T.C.
SAKARYA UNIVERSITY
SOCIAL SCIENCES INSTITUTE
DEPARTMENT OF ISLAMIC ECONOMICS AND FINANCE

FINANCIAL INCLUSION - UNDERGROUND ECONOMY NEXUS: DOES INSTITUTIONAL QUALITY MATTER ? EVIDENCE FROM OIC MEMBER COUNTRIES

Mrisho MRISHO

MASTER DEGREE THESIS

Thesis Supervisor: Assoc. Prof. Hakan ASLAN

AUGUST - 2024

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"This thesis was defended hybrid on 22/08/2024 and was unanimously accepted by the jury members whose names are listed below."

JURY MEMBER	APPROVAL
Assoc. Prof. Hakan ASLAN	Successful
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Assist. Prof. İsa YILMAZ	Successful

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Mrisho MRISHO

22/08/2024

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22/08/2024

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ABBREVIATION

UE **:** Underground Economy

OIC **:** Organization of the Islamic Cooperation

RE **:** Random Effects

FE **:** Fixed Effects

OECD **:** Organisation for Economic Co-operation and Development

GDP **:** Gross Domestic Product

MIMIC **:** Organisation for Economic Co-operation and Development

ILO **:** International Labour Organisation

COMCEC **:** Standing Committee for Economic and Commercial Cooperation

EFInA **:** Enhancing Financial Innovation and Access

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ABSTRACT

Title of Thesis: Financial Inclusion - Underground Economy Nexus: Does Institutional Quality Matter ? Evidence From OIC Member Countries

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Supervisor: Assoc. Prof. Hakan ASLAN

Accepted Date: 22/08/2024 **Number of Pages:** vii (pre text) + 92 (main body)

The growth of the underground economy within the OIC nations has alarmed many states to find solutions because it limits the development of the region by directly or indirectly influencing policies. The study's objectives are to examine the impact of financial inclusion on the underground economy within a dual banking system, then measure the role of institutional development on the underground economy, and lastly examine the factors influencing the underground economy, particularly in the OIC region. The study applies the fixed effects methodology to panel data from 49 countries for over 16 years, from 2002 to 2018. The findings depict that there is a negative relationship between the underground economy and financial inclusion between both Islamic and conventional banks. There is a positive relationship between institutional quality and the underground economy in the presence of Islamic banks and a negative relationship in the presence of conventional banks. Furthermore, as the size of the underground economy increases as taxes increase in the presence of both Islamic and conventional banks, the real effective exchange rate and GDP annual growth are positive in the presence of Islamic banks, caused by the small market share of Islamic banks within the OIC compared to conventional banks, and negative in the presence of conventional banks. Thus, the study suggests that policymakers need to consider investing more in Islamic institutions to increase the impact of financial inclusion and institutional quality on the underground economy.

Keywords: Underground Economy, Financial Inlusion, Institutional Quality, Islamic Banks, FE

ÖZET

Başlık: Finansal Tabana Yayılma - Yeraltı Ekonomisi Bağı: Kurumsal Kalite Önemli Mi? İİT Üyesi Ülkelerden Kanıtlar

Yazar: Mrisho MRISHO

Danışman: Doç. Dr. Hakan ASLAN

Kabul Tarihi: 22/08/2024 **Sayfa Sayısı:** vii (ön kısım) + 92 (ana kısım)

