowing, could help dampen the effects of international price shocks [35]. A prudential approach by the government in regulating foreign currency lending could also mitigate the risks to financial markets posed by global price shocks [6, 36, 37]. High levels of foreign currency lending can undermine the effectiveness of monetary policy, particularly in countries with limited foreign assets [38]. However, it is important to note that while increased government intervention may reduce these risks in the short term, it could lead to long-term consequences such as reduced productivity and distorted market signals, as argued by neoclassical economists, the Austrian School, and the Chicago School [39–42].

3.2 Commodity resource windfalls

Positive shifts in international commodity prices, characterized by significant increases in export prices or decreases in import prices, are often referred to as resource windfalls. These are external events well documented in economic literature, with countries often acting as price-takers in global markets [43, 44]. The effects of such price shocks can vary; they may negatively influence financial outcomes through mechanisms associated with the “resource curse,” or they may have positive effects, aligning with theories from the “new trade theory” perspective [25, 39, 45, 46]. Recently, there has been an increased focus on understanding how these price shocks affect the global financial system, particularly during periods of heightened vulnerability, such as the Russia-Ukraine conflict and the COVID-19 pandemic [47–49].

New trade theory suggests that resource windfalls from international trade can provide numerous benefits, while adverse shocks may not necessarily lead to long-term losses [39, 46, 50]. First, these windfalls can significantly enhance sectoral performance. For example, during periods of high oil prices, banks in oil-exporting countries often see substantial gains in return on equity and interest margins relative to gross income [51]. Additionally, a reduction in import commodity prices can provide substantial economic relief to importing nations by lowering costs, improving trade balances, reducing production costs for businesses, and decreasing consumer prices. Kilian [52] examined this dynamic in the U.S. during the mid-1980s and late 2010s, finding that a drop in oil prices led to lower energy costs, reduced inflationary pressures, and bolstered economic growth and stability.

Second, elevated commodity prices benefit firms within commodity-producing sectors by increasing revenues, which can be reinvested in expanding production capacity, exploring new resources, and adopting advanced technologies, thereby fostering sectoral growth and productivity gains [26, 27, 53]. Third, for financial institutions with significant exposure to the commodity sector, asset value appreciation can strengthen balance sheets, leading to greater financial stability and reduced default risk [26]. Fourth, the rise in foreign exchange earnings from increased commodity prices can improve the external positions of exporting countries, enabling them to build foreign exchange reserves that strengthen their net open position relative

to capital and provide a buffer against economic shocks [31, 54]. Notably, recent research by Ilzetzki et al. [38] highlights the systemic risks posed by foreign exchange reserve shortages worldwide.

Additionally, lower prices for imported commodities can reduce cost pressures on the manufacturing and transportation sectors, indirectly boosting profitability and creating investment opportunities within these industries. Consequently, financial systems in importing countries may experience a more stable economic environment, characterized by fewer non-performing loans and reduced default risk among borrowers who benefit from lower production costs and increased profitability [51].

The asymmetric effects of mechanisms associated with “new trade theory” have been identified in previous research, particularly in contexts where export commodity prices decline or import commodity prices rise. In exporting countries facing a decrease in commodity prices, several empirical studies support this view, using global panel data [30], over 150 years of time series data [55], and samples from advanced economies [19]. For example, Al-Khazali and Mirzaei [56] found that in wealthy Arab countries, a 1% drop in oil prices is associated with a 0.1% increase in the risks of loan defaults and asset devaluations. Similarly, in commodity-importing countries grappling with higher import prices, Bettarelli et al. [57] confirmed the negative impact across a panel of 129 advanced and developing economies from 1970 to 2013, with consistent results in low-income countries and those with weak governance in Africa [57, 58].

3.3 Government actions

In examining strategies to alleviate the adverse effects of global price shocks on financial markets, we turn our attention to several key documents that outline government actions. A primary recommendation is for policymakers to exercise careful management of capital conservation fluctuations. This could involve the establishment of reserve or stabilization funds to effectively save and invest surplus revenues. Such measures would not only promote long-term economic stability but also help mitigate the risks associated with volatility and overreliance on commodity exports, as highlighted by Aizenman et al. [31], Allegret and Allegret [32], Di Bonaventura Altuve [59], Gelb and Grasmann [33], and Souhila [34].

Additionally, implementing loan restrictions—whether through tightening limits or outright prohibitions—can be an effective strategy for dampening the impact of international price shocks, as suggested by Guillaumont and Jeanneney [35]. A prudent regulatory approach toward foreign currency lending is also crucial in addressing the vulnerabilities posed to financial markets by these global price fluctuations. As noted by Castelnuovo et al. [6], Natal [36], and Skibińska [37], excessive foreign currency lending can undermine the effectiveness of monetary policy, particularly in countries that lack sufficient foreign assets [38].

It is essential, however, to recognize that while increased government intervention may provide short-term relief from these risks, it could also lead to long-term challenges. Such interventions may result in decreased productivity and distorted market signals, concerns raised by neoclassical economists, the Austrian School, and the Chicago School of thought [39–42]. Thus, while immediate strategies can be employed to shield financial markets from volatility, a balanced approach is necessary to avoid unintended consequences in the future.

4. Policy implications and recommendations

This chapter delves into the influence of commodity terms of trade on different facets of financial stability by using the systematic review. The findings suggest that while commodity shocks can heighten risks and intensify competition, they also provide considerable advantages in strengthening the financial market. It is important to emphasize that the observed rise in risks and competition is predominantly linked to short-term market dynamics, such as high-risk, high-return scenarios, rather than presenting enduring threats to the financial system. Moreover, when factoring in institutional and financial state capacity, the findings support the “new trade” theory over the “resource curse” hypothesis.

The chapter also addresses how governments might alleviate short-term uncertainties arising from such shocks in theory. The findings suggest that implementing prudent actions, such as enforcing stricter loan restrictions and controlling foreign currency lending by imposing limits and prohibitions based on specific loan characteristics, along with mandating central banks to maintain a capital conservation buffer, can effectively reduce risk-taking behaviors. However, as we observed from previous studies, in countries plagued by corruption, such interventions can be erratic, potentially increasing long-term uncertainties in market signals. Indeed, while unexpected government actions may reduce short-term risks, they could inadvertently create more significant long-term uncertainties, as businesses remain uncertain about when or how the government might intervene [41, 60]. Therefore, rather than offering a definitive stance on government intervention, the chapter provides guidance for policymakers, highlighting the potential risks in a globally interconnected economy and stressing the importance of recognizing the complexities that may arise from intervening in such contexts [61–71].

Additional information


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Financial Aid Distribution amid Covid-19 in Lebanon: Ministerial Executive Relief Initiative

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Abstract

Covid-19 impacted mostly the vulnerable families around the world. Lebanon, a country witnessing a dire economic crisis, struggled with the increasing penurious needs of its households, and gathered local and international energies to face the crisis and support the population. The aid distribution was planned and executed while the pandemic was circulating in the country, striking an unprepared state for such an outbreak, and adding challenges for indigent citizens. A National Social Solidarity Program (NSSP) was launched in Spring 2020 to collect data around families affected by the pandemic, delivering financial aids as an impulse to survive the crisis. Our paper describes a collaborative work done in two months by local councils and central authorities collecting data through a digital platform, a pioneer project in Lebanon, to provide financial aid to most vulnerable families, while municipalities were struggling with low resources and budget, requesting help from central authority. Afterwards, a data analysis was carried out by a special committee selecting families for the aid distribution. More transparent and agile tools should be used in the future and the government should determine its priorities, implement good practices from lessons learned, seek developed options for accurate need's assessment, and take data-driven evidence-based decisions.

Keywords: Lebanon, Covid-19, aid distribution, platform, needs, households

1. Introduction

Several opinions were discussed regarding the political, economic, and social situation in the last couple of years in Lebanon. The country has faced several challenges causing prevalent harm to the vulnerable populations, without discriminating between Lebanese and immigrant population. Multiple events took place from the 17 of October, 2019 uprising against the Government of Lebanon (GoL), through the emerging Covid-19 pandemic in early 2020, the Beirut port's blast on August 4th, 2020, all the way to the ongoing crippling economic crisis and the mismanagement of the country [1, 2]. The devaluation of the Lebanese pound (LBP) has reached an unprecedented low level, as the economic recession and the state bankruptcy had also

worsened the situation, not forgetting the impact of the pandemic on the country with an unprepared health sector lacking resources [3, 4].

The Covid-19 pandemic triggered a global economic crisis that impacted both wealthy and impoverished nations. It had a detrimental effect on societies, economies, and public health worldwide, necessitating an efficient and professional response from governments. The effective management of each country's resources and reserves became vital for survival during this period. Governments, as the primary authorities responsible for implementing protective measures, took swift action to mitigate the virus's effects on their communities through emergency response plans.

In Lebanon, the situation was further complicated by political and economic turmoil, as well as a population of over 6.9 million, including 2 million displaced individuals and 500,000 migrant workers (comprising 36% of the population), most of whom resided in densely populated urban areas with poor living conditions across just 10,452 km² [2, 5]. Poverty levels surged, with over 75% of the population living below the poverty line. For the Lebanese, the challenges intensified when in-kind and cash aid from the United Nations (UN) was directed exclusively toward non-Lebanese residents, while the government struggled to manage its own array of crises. This raised concerns about Lebanon's future and its ability to cope with its ongoing monetary collapse.

Lebanon faced numerous obstacles in preparing for the pandemic. Alongside its economic and political instability, the country was densely populated with refugees, including 2 million displaced individuals and 500,000 migrant workers. These residents, living in overcrowded areas with inadequate infrastructure, had limited access to basic services like clean water, sanitation, and hygiene facilities. The pandemic prompted multiple efforts to allocate aid and emergency funds to assist both Lebanese citizens and foreign residents already suffering from the worsening economic situation. Consequently, measures, such as public awareness campaigns, testing, surveillance, contact tracing, and the creation of isolation centers, were implemented as part of the Covid-19 emergency plan, in collaboration with governmental bodies like the Ministry of Interior and Municipalities (MOIM), the Ministry of Public Health (MoPH), and the Ministry of Social Affairs (MoSA), as well as the United Nations High Commissioner for Refugees (UNHCR) in Lebanon [2, 6]. However, some undocumented migrants were reluctant to cooperate with government agencies, fearing stigmatization and potential deportation. Despite these challenges, aid relief operations, supported by local and international funding, were carried out by both public and private institutions.

The displaced vulnerable populations, including the displaced and refugees, perceived by the authorities to provide aid reliefs, needed a focused approach to address their fears of deportation and concerns about stigmatization when interacting with government agencies. As a result, all efforts—including the distribution of hygiene supplies, the implementation of testing and surveillance strategies, and the creation of isolation centers within informal settlements—were carried out through United Nations agencies in Lebanon, in partnership with the government [2, 6].

In its late 2019 report, the United Nations High Commissioner for Refugees (UNHCR) estimated a rise in poverty levels among Syrian refugees. The percentage of refugees living below the extreme poverty line grew from 55% before the crisis to about three-quarters of the refugee population in the country. Likewise, poverty rates among Palestinian refugees increased, with 65% of those in Lebanon and 90% of those from Syria recorded as living in poverty in 2015 [6]. To address this and lessen the impact of Covid-19 on vulnerable communities, several UN agencies, in

collaboration with the Ministry of Interior and Municipalities (MOIM) and other government partners, launched a new awareness campaign in the refugees' native languages. Additionally, they developed a Covid-19 emergency plan as part of the national pandemic response. Primarily, the World Health Organization (WHO) Regional Office for the Eastern Mediterranean (EMRO) assisted the Ministry of Public Health (MoPH) in enhancing the preparedness and response capabilities of the Lebanese healthcare system. Meanwhile, UNICEF and UNHCR focused on supporting informal settlements by prioritizing their needs, engaging with communities, sharing best practices, and ensuring access to Covid-19-related services.

Aid distribution to the most vulnerable Lebanese families impacted by Covid-19 was carried out by key governmental bodies, including the Presidency of the Council of Ministers (PCM), the Ministry of Social Affairs (MoSA), the Ministry of Interior and Municipalities (MOIM), and the Lebanese Armed Forces (LAF). This was done through the National Poverty Targeting Program (NPTP), the Emergency Crisis Response Social Safety Net Program, and the National Social Solidarity Program (NSSP). Data on these families were gathered through the Inter-Ministerial/Municipal Platform for Assessment Coordination and Tracking (IMPACT) platform by over 5000 users from local authorities (municipalities and villages), supplemented by previous door-to-door assessments. WHO statistics indicate that from February to late June 2020, a total of 1778 positive Covid-19 cases were recorded, with the daily count not surpassing 63 cases (May 23, 2020), which reflects the stability and control of the health situation in the country during this period.

Therefore, the aim of this paper is to illustrate the Lebanese government's plan to mitigate the impact of the pandemic on the population, especially on the most vulnerable families, through the financial aid distribution during the Covid-19 pandemic in 2020.

2. Methodology

We conducted thorough research of the literature concerning the economic crisis in Lebanon and its impact on the population using Medical Subject Headings (MeSH) terms, title words, and keywords on PubMed Advanced Search Builder over the last decade. Following this search, some of the articles and publications referenced in this paper were selected in relation to Lebanon, its recent financial crisis, and the aid distributions, in parallel with other manuscripts cited in the media and press during the Covid-19 pandemic outbreak to be cited. The circulars and directives from the Lebanese Republic were taken as references as well from the official sites and governmental libraries of the Presidency of the Council of Ministers (PCM), the Ministry of Interior and Municipalities (MOIM), the Ministry of Social Affairs (MoSA), and the Lebanese Armed Forces (LAF). Data collection and analysis is detailed in the sections below.

2.1 Ministerial relief initiative

In 2020, the public confidence in the Lebanese state, sitting already at a cross-road, was the lowest it has been in decades. Corruption, bureaucratic mismanagement, bloated and ineffective public sector spending have left the country facing a financial, economic, and political crisis. Yet, the crisis has also made clear that the recent situation is unsustainable, and that change has become inevitable. The Covid-19 crisis has

only amplified this need for change, and public officials are now open to innovative solutions previously been tied up in politics [7].

2.2 National social solidarity program

From April 8th until May 18th, 2020, the MoSA in partnership with the MOIM launched the National Social Solidarity Program (NSSP) [8]. The aim was to identify the most vulnerable families in Lebanon impacted by Covid-19 to provide them with emergency cash-based assistance. The collected raw data basically consisted of 469,075 forms per household (HH) of the most vulnerable families in Lebanon in need due to the pandemic spread in Lebanon, encompassing 1,858,337 family members. Data collection was provided via the Inter-Municipal/Ministerial Platform for Assessment Coordination and Tracking (IMPACT) platform by more than 5000 active users from local authorities, i.e., users from municipalities and villages. The latter's performance was monitored by the MOIM and audited by MoSA and the central inspection "admin" users (**Figure 1**). In the following, we will be showing some of IMPACT's data to have broader scope of view on the efforts done during this phase.

This state-driven platform, crafted by the private sector under the oversight of MOIM and MoSA, was used not only in collecting data of public interest but also in analyzing statistical infographics to provide a well-shaped design of sound policies and to yield evidence-based decisions taken by high-level authorities. Further participation with local authorities, international Non-Governmental Organizations (iNGOs), and civil society was fostered through a MOIM directive issued on April 15, 2020 to cluster efforts for the proper use of the platform. The multiple stakeholders using IMPACT had the role of data entry, while the central authority such as the relevant ministries took the data monitoring and analysis part, and planned for the relief distribution mechanism [9].

For the first time in the region, local and central authorities successfully gathered a large amount of data across multiple communities within a short timeframe, following the data collected through the National Poverty Targeting Program since 2014 [10]. The Presidency of the Council of Ministers (PCM) organized the aid distribution process for families most affected by the Covid-19 pandemic. A detailed data analysis, supervised by a special PCM committee, was conducted before distributing the aid to establish a consistent distribution mechanism carried out by the Lebanese Armed Forces [6, 11, 12]. However, this part will not be discussed in this paper.

On March 26, 2020, the Government of Lebanon (GoL) approved a loan of LBP 75 billion to the Higher Relief Council to provide social assistance to those impacted



Figure 1. Flow chart of IMPACT users' distribution among central and local authorities.

by lockdown measures. In a similar vein, by April 2020, the World Bank allocated US dollar (USD) 40 million for emergency response efforts, while the PCM introduced the “Impulse and Safety” plan under the Emergency Social Safety Net (ESSN) program, amounting to LBP 1.2 billion, to address the effects of the pandemic and the lockdowns. This social emergency plan was designed to manage the consequences of the Covid-19 crisis. On May 21, 2020, the parliamentary “Finance and Budget Commission” approved the government’s new law proposal to support the PCM’s plan for aiding the most vulnerable groups, such as landmine victims, the elderly, families of public-school students, and individuals with special needs, with a financial aid of LBP 400,000 [13–15].

It is important to note that after identifying the households (HH) in need, the financial assistance was distributed in two phases. The first phase in May 2020 targeted landmine victims (1000 HH), taxi drivers (35,000 HH), parents of public-school students (136,000 HH), and families in extreme poverty (15,000 HH). The second phase in July 2020 provided aid to individuals with special needs, MoSA cardholders, civil defense volunteers, and beneficiaries selected from forms submitted via the IMPACT platform (Figure 2) [16].

Around 200,000 HH aids between Spring and Summer 2020 were distributed [17] in eight governorates; 27 districts and 1371 municipalities and villages. Mount Lebanon governorate (purple) registered the highest number of HH aid requests (131,513 forms: 28.04% of total forms submitted), while Beirut (green) recorded the lowest (15,936 forms: 3.4%) (Figure 3).