İİT ülkelerindeki yeraltı ekonomisinin büyümesi, politikaları doğrudan veya dolaylı olarak etkileyerek bölgenin kalkınmasını sınırlandırdığı için birçok devleti çözüm bulma konusunda alarma geçirmiştir. Bu çalışmanın amaçları, finansal tabana yayılmanın ikili bankacılık sistemi içerisinde yeraltı ekonomisi üzerindeki etkisini incelemek, ardından kurumsal gelişimin yeraltı ekonomisi üzerindeki rolünü ölçmek ve son olarak özellikle İİT bölgesinde yeraltı ekonomisini etkileyen faktörleri incelemektir. Çalışma, 2002'den 2018'e kadar 16 yılı aşkın bir süre boyunca 49 ülkeden elde edilen panel verilere sabit etkiler metodolojisini uygulamaktadır. Bulgular, hem İslami hem de konvansiyonel bankalar arasında kayıt dışı ekonomi ile finansal tabana yayılma arasında negatif bir ilişki olduğunu göstermektedir. Kurumsal kalite ile kayıt dışı ekonomi arasında İslami bankaların varlığında pozitif, konvansiyonel bankaların varlığında ise negatif bir ilişki vardır. Ayrıca, hem İslami hem de konvansiyonel bankaların varlığında vergiler arttıkça yeraltı ekonomisinin büyüklüğü artarken, reel efektif döviz kuru ve GSYİH yıllık büyümesi, İslami bankaların İİT içindeki pazar payının konvansiyonel bankalara kıyasla küçük olmasından dolayı İslami bankaların varlığında pozitif, konvansiyonel bankaların varlığında ise negatiftir. Dolayısıyla çalışma, politika yapıcıların finansal kapsayıcılık ve kurumsal kalitenin kayıt dışı ekonomi üzerindeki etkisini artırmak için İslami kurumlara daha fazla yatırım yapmayı düşünmeleri gerektiğini ortaya koymaktadır.

Anahtar Kelimeler: Yeraltı Ekonomisi, Finansal İçerme, Kurumsal Nitelikli İslami Bankalar, Sabit Etkiler

INTRODUCTION

Unrecognized and illicit activities, collectively called underground activities, have been around for ages and have been an element of life, but they are now on the rise around the world, and nearly all nations are attempting to prevent their spread due to the potentially devastating consequences.

The conception of the underground economy stretches back as far as the late Edwardian era, as observed by Furnivall (as cited in Khan and Rehman, 2022), whose work subsequently delved deep to observe the implications of the unregulated markets on the country's growth. To add to that, Koufopoulou et al. (2019) discuss Lewis's (1954) idea of the dual economy without geographical restrictions, which was among the initial texts to highlight the subject of the underground economy. The phenomenon under discussion in all of these studies was the same: the underground economy or the unregulated sector. However, there were differences in the descriptions, definitions, and ascribed terminologies used for clarifying the conventional (underground) sector of the market.

The underground economy has been defined diversely throughout time. The difficulty in defining the underground economy arises due to the shifting nature of the subject matter, which cannot be restricted to certain activities due to adjustments in a set of laws and time, but generally, it can be defined as both unreported and illegal activities done through ways like taxation fraud.

According to Schneider and Enste (2000), the increasing size of the underground economy makes public figures like layoffs, workforce, earnings, expenditures, and consumption unreliable. Schemes and strategies that depend on erratic figures may be inopportune and ineffective. The World Bank (2014) reported that 54.3 percent of all companies are competing against companies that are not recognized by the official bodies. It also affects the level of revenue collected. This could impose a mark on the caliber of essential services supplied by the authorities (Boitano and Abanto, 2019).

Subject of the Research

Recently, the subject of the unregulated marketplace has captured the attention of scholars and policymakers because of the dire effects the phenomenon has on policies and economic growth. Johnson, Kaufmann, and Zoido-Lobatón (1998) recommended that policymakers must comprehend the scope and dynamics of the underground economy.

Their study clarifies difficult issues, including how to assess the operations of the underground economy, what drives the underground market, and how it affects the larger economy.

According to Karlinger (2009), labor market regulation and taxation in developing and OECD economies are the primary contributors to the underground economy. In contrast, Friedman et al. (2000), on the other hand, demonstrate how fraud and too much oversight significantly impact the black market. Feld and Schneider (2010) indicate that too much government oversight, unemployment, and taxes have immediate consequences for the underground economy and that this impact is greater in developing nations than in transition economies. Individual ethical standards, on the other hand, have adverse implications for the underground economy.

When considering the OIC nations, the OIC standing committee reported that the underground economy is prevalent in several OIC nations (COMCEC, 2016). To entice underground firms and laborers into the formal sector, a stable regulatory environment, company development prospects, and job chances are essential. Given the OIC's interest in the underground economy, this investigation would build upon the current body of research.

Previous examinations have tried to explain the association among financial inclusion, quality institutions, and the underground economy; for instance, Bayar and Ozturk (2016) and Onwuka and Ayeni (2023). However, multiple papers like Schneider and Enste 2000, along with Kucera and Roncolato (2008) and Nguimkeu and Okou (2019), covered other determinants of the underground economy, for instance, business regulations and institution factors along with taxation. Scholars have hardly focused on factors such as financial inclusion and financial sector reforms. Hassan and Schneider (2016) investigated if Egypt has an underground economy; they estimated the extent of the black markets dating from 1976 and the impact of institutional quality on the number of informal marketplaces.

Objective of the Study

More than three significant contributions to the literature are made by this investigation. First, no extensive study has been performed on the factors influencing the underground economy in OIC member countries. In addition, this investigation examines the effects of

financial inclusivity on the black market in OIC nations, drawing on information from Medina and Schneider's (2017) underground economy index.

Importance of the Research

There is a lack of research in the existing literature on the underground economy in OIC nations. Our empirical investigation yielded three important discoveries. Initially, analyze the factors that influence the underground economy in the dual banking system among OIC countries. The second discovery of this investigation shows how financial inclusion impacts the subterranean economy in dual banking systems in OIC countries. Finally, this research demonstrates whether institutional quality is important for the informal economy in a two-tier banking system.

Method of the Research

This paper utilizes various fixed effects panel techniques as a suitable methodology for panel data analysis.

Limitation of the Study

The main obstacle encountered during the execution of this research centers around the lack of sufficient and pertinent data related to Islamic financial institutions, particularly in emerging states.This scarcity has constrained our examination to a limited number of economies and time periods. The data utilized in this study is deemed insufficient due to the absence of records from numerous nations, thereby restricting the breadth of our analysis. The paucity of recent and relevant studies addressing the informal economy and financial inclusion poses a challenge to accurately assessing the impact of these variables in contemporary times and expanding upon existing scholarly works.

The paper will start by analyzing the conceptual framework behind the concept of the underground economy. Then further progress is made to assess the relevant literature on the underground economy and financial inclusion in Chapter 2. Chapter 3 reviews data, selection of variables, and specification in econometric models. The practical outcomes, along with rigorous tests, are showcased and talked about in Chapter 4. Chapter 5 will include a presentation of the discussions and policy implications.

CHAPTER 1: CONCEPTUAL FRAMEWORK

Defining the underground economy has been a challenging issue for researchers since it involves some regulatory issues that may vary from country to country. But commonly, the underground economy refers to all legal and illegal activities that should be included in the estimation of the national income but are not accounted for due to limited methods of collecting and registering data, concealed added value by parties, and individuals choosing not to register.

This study uses the word underground economy, as referred to in the works of Shneider and Enste (2000). Their work categorized the economy into two parts: the first part of the economy was referred to as the official sector, and the second part of the economy was considered the underground economy, which was further divided into two portions, including the shadow economy. Noticing that, we decided to utilize the term underground as an umbrella term, as it has been shown to even cover the shadow economy. Nevertheless, the term underground economy has been used simultaneously with other terms like informal economy, unregulated marketplace, and black market.

Though there was an ongoing discussion regarding the informal economy, researchers did not invest intensively in studying the subject. Gutmann (1985), which discusses the underground economy, was among the pioneering works that highlighted the significance of the informal economy during a time when the subject matter was thought to be an insignificant issue, and currently scholars are in consensus on how the growth rates of the underground economy are reaching a pace that cannot be marched by the formal sector.

1.1. Theoretical Framework

To further understand the structure and traits of the underground economy, we have to investigate the theoretical structure for which the concept of the underground economy has been built. Several theories have been formulated, which include the following:.

1.1.1. Management Perspective

For the purpose of gaining a deeper understanding of why businesses engaging with the underground economy may be able to outsmart and outcompete other business rivals in other markets, researchers on management collaborated with academia from other fields, including experts in business and other related spaces (Godfrey, 2011).

Within that proposition, scholars have debated that, in some instances, even registered companies may opt to operate in the informal economy because of strategic managerial decisions that will help them compete. The relationship between management theory and the underground economy can be understood through the lens of organizational behavior, resource management, and strategic planning (Koufopoulou et al., 2019).

A fundamental basis for understanding how firms run, execute decisions, and redistribute capital is provided by management theory. Despite the fact that it is in a less legitimate and illicit setting, For instance, J. H. Dyer and Singh (1998) argued that businesses may capitalize on attractive rates while undertaking transactions between two separate entities if apparent standards or specifications are not put in place at the time of finalizing a contract agreement.