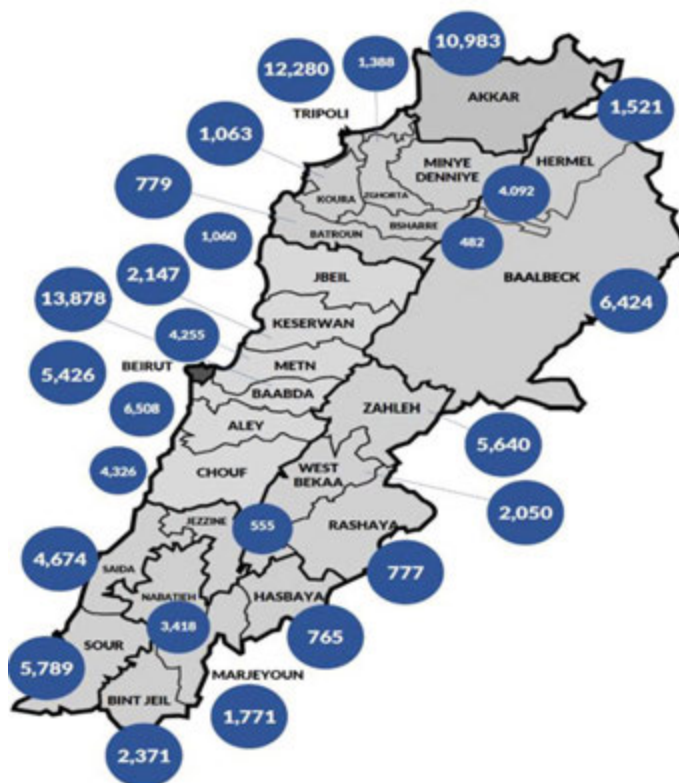


Figure 2.
PCM’s suggested aid distribution mapping—IMPACT data personal communication.

2.3 Municipalities' needs

Aside from the aid requests filled and submitted on IMPACT, other features were added for the platform users to enter Covid-19 case information instead of having them usually written on traditional papers, as the latter were considered as a “vector” transmitting the outbreak into the community. Additional features were deployed to add local councils' needs due to the pandemic, and to inform the central authority about the emerging requisites (912 needs submitted) of those municipalities and villages (Figure 4).

As for municipalities' needs, the major requests were for health assistance (29.71%), financial and food supplies (25.66 and 24.01%, respectively) while the requisite for logistical support recorded only 12.39% [18].

Figure 5's timeline revealed the distorted shape of the needs according to the demand of the local councils concurrently with the sanitary and health status in the country. An increase in health and food demands was shown during the peak of the outbreak, as well as during the total lockdown periods (March, April, and November 2020 and February 2021).

2.4 Call center

The MOIM and MoSA have designated a hotline to receive citizens' complaints regarding the relief plan for families affected by the Covid-19 pandemic. In order to

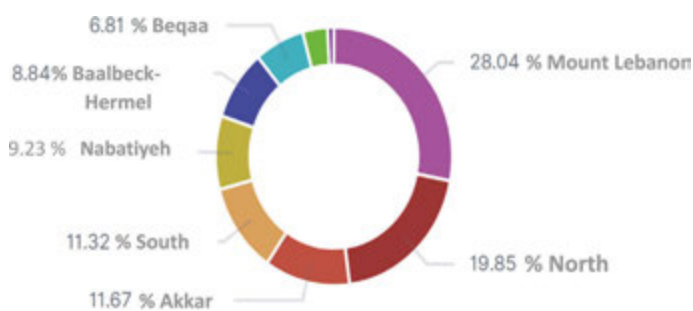


Figure 3. HH aid distribution by governorates: Mount Lebanon (purple), North (brown), Akkar (red), South (orange), Nabatiyeh (yellow), Baalbeck-Hermel (blue), beqaa (cyan) (APC-MOIM, 2020).



Figure 4. Municipalities needs by category: health (purple), financial (olive), food (magenta), logistic (green), security (yellow), isolation center (dark blue) (APC-MOIM, 2020).

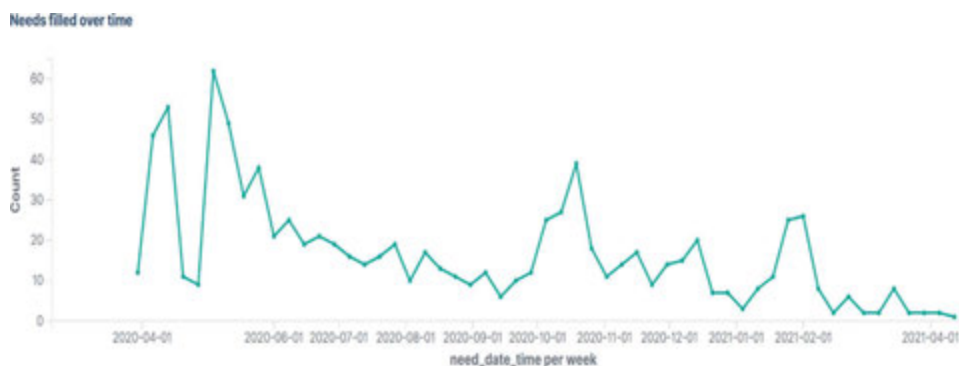


Figure 5.
 Timeline curve of municipalities’ needs filled per week (APC-MOIM, 2020).

professionally conduct the work procedures of the hotline, a developed call center was established to follow up on complaints and inquiries (**Figure 6**). Mainly, the call center handled claims raised by citizens with regard to the “families in need” forms submitted via IMPACT, which were collected regionally, specifically regarding filling the forms by phone from the users and the complaints that were raised from that mechanism. The latter were solved with the “Complaint Processing Unit” at MOIM (**Figure 6**).

The mentioned unit adopted a framework that considered the basic principles to be followed in managing call centers, with the aim of refining the operational level and contributing to raising the level of confidence among citizens toward the government. The unit was established to answer and process people’s complaints and/or inquiries throughout a specific mechanism. The follow-up on complaints and inquiries by real-time remote monitoring and data access was done regularly by MOIM officers ensuring the immediate response and achieving maximum efficiency and effectiveness, which contributed to increasing the confidence of citizens (**Figure 6**). In total, more than 8000 calls were received and treated from April 15th until May 18th, 2020 [18].

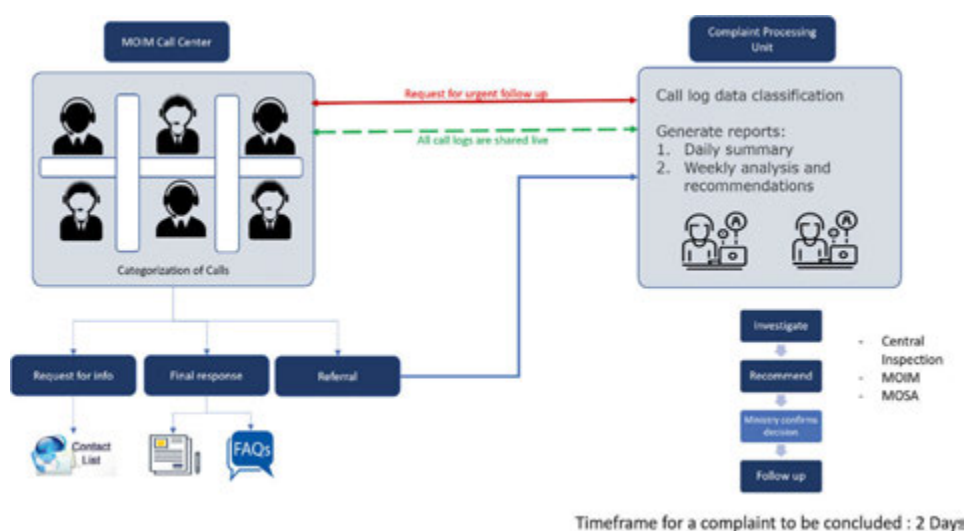


Figure 6.
 Flow chart of MOIM’s call center mechanism (APC-MOIM, 2020).

3. Results

3.1 Aid requests

The higher number of requests was recorded from Akkar District (blue arrow 54,721 forms) followed by Tripoli and Baabda districts (red arrow 50,510 and green arrow 46,375 forms, respectively), while Jezzine district showed a low record of requests submitted (orange arrow 2279 forms) (Figure 7) [18].

The majority of vulnerable families in need (79.34%) who requested aid had their HH members below retirement age (around 370,000 HH below 64 years). This demonstrated the remarkable need to receive help and support despite their age to some extent (Figure 8). In Figure 9, it can be shown that a high percentage of unemployed HH requesting aid reflected the severe economic status of this category of population (more than 240,000 HH: 51.18%). Moreover, Figure 10 reflects that the majority of the requesting citizens for aid had received only a primary education level (257,924 HH: 54.98%), showing the low education levels this category of families has received, also reflecting their inability to secure their basic needs without external assistance [18].

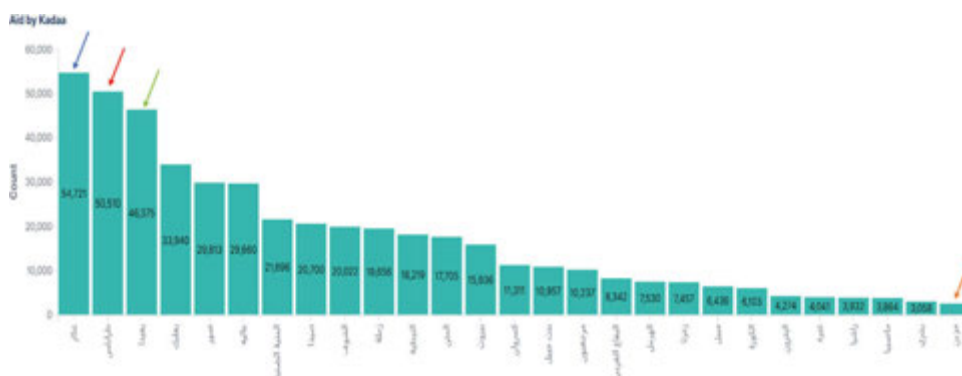


Figure 7. Bar chart showing decreasing distribution of submitted forms per district: Akkar (blue arrow), Tripoli (red arrow), Baabda (green arrow), Jezzine (orange arrow) (APC-MOIM, 2020).

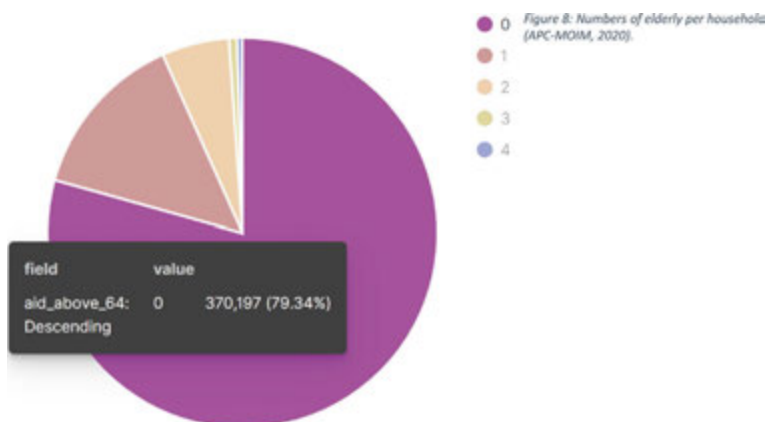


Figure 8. Numbers of elderly per household (APC-MOIM, 2020).

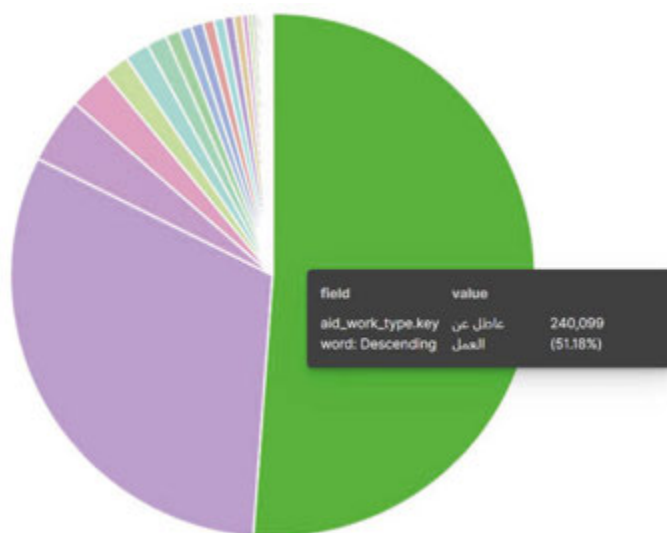


Figure 9. Work type among HH requesting aid (unemployed: green, other public/private jobs: other colors) (APC-MOIM, 2020).

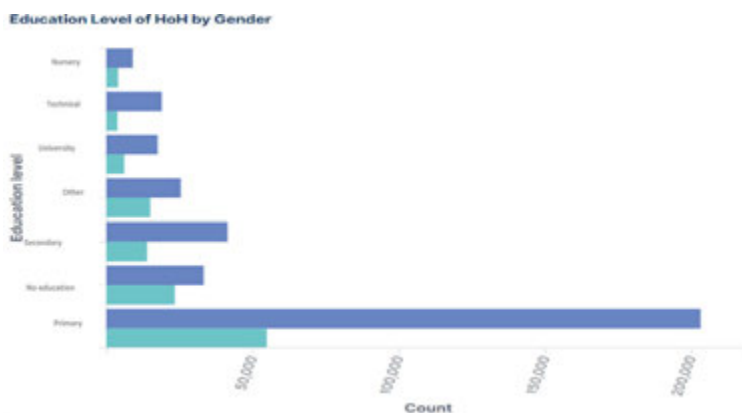


Figure 10. Education level of HH requesting aid (male: blue, female: green): Primary, no education, secondary, other, university, technical, nursery level (APC-MOIM, 2020).

One of the interesting findings shown in **Figure 11** is the number of females submitting the requests on behalf of their families (more than 120,000 forms: 25.7%). This indicates the high percentage of women (single mothers, widows, etc.) taking responsibility to provide basic needs for their families [18].

Regarding the forms submitted, a preliminary audit for the whole process was done. A phone perception survey (random digit dialing) was conducted with 200 residents in Beirut in 2020. The purpose of this exercise was to measure the perceptions on relief response, mainly needs' assessments and aid distribution, and to assess the overall experience of the relief initiative. The results were as follows: one-third of the responders declared taking part in needs assessment surveys (36%) and one-fifth confirmed having received some kind of aid (21%). Among the latter, two-thirds



Figure 11. HH aid requests' distribution by gender: Male (blue), female (green) (APC-MOIM, 2020).

(69%) had already filled a needs assessment survey, with one-third (31%) reporting receiving aid without a prior survey, whether from LAF (40%), religious organizations (20%), or charity associations (14%) [7, 16].

As for the assessment done by the state prior to the aid distribution (selected from the NPTP data or after LAF intelligence assessment of data entry), it seems those inquiries were deemed insufficient or useless (31% and 24%, respectively) by more than half of the respondents to the phone survey conducted in 2020, while 38% considered them useful to inform relief activities and target aid. Among those who received aid based on needs assessments, 69% felt the aid was unfair. Similarly, 59% of individuals who received aid without survey-based assessments shared this view, highlighting the limited influence of surveys on the perceived fairness of aid distribution [7, 16].

3.2 Municipalities' needs

Security needs were of minor priority (4.61%) for municipalities, particularly with regard to resources and the shortage of staff (**Figure 4**). The main theme of security needs currently being reported was requests for greater police presence or budget to cover the cost of increasing tasks and responsibilities. The latter was difficult to provide due to the low budgeting and the dire economic crisis Lebanon was going through, which explains the low interest of municipalities regarding that category of request. The other needs were treated by the central authority to fulfill the requisites according to the state's priorities and capacities. Donations were also received and distributed to municipalities as a first step to meet their needs [18].

3.3 First governmental pilot platform toward national digitalization

IMPACT was adopted by the MOIM to support the GoL's nationwide response plan to the Covid-19 crisis and also to support MoSA's projects to mitigate the poverty so as to avoid any security risk that may arise as a result of the increasing number of populations below the extreme poverty line in Lebanon raising concerns concomitantly. The platform enabled two-way communications, with the ministry able to disseminate key information to municipalities while the latter operate data entry. First, MoIM was utilizing it to monitor and coordinate municipalities' preparedness for Covid-19. In addition, MoSA collaborated with MOIM to collect and analyze nationwide HH emergency needs through the platform. IMPACT was considered the first national digital platform established by the government and used by all the municipalities. This new deployment was ensuring a high degree of transparency, an effective oversight of resources, an interactive performance with cross-institutional

data governance, and most importantly an increased outreach of relevant governmental entities with each other, and with all citizens and residents as well. Data validation whether for aid forms or for Covid-19 response was provided to relevant users with the possibility to track, assess, and approve modifications.

By dint of use, IMPACT has developed into a valuable tool for incident reporting and crisis management, providing efficient workflows that connect various stakeholders and facilitate rapid notifications and alerts. The platform has around it an entire ecosystem including complaint and support centers, analysis teams supporting the central authority to take data-driven decisions.

4. Discussion

Maintaining a balance between the health and economic sectors in a fragile country like Lebanon is undeniably challenging. The most effective ways to address the impact of crises in vulnerable nations are through preventive preparedness, learning from past experiences, and strategic planning. Proper management and adherence to best practices can equip countries with solid reserves and contingency plans to handle future health crises. For this reason, strong collaboration between health and administrative stakeholders in the public sector, along with the private sector, is essential. A public-private partnership is crucial to jointly manage crises, while effective media engagement is needed to raise awareness in the community and keep the public informed about their responsibilities and the nation's status during difficult times. Awareness plays a key role in the rapid response plan, helping to prevent panic and further spread of infection. It also encourages public support for the government through volunteerism, such as involvement in scouts and NGOs. This framework must be prepared in advance, especially in countries with a high likelihood of crises and emergencies, like Lebanon. In 2020, Lebanon faced numerous crises, including a financial collapse and the disintegration of the banking sector. In response, national authorities implemented several emergency plans aimed at easing the hardships of the most vulnerable families. However, these efforts revealed significant flaws.