Furthermore, as a way of making up for the inadequacies of institutions and regulatory bodies, firms can choose to engage in the underground economy by making informal agreements in order to strategically attain their goals. To add on to that, according to a Tax Justice Network (2023) report pertaining to how firms tap into the underground economy through legally cooking financial books, other data goes unnoticed, hence not being accounted for in official figures, and approximately 4.8 trillion USD worldwide is expected to be lost within the coming 10 years. Other ways through which organizations can be engaged in the underground economy can be seen when organizations work with each other. Established enterprises with contractual procedures and legal protections have no negative impact on communal interactions. Despite their inclination towards binding agreement and formal commitment, particular ethnic communities might perceive legal incorporation as a repudiation of family values or a dearth of trustworthiness (Godfrey, 2011). Other studies show that familial ties serve as a replacement authority structure for established juridical frameworks (Godfrey, 2011). According to Piore and Sabel (1985), the persistent search for efficiency might drive corporations to shift operations to the unregulated industry, in which manpower and other expenditures are lower.

Even though this would potentially propel the firm’s returns in the immediate future, it could additionally help foster and proliferate the underground economy by luring other commercial entities into the unregulated sector. This involves transferring operations to modest production facilities or individuals who violate the established legal structures.

1.1.2. Neoliberal Framework

According to neoliberal theory, subterranean activities are a sensible economic answer for business units facing a cumbersome regulatory environment, the amount of which means that countries operate with a significant amount of consolidation of authority. Excessive government engagement in the free market leads enterprises to consider transitioning to the unregulated marketplace; rules such as title deed laws or legal processes render participation in the formal economy challenging or impossible (Koufopoulou et al., 2019).

According to neoliberal theory, subterranean activities are a sensible economic answer for business units facing a cumbersome regulatory environment, the amount of which means that countries operate with a significant amount of consolidation of authority. Excessive government engagement in the free market leads enterprises to consider transitioning to the unregulated marketplace, distinguished by shorter duration, lower costs, and increased attempts to comply with bureaucratic procedures. thereby, for neoliberal doctrine (Zarina, Zvaigzne, and Klodane, 2022). Shadowing remains the outcome of excess oversight, astronomical taxes, and undue government involvement. Neo-liberal doctrine is also described as the legalist school of thought. The idea it stresses is that there is a stall in GDP triggered by productivity deficiencies, restricted investments, ineffective revenue collection structures, inadequate technological implementation, and complex economic policies (Zolkover & Kovalenko, 2020). Another argument that is proposed from this theory is the urge for people to retain their freedom and control over their own lives. Those individuals normally reject the idea of the government exerting control over their lives through bureaucracy, which promotes perseverance and defiance of regulations, hence promoting the underground economy (Maloney, 2004). Other researchers, like Hadas (2003), linked the underground economy and neoliberal theories through property rights protections. Due to a lack of ownership privileges, unregulated businesses cannot use credit from banks to provide collateral for their properties. Restrictive incorporation, licensing, and procedural regulations promote the growth of the unregulated industry. The scholar also links connections and legal systems in several developing countries, where he asserts how the shadow economy results in competition occurring when formal rules such as title deed laws or legal processes render participation in the formal economy challenging or impossible (Williams and Nadin, 2011).

1.1.3. Political Economy Theory

The premises of this theory are based upon power decentralization, which implies that state policy favors minimum interference, for instance, in the pension system. This doctrine, as observed, is contrary to the legalist way of thinking. Furthermore, the decentralization of power can weaken law enforcement. Decentralization allows law enforcement agencies' power and resources to be distributed among many local administrations. This can result in an absence of coordination and disciplinary capabilities, allowing unlawful actions to go unnoticed and not penalized (Fisman and Gatti, 2002); moreover, the lack of necessary expertise and means to properly implement laws sets such drawbacks, which could foster a setting in which unofficial economic activities may thrive without fear of exposure or penalty.

Decentralization can also result in regulatory inequalities among regions or localities. People or organizations engaged in unlawful activities can take advantage of weak or uneven legislation in particular regions to operate without investigation (Fjeldstad, 2004). This inconsistency can lead to uncertainty and higher compliance expenses for organizations, prompting companies to function unofficially to reduce the level of detail. To add to that, decentralization might translate to a fall in visibility and transparency and an increase in the number of decision-making centers, which would facilitate corrupt practices and fraud (Treisman, 2002). In compensation for certain personal gifts and advantages, local authorities become more susceptible to bribes and turn a blind eye to illicit acts, and it could also maximize the formation of unauthorized relations and networks between government officials and other entities, which would help foster underground economic activities. Such networks can be advantageous to people operating prohibited businesses since they can offer them tenders, unfair support, and security (Rose-Ackerman and Søreid, 2011).

Finally, decentralization can make it difficult for different areas or locations to coordinate and share information effectively, and administrative structures that are fragmented could render collaboration across distinct levels of authority harder. This dispersion can provide gaps in supervision, enabling the underground economy to thrive. This can make it difficult to detect and combat illegal economic operations that traverse many jurisdictions. Tendler (1997) reported that decentralization within a number of Latin American nations appears to be linked to greater regional fraud and the growth of

unregulated commerce as a result of inadequate local administration. Decentralized finance within China has resulted in local taxation rivalry and provincial protectionist policies, occasionally forcing enterprises into the underground economy in order to avoid substantial fees and scrutiny from regulators (Tsai, 2007).

1.1.4. Dualist Theory

The dualist hypothesis holds that the unregulated economy is essentially different from the formal economy, consisting of discrete sectors with little contact between them. This idea, based on the work of academics researching developing nations, proposes that the unregulated sector is a leftover, subsistence-based sector that survives within the regulated, more advanced sector (Godfrey, 2011). From the dualist point of view, the underground economy is observed as a vital shelter for the economically disadvantaged, providing options for subsistence and survival when regular employment is not available. Furthermore, the hypothesis contends that there is little movement across the official and unofficial industries. Usually, most personnel working in the unregulated economy do not have the expertise, training, and social network required for advancement towards job opportunities that are official. Thus, it creates a dual economy in which unofficial laborers are confined to jobs with little efficiency (Hart, 1971). According to Fields (1975), the underground economy is viewed as a means of survival for people who are unable to find work in official settings. This sector provides basic commodities and services, allowing the poor to survive despite a lack of official employment possibilities. According to Tokman (2001), unregulated operations tend to be limited in scale and labor demand and need little capital investment, and they often involve hawking on the streets, temporary work, local manufacturing, and various kinds of working independently. Labor in the underground economy tends to be excluded, with limited access to formal job perks, welfare, and economic possibilities. Such exclusion increases the distinction between regulated and unregulated economies (Moser, 1978).

The presence of the underground economy may act as a cure to minimize the effects of unemployment by providing jobs during recessionary periods and hard economic times. Furthermore, the theory that supports the existence of the underground economy indicates the failure of the regulated economy to provide business opportunities, especially within nations with dense populations. Dualism as the cause of the underground economy has

also been spotted within the structure of how societies produce and supply products, whereas there is a two-sided nature across markets when it comes to cities and villages, whereas commercial operations occurring within cities are much more organized than those carried out in the villages (Moser, 1978).

The conclusion of this part is that the dualist theory purports the idea that the underground economy is fueled by the failure of the formal economy to adequately satisfy macroeconomic variables like employment and business opportunities for the minority segment of society.

1.1.5. Structure-Centered Paradigm

This school offers a broad framework for examining the origins and persistence of the underground economy. Even though various theories view the unregulated sector as a separate and independent peripheral entity, the structuralist proposition maintains that the underground economy is an integral part of the advanced capitalist system, which is determined by underlying structures and inherent inequalities that can be attributed to the regulated economy (Koufopoulou et al., 2019). According to Portes, Castells, and Benton (1989), the underground economy is integrally dependent on the informal economy. It is neither a separate nor an outlying sector, but instead part of the vital component of the capitalist system that offers flexible labor, reduces costs, and sustains its economic sustainability. According to Sassen (1994), the structuralist perspective stresses the idea that describes the way in which labor markets are segmented between a formal and an unregulated sector. The informal sector is the result of economic and social inequality in that the marginalized—women, immigrants, and unskilled workers—are forced into informal jobs because they have limited access to jobs in the unregulated marketplace. Enterprises participate in the informal sector in order to escape regulatory costs such as taxes, minimum wages, and labor standards. Noncompliance is viewed as a rational strategy to ensure competitive advantage in an increasingly regulated market economy (Chen, 2007). According to Davis (2006), economic inequality is thought to be among the very fundamental factors influencing the underground marketplace. Income and wealth inequality push disadvantaged segments of society into the underground economy as they seek to survive beyond the formal sector, which marginalizes them. Their other contention suggests the underground economy can be justified when it is more prevalent