First, multiple relief initiatives were introduced by the government (such as NPTP, ESN, and NSSP) as well as by non-governmental organizations (NGOs) and international organizations, leaving many families confused about which program they were eligible for or which best suited their needs. The state's crisis management exposed numerous weaknesses, resulting in some families missing out on aid while others received duplicate assistance. This further eroded public trust in government institutions.

In terms of addressing the needs of municipalities, the state's response, particularly during the height of the outbreak, was inadequate. A request for funding from external partners could have provided critical support to local councils in addressing health, economic, and food needs, potentially having a positive impact by demonstrating the government's commitment to assisting its citizens during this difficult time.

The data gathering was launched in April 2020 and the aid distribution operation was implemented few months later as part of the National Social Solidarity Program (NSSP). It was based on existing and outdated datasets from previously collected data years ago (NPTP 2014). Despite the LAF being requested to audit these datasets (leading to distribution delays), around 200,000 households benefited from the NSSP aid according to MoSA, whereas alternative mapping tools allowed the identification of more than 460,000 households in need between April and May

2020 (equivalent to 1.8 million citizens). Yet, these tools served partially in the relief process and the data collected were disregarded by decision-makers when providing the aid reliefs to HH. As a result, many individuals who applied for aid did not receive any, while others who were less in need received assistance, sometimes multiple times, due to duplication of names across lists from different sources [15]. Citizens and local authorities were disappointed, as the nationwide mapping, to which they had contributed on the IMPACT platform, collecting data, was barely used. This situation disrupted the cooperation between the central government and decentralized local entities. It also impacted community dynamics, as citizens felt betrayed by their elected officials, placing increased pressure on municipal leaders and village elites. That issue raised concerns regarding the transparency, impartiality, fairness, and efficiency of the aid distribution operation, diminishing the overall credibility of the state's response, and linking the failure to address the crisis.

In a report published in April 2020, Human Rights Watch warned of an “inadequate government response creating a risk of hunger for many” [19]. This warning reflected the realism of the situation, with local authorities criticizing the lack of transparency and unfairness in the selection process of beneficiaries, leading to a non-homogenous aid distribution process. The need for thorough coordination regarding the aid distribution process emerged, as well as the need to consolidate efforts into a compiled plan for a more rapid, agile, transparent, and efficient crisis response.

5. Conclusion

The declaration of a State of Emergency carried a securitized approach to emergency situations that was not adequate, at a given period of time, to the size and complexity of the country's calamities and the people's needs. The present mindset needs to be urgently replaced with a cluster-driven structure fostering coordination and cooperation between state administrations, local authorities, and relief actors on the ground, so that the aid reaches the deserved and accurately selected category of people. Moreover, the needs analysis should move beyond the politics of conflict and adopt forward-thinking and collaborative solutions, building the trust between the state and the citizens. In this regard, a media report issued recently highlighted the importance of properly using the data collected by IMPACT away from clientelism or for election affairs [12], as the use of this platform helped stakeholders not only to have significant data gathered from the field, but also to analyze it and take data-driven decisions. A similar experience was cited in the literature in Jordan where a “government financial management system” helped the Jordanian government to solve problems regarding the budget and to take ad hoc decisions as a way of reform in the financial sector [20].

However, the lack of data gathered during the past years and the difficulties in managing the crisis reflected the weight of pressure and burden on the government's shoulders to bear while juggling between the pandemic and supporting the people in need. Lebanon is facing and will face multiple crises at least in the short term. Aid distribution through the government or non-governmental organizations (including international committees) will continue to take place in the country, supporting citizens and mitigating the impact of the crisis on the population. The past experience in 2020 should be taken into consideration for a proper needs analysis, defining priorities, and implementing good practices while collecting data (if not already done before the crisis) for a strong, well-designed crisis response in the future.

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Conflict of interest

The authors declare no conflict of interest.

Acronyms and abbreviations

ESSN	Emergency Social Safety Net
GoL	Government of Lebanon
HH	Households
HoH	Head of Household
IMPACT	Inter-Ministerial/Municipal Platform for Assessment Coordination and Tracking
INGO	International Non-Governmental Organization
LAF	Lebanese Armed Forces
MOIM	Ministry of Interior and Municipalities
MoSA	Ministry of Social Affairs
NPTP	National Poverty Targeting Program
NSSP	National Social Solidarity Program
PCM	Presidency of the Council of Ministers
UNHCR	United Nations High Commissioner for Refugees

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Chapter 5

Public Accounting and Governmental Accounting in the United States: Evolution, Core Services, and Regulatory Frameworks

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Abstract

This chapter provides a comprehensive overview of public and governmental accounting in the United States, highlighting their evolution, core services, regulatory frameworks, and the challenges they face. It begins with the historical development of public accounting, tracing its roots from the nineteenth century to the present, including the formation of key professional organizations and regulatory milestones such as the Sarbanes-Oxley Act of 2002. The chapter details the core services offered by public accountants, including auditing, tax services, and consulting, and emphasizes the critical role of Certified Public Accountants (CPAs) in ensuring financial integrity and compliance. The discussion then shifts to governmental accounting, outlining its fundamental principles such as public accountability, legal compliance, and fund accounting. It explains the unique characteristics of governmental accounting, including the use of various fund types and the importance of budgetary accounting. The regulatory framework governing governmental accounting, primarily established by the Governmental Accounting Standards Board (GASB) and the Federal Accounting Standards Advisory Board (FASAB), is also examined. The chapter concludes by addressing the challenges faced by both public and governmental accounting, such as increased regulatory burdens, global competition, technological advancements, and ethical issues. Despite these challenges, the chapter underscores the ongoing demand for skilled accountants and the vital role they play in the financial health and transparency of both private and public sectors.

Keywords: public accounting, governmental accounting, CPA, GASB, US government

1. Introduction

Public and governmental accounting are fundamental pillars of the financial infrastructure in the United States, playing a crucial role in ensuring transparency,

accountability, and effective financial management. This chapter delves into the intricate world of public accounting, tracing its evolution from the early nineteenth century to the present day. It explores how the profession has developed in response to the growing complexity of American industry and commerce, highlighting key milestones such as the formation of the American Institute of Certified Public Accountants (AICPA) and the enactment of the Sarbanes-Oxley Act of 2002 [1].

This chapter also examines the core services provided by public accountants, including auditing, tax preparation, and consulting, and underscores the importance of Certified Public Accountants (CPAs) in maintaining the integrity of financial reporting and compliance with regulatory standards. As trusted advisors, CPAs play a vital role in the financial health of businesses and individuals alike. In addition to public accounting, the chapter provides a comprehensive overview of governmental accounting, a specialized field designed to meet the unique needs of government entities. It discusses the fundamental principles of governmental accounting, such as public accountability, legal compliance, and fund accounting, and explains how these principles ensure the transparent and efficient use of public funds. The regulatory framework governing governmental accounting, primarily established by the Governmental Accounting Standards Board (GASB) and the Federal Accounting Standards Advisory Board (FASAB), is also explored.

The chapter concludes by addressing the challenges faced by both public and governmental accounting, including increased regulatory burdens, global competition, technological advancements, and ethical issues. Despite these challenges, the demand for skilled accountants remains strong, underscoring the vital role they play in the financial stability and transparency of both the private and public sectors.

By understanding the history, core services, and regulatory environment of public and governmental accounting, readers can gain a deeper appreciation for the essential role these professions play in the economy and the ongoing efforts to uphold high standards of financial integrity and accountability.

2. New public management

NPM (New Public Management) ideas are influential and serve as an immediate response to common pressures such as public dissatisfaction with government services, budget constraints, performance-based accountability, and globalization [2]. One goal of NPM-inspired reforms is to adopt the RBM (Results-Based Management) approach, which requires governments to focus on performance outputs and outcomes rather than management processes. This approach has been adopted by various developing countries following the rise of the NPM doctrine. The NPM doctrine suggests that enhancing public service performance requires a focus on results while granting public managers greater control over fiscal and human resources. Additionally, this reform agenda requires political leaders to set performance objectives and results, use KPIs and strategic planning, allocate resources, and delegate implementation tasks to lower-level administrative managers [2, 3].

NPM reforms are often viewed as a functionalist approach. One of the key aims of these reforms is to enhance economic efficiency and effectiveness in public organizations [4]. A functionalist perspective assumes that organizations and their members rationally choose actions to achieve their goals. This approach emphasizes that decisions should be based on factors like economic efficiency and effectiveness [5–7]. However, many accounting scholars argue that other institutional factors, beyond

economic considerations, play a crucial role in implementing budgeting changes in both private and public organizations [8, 9].

3. Public accounting in the United States: A comprehensive overview

Public accounting in the United States is a dynamic and highly regulated profession that plays a critical role in the financial health of businesses and individuals. Public accountants provide a wide range of services, including auditing, tax preparation, and consulting, to clients ranging from small businesses to multinational corporations [10]. This chapter delves into the key aspects of public accounting in the U.S., including its history, regulatory framework, core services, and the role of the Certified Public Accountant (CPA) designation.

3.1 A brief history of public accounting in the U.S.

The roots of public accounting in the U.S. can be traced back to the late nineteenth century, when the Industrial Revolution and the growth of corporations led to an increased demand for financial expertise. Early public accountants were primarily focused on auditing financial statements and preparing tax returns.

The establishment of the American Institute of Certified Public Accountants (AICPA) in 1887 marked a significant milestone in the development of the profession. The AICPA played a pivotal role in setting professional standards and advocating for the interests of public accountants.

3.2 The regulatory framework

The practice of public accounting in the U.S. is heavily regulated by both federal and state governments. The primary federal regulator is the Securities and Exchange Commission (SEC), which oversees the financial reporting of publicly traded companies. The Public Company Accounting Oversight Board (PCAOB) is a private-sector, nonprofit corporation established by the Sarbanes-Oxley Act of 2002 to oversee the audits of public companies.

State boards of accountancy regulate the licensing and practice of CPAs within their respective states. These boards establish specific requirements for obtaining a CPA license, including education, examination, and experience [11].

3.3 Core services of public accountants

Public accountants offer a diverse range of services to their clients. The three primary core services are:

- *Auditing*: Auditing involves examining a company's financial statements to ensure they are accurate, complete, and compliant with relevant accounting standards. Auditors provide an independent assessment of a company's financial health and offer reasonable assurance that the financial statements are free from material misstatement.
- *Tax preparation and planning*: Public accountants assist individuals and businesses in preparing and filing tax returns, as well as developing tax strategies to

minimize tax liabilities. They stay up-to-date on complex tax laws and regulations to ensure compliance and maximize tax benefits.

- *Consulting*: Public accountants offer a wide range of consulting services, including financial forecasting, risk management, and business valuation. They provide expert advice to help clients make informed decisions and achieve their financial goals.

4. The role of the CPA

The CPA designation is a recognized symbol of professional competence and ethical integrity in the accounting profession. CPAs are required to adhere to a strict code of ethics and must meet rigorous education, examination, and experience requirements.

CPAs play a critical role in ensuring the integrity of financial reporting, promoting investor confidence, and contributing to the overall economic health of the U.S. They are trusted advisors to businesses and individuals, providing valuable insights and guidance on complex financial matters.

4.1 Public accounting in the USA

Public accounting involves providing accounting services to clients such as individuals, businesses, and government entities. The key players in this field are Certified Public Accountants (CPAs), who are licensed by state boards of accountancy after meeting education, experience, and examination requirements.

4.1.1 Key functions

- *Auditing and assurance*: CPAs conduct audits to ensure financial statements are accurate and comply with regulations.
- *Tax services*: CPAs prepare and file tax returns, offer tax planning, and represent clients in tax disputes.
- *Consulting services*: CPAs provide financial consulting, including business valuations, mergers and acquisitions, and financial planning.
- *Forensic accounting*: CPAs investigate financial discrepancies and fraud.

4.1.2 Leading firms

The “Big Four” accounting firms—Deloitte, PricewaterhouseCoopers (PwC), Ernst & Young (EY), and KPMG—dominate the U.S. market. These firms offer a wide range of services and are known for their extensive client base and high revenue².

4.2 Finance in the USA

The finance sector encompasses a broad range of activities, including banking, investment, and financial markets. It is a cornerstone of the U.S. economy,

influencing everything from individual wealth management to corporate financing and government fiscal policy.

4.2.1 Key components

- *Banking*: Commercial banks, investment banks, and credit unions provide loans, credit, and other financial services to individuals and businesses.
- *Investment*: This includes stock markets, bond markets, and mutual funds, where individuals and institutions invest money to earn returns.
- *Financial markets*: The New York Stock Exchange (NYSE) and NASDAQ are major stock exchanges where securities are traded.
- *Regulation*: The Securities and Exchange Commission (SEC) and other regulatory bodies oversee the financial markets to ensure fairness and transparency.

4.3 The evolution of public accounting

The evolution of public accounting in the U.S. is intrinsically tied to the growth of American industry and commerce. In the early nineteenth century, as businesses grew in size and complexity, so too did the need for independent financial oversight. This led to the emergence of professional accountants who could provide services such as auditing, tax preparation, and consulting.

4.3.1 Key milestones in the development of public accounting

- *Late nineteenth century*: The formation of professional organizations like the American Association of Public Accountants (AAPA), which later became the American Institute of Certified Public Accountants (AICPA).
- *Early twentieth century*: The establishment of state boards of accountancy, which began to regulate the profession and set licensing standards.
- *Mid-twentieth century*: The growth of public accounting firms, particularly the “Big Eight” firms, which dominated the industry.
- *Late twentieth century*: The passage of the Sarbanes-Oxley Act of 2002, which significantly increased regulatory oversight of public companies and their auditors.

4.4 Core services of public accountants

1. Auditing:

- *Financial statement audits*: Assessing the fairness and accuracy of a company’s financial statements.
- *Compliance audits*: Ensuring adherence to specific laws, regulations, or internal controls.

- *Operational audits:* Evaluating the efficiency and effectiveness of business processes.
- *IT audits:* Assessing the security and reliability of information systems.

2. Tax services:

- *Tax preparation:* Preparing income tax returns for individuals, corporations, and partnerships.
- *Tax planning:* Developing strategies to minimize tax liabilities while complying with tax laws.
- *Tax controversy:* Representing clients in tax disputes with tax authorities.

3. Consulting services:

- *Financial advisory services:* Providing advice on mergers and acquisitions, valuations, and financial restructuring.
- *Risk advisory services:* Identifying and mitigating risks, such as fraud, cyber threats, and operational risks.
- *Forensic accounting:* Investigating financial crimes, such as fraud and embezzlement.

4.5 The role of the CPA

Certified Public Accountants (CPAs) are licensed professionals who have met specific educational, examination, and experience requirements. They are held to high ethical standards and are expected to act with integrity and objectivity.

4.5.1 Key roles of CPAs

- *Financial reporting:* Ensuring accurate and reliable financial information.
- *Tax compliance:* Adhering to complex tax laws and regulations.
- *Business advisory:* Providing strategic advice to businesses.
- *Public interest:* Protecting the public interest by maintaining high professional standards.

4.6 Challenges and opportunities in public accounting

The public accounting profession faces a number of challenges, including:

- *Increased regulatory burden:* The Sarbanes-Oxley Act and other regulations have significantly increased the compliance costs for public accounting firms.
- *Global competition:* Increased competition from international accounting firms.

- *Technological advancements:* The rapid pace of technological change requires public accountants to adapt to new tools and techniques.
- *Ethical challenges:* Maintaining ethical standards in a complex and often high-pressure environment.

Despite these challenges, public accounting offers a rewarding career with opportunities for growth and advancement. As businesses continue to grow and become more complex, the demand for skilled public accountants is likely to remain strong [12].

5. Evolution of public and governmental accounting

5.1 Public accounting

- *1928–1951:* The period from 1928 to 1951 saw significant changes in public accounting due to external forces like the Great Depression and World War II. The Great Depression led to the codification and regulation of accounting practices, while World War II introduced new practices and responsibilities

5.2 Governmental accounting

- *Recent decades:* Governmental accounting has evolved significantly as part of New Public Financial Management (NPFM) reforms. These reforms aimed to improve transparency, accountability, and efficiency in public sector financial management

6. Core services

6.1 Public accounting

- *Auditing:* Public accountants provide independent audits of financial statements to ensure accuracy and compliance with accounting standards.
- *Tax services:* They assist clients with tax planning, preparation, and compliance.
- *Consulting:* Public accountants offer advisory services on financial management, mergers and acquisitions, and other business strategies.

6.2 Governmental accounting

- *Budgeting:* Government accountants prepare and manage budgets for public entities, ensuring funds are allocated efficiently.
- *Financial reporting:* They produce financial reports that provide transparency and accountability to the public and other stakeholders.
- *Compliance:* Government accountants ensure that public funds are used in accordance with laws and regulations.

7. Regulatory frameworks

7.1 Public accounting

- *Securities and exchange commission (SEC)*: The SEC regulates public accounting firms that audit publicly traded companies to protect investors and maintain fair markets.
- *Public company accounting oversight board (PCAOB)*: Established by the Sarbanes-Oxley Act of 2002, the PCAOB oversees the audits of public companies to ensure accuracy and reliability.

7.2 Governmental accounting

- *Governmental accounting standards board (GASB)*: GASB establishes accounting and financial reporting standards for U.S. state and local governments.
- *Office of management and budget (OMB)*: The OMB issues guidelines and standards for federal financial management, including the preparation of the federal budget.

These examples should provide a more comprehensive understanding of the evolution, core services, and regulatory frameworks in public and governmental accounting in the United States.

7.3 Governmental accounting in the United States: A comprehensive overview

Governmental accounting in the United States is a specialized field that differs significantly from commercial accounting. This unique approach is designed to meet the specific needs of government entities, ensuring transparency, accountability, and effective financial management [8, 13, 14]. This paper will delve into the fundamental principles, key characteristics, regulatory framework, and challenges of governmental accounting in the U.S.

8. Fundamental principles of governmental accounting

Governmental accounting operates on several fundamental principles:

1. *Public accountability*: Government entities are accountable to the public for the use of public funds. Financial reporting should be transparent and understandable to citizens.
2. *Legal compliance*: Governmental accounting must adhere to specific laws, regulations, and standards established by federal, state, and local governments.
3. *Fund accounting*: Government entities use fund accounting to categorize and track financial resources for specific purposes.

4. *Accrual basis accounting*: Most government entities use the accrual basis of accounting, recognizing revenues when earned and expenses when incurred.
5. *Budgetary accounting*: Government entities operate on annual budgets, and budgetary accounting involves comparing actual results to budgeted amounts.

9. Key characteristics of governmental accounting

1. Fund accounting:

- **Governmental funds**: Used to account for the flow of current financial resources. These funds are further divided into:
 - **General Fund**: Used for general operations not accounted for in other funds.
 - **Special Revenue Funds**: Used for specific purposes, often financed by dedicated revenue sources.
 - **Capital Projects Funds**: Used to account for the acquisition or construction of capital assets.
 - **Debt Service Funds**: Used to account for the accumulation of resources for the payment of principal and interest on long-term debt.
 - **Permanent Funds**: Used to account for resources that are legally restricted to the extent that only earnings, not principal, may be used.
- **Proprietary funds**: Used to account for government operations that are similar to private businesses, such as utilities and hospitals.
- **Fiduciary funds**: Used to account for resources held by the government in a trustee or agency capacity.

2. *Accrual basis accounting*: While most governmental entities use a modified accrual basis, some use a cash basis. Accrual accounting recognizes revenues when earned and expenses when incurred, providing a more accurate picture of financial performance.

3. *Budgetary accounting*: Governments operate on annual budgets, and budgetary accounting involves comparing actual results to budgeted amounts. This helps ensure fiscal discipline and accountability.

4. *Focus on public accountability*: Governmental accounting emphasizes transparency and accountability to the public. Financial reports are designed to provide information to citizens, taxpayers, and elected officials about how public funds are being used.

10. Regulatory framework

The Governmental Accounting Standards Board (GASB) is the primary standard-setting body for state and local governments in the U.S. GASB standards establish the generally accepted accounting principles (GAAP) for state and local governments. The Federal Accounting Standards Advisory Board (FASAB) sets standards for the federal government.

11. Challenges in governmental accounting

Governmental accounting faces several unique challenges:

1. *Complex regulatory environment*: Government entities must comply with a myriad of federal, state, and local laws and regulations.
2. *Political influence*: Political considerations can sometimes influence financial decisions, which can impact the accuracy and reliability of financial information.
3. *Long-term liabilities*: Governments often incur long-term liabilities, such as pension and healthcare costs, which can pose significant financial challenges.
4. *Public scrutiny*: Government entities are subject to public scrutiny, and their financial decisions are often closely monitored by taxpayers and the media.

12. A critical analysis of key characteristics of governmental accounting

12.1 Fund accounting

Fund accounting is a cornerstone of governmental accounting, allowing for the segregation of financial resources based on specific purposes. This approach enhances transparency, accountability, and financial control. However, it can also lead to complexity and administrative burdens.

12.2 Advantages

- *Improved accountability*: By separating funds, it becomes easier to track how money is spent and ensure that it is used for its intended purpose.
- *Enhanced financial control*: Fund accounting allows for better monitoring of financial performance and the identification of potential problems.
- *Enhanced transparency*: By segregating funds, it is easier for the public to understand how government money is being used.

12.3 Disadvantages

- *Complexity*: Fund accounting can be complex, requiring specialized knowledge and expertise.

- *Administrative burden:* The maintenance of multiple funds can increase administrative costs.
- *Potential for misallocation of resources:* If funds are not properly managed, there is a risk of misallocation of resources.

13. Accrual basis accounting

Accrual accounting provides a more accurate picture of financial performance by recognizing revenues and expenses when they occur, rather than when cash is exchanged. This approach is essential for long-term financial planning and decision-making.

13.1 Advantages

- *Improved financial reporting:* Accrual accounting provides a more accurate and comprehensive view of financial performance.
- *Enhanced decision-making:* By providing a more accurate picture of financial performance, accrual accounting can help government officials make better decisions.
- *Improved accountability:* Accrual accounting can help to improve accountability by providing a clearer picture of how government resources are being used.

13.2 Disadvantages

- *Complexity:* Accrual accounting can be more complex than cash basis accounting.
- *Estimates and judgments:* Accrual accounting often requires estimates and judgments, which can introduce uncertainty into the financial statements.

14. Budgetary accounting

Budgetary accounting is a crucial tool for financial control and accountability. By comparing actual results to budgeted amounts, governments can identify variances and take corrective action.

14.1 Advantages

- *Improved financial control:* Budgetary accounting helps to ensure that government spending is controlled and that resources are used efficiently.
- *Enhanced accountability:* By comparing actual results to budgeted amounts, it is easier to hold government officials accountable for their financial decisions.
- *Improved decision-making:* Budgetary accounting can help government officials make better decisions by providing information about the financial impact of those decisions.

14.2 Disadvantages

- *Rigid*: Budgetary accounting can be too rigid, making it difficult to respond to unexpected changes in circumstances.
- *Potential for budgetary gimmicks*: Government officials may use budgetary gimmicks to manipulate financial results.
- *Limited focus on long-term financial health*: Budgetary accounting often focuses on short-term financial performance, which can lead to neglect of long-term financial health.

15. Focus on public accountability

Government financial reporting is designed to provide information to the public, including taxpayers, elected officials, and other stakeholders. This information should be clear, concise, and understandable.

15.1 Advantages

- *Increased public trust*: Transparent and understandable financial reporting can help to increase public trust in government.
- *Improved decision-making*: Informed citizens can make better decisions about government policies and programs.
- *Enhanced accountability*: Public scrutiny can help to ensure that government officials are held accountable for their financial decisions.

15.2 Disadvantages

- *Complexity*: Government financial reporting can be complex and difficult to understand, even for experts.
- *Potential for misinterpretation*: Financial information can be misinterpreted, leading to misunderstandings and misinformed decisions.

16. The process of fund accounting

Fund accounting is a specialized accounting method that separates financial resources into distinct funds based on their specific purpose or restriction. This process ensures transparency, accountability, and effective financial management, especially for non-profit organizations and government entities.

Here's a breakdown of the fund accounting process:

1. Fund identification and classification

- *Identify funds*: Determine the different types of funds required based on the organization's goals, restrictions, and donor intent.

- *Classify funds*: Categorize funds into appropriate types, such as:
 - *Restricted funds*: Funds with specific donor restrictions on how they can be used.
 - *Unrestricted funds*: Funds that can be used for general operating purposes.
 - *Temporarily restricted funds*: Funds that have specific time or purpose restrictions before they can be used.

2. Budgeting and planning

- *Develop budgets*: Create detailed budgets for each fund, outlining expected revenues and expenses.
- *Allocate resources*: Allocate resources to each fund based on the budget and the specific needs of the fund.

3. Transaction recording

- *Track transactions*: Record all financial transactions, including revenues and expenses, for each fund.
- *Maintain separate records*: Keep separate financial records for each fund to ensure accurate tracking.
- *Allocate expenses*: Allocate expenses to the appropriate funds based on their purpose and the restrictions associated with each fund.

4. Financial reporting

- *Prepare financial statements*: Generate financial statements for each fund, including:
 - *Statement of financial position*: Shows the fund's assets, liabilities, and net assets at a specific point in time.
 - *Statement of activities*: Shows the fund's revenues, expenses, and changes in net assets over a period of time.
 - *Statement of cash flows*: Shows the fund's cash inflows and outflows over a period of time.
 - *Consolidated financial statements*: Prepare consolidated financial statements for the entire organization, combining the financial information from all funds.

5. Monitoring and analysis

- *Track performance*: Monitor the financial performance of each fund against its budget and prior-year performance.

- *Analyze variances*: Identify and analyze variances between actual results and budgeted amounts.
- *Adjust budgets*: Make adjustments to budgets as needed to reflect changes in circumstances.

6. Auditing and compliance

- *Conduct audits*: Undergo regular audits to ensure compliance with accounting standards and regulations.
- *Review financial statements*: Review financial statements to ensure accuracy and completeness.
- *Comply with regulations*: Adhere to relevant laws and regulations, such as those governing non-profit organizations and government entities.

By following these steps, organizations can effectively manage their finances, ensure accountability, and make informed decisions. Fund accounting is a valuable tool for organizations that need to track and manage multiple sources of funding and ensure that resources are used for their intended purposes.

17. The process of accrual basis accounting

Accrual basis accounting is an accounting method that recognizes revenues and expenses when they are earned or incurred, regardless of when cash is exchanged. This contrasts with cash basis accounting, which only recognizes transactions when cash is received or paid [8, 13, 14].

A breakdown of the accrual basis accounting process:

1. Revenue recognition

- *Identify contractual obligations*: Determine the specific obligations outlined in contracts with customers.
- *Allocate transaction price*: Allocate the transaction price to performance obligations within the contract.
- *Recognize revenue*: Recognize revenue when performance obligations are satisfied, even if cash has not been received yet.

2. Expense recognition

- *Match expenses to revenues*: Match expenses to the revenues they generate.
- *Accrue expenses*: Recognize expenses when incurred, even if payment has not been made yet.
- *Depreciation and amortization*: Allocate the cost of long-term assets over their useful lives.

3. Adjusting entries

- *Accrued revenues*: Record revenues earned but not yet received.
- *Accrued expenses*: Record expenses incurred but not yet paid.
- *Unearned revenue*: Adjust for revenue received in advance but not yet earned.
- *Prepaid expenses*: Adjust for expenses paid in advance but not yet incurred.

4. Financial statement preparation

- *Income statement*: Prepare an income statement that reflects revenues earned and expenses incurred during the period.
- *Balance sheet*: Prepare a balance sheet that shows the organization's financial position at a specific point in time, including assets, liabilities, and equity.
- *Cash flow statement*: Prepare a cash flow statement that shows the organization's cash inflows and outflows over a period of time.

5. Closing the books

- *Transfer net income or loss*: Transfer the net income or loss from the income statement to the retained earnings account.
- *Close temporary accounts*: Close revenue and expense accounts to the income summary account, and then close the income summary account to retained earnings.

By following these steps, organizations can provide a more accurate and comprehensive picture of their financial performance. Accrual basis accounting is essential for long-term financial planning and decision-making.

18. The process of budgetary accounting

Budgetary accounting is a crucial financial management tool that involves the creation, monitoring, and analysis of budgets. It helps organizations plan their financial activities, control costs, and make informed decisions.

Here's a breakdown of the budgetary accounting process:

1. Budget preparation

- *Develop a budget*: Create a detailed budget for a specific period, typically a year.
- *Identify revenue sources*: Determine potential sources of revenue, such as sales, grants, or investments.
- *Estimate expenses*: Estimate expenses for various categories, including salaries, rent, utilities, and supplies.

- *Allocate resources:* Allocate funds to different departments or projects based on priorities.

2. Budget approval

- *Review and approve:* Submit the budget to the appropriate authority for review and approval.
- *Obtain necessary authorizations:* Secure any required authorizations or approvals from relevant stakeholders.

3. Budget implementation

- *Communicate the budget:* Communicate the budget to all relevant personnel, ensuring understanding and adherence.
- *Monitor performance:* Regularly track actual revenues and expenses against the budget.
- *Adjust as needed:* Make necessary adjustments to the budget as circumstances change.

4. Financial reporting

- *Prepare financial reports:* Generate financial reports that compare actual performance to the budget.
- *Analyze variances:* Identify variances between actual and budgeted figures.
- *Explain variances:* Analyze the reasons for variances and take corrective action if necessary.

5. Budget review and revision

- *Evaluate performance:* Assess the overall performance of the budget.
- *Identify areas for improvement:* Identify areas where the budget could be improved.
- *Revise the budget:* Make necessary revisions to the budget for the next period.

Key Benefits of Budgetary Accounting:

- *Improved financial control:* Helps organizations control costs and prevent overspending.
- *Enhanced decision making:* Provides valuable information for making informed decisions.

- *Increased accountability*: Holds individuals and departments accountable for financial performance.
- *Improved planning*: Facilitates long-term financial planning.
- *Enhanced efficiency*: Identifies areas for cost savings and operational efficiency.

By following this process, organizations can effectively manage their finances, achieve their goals, and improve their overall performance.

19. The process of focusing on public accountability

Public accountability is a crucial aspect of good governance. It involves holding public officials and organizations accountable for their actions and decisions. Here's a process to enhance public accountability:

1. Establish clear expectations

- *Define roles and responsibilities*: Clearly outline the roles and responsibilities of public officials and organizations.
- *Set performance standards*: Establish clear performance standards and benchmarks to measure success.
- *Communicate expectations*: Effectively communicate expectations to the public and stakeholders.

2. Promote transparency

- *Open and accessible information*: Make public information easily accessible to citizens.
- *Regular reporting*: Provide regular reports on performance and financial activities.
- *Proactive disclosure*: Disclose information proactively, rather than waiting for requests.

3. Encourage public participation

- *Public hearings and consultations*: Organize public hearings and consultations to gather input from citizens.
- *Citizen advisory boards*: Establish citizen advisory boards to provide oversight and feedback.
- *Online platforms*: Utilize online platforms for public engagement and feedback.

4. Implement strong oversight mechanisms

- *Independent audits:* Conduct regular audits to assess financial and operational performance.
- *Legislative oversight:* Ensure strong legislative oversight to hold public officials accountable.
- *Media scrutiny:* Encourage media scrutiny to expose wrongdoing and inefficiency.

5. Establish accountability mechanisms

- *Performance reviews:* Conduct regular performance reviews of public officials and organizations.
- *Accountability frameworks:* Develop and implement accountability frameworks that outline consequences for non-compliance.
- *Whistleblower protection:* Protect whistleblowers who report wrongdoing.

6. Foster a culture of integrity

- *Ethical leadership:* Promote ethical leadership and behavior among public officials.
- *Code of conduct:* Establish a strong code of conduct and ethics.
- *Training and education:* Provide training and education on ethics and accountability.

By following these steps, organizations can enhance public trust, improve decision-making, and ensure that public resources are used effectively and efficiently.

20. Conclusions

The landscape of public and governmental accounting in the United States is both dynamic and complex, reflecting the evolving needs of businesses, individuals, and government entities. This chapter has traced the historical development of public accounting, highlighting key milestones such as the formation of the American Institute of Certified Public Accountants (AICPA) and the enactment of the Sarbanes-Oxley Act of 2002. These developments have shaped the profession, establishing rigorous standards and enhancing the role of Certified Public Accountants (CPAs) in ensuring financial integrity and compliance.

Public accountants provide essential services, including auditing, tax preparation, and consulting, which are critical to the financial health of their clients. The role of CPAs extends beyond technical expertise; they are trusted advisors who uphold high ethical standards and contribute significantly to the economic stability of the nation.

Governmental accounting, with its unique principles and regulatory framework, ensures transparency and accountability in the management of public funds.

The use of fund accounting, accrual basis accounting, and budgetary accounting are fundamental to maintaining fiscal discipline and providing clear, accurate financial information to the public. The regulatory oversight provided by bodies such as the Governmental Accounting Standards Board (GASB) and the Federal Accounting Standards Advisory Board (FASAB) is crucial in maintaining these standards.

Despite facing challenges such as increased regulatory burdens, global competition, technological advancements, and ethical dilemmas, the fields of public and governmental accounting continue to offer rewarding career opportunities. The demand for skilled accountants remains strong, driven by the ongoing complexity of financial environments and the need for robust financial oversight.

20.1 Future trends and challenges

As we look to the future, several trends and challenges will shape the field of accounting:

1. *Technological advancements*: The integration of artificial intelligence (AI) and automation will transform accounting practices, enabling more efficient data processing and analysis. Accountants will need to adapt to these technologies to remain competitive
2. *Cybersecurity*: With the increasing reliance on digital systems, cybersecurity will become a critical concern. Accountants will need to ensure the protection of sensitive financial data against cyber threats
3. *Regulatory changes*: Ongoing changes in regulations and tax laws will require accountants to stay updated and ensure compliance. This will be particularly important as governments adapt to new economic realities
4. *Sustainability reporting*: There will be a growing emphasis on sustainability and environmental, social, and governance (ESG) reporting. Accountants will play a key role in measuring and reporting on these factors
5. *Talent shortages*: The accounting profession will face challenges in attracting and retaining talent. Firms will need to invest in training and development to bridge the skills gap and appeal to younger professionals
6. *Globalization*: As businesses operate on a global scale, accountants will need to navigate international accounting standards and practices. This will require a deep understanding of cross-border financial regulations.

In conclusion, understanding the history, core services, and regulatory environment of public and governmental accounting provides valuable insights into their vital roles in the economy. As these professions continue to evolve, they will remain integral to ensuring financial transparency, accountability, and integrity in both the private and public sectors. Embracing future trends and addressing emerging challenges will be essential for accountants to thrive in this dynamic landscape.

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Remodeling Public Finance: Shifting from Cash Accounting to Accrual Accounting

Awwad Alnesafi

Abstract

The shift from cash-based accounting to accrual accounting is a major reform in Saudi Arabia's public finance as well as in the public sector financial reporting that entered into the Kingdom's determination to improve compliance with international standards as stipulated under the Vision 2030 agenda. This paper looks into the opportunities, challenges, and potential in the change of this paradigm shift that aims at better decision-making, sound fiscal management, and quality asset-liability management. The research method applied in this study is a qualitative research which involves a bibliographic survey of the extant literature, policies, and case studies across the globe as well as administration of interviews with accounting practitioners, policy-makers, and stakeholders in the KSA. The current study's thematic analysis reveals patterns and issues pertinent to the Saudi context and, as a result, provides understanding of issues that are central to the implementation and outlines in the literature. As the article anchors the global best practices which explain that while the shift brings about several concerns, it presents a daunting opportunity for a change in enhancing Saudi Arabia's public financial management as well as boosting sustainable fiscal governance.

Keywords: accrual accounting, public finance, fiscal transparency, financial governance, global accounting standards

1. Introduction

Currently, Saudi Arabia is in the progression of essential transformation associated with the noteworthy progress of putting into exercise the unconventional accounting techniques that match to the international standards. Formerly, the financial reporting systems in the kingdom generally complied with the cash-based accounting with limitations of reporting on financial firmness. Nevertheless, this alteration has happened and is now decisively impenetrable in a move to accrual accounting, which is reinforced by large-scale economic reforms as well as the strategic Vision 2030 progression. These modifications are significant for not only increasing the competence of observing the companies' financial performances by investors and stakeholders but also for rendering the Saudi undertakings more competitive to the global counterparts.

Accounting reforms are part and parcel of mainstream economic liberalization measures intended at reforming the Saudi Arabian economy and diversifying its mono-structural dependency on crude oil. These reforms are synchronized with the Vision 2030 agenda that is a strategic plan of upgrading for Saudi financial sector which outlines the requirements for constructing up-to-date financial infrastructure [1], applying high accounting standards, and accomplishing sustainable economic growth. This initiative purposes the enhancing Saudi's competency to establish a strong private sector that is more competitive, sustainable, diversified, and US Dollars earning that attracts Foreign Direct Investment (FDI) and improves business environment.

In this course of transformation, accrual accounting is exceptional as it interprets the recording of financial transactions based on the events that have the monetary and economic implication for the company irrespective of cash. Opposite to cash-based accounting, where recognizable transactions are only recorded considering the cash, accrual accounting accounts revenues and expenses when these are earned and incurred, respectively. Because of this, it becomes at ease to acquire a healthier representation of the consolidated position of the company's financials which is fundamental in strategic planning and objectives. Through accrual accounting, the Saudi industries can profit from better-quality result, improved financial analysis proficiency, and superior strategic risk management by the way of optimized resource allocation.

Similarly, the deployment of accrual basis of accounting is fundamental to support Saudi Arabia to align with IFRS as well as other international accounting standards. This alignment advances the standardized demonstration of financial statements, which is critical in enhancing investors' trust and access to international capital. Implementation of these standards empowers Saudi enterprises to target the demands of international investors and agencies, subsequently improving the chances of getting overseas capital for Saudi enterprises. It does not only help in FDI inflow but also benefits in constructing a stronger entrepreneurial base that in turn supports in diversification of economy.

The acceptance of accrual accounting practices improves the competitiveness of Saudi enterprises for the international market as it gives flawless and truthful information fundamentally required for both domestic and international laws. Consequently, the Saudi businesses, as they board into the globalization progressions, apparently in the kingdom at the moment, get courage to knock different avenues for both growth and innovations. Strategic partnerships, tractability to moving demands of global business atmosphere are painlessly attainable due to this upgraded fiscal responsibility.

The implementation of accrual accounting has many positives, and the attempt has unique difficulties that need to be oppressed for the progression to work. Businesses are bound to incur the expenditures of training, technology acquisition, and business practices conversion to upkeep with this sophisticated accounting system. In addition, there is a strong necessity for a cultural revolution, which infers those values which mirror such areas like openness and responsibility. The ethical finance should be fundamental to organizational culture in companies. Such changes are crucial not only for the principle of accuracy in financial reporting but also for constructing a corporate governance culture that carries the focus on a number of stakeholders and fund providers.

Conversely, it is also vital to distinguish that the changeover to the accrual accounting system has its countless potential for the growth of different lines of

business in a country. It indicates that enhanced operating skills and knowledge of the economic environment permits a company to adjust with a new situation successfully. The massive investment into human assets and technological base certainly effects the whole progress of the national economic system.

The Vision 2030 has assuredly assisted the adoption of accrual accounting. The nation is laying the foundation to attentively endure future economic difficulties as well as improve its place on the global competitiveness index. It supports in improving the level of financial reporting while introducing Saudi businesses to a right track as they progress in worldwide interconnectedness. Saudi Arabia is strengthening its position in the global economy for the succeeding generation through empowering strategic innovation, attracting foreign investment and developing the strategic management capability of decision-making. The introduction and integration of accrual accounting practices shall develop the foundation:

- for sturdy economic development,
- critical problems solving skills in the national and international economy,
- successful search for new opportunities, and
- the creation of the appropriate conditions.

All in all, the existing state of the progression of accounting in Saudi Arabia displays that the country has chosen the course of its modernization and globalization deliberately and consciously.

2. Transitional rationale

Saudi Arabia's transition from cash-based to accrual-based accounting in its public financial management and reporting is driven by numerous logical rationales [2]:

2.1 Higher financial transparency

The shift in policy-making from cash-based accounting system to accrual-based accounting system in public financial management and reporting could be perceived as a noteworthy footstep toward enlightening the domain of financial reporting. This move is also noteworthy for administrations because it has a substantial influence on not only Financial Reporting Procedure but on how monetary data are measured by the diverse stakeholders including people, policy-makers, and international investors. Accrual accounting meaningfully varies in terms of time and form of recognition of financial movements and delivers an accurate representation of the state of a government's finances too.

On the positive side, the practice of accrual basis of accounting for the provision of financial information is related to the enhanced level of financial transparency in numerous ways. The first benefit that can be expected from it is more accurate and comprehensible representation of private firms and government's financial health which permits stakeholders to appraise the actual state of affairs in the domestic economy. This enhanced transparency is crucial for the consideration of accountability because the stakeholders perceive the information supporting them in

examination of the accurate deployment of the public funds. Furthermore, improved financial reporting and disclosure based on accrual accounting has been chosen as the sole most essential factor to surge the trustworthiness of organizations in the eyes of the public and stakeholders. If the people can see suitable picture of how funds are disbursed, it supports them with trust in the government.

Additionally, these assertions are sustained by compliance with global accounting standards including the International Public Sector Accounting Standards (IPSAS). Through the formation of money laundry rules and the certified compliance to the prominent standards, Saudi Arabia will not only progress the reliability in-house level but also elevate the position it holds globally as one of the main performer in the international economic market. This orientation also considers that the country is transparent and responsible to its fiscal obligation toward foreign investors and financial institutions which may propel additional investment in country's economy.

It also reduces the possibility of creating erratic financial reports that could be prepared under cash-based accounting. For example, a government may display indicators of financial strength during the time of high cash balance such as during tax collections while gathering large parts of the liability. It can deliver a view of positive solvency which may hide prevailing problems in the financial system. Conversely, accrual accounting notifies these obligations, which give a detailed picture of organizational obligations and fiscal competence of the nations. The strength and weakness of the accrual accounting also contend in favor of its usage, as it supports to make some objective inferences about the government's capacity to satisfy present and future financial responsibilities.

Transformation of over dependence on cash basis to the practice of accrual basis of accounting in public financial management significantly enhanced financial reporting. Accrual accounting is a more effective style to get accurate evidence and information depicting comprehensive financial position of a government than cash accounting. Finally, accrual accounting comes out as an essential mechanism that can support government or organizations to boost the efficacy of governance and launch reformative financial policies. The advantages of such transformation do not end at the level of preparing and presenting the consolidated statement of financial status, but it conveys about transparency to inspire the public to be vigorously involved in the running of the nation's economy.

2.2 Enriched decision-making

Largely, the practice of accrual accounting in public financial management transforms decision-making organisms by proposing recent and comprehensive financial information about the fiscals of the government. The shifting of the accounting measurement technique empowers policy-makers to appraise the disequilibrium of liabilities and assets. This is a crucial contribution to the enhancement of policy-making, strategic resource allocations, and fiscal-oriented sustainability. Accrual accounting leads to a widespread set of financial data of present cash flows with the estimates of future financial obligations and capacities. By this way, the policy-makers are provided with suitable tools to take informed decisions which comprehend the understanding of predetermined associated costs.

Another crucial aspect of accrual accounting is it supports the policy-makers to assess the accurate state of activities of the public entities. It shows that, for instance, long-term liabilities and other debts form the part of the balance sheet, in addition to current assets, consequently give a better valuation of the net worth. For determining

the feasibility of fiscal frameworks as well as the devising of strategic adoptions regarding the appropriate expenditure, such financial transparency becomes obligatory.

In case, if a government is in a deficit, policy-makers may use accrual data to determine the level of disclosure that may need rectification. It will help them to work out their budget primacies and determine what can be fiscally cut or what innovative sources of revenue might occur. Henceforth, informed decision-making becomes a demand of picking the utmost sensible solution financially for the constructive consequences in terms of financial sustainability of public units. Fiscal business modeling, which comprises testing out what may occur if a specific fiscal strategy is engaged for overall fiscal sustainability, may be used by the policy-makers.

Furthermore, the findings delivered by accrual accounting drive the provision of the better strategic planning. Managers can do solid forecasts and credible outlook of various conditions with the help of systematic data composed from year to year. Understanding the nature of the existing and expected cash flows, the decision-makers can surface with more accurate budgets which are parallel to the prevailing economic realism. This competence is most valued in present day as wide-ranging and unanticipated economic fluctuations like instabilities in market, demography alterations, and geopolitical jeopardies which are away from the control of any government, affect the national wealth [3].

The performances based on the standards and goals of achievements over time can be measured by the use of accrual accounting. It also obliges specific public bodies to clarify their financial actions and performance in addition to increased transparency. The stakeholders in general are empowered to pin-point the effectiveness of spending consequently encouraging the public engagement. Creation of specific quality reports improves answerability because the stakeholders are in a situation to test or approve government policies with significant information.

2.3 Enhanced budgeting processes

Shifting from cash-based accounting to accrual accounting is a massive jump forward in handling organizational resources, and it has intense implication in the overall financial management concerns especially in the budgeting. This concept of transformation permits a more accurate considerate of an organization's financial information, a critical aspect in taking managerial and strategic decisions. Possibly, the prime gain linked with practice of accrual accounting is the capability to facilitate the match of budget with the cost of services rendered on a daily basis.

It can similarly be sustained that better control over the expenses and budgets due to accrual accounting have an uninterrupted impact on the resource allocation. When the budgets are technically supported by the analysis of the current and future liabilities, the authorities are habitually in a better position to take monetary decisions. It becomes even more valued in situations where resources are limited and numerous stakeholders are making claims.

Accrual accounting is also convenient in appraising organizational development requirements and determining the likely potential financial strength and correct calculations of future financial performance. This forecast ability, crucial for strategic planning for the long-term, offers the visual prompt for funding requirement by the institutions and probable challenges in fund raising so that effort can be put to deal with the issue preventatively.

Largely, the study displays that incorporation of the accrual accounting improves the eminence of budgeting by refining compliance of budgets with the real costs

of the services delivered. It strengthens the financial planning performances and financial accountability to supply enhancement in the overall financialization. That is why, the implementation of the accrual accounting is a decisive development and key step in achieving the goals in today's fast progressing economic atmosphere by streamlining and improving financial management. Through transparency, effective resources allocation, and correct assessment of cash flows, the accrual accounting has the capability to support organizations to address the problems and grab the development opportunity. Lastly, as it has previously been renowned that the transition to the accrual accounting is not just an alteration of the nature of account activities but it is clearly a strategic move to deliver organizations the bigger opportunity to use its resources to invest it for the accomplishment of institutional goals.

2.4 Aligned with global standards of public finance

Accrual accounting is an additional substantial move in the progress of public finance management in Saudi Arabia which guides the country's accounting practices toward the global standards especially International Public Sector Accounting Standards (IPSAS). The implementation of these standards is not just a methodical rectification; it is a whole course that broadens openness, responsibility, and, in general, the reform of public finance. Through the adoption of the accrual basis of accounting, Saudi Arabia boosts its trustworthiness and acceptability in the international arena of systemized financial associations within evolving globalized economy. In view of this, Saudi Arabia aligns itself with the necessity of IPSAS which targets at quality and standard in accurate, complete and comparable information in the financial reports of the public sector. Some of the doctrines of IPSAS include that it is analytically important for earning trustworthiness on the side of citizens, investors, and other extra-governmental international bodies.

The pledge of KSA to mix its public finance practices to follow the IPSAS to establish this nation as a recipient of best practices in the international markets while at the same time attesting to the corporate's financial policies to form of commercial partnership is vital for the national growth [4]. This will message the global commercial community that Saudi Arabia will perform its part as a responsible and trustworthy performer in Global Financial Markets. The level of compliance with the International Standards certainly impacts the comparability of financial data across the jurisdictions which is critical to investors and financial analysts who evaluate the financial position or operational efficiency of different countries. Because of the integration of accrual accounting and compliance with IPSAS, Saudi Arabia will bid stakeholders steady and comparable financial evidence to carry out significant performance measurement and assessment. This development serves to escalate investor trust and, at the same time, plants pressure on the countries to address concerns of financial management with the global economy.

The constructing trustworthiness with global investors, drawing investment and the enhancement of conformity with international standards in public financial management, would have a giant constructive impression on internal governance within Saudi public sector bodies. Compulsory reports of financial transactions in a well-timed routine stretch the accountants' accuracy and condense the likelihood of misappropriation over the use of accrual accounting. Public officials are lawfully made accountable for their budgetary actions and usage of funds which supports in improving budgetary obligation as well as realistic apprehensions with policy objects. Through the integration of accrual accounting practices, the public bodies can deliver

reports not only about the financial position but also for operational performance. This makes it easier for public managers to mobilize monetary resources for the achievement of national goals and objectives. For example, the managers can find the gray zones that need improvement and device modification in case of costs related to different programs.

To adopt the accrual-based systems of accounting, it is relatively common that staff development and capability enrichment programs are mandatory. To construct a competitive human wealth who will be able to apply contemporary accounting methodologies and principles of finances successfully, this system of accounting will empower Saudi Arabia to invest in its people to a successful implementation of accrual accounting but also to advance the all-purpose competence of the public sector finance workforces.

2.5 Performance evaluation and accountability

In determining stewardship and delivering services to the public especially by public corporate bodies, governing accountability and performance appraisal are considered crucial. In this respect, accrual accounting builds up these fundamentals by offering still richer understanding about the efficiency and productivity of public sector working. This method is convenient for refining the understanding of the stakeholders such as the government, citizens, and oversight bodies in terms of how resources are spent and used and the results arising from the utilization of resources.

The first benefit that can be resultant from accrual accounting is the detailed picture of the resources used to deliver public services. This weight enables the public entities to accurately identify all costs associated with service delivery which include inverted balances, employee entitlements, and the gradual wear and tear of various assets. Accrual accounting helps in decision-making by providing information on cost of economically significant resources that is useful in the assessment of the cost-efficiency of existing and proposed programs and projects for the execution of public missions and delivery of public services.

Additionally, performance measurement that accrual accounting delivers goes beyond the financial consequences of operations and contains the assessment of the outcomes attained through service provision by public entities. By preparing and submitting to the government both the amount of inputs used and the number of outputs delivered, the public managers can review the correlation between the two and determine which areas are performing optimally or need improvements. This approach led to the promotion of accountability within executing public officials, who are responsible for the outcomes of their programs and appraise plans to advance the delivery of service.

Besides internal decision-making, accrual accounting upsurges external accountability, as it enables stakeholders to have a clear picture of performance by the public sector. People of the nation on the other hand have the right for knowing how their money will be spent and the outcome of those investments within society. The use of accrual accounting practices permits the preparation of financial statements that not only present information on the state of affairs of public entities but also report on the concerns of activities. Such openness is crucial here because its absence undermines confidence in an organization.

The incorporation of performance measurement frameworks with accrual accounting enables the development of Key Performance Indicators (KPI), thus improving the strategic direction of financial management of public entities. This is

because of the incorporation of financial analysis with operations lets organizations to determine the levels of effectiveness.

Accountability through accrual accounting also encourages the development of a stronger system for the provision of sustained improvement within the public sector organizations. This way performance data can be used by public managers to commence transformation processes learnt by the performance data with an aim of improving service delivery and total organizational performance. In addition to facilitating accountability, this iterative process also inspires problem identification and solution and coping with complexity in the public sector.

Furthermore, consistent use of the accrual accounting enhances strategic management of resources since the accounts offer clarity on the opportunities created by different policies. Government organizations are able to prepare long-term financial forecasts, which is an indispensable tool to forecast potential ways of improvement, and deliver effective budgeting. It is even more valuable when there is economic crisis, and all the organizations, including those of public sector, have to address different needs. In times when public attention has become more focused, and people require much explanation and disclosure, accrual accounting can really help improving accountability. It also improves the accuracy of public reporting apart from enabling stakeholders to address public entities and demand accountability on performance thus increasing participation in governance.

2.6 Helping economic divergence

With Saudi Arabia beginning a visionary process of diversification of economy from being extremely reliant on petroleum, comprehensive financial management practices form one of the key transformations of this progression. This transformation is not reactive to wobbly oil prices, but a proactive one which should benefit the countries to deal with unstable economic atmosphere in the future. The transformation plan Vision 2030 launched by the Kingdom of Saudi Arabia sets out a blueprint to diversify the economy away from relying on hydrocarbon resources and to energize privatization of the economy [5, 6]. Fundamental to the realization of these lofty goals is the upgrading of financial management systems and structures with special regard to the conversion to accrual basis of accounting.

Accrual accounting is a major improvement which records economic events in the current accounting period. This method gives a broad perspective of the financial status of an entity as compared to absolute figures, thus enabling assessment of the historical financial accomplishment. In Saudi Arabia's current process of diversifying its economy and shifting from an oil-reliant economy to innovative sectors like technology or tourism or renewable energies, proper and timely financial information cannot be overemphasized. For this reason, the benefits of accrual accounting are most evident when appraising investments and as a general measure of the economic performance of a business enterprise. The principles of accrual accounting help to supply policy-makers and leaders with timely financial data and, therefore, will help them make efficient decision as to the real economic situation within the various sectors.

Additionally, the process of transforming Saudi Arabia's economy to focus on these newly emerging sectors is affected by the country's attempt to internationalize its monetary supply through the attraction of foreign investors. This puts pressure on the accuracy and credibility of financial disclosures made by Saudi Arabian firms. The function of accrual accounting is not limited only to the evaluation of individual investments; it also helps to consider the economic performance at macroeconomic

level [7]. Credible financial information facilitates better formulation of fiscal policies for government because it enhances precision of tracking public sector finances. Based on the scales of accrual accounting, Saudi government can control the expenses and receipts for administrative activities and improve the resource management. It is very useful with regard to the constantly shifting economic situation where accurate information is crucial for making necessary changes in legislation and policy as well as developing new business strategies [8].

It is noteworthy that, apart from enhancing the quality of investment and macro-economic assessments and the commitment to orderly accrual accounting as well, the adjustment to and enforcement of the new standards contribute to the development of an era of organization and responsibility. Due to insistence on compiling legal recognition of the ultimate amount of dollars, the entity will be obligated to pay in future in preparation of its financial statements, accrual accounting promotes responsible financial behavior and future planning. It is crucial to change this culture to create an environment in which organizations involve themselves in certain forms of businesses that are encouraged to pursue innovative opportunities.

The adoption of accrual accounting can improve the quality of public services. Therefore, in the process of the Saudi Arabian economic transition where the authorities are still stressed to stabilize the country's economy, the accrual accounting appears to be fundamental and valuable for the improvement of financial management. In addition to helping make sound decisions about investments, which is critical at the current stage of the country's development. While the Kingdom marches forward to the achievement of Vision 2030, the adoption of better financial management practices especially through adoption of the accrual accounting will prove to be central for the achievement of sustainable and diversified economy. Not only must this transition occur for stabilizing economic growth but it is also crucial for the development of a new, better economic future capable of withstanding the pressures of an ever evolving economy.

3. Cash to accrual accounting transition challenges in Saudi Arabia

Shifting from cash-based to accrual-based accounting system is a significant work-out for any country, and Saudi Arabia has its blend of challenges. Despite the widely accepted fact that using the principles of accrual accounting is beneficial for states, including the increase of financial transparency, improvement of the decision-making process, and attraction of foreign investments. As it has been pointed out that the way toward the implementation of the accrual accounting is paved with challenges [9]. These challenges can be categorized into several key areas: conducted at the organizational, technological, educational, cultural, regulatory, and financial reporting contexts.

3.1 Organizational structural challenges

One of the biggest problems arising from shifting from cash-basis accounting to the accrual basis accounting method is the prerequisite for widespread organizational changes. From an academic perspective, this transition can be understood through several key themes: sustaining change, organizational inertia, reengineering of functions, creation of corporate control mechanisms, and the requirement for cultural change of financial reporting. Each of these points synthesizes the vast blurred lines which define transitions between decision making methodologies in accounting.

Collectively, the following are some of the main challenges experienced during this phase. The first major challenge is organizational inertia. The latter can be defined as a tendency to stop changing or to be reluctant to change due to certain patterns and organizational culture as well as due to psychological factors that influence employees and stimulate them to carry on with the familiar mode of work. Companies that have adopted operational cash accounting for a long time may realize that current processes and accounting reports are imbedded into the organizational framework. It can show itself in many ways and forms—from disbelief in the usefulness and positive impact of implementing accrual system, fear of the unknown and mysterious data and processes which may appear in application of new systems.

To overcome this inertia, however, more than strategic planning is needed, but good management practices will do much better. Managers have to develop a persuasive vision to make accrual accounting advantageous, for example, increased accuracy of financial statements, improved decision-making capability, and compliance to regulations. It is important to engage people at all levels, from the organizational top to the bottom, in order to increase perceived commitment from the subordinates and lower the level of resistance. Awareness raising and accessible training and development should also form a large part of the strategy for remediating the knowledge deficits and cultivating self-assurance in the new accounting techniques.

The change to use accrual accounting means that certain fundamental processes throughout the organization need to be first analyzed and redesigned. While cash accounting recognizes transactions only when they involve the exchange of cash, accrual accounting demands that business recognize any economic event that happens, irrespective of the delivery of cash for the event. This shift in the fundamentals of financial reporting means that there is likely to be a need for review of responsibilities within organizations and its departments.

The issues with revenue and expense recognition also require the defining of the best processes for reengineering the company. The management of an organization must set specific rules that explain the frequency and manner in which transactions should be documented. This can be specifically demanding in those businesses whose revenue recognition principles demand a lot of judgment or estimation, for example, construction or software development industries.

For adopting or implementing new accounting standards, there is usually a requirement to either develop or strengthen an internal audit. Accrual accounting brings in more complications comparative to the amount of time and approach to be taken in order to identify revenues and expenses to be recognized. Some of the requirements may not fit well into the current organizational structures, and hence many organizations may experience some form of a gap during the transition which may take time to optimize.

To ensure the internal control system keeps checking on the integrity of the financial reporting and compliance with the legal requirements, the organization should establish the sound internal control procedures [10]. This includes setting up procedures for documenting and approving all deals, along with using audits for checking organizational compliance of consecutive accounting processes using the accrual method. Managers may also want to sit down and discuss how vulnerabilities are identified during the transition and come up with ways of avoiding them.

In addition, since internal controls affect the financial processes so training on internal controls are essential for all workers dealing with these functions. Employees need to be aware of standard procedures and realize that they are a part of chain of protection against fraud and errors. The compliance and accountability tendency are

very important to promote the culture of transparent and ethical system of the organization. The change in accounting from cash to accrual-based accounting requires shifting the culture in how organizations think about financial management. This transition requires the shift from the simple notion of cash flows to flow of events and effects over time. All stakeholders require evolving their outlook from short-term cash availability to longer-term ones.

3.2 Educational challenges

The transformation process from cash to accrual accounting systems in organizations is a multifaceted progression with both broad organizational and managerial consequences for financial reporting systems. This transition is particularly crucial in countries such as Saudi Arabia that have for long been employing conventional cash-based accounting solutions. From the academia point of view, it is possible to enhance this process from the points of educational credentials, skills, the part played by professional development, and the perspective of training for future workforce.

Training programs should be created and put into practice in order to fill this gap, providing all the necessary knowledge. Such programs should be able to target all professionals who in one way or the other are involved in the preparation and reporting of financial statements or the management of an organization, including accountants, finance managers, auditors, and even non-financial managers who require knowledge and understanding of how accrual accounting impacts his/her department [11]. These should include basic and key aspects of accrual accounting and other aspects that may include rigid aspects of the International Financial Reporting Standards (IFRSs), and other sectorial or organizational aspects of accounting that may develop over a period of time in relation to the adoption of new mode of accounting.

It therefore calls for the enhancement of training curricula. Employers in the local workforce should engage educational institutions and other professional bodies and academic faculties to ensure that there are programs which can meet with the demands of the local market [12]. It may cover such forms as workshops, seminars, and online classes which may be convenient and responsive to time constraints for the working population. In addition, curricula should use examples which operates from real-life situation that is experienced with the change of systems to accrual accounting. It brings home the realities of professional practice in solving similar problems in other organizations, thus enriching learning and practical experiences. There is the absence of well-coordinated training programs which can assist in creating a competent workforce which could manage the conversion to the accrual based accounting system. Monitoring of training tends to ensure that training programs are maximally harmonized to set basic competencies expected in the field. It thus can enhance the level of confidence among the stakeholders of different organizations with regards to the financial reports compiled by those organizations.

The schools symbolize an important role in molding the future generation of accountants to meet the demands for effective change to accrual accounting. For that reason, institutions need not only to pay proper attention to the theoretical knowledge but also to give the premium value to that domain. The effectiveness of the simulated environment, internships, and the opportunity to work on business cases through partnership with local companies may offer student practical information on the practical application of the theory of accrual accounting. Also, students should be introduced to the best educational programs that enhance computer skills

in accounting activities since the use of accounting software has been increasing and since accounts are now using more software that helps in accrual accounting.

In its capacity, the transition to accrual accounting is not a one-off process; rather, it is a long-term occupation of the professional. Generally, standards and practice in accounting are constantly changing due to changes in laws, the use of computer systems, and economical situations in the world. As such, there is the need for the organization to popularize and integrate the culture of lifelong learning in organizations. Such commitment to continuing education may assume different shapes, and these may range from workshop attendance, industry conferences, and subscription to professional journals/online resources containing relevant updates on current developments in accounting standards.

3.3 Social and cultural barriers

Another constraint to the implementation of accrual accounting is cultural conviction. The resistance root stems from culture which can be seen in organizations that have embraced accrual accounting after having operated for many years on the cash accounting system. This resistance is not a superficial layer of imposition; it is a serious pervasive culture issue that threatens the change process on the level of attitudes, behavior, and—therefore—outcomes.

Cultural resistance to change can be discussed employing different theoretical perspectives concerning organizational culture as a crucial factor affecting employees. Edgar Schein's Organizational Culture Model is particularly relevant, as it outlines three levels of culture: tangible aspects, namely, artifacts (what is seen and touched), espoused values (the code of conduct and beliefs), and the latent aspect, underlying assumptions (the unseen but real core beliefs). Consequently, in numerous organizations, specifically in the public domain, cash accounting has become institutionalized and has been viewed as an organizational cultural asset. The employees can start perceiving such practices as more than mere protocols that should be followed, but organizational values that are considered an essential part of the worker's code of ethics, which results in massive resistance toward the adoption of new methods that question these practices.

Culture resistance is a big issue in the implementation of change, and there is a close relationship between leadership and culture needed to overcome this hurdle. On the one hand, at the same time, it is acknowledged that leaders not only define organizational culture but also affect the perception and behavioral attitudes of employees regarding the transition. It is also important to note that the transformational leadership style is most conducive for creating a culture of adaptation and innovation. Leadership capabilities, particularly of the transnational kind, mean that vision can be communicated well and that the change to accrual accounting is framed as being consistent with other goals of the organization.

Also, change leaders are required to model and champion the change process. They can assure the employees and create the confidence among them when they are actively participating in the creation and implementations of the company policies. Whenever leaders themselves are willing to change regarding new accounting practices within their organizations, they act as reference points and other stakeholders will be compelled to make similar changes as well.

Employing diverse number of communication tools like newsletter, intranet, company meetings, and Webinars can help to address every employee. In addition, making provision for comments and discussion ought to be made in order to help

address those concerns and misunderstandings that may lead to resistance. This communication strategy known as proactive communication supports—ADKAR Model of change management—that calls for awareness, desire, knowledge, ability, and reinforcement. It is vital in the change process to involve the stakeholders in order to ensure they have the personal stake in the new accounting policies. Where employees are encouraged to participate in the discussions pertaining to the transition process, they are most likely to get a sense of worth, which acts as a mechanism to eradicate any resistance that was likely to occur.

3.4 Regulatory challenges

A shift from the cash-based system of accounting to accrual system of accounting in Saudi Arabia can therefore be described as a significant change in the nation's fiscal reporting. This evolution is not an addition, subtraction, or merely a tweaking but an overhaul of the entire economy and institutions. An academic exploration of this shift reveals several critical dimensions: the significance of the regulatory environment, stakeholder participation, the impact on the management of finances, and the objectives of the program for the diversification of the economy.

Regulations remain the center-point around which changes toward accrual accounting rests on. In essence, the overall regulatory regime is the foundation for overhauling existing and implementing new accounting standards. The Saudi Arabian government has recently highlighted its desire for improving the financial management of its organizations; however, despite high-level rhetoric for change, the lack of an effective legal and regulatory basis for this process has the potential to seriously hamper it.

The experience of transition to accrual accounting requires a well-defined legal basis in the legislation system of the country. For such a framework, organizations should have fill-out working guidelines and standard that would make it possible for a firm to be using it as a map when engaging in their activities. The absence of such guidelines makes it possible to arrive at divergent meanings of the accrual accounting leading to fragmented financial reporting that goes against the intended spirit of the goals of the measurement framework targeting the areas of transparency and accountability.

Furthermore, current legislation and regulations can also prove very rigid to amend in order to incorporate the accrual accounting information. This is not simply a process of changing words; in a significant way, it requires a change of paradigm in terms of how financial reporting is done and public financial management systems are structured. Any such process is bound to be elaborate and can be even time-consuming given the fact that there is consideration of domestic as well as international standard [13].

Accrual accounting can only be implemented when a wide range of stakeholders is willing and committed to participate in the process. This includes any and all departments of the government, accounting professionals, industry authorities, and organizations as well as civil society organizations. Every one of these groups has different perspectives and experience which is invaluable to the formulation of a functional and workable set of rules. Stakeholders must be encouraged to discuss regulatory changes for a number of reasons. It firstly creates unity of people with the same goals, which is useful for considering various perspectives when developing effective guidelines. For example, professional bodies such as accounting and financial organizations can help in coming up with practical implementation issues on accrual

accounting, while other representatives of industries can explain consequences of applying accrual accounting on business activities and reporting.

Also, as to the stakeholder engagement, it may also increase the credibility of the new format. This means that when it comes to perceiving how decisions made by these stakeholders affect them; there is increased likelihood to support the change. The accrual accounting implementation will only be successful if there is collective compliance with the new standards. In addition, education and training activities are likely to be needed to develop the capacity of the various stakeholders in the context of the change in the accounting practices. This may include designing courses that may serve to build the capacity of accounting professionals as well as offering materials that organizations may adopt when transforming their people's operations. Strong human capital of Saudi Arabia is the key prerequisite for a successful implementation of the accrual accounting, and investments into the human capital can make Saudi Arabia secure this type of capital for the future.

These changes have fundamental impacts on the nature of financial management practices inside Saudi Arabia through transfer to accrual accounting. As a result of accrual accountings, the government and organizations will have a better picture of their state and performance. Accrual accounting records transactions based on the economic reality of the occurrence rather than the physical exchange of money and as such offers a better measure of financial position.

However, it was acknowledged that the adoption of the system of accrual accounting can greatly enhance the accountability and transparency in the financial management area. Improvements to the quality of financial statements reduce the potential for improper use of funds and possible corruption because the general public is in a position to monitor the efficient use of public resources. Such transparency can help rebuild public confidence in the leaderships of the government and is a precondition for the formation of a stable economic environment. The switch to accrual accounting is undoubtedly tied to Saudi Arabia's general economic diversification agenda expressed in Vision 2030. This magnificent plan and strategy have the long-term vision of the country to minimize the influence of oil and diversify the economy along its development where it has planned sectors such as tourism, entertainment, technology.

Also, it encourages the enhancement of an effective accrual accounting system which in turn enhances the effectiveness in evaluating the performance of some public sector initiatives. In addition to enhanced efficiency in tracking revenue, policy-makers can determine the impact of different programs and projects and make the right decisions in an effort to support the wider aims of the diversification of the economy. This feedback is very important in the management of strategy and resource use and hence helps in the sustainability of any given strategy. In this regard, accrual accounting can be a very useful tool to ensure the better understanding of actual situation of different governmental units and state-owned companies. As the government aims at attracting foreign investment and enhancing the private sector development, the accuracy of financial information is crucial. Potential investors prefer to deal with firms which are reliable and in compliance with accounting standards set internationally.

4. Conclusion

All in all, the shift from cash basis to accrual basis of accounting offers opportunities as well as threats of considerable proportions for organizations, and hence

the need for strategic management for change. It is worth considering that there is just about a list of advantages of adoption of accrual accounting including increases in financial transparency, effectiveness of decision-making, and attraction of the foreign investment. However, it is also worth to realize that the process of its adoption may be challenging. The key questions that organizations experience based on a business case for the implementation of accrual accounting system include: technological infrastructure, cost, change, and education.

Implementation of accrual accounting needs specialized technology to support the accounting systems as well as to meet accounting standards. They therefore require better accounting systems including purchased software, data management policies, and recurrent staff education to handle these complications of an accrual system. Another problem to be solved during the implementation of these transformations is integration issues, and data migration that results in conversion issues, compatibility of systems, and regulatory compliance all add another layer of technological difficulties that organizations face during this process.

Finally, from a cost standpoint, new form of accounting may imply overhead cost due to compliance with the accruals particularly in the small organizations or public enterprises which often work under bony budgets. Many organizations will invest heavily in adopting the technology needed to support accrual accounting, training needed to implement the system, and the constant support that may be required once the new system is in place; therefore, organizations will need to ensure that they do a cost benefit analysis of using the new system of accounting against the benefits they expect to realize in the future.

This paper supports that change management is crucial in helping organizations to transform to the use of accrual accounting. Chief and other pertinent authorities have the responsibility of marketing the accrual accounting, with focusing at all levels of stakeholders and encouraging policy continuous updating.

Education and skill development in accrual accounting transition is a critical part. Programs here have to ensure that they come up with the needed training for accountants who may always be associates of organizations using cash-based systems and who will need a basic understanding of concepts like the international financial reporting standards. Creating competence enhancing training curricula to suit the needs of the local work force require active participation of training institutions and practicing organizations.

It is evident from the various discussion made in this article that the transition to adopt accrual accounting has the potentials that can benefit organizations greatly though it comes with challenges which need proper management in terms of money, technology, change and training. Overcoming all these issues is vital if organizations are to tap into accrual accounting benefits, improve their financial reports, and make strategic decisions within the complex and growing digital environment.


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Chapter 7

Using the Government Blockchain in Cryptocurrency: Present and Future

Jacob Habashi

Abstract

Blockchain technology has emerged as a disruptive force in the financial sector, offering unparalleled transparency, security, and efficiency in managing digital transactions. Governments around the world are increasingly adopting blockchain to enhance their operational capabilities and address the challenges posed by decentralized cryptocurrencies. This chapter will explore the current utilization and future potential of government-endorsed blockchain frameworks in the cryptocurrency ecosystem. It will examine how these initiatives impact financial transparency, regulatory compliance, and economic inclusivity, while also addressing the challenges and ethical considerations involved. The chapter begins by providing an overview of government blockchain initiatives worldwide, focusing on their application in central bank digital currencies (CBDCs), taxation systems, and anti-money laundering efforts. It then delves into the interplay between these frameworks and decentralized cryptocurrencies, discussing their coexistence and potential synergies. Case studies from pioneering nations, such as China's Digital Yuan project and Estonia's blockchain-based e-governance, will illustrate real-world implementations. Looking toward the future, the chapter hypothesizes scenarios for the global adoption of government blockchain in cryptocurrency, considering technological advancements, geopolitical influences, and economic trends. It will critically assess the risks, including potential overreach, surveillance concerns, and barriers to interoperability, proposing actionable recommendations to ensure equitable and sustainable development.

Keywords: blockchain technology, government Blockchain, cryptocurrency, central Bank digital currency (CBDC), blockchain regulation, financial transparency, decentralized finance (DeFi)

1. Introduction

1.1 Target audience

The chapter is intended for a multidisciplinary audience, including:

- *Academics, researchers, and students in blockchain and cryptocurrency research:* Identifying gaps and opportunities for further exploration in blockchain integration and cryptocurrency adoption.
- *Policymakers and government officials involved in digital currency initiatives:* Developing balanced regulatory frameworks that support innovation while ensuring financial stability and consumer protection.
- *Industry professionals and investors interested in the regulatory landscape of blockchain:* Leveraging government blockchain initiatives to enhance transparency, compliance, and operational efficiency.
- *Developers and technologists working on blockchain-based solutions:* Creating innovative tools that align with emerging government blockchain frameworks and standards.

The integration of blockchain technology into government operations and the broader cryptocurrency ecosystem marks a transformative juncture in the evolution of global financial systems. As blockchain continues to revolutionize traditional industries, its promise of enhanced transparency, security, and efficiency is reshaping both the public and private sectors. Recognizing this potential, governments worldwide are actively exploring blockchain's applications in critical areas such as Central Bank Digital Currencies (CBDCs), financial services, regulatory frameworks, and consumer protection.

Realizing this vision will require sustained collaboration among governments, financial institutions, regulatory bodies, and technology developers. By addressing the challenges of blockchain adoption and crafting clear, forward-thinking regulatory frameworks, governments can unlock their potential to foster innovation, safeguard consumer interests, and ensure financial stability. As countries like China and the European Union advance their CBDC initiatives, and nations like Estonia and Singapore demonstrate the transformative impact of blockchain in public services, the path forward becomes clear: embracing blockchain's promise while building a more inclusive, secure, and innovative financial future.

1.2 Blockchain technology

Blockchains are a form of a digital register that once altered cannot be done so without leaving a trail of the alteration. Since these digital ledgers are deployed in a distributed fashion, there is usually no central storage system, such as a bank, corporation, or even a government. This is because there is no need for a centralized store and supply entity [1].

In its simplest form, blockchains allow a list of people to record transactions between each other using a single ledger. This is because of the design of the network

and hence, once a transaction has been recorded on a blockchain, it cannot be modified, making it impossible to modify the transaction. Therefore, a Blockchain is a distributed and time-stamped database that allows the management of assets in each business network. In other words, a Blockchain is a decentralized, unchangeable ledger that makes it easier to record transactions and manage assets within a commercial network. An asset can be defined as anything that has a physical existence, for instance, a house, a car, money, or even a piece of land [1].

However, other intangible assets may include things such as intellectual property, patents, copyrights, and trademarks among others. As such, a blockchain network can list and transfer any asset of value, thus reducing the risks and costs involved for all the involved parties [1].

The launch of the Bitcoin network in the year 2009 can be considered the birth of blockchain technology, the beginning of widespread public awareness of this technology as this is when the public became aware of the existence of blockchain technology. When implementing Bitcoin and other systems presumed to be like it, it is assumed that the processing of the digital information that symbolizes digital payment is done through a distributed network system [1].

1.3 Government blockchain

Government blockchain refers to the adoption and utilization of blockchain technology within public sector systems. This technology is designed to enhance transparency, compliance, security, and efficiency in government operations. By decentralizing and securely recording transactions, government blockchain initiatives have the potential to revolutionize various domains, including public administration, finance, healthcare, and voting systems [1].

One prominent example of government blockchain is Estonia's e-governance system. Estonia employs blockchain to secure its citizens' data and facilitate services like digital identification, online voting, and e-taxation. This integration not only streamlines administrative processes but also ensures data integrity and reduces fraud. Additionally, China's Digital Yuan project demonstrates the use of blockchain to modernize monetary systems, allowing the central bank to monitor and control the currency's circulation while maintaining some transparency for users [2].

Governments also use blockchain to combat corruption and promote accountability. For instance, the United Arab Emirates (UAE) has implemented blockchain-based land registries to prevent fraudulent property transactions and increase trust in the real estate market. Such applications showcase the versatility and impact of blockchain in fostering public trust and operational efficiency [1].

2. The role of government blockchain in shaping cryptocurrency ecosystems

The intersection of government blockchain and cryptocurrency ecosystems has created a dynamic landscape where regulation and innovation coexist. Government blockchain initiatives, such as Central Bank Digital Currencies (CBDCs), are reshaping the cryptocurrency domain by introducing digital assets backed by sovereign authorities. These assets aim to combine the benefits of blockchain—such as transparency and immutability—with the stability and trust of government backing [3].

For example, the European Central Bank's exploration of a Digital Euro exemplifies how governments can leverage blockchain to compete with decentralized cryptocurrencies like Bitcoin and Ethereum. Unlike decentralized tokens, CBDCs are governed by central authorities, enabling greater control over monetary policy and financial stability [3].

However, this integration poses challenges, including the potential clash between centralized control and the decentralized ethos of cryptocurrencies. Governments must address issues of privacy, surveillance, and interoperability between public and private blockchain networks. For instance, India's ongoing efforts to regulate cryptocurrencies while developing its own CBDC highlight the complexities of fostering innovation without stifling private sector contributions.

Government blockchain frameworks can also foster collaboration with decentralized finance (DeFi) platforms. By setting standardized protocols and regulations, governments can ensure compliance while enabling secure integration with public blockchains. This synergy can enhance financial inclusion, especially in underserved regions, by combining the efficiency of government oversight with the innovation of the cryptocurrency ecosystem.

3. Government blockchain: Catalyzing the future of digital finance

The adoption of blockchain technology by governments is reshaping the digital finance landscape. Government-backed blockchain initiatives, such as Central Bank Digital Currencies (CBDCs), are bridging the gap between traditional finance and emerging technologies, driving innovation and inclusivity.

CBDCs are a prime example of this transformation. These digital currencies, issued and regulated by central banks, combine the benefits of blockchain with the stability of fiat currency. China's Digital Yuan exemplifies this shift, allowing for real-time transactions and enhanced financial oversight. Similarly, the Bahamas' Sand Dollar is enabling financial access in remote regions, demonstrating blockchain's potential to promote economic inclusion [4].

Governments are also using blockchain to combat financial crime. Blockchain's transparent and immutable nature aids in detecting fraudulent activities and ensuring compliance with anti-money laundering (AML) regulations. For example, the Monetary Authority of Singapore (MAS) employs blockchain to enhance regulatory monitoring and streamline financial reporting [5].

Furthermore, government blockchain initiatives foster innovation in decentralized finance (DeFi). By establishing regulatory frameworks, governments can facilitate the integration of public and private blockchain ecosystems, unlocking new opportunities for collaboration. Estonia's e-Residency program illustrates this synergy by enabling entrepreneurs to establish blockchain-based businesses with global reach [6].

However, challenges such as interoperability and regulatory fragmentation persist. Governments must adopt standardized protocols and collaborate internationally to address these issues. Additionally, balancing innovation and privacy is crucial to prevent overreach and build public trust.

Therefore, government blockchain initiatives are at the forefront of the digital finance revolution by leveraging blockchain to enhance financial systems and promote inclusivity, governments are catalyzing a new era of innovation and stability.

The continued evolution of these initiatives will shape the future of global finance, fostering collaboration between the public and private sectors [1].

4. Blockchain in government: The New Frontier for cryptocurrencies

Blockchain technology is redefining governance by enabling more secure, transparent, and efficient systems. Governments adopting blockchain are inadvertently laying the groundwork for cryptocurrencies to thrive in a regulated environment.

One key area is the use of blockchain for digital identity management. Estonia's digital ID system, built on blockchain, is a pioneer in this domain. By enabling secure and seamless identity verification, Estonia has created a foundation for blockchain-based financial services, including cryptocurrency transactions [6].

Another example is the exploration of blockchain for intergovernmental operations. The European Union's European Blockchain Services Infrastructure (EBSI) demonstrates how blockchain can facilitate cross-border services while ensuring compliance. Such initiatives indirectly benefit cryptocurrencies by showcasing blockchain's scalability and reliability.

The adoption of blockchain for regulatory compliance further supports cryptocurrency ecosystems. Blockchain-based smart contracts enable automated compliance checks, reducing costs and inefficiencies. For instance, the U.S. Department of Homeland Security has explored blockchain for supply chain verification, demonstrating its potential for secure and efficient oversight.

Despite these advancements, challenges such as resistance to change and technological barriers persist. Governments must adopt a collaborative approach to overcome these hurdles and unlock blockchain's full potential for governance and cryptocurrencies.

5. From regulation to innovation: Government blockchain in action

Government blockchain initiatives are transitioning from regulatory tools to innovation enablers, creating opportunities for cryptocurrencies and decentralized technologies [7].

Central Bank Digital Currencies (CBDCs) are a clear example. Projects like Nigeria's eNaira demonstrate how governments can use blockchain to create innovative financial systems that promote inclusivity. By leveraging blockchain's transparency and efficiency, CBDCs are providing a stable alternative to volatile cryptocurrencies [8].

Blockchain's application in public procurement is another innovative use case. Chile's use of blockchain to track government contracts enhances transparency and reduces corruption. Such applications build public trust in blockchain, indirectly fostering cryptocurrency adoption.

Furthermore, blockchain in government enables decentralized applications (DApps) to flourish. By providing infrastructure and regulatory clarity, governments are creating a fertile environment for innovation. For instance, Dubai's blockchain strategy includes support for startups developing DApps, bridging the gap between public and private blockchain ecosystems [1].

Challenges such as interoperability and privacy concerns remain significant barriers. Governments must address these issues through international collaboration

and standardized protocols to ensure the seamless integration of blockchain technologies across sectors.

6. Leveraging government blockchain initiatives to enhance transparency, compliance, and operational efficiency

Government blockchain initiatives hold immense potential to enhance transparency, compliance, and operational efficiency across public and private sectors. By leveraging blockchain's inherent characteristics—immutability, decentralization, and real-time data sharing—governments can transform their operations and foster trust among stakeholders [1].

6.1 Transparency

Blockchain's immutable ledger ensures that all transactions are permanently recorded and accessible for verification. For example, the government of Georgia implemented a blockchain-based land registry system that enables citizens to verify property ownership and transaction history transparently. This initiative reduces the risk of corruption and enhances public trust [9].

Similarly, Chile's National Energy Commission uses blockchain to track and publicly disclose energy data, ensuring transparency in energy pricing and distribution. By making data tamper-proof and accessible, governments can address concerns of manipulation and promote accountability.

6.2 Compliance

Compliance with regulatory requirements is a critical aspect of governance. Blockchain simplifies this process by providing a single source of truth for all transactions. For instance, the Monetary Authority of Singapore (MAS) utilizes blockchain to streamline regulatory reporting for financial institutions, ensuring compliance with anti-money laundering (AML) and combating the financing of terrorism (CFT) regulations [5].

Furthermore, blockchain enables automated compliance through smart contracts. These self-executing contracts enforce regulatory conditions without manual intervention. For example, blockchain-based supply chain systems can ensure that goods meet regulatory standards before entering a market.

6.3 Operational efficiency

By automating processes and reducing bureaucratic overhead, blockchain enhances operational efficiency. The United Arab Emirates (UAE) has applied Dubai's Smart Dubai initiative, which leverages blockchain to digitize government services, eliminating paper-based transactions and reducing processing times. This initiative is projected to save the government over \$1 billion annually in operational costs [1].

Additionally, blockchain streamlines cross-border trade by reducing documentation requirements and enhancing data accuracy. The World Trade Organization (WTO) highlights how blockchain can simplify customs procedures, reducing delays and fostering economic growth.

7. Challenges and future directions

Despite its benefits, implementing blockchain in government operations faces challenges such as high initial costs, technical complexity, and resistance to change. Governments must invest in capacity-building programs and foster public-private partnerships to overcome these barriers.

Future advancements in blockchain interoperability and scalability will further enhance its utility in governance. Governments should also prioritize data privacy by implementing robust encryption protocols and adhering to international standards.

In conclusion, government blockchain initiatives are transforming transparency, compliance, and operational efficiency. By addressing implementation challenges and embracing innovation, governments can unlock the full potential of blockchain technology to improve public services and governance frameworks [10].

8. Creating innovative tools that align with emerging government blockchain frameworks and standards

The emergence of government blockchain frameworks and standards presents an opportunity for innovators to develop tools that align with these guidelines, fostering synergy between public and private sectors. By creating solutions that adhere to regulatory requirements while leveraging blockchain's potential, developers can drive widespread adoption and impact [11].

8.1 Blockchain-based identity solutions

Digital identity is a cornerstone of government blockchain initiatives. For example, India's Aadhaar system integrates blockchain technology to provide secure and tamper-proof identity verification for over a billion citizens. Innovators can build tools that enhance this system by integrating biometric authentication and decentralized identity management solutions, ensuring privacy and data ownership [11].

8.2 Supply chain transparency tools

Supply chain management is another area ripe for innovation. Governments worldwide are adopting blockchain to ensure traceability and compliance in supply chains. For instance, the European Union's blockchain initiatives for food safety aim to track the journey of agricultural products from farm to table. Developers can create tools that provide real-time data visualization and predictive analytics, enabling stakeholders to make informed decisions [12].

8.3 Smart contract frameworks

Smart contracts are integral to automating compliance and reducing administrative overhead. Innovators can develop user-friendly platforms that allow governments and businesses to deploy, manage, and audit smart contracts seamlessly. These platforms should align with emerging standards, such as those outlined by the International Organization for Standardization (ISO), to ensure interoperability and security [13].

8.4 Cross-border payment solutions

Cross-border payments remain a challenge due to high fees and delays. Government blockchain frameworks, such as the ASEAN Blockchain Consortium, aim to streamline regional payment systems. Developers can create tools that facilitate real-time currency exchange and settlement, leveraging blockchain's efficiency and transparency [10].

8.5 Public sector DApps

Decentralized applications (DApps) tailored to public sector needs can enhance service delivery. For instance, blockchain-based voting DApps can ensure election integrity by providing a transparent and secure platform for casting and counting votes. Innovators must prioritize user experience and scalability to drive adoption in large-scale implementations [10].

8.6 Challenges and the path forward

Developing tools that align with government frameworks involves navigating regulatory complexities and ensuring compatibility with existing systems. Collaboration between developers, policymakers, and standards organizations is essential to address these challenges.

Furthermore, innovators must balance innovation with ethical considerations. For example, tools that handle sensitive data should prioritize privacy and adhere to global data protection standards, such as the General Data Protection Regulation (GDPR).

Therefore, creating innovative tools that align with emerging government blockchain frameworks and standards is a vital step toward realizing the full potential of blockchain technology. By fostering collaboration and adhering to best practices, developers can contribute to a more transparent, efficient, and inclusive digital ecosystem [10].

9. Public sector blockchain and its impact on cryptocurrency innovation

Public sector blockchain initiatives are driving innovation in the cryptocurrency landscape by creating regulatory clarity and fostering trust in blockchain technology. Governments worldwide are embracing blockchain to modernize their operations, indirectly influencing the evolution of cryptocurrencies.

For instance, government projects like the United Arab Emirates (UAE) Blockchain Strategy 2021 have highlighted how blockchain can streamline administrative tasks while bolstering innovation. By implementing blockchain across various departments, the UAE reduced paperwork and enhanced efficiency, setting a benchmark for other nations [1].

Moreover, blockchain in the public sector facilitates cryptocurrency adoption by addressing concerns about security and trust. The Indian government's consideration of blockchain for land records and health data demonstrates how public sector projects can establish credibility for the underlying technology. This credibility trickles down to cryptocurrencies, encouraging broader acceptance.

Public-private partnerships are also a significant driver of cryptocurrency innovation. Governments collaborating with private blockchain firms enable the development of hybrid systems that merge public oversight with private innovation. For

example, the partnership between IBM and local governments to develop blockchain-based supply chain solutions has accelerated the integration of blockchain across industries, including finance and logistics [14].

Challenges such as interoperability and regulatory gaps remain. Governments must balance regulatory oversight with the need for innovation to ensure that public sector blockchain initiatives continue to support cryptocurrency development.

10. Cryptocurrency meets governance: Blockchain in the public sector

Blockchain technology is transforming the public sector by introducing unprecedented levels of transparency, efficiency, and accountability. As governments adopt blockchain to modernize their operations, they unlock new opportunities to enhance governance frameworks and public service delivery [15].

One notable application is the use of blockchain for voting systems. Blockchain-based voting ensures that election results are tamper-proof and auditable, addressing concerns of fraud and manipulation. For example, West Virginia in the United States piloted a blockchain voting system for overseas voters in 2018, demonstrating how the technology can empower citizens while maintaining election integrity [10].

Another impactful area is land registration. Countries like Georgia, Sweden, and The United Arab Emirates (UAE) have implemented blockchain-based land registries to streamline property transactions and prevent disputes. By securely recording ownership data on an immutable ledger, these systems reduce bureaucratic inefficiencies and foster trust among stakeholders [10].

Taxation is also being revolutionized by blockchain. Governments are utilizing the technology to enhance tax collection and compliance. The Australian Taxation Office (ATO), for instance, leverages blockchain to track goods and services tax (GST) obligations, reducing tax evasion and ensuring accuracy [16].

While the benefits are evident, challenges remain. Privacy concerns, integration complexities, and high implementation costs are significant barriers. Governments must address these issues through robust policies and partnerships with technology providers. Nonetheless, blockchain's potential to revolutionize governance is undeniable, paving the way for more transparent and efficient public sectors [10].

11. Gaps and opportunities for further exploration in blockchain integration and cryptocurrency adoption

The rapid proliferation of blockchain technology and cryptocurrencies has brought forth a myriad of opportunities, but it has also revealed significant gaps that demand attention. Addressing these gaps and leveraging opportunities are critical for the sustainable growth of the blockchain ecosystem.

11.1 Interoperability among blockchain platforms

One of the most pressing gaps is the lack of interoperability between blockchain platforms. Most blockchain networks operate in isolation, hindering seamless communication and data exchange. For example, Ethereum and Binance Smart Chain have separate ecosystems, limiting cross-platform functionality. Interoperability solutions like Polkadot and Cosmos aim to bridge these divides, but widespread adoption remains limited.

Opportunities lie in developing universal standards and protocols to enable blockchain interoperability. Governments and private enterprises can collaborate to establish cross-chain frameworks, facilitating cohesive blockchain ecosystems. This advancement could drive innovation in decentralized applications (DApps) and enhance user experiences across platforms.

11.2 Regulatory uncertainty

Cryptocurrency adoption faces significant hurdles due to unclear and inconsistent regulations. Jurisdictions vary widely in their approach to cryptocurrencies, ranging from outright bans to full-scale adoption. For instance, while El Salvador has embraced Bitcoin as legal tender, countries like China have imposed stringent restrictions on cryptocurrency activities.

This regulatory ambiguity stifles innovation and deters institutional investors. Governments must work toward harmonizing regulations at regional and global levels. Initiatives like the Financial Action Task Force (FATF) guidelines on cryptocurrency transactions represent steps in the right direction but require broader implementation and refinement [17].

11.3 Scalability issues

Blockchain networks often struggle with scalability, particularly during periods of high demand. Bitcoin and Ethereum's network congestion during the 2021 NFT boom is a stark example of this limitation. Layer-2 solutions, such as Optimistic Rollups and zk-Rollups, offer potential remedies, but their adoption is still in the early stages [18].

Exploring scalable blockchain architectures, such as sharding and state channels, presents an opportunity for researchers and developers. Collaborative efforts between academia and industry can yield breakthroughs in achieving scalability without compromising decentralization or security.

11.4 Financial inclusion

Despite its promise, cryptocurrency adoption remains uneven, particularly in developing regions. Barriers such as limited internet access, lack of digital literacy, and high transaction costs impede widespread usage. For instance, while cryptocurrencies can facilitate remittances in regions like Sub-Saharan Africa, the high fees associated with certain blockchain networks deter adoption.

Addressing these barriers requires targeted efforts to improve accessibility and affordability. Initiatives like the Stellar Development Foundation's partnerships with local payment providers exemplify how blockchain can drive financial inclusion. Governments and NGOs can further these efforts by investing in digital infrastructure and education [19].

11.5 Environmental concerns

The environmental impact of blockchain, particularly proof-of-work (PoW) systems, has drawn widespread criticism. Bitcoin mining, for example, consumes more electricity annually than some countries. Transitioning to more

energy-efficient consensus mechanisms, such as proof-of-stake (PoS), offers a viable solution.

Opportunities exist in exploring sustainable blockchain practices and integrating renewable energy sources into mining operations. Projects like Ethereum's transition to PoS through the Ethereum 2.0 upgrade demonstrate how the industry can mitigate environmental concerns while maintaining security and efficiency.

Addressing these gaps and capitalizing on opportunities requires a collaborative approach involving governments, industry stakeholders, and academia. By fostering innovation and inclusivity, the blockchain ecosystem can overcome its challenges and unlock its full potential [1].

12. Developing balanced regulatory frameworks that support innovation while ensuring financial stability and consumer protection

The rise of blockchain and cryptocurrencies has disrupted traditional financial systems, necessitating the development of balanced regulatory frameworks. These frameworks must support innovation while safeguarding financial stability and protecting consumers [20].

12.1 Promoting innovation through regulatory sandboxes

Regulatory sandboxes provide a controlled environment for blockchain and cryptocurrency projects to test their innovations without facing immediate regulatory hurdles. For example, the UK's Financial Conduct Authority (FCA) has successfully implemented a sandbox program that fosters innovation while addressing potential risks.

Governments worldwide can adopt similar approaches, offering startups the flexibility to experiment while ensuring oversight. These sandboxes can also facilitate dialog between regulators and innovators, enabling the co-creation of policies that support technological advancements.

12.2 Ensuring financial stability

Cryptocurrencies' volatile nature poses risks to financial stability. For instance, the rapid fluctuations in Bitcoin prices can impact the broader financial market by influencing investor sentiment and triggering speculative trading. A notable example occurred during the 2017 Bitcoin bubble when the cryptocurrency's value surged dramatically before crashing, causing significant market instability [1].

To mitigate such risks, governments and financial institutions are exploring strategies to stabilize the cryptocurrency market. Stablecoins, which are pegged to traditional assets like the U.S. dollar, offer one solution by reducing volatility. Tether (USDT) and USD Coin (USDC) are prominent examples that provide stability for transactions and investments [1].

Moreover, central banks are investigating the issuance of Central Bank Digital Currencies (CBDCs) as a means to ensure stability. CBDCs, being government-backed digital currencies, combine the benefits of blockchain technology with the reliability of fiat money. The European Central Bank's digital euro initiative, for example, aims to provide a secure and stable digital currency option to counteract the risks associated with unregulated cryptocurrencies [1].

12.3 Protecting consumers

Consumer protection is a critical component of regulatory frameworks. Cryptocurrencies, due to their pseudonymous nature, are vulnerable to scams and fraud. In 2021, losses from cryptocurrency-related scams reached an all-time high, highlighting the need for stricter oversight.

Regulators are implementing measures such as mandatory Know Your Customer (KYC) protocols and transaction monitoring to enhance transparency and protect consumers. For example, the Financial Crimes Enforcement Network (FinCEN) in the United States mandates reporting requirements for cryptocurrency exchanges to prevent illicit activities.

The focus on consumer protection will continue to be a driving force behind government blockchain initiatives. As cryptocurrencies and blockchain-based assets become more integrated into the global financial system, governments will need to focus on enforcing more regulations that safeguard consumer rights while fostering an environment conducive to innovation [1].

12.4 Balancing innovation and regulation

Striking the right balance between encouraging innovation and enforcing regulation is paramount. Overregulation can stifle technological progress, while under-regulation can lead to financial instability and consumer exploitation. Collaborative efforts between regulators, industry stakeholders, and academia can facilitate the development of policies that achieve this balance.

Therefore, we recommend that developing balanced regulatory frameworks is essential to harness the potential of blockchain and cryptocurrencies by promoting innovation, ensuring financial stability, and protecting consumers, governments can create a conducive environment for the growth and adoption of these transformative technologies [1].

13. The synergy between decentralized cryptocurrencies and government blockchain

The relationship between decentralized cryptocurrencies and government blockchain systems represents a complex but synergistic dynamic. While decentralized cryptocurrencies like Bitcoin and Ethereum operate independently of centralized control, government blockchains focus on providing oversight and fostering trust within the ecosystem. This synergy has the potential to drive innovation and inclusivity in the financial landscape.

Decentralized cryptocurrencies thrive on their independence and global accessibility. For instance, Bitcoin has been widely adopted as a store of value and medium of exchange in regions with unstable local currencies. However, concerns about volatility and regulatory compliance often limit broader adoption. Government blockchain initiatives can address these challenges by providing a regulatory framework that bridges the gap between traditional financial systems and cryptocurrencies.

For example, El Salvador's decision to adopt Bitcoin as a legal tender demonstrates the potential synergy between decentralized cryptocurrencies and government oversight. The government leveraged blockchain technology to enhance financial inclusion, offering citizens access to digital wallets and bypassing traditional banking

barriers. Simultaneously, it implemented regulations to ensure the system's integrity and user protection.

The synergy also extends to enhancing security and transparency. Government blockchains can support decentralized finance (DeFi) platforms by integrating compliance mechanisms without compromising decentralization. For instance, blockchain analytics firms like Chainalysis collaborate with governments to monitor cryptocurrency transactions, ensuring compliance with anti-money laundering (AML) and combating the financing of terrorism (CFT) regulations.

While opportunities abound, challenges such as interoperability, privacy concerns, and balancing innovation with regulation persist. Governments must adopt an inclusive approach to foster collaboration with the decentralized cryptocurrency community, ensuring a harmonious and innovative financial ecosystem [1].

14. Revolutionizing finance: Government blockchain in the cryptocurrency era

The advent of blockchain technology has revolutionized the financial sector, with government blockchain initiatives playing a pivotal role in this transformation. By leveraging blockchain's transparency and efficiency, governments are reshaping traditional finance and creating opportunities for cryptocurrencies to thrive [1].

Central Bank Digital Currencies (CBDCs) are a testament to this revolution. CBDCs combine blockchain's advantages with the trust and stability of government-issued currencies. For example, Sweden's e-Krona project aims to provide a digital alternative to cash while ensuring accessibility and security. Similarly, Nigeria's eNaira promotes financial inclusion by offering digital payment solutions in underserved regions [21].

Government blockchains are also addressing inefficiencies in cross-border payments. Traditional payment systems are often slow and costly, particularly for international remittances. Blockchain-based solutions like RippleNet have demonstrated how government collaboration with blockchain companies can reduce transaction costs and enhance speed. Governments in Southeast Asia, for instance, are exploring regional blockchain-based payment networks to streamline cross-border trade [22].

Moreover, government blockchain initiatives are fostering innovation in public finance management. Blockchain's immutable ledger ensures transparency in government spending, reducing corruption and enhancing public trust. For example, Chile's government uses blockchain to track public procurement contracts, ensuring accountability and efficiency.

Despite these advancements, challenges such as regulatory fragmentation and technological barriers remain. Governments must work collaboratively with international organizations and private blockchain firms to establish standardized protocols and ensure interoperability. This collaboration will pave the way for a unified and efficient financial ecosystem [10].

15. The future of cryptocurrency through the lens of government blockchain

As blockchain technology continues to evolve, the role of government blockchains in shaping the future of cryptocurrency becomes increasingly significant.

By providing regulatory clarity and fostering innovation, government blockchains are poised to influence the trajectory of cryptocurrency adoption and integration.

One key area of influence is the establishment of global standards. Governments collaborating through blockchain consortia can create interoperable frameworks that facilitate cross-border cryptocurrency transactions. The European Blockchain Services Infrastructure (EBSI) is an example of such collaboration, enabling seamless data sharing and transaction processing across member states.

Government blockchains also play a crucial role in enhancing cryptocurrency security. By implementing blockchain-based identity verification systems, governments can reduce fraud and improve user trust in cryptocurrency platforms. For instance, Singapore's blockchain-powered National Digital Identity system ensures secure access to financial services, promoting broader cryptocurrency adoption [1].

Furthermore, government blockchains can drive innovation in decentralized applications (DApps). By providing infrastructure and regulatory support, governments can create an environment conducive to DApp development. Dubai's blockchain strategy, for example, includes initiatives to support startups developing innovative blockchain solutions, bridging the gap between public and private sectors [1].

However, the future of cryptocurrency through government blockchain faces challenges, including balancing innovation with privacy concerns and addressing technological limitations. Governments must adopt a forward-thinking approach, fostering collaboration with private blockchain entities to unlock the full potential of cryptocurrency and blockchain technology.

From my perspective, government blockchains are at the forefront of cryptocurrency innovation, driving regulatory clarity, security, and inclusivity. As the synergy between public and private blockchain ecosystems grows, the future of cryptocurrency looks promising, marked by collaboration, innovation, and global adoption [1].

16. Actionable recommendation for equitable and sustainable development of government blockchain in cryptocurrency

Here are some recommendations that I find useful and actionable to ensure the equitable and sustainable development of government blockchain systems in cryptocurrency ecosystems, policymakers and stakeholders should adopt a multi-faceted approach that balances innovation with inclusivity, transparency, and ethical governance. Key recommendations include:

1. Inclusive policy design

- *Engage stakeholders:* Include diverse stakeholders—such as marginalized communities, private sector innovators, and international bodies—in the policy formulation process to address diverse socioeconomic needs and prevent exclusion.
- *Equity Audits:* Conduct regular equity audits of blockchain initiatives to identify and address potential disparities in access and benefits, ensuring fair participation across all demographics [1].

2. Promote interoperability and open standards

- *Interoperable frameworks:* Develop and adopt open standards for blockchain technologies to facilitate seamless integration between government blockchain systems and decentralized cryptocurrencies.
- *Global collaboration:* Work with international organizations to harmonize standards and reduce geopolitical barriers to cross-border blockchain applications [23].

3. Ethical and transparent governance

- *Privacy protections:* Implement robust data privacy safeguards to mitigate surveillance concerns and ensure citizen trust.
- *Transparent algorithms:* Mandate transparency in blockchain governance algorithms to ensure accountability in decision-making processes [1].

4. Capacity building and education

- *Public awareness campaigns:* Educate citizens about the benefits and risks of government blockchain systems to foster informed participation.
- *Skill development:* Invest in training programs to build local technical expertise, particularly in underserved regions, to enhance the equitable distribution of opportunities [1].

5. Sustainable infrastructure development

- *Green blockchain solutions:* Encourage the adoption of energy-efficient consensus mechanisms (e.g., proof-of-stake) to minimize environmental impacts.
- *Infrastructure Accessibility:* Ensure that blockchain infrastructure development prioritizes accessibility in remote and underprivileged areas [24].

6. Monitor and mitigate risks

- *Independent oversight:* Establish independent oversight bodies to monitor the implementation and operation of government blockchain initiatives.
- *Risk assessments:* Conduct continuous risk assessments, particularly regarding surveillance and overreach, to maintain a balance between security and civil liberties. By incorporating these principles, governments can leverage blockchain technology to enhance financial transparency, foster economic inclusivity, and uphold ethical governance, contributing to a globally equitable and sustainable cryptocurrency ecosystem [1].

17. Conclusion

The path ahead for government blockchain in cryptocurrency will require ongoing collaboration between governments, financial institutions, regulatory bodies,

and technology developers. By embracing blockchain's potential while addressing its challenges, governments can create a more inclusive, secure, and innovative financial landscape for the future.

The integration of blockchain technology into government operations and the cryptocurrency ecosystem represents a pivotal moment in the evolution of global financial systems. As blockchain continues to disrupt traditional industries, its potential for enhancing transparency, security, and efficiency in both public and private sectors is undeniable. Governments around the world are recognizing the transformative power of blockchain and are actively exploring its use in key areas such as Central Bank Digital Currencies (CBDCs), financial services, regulatory frameworks, and consumer protection.

The future of government blockchain in cryptocurrency hinges on the development of clear, consistent, and forward-thinking regulatory frameworks that can balance the need for innovation with the imperative to protect consumers and ensure financial stability. The emergence of CBDCs in countries like China and the European Union highlights the growing recognition that blockchain can offer governments greater control over monetary policy, while also providing citizens with a stable, digital alternative to private cryptocurrencies. This shift toward government-backed digital currencies will likely influence the broader cryptocurrency ecosystem, fostering trust and stability while providing a safeguard against the volatility of decentralized assets.

Blockchain's potential for consumer protection also cannot be overstated. Governments are increasingly leveraging technology to enhance transparency, reduce fraud, and ensure the security of financial transactions. Smart contracts, decentralized identity systems, and transparent transaction ledgers offer significant advancements in safeguarding consumer interests. The success of blockchain initiatives, particularly in countries like Estonia and Singapore, illustrates how governments can use blockchain to streamline processes, improve service delivery, and create a safer, more efficient digital environment for their citizens.

However, significant challenges remain, including the need for international cooperation on regulatory standards, addressing the technological complexities of scalability and interoperability, and ensuring equitable access to blockchain-based solutions. The rapid pace of innovation in blockchain requires governments to remain agile, adapting their regulatory and policy frameworks to keep pace with emerging trends in cryptocurrency and digital finance.

Looking ahead, the role of blockchain in government and cryptocurrency ecosystems will continue to expand, with governments at the forefront of fostering secure, transparent, and innovative financial environments. By addressing challenges such as regulatory alignment, technological integration, and global cooperation, governments can help create a stable and inclusive digital economy that benefits businesses, consumers, and society at large. The path forward for government blockchain in cryptocurrency holds immense promise, and with careful planning and collaboration, it will shape the future of finance and governance for years to come.

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This Edited Volume, *Public Finance and Accounting* is a collection of reviewed and relevant research chapters, offering a comprehensive overview of recent developments in the field of Public Finance and Accounting. The book comprises single chapters authored by various researchers and edited by an expert active in the field. All chapters are complete in themselves, but they are united under a common research study topic.

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*Taufiq Choudhry,
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