in some places than in other settings because of the historical context, politics, and governance structures. Proposing that to merge the unregulated marketplace and the official marketplace, the political and governance structures must be appropriately set up. Attributing the underground economy to the underdeveloped states due to the inefficiency experienced in the markets. When considering advanced nations, the underground economy is a result of established firms aiming to increase profitability and minimize expenses through engaging with the unregulated marketplace (Portes, Castells, and Benton, 1989).

1.2. Effects of the Underground Economy

This section discusses the effects of the underground sector on various states. However, in order to understand why it is critical to engage in the issue of the underground economy inside the OIC, the effects of the unregulated marketplace must be examined from a variety of perspectives, including economic development, social fairness, labor markets, and governance.

1.2.1. Economic Growth and Development

The underground economy can contribute, affecting the GDP of a nation. This is due to the fact that unregulated activities lead to losses in revenue through tax evasion and avoidance (Ghazo, Qasrawi, & Abu-Lila, 2021). For instance, the underground economy persisting in numerous developing countries, including those in sub-Saharan Africa, consists of above 40% of GDP, indicating a significant tax gap; consequently, the earnings lost restrict the government budget, reducing the government's ability to reallocate sufficient funds into crucial services such as health, education, infrastructure, and other public goods for the sustainable development of a nation (Schneider, 2005).

Distortion of Economic Statistics: When there is a significant size of the underground economy within any nation, it can impact official economic statistics, which will ultimately undermine the formulation and ratification of fiscal and monetary policies (Schneider and Williams, 2013). This is because lawmakers can only base their decisions on meager data, which gives them less than satisfactory results. In this way, it distorts the proper formulation and implementation of economic policies that ensure prosperity and security at the same time (Elgin and Oztunali, 2012).

Entrepreneurial Activities: On the positive side, the impact of the unregulated economy can enhance small-business development by providing an avenue for firms to conduct research and creativity in a market with limited government intervention. Informal firms often serve as incubators for small firms that might, over time, transition into the formal sector (Maloney, 2004). A lack of formal recognition and support, however, may restrict their chances for growth and the availability of capital, innovation, and customers.

1.2.2. Social Equity and Labor Markets

In many parts, it is the underground economy that provides gainful employment and income in areas of high unemployment and where the formal sector in any economy cannot offer employment. In many developing countries, informal work is the mainstay of people's livelihoods. Many people, especially in developing countries, survive on informal employment as their main means of livelihood (ILO, 2018).

In many parts, it is the underground economy that provides gainful employment and income in areas of high unemployment and where the formal sector in any economy cannot offer jobs. In numerous underdeveloped states, informal work is the mainstay of people's livelihoods. Many individuals, particularly in third-world nations, survive on informal employment as their main means of livelihood (ILO, 2018).

While the sector affords vital economic opportunities, the jobs within it are mostly very poorly paid, and the conditions are the worst. There is also no form of social protection, hence exacerbating social inequalities and leaving workers very vulnerable to exploitation and poverty (Chen, 2007).

Gender and Social Inclusion: The informal economy generally has a larger proportion of women, migrants, and other disadvantaged groups barred from formal employment. Work in informal environments generally provides flexible working conditions whereby an individual can accommodate care responsibilities and other social constraints of all kinds (Lund and Srinivas, 2000). However, the dearth of regulation in the unregulated marketplace means that the inequalities experienced by these workers and their households because of gender and social discrimination are continued through the lack of labor rights and protection.

1.2.3. Governance and Institutional Effects

Regulatory Evasion and Corruption: The underground economy thrives in settings with high regulatory burdens and a weak governance environment. Businesses and normal people may partake in unregulated operations to evade taxation, labor laws, and other rules that are perceived as being overbearing or corrupt. The unregulated marketplace is partly a result of regulatory evasion—businesses find it difficult to survive within the legal boundary of the economy due to restrictive regulations (Schneider and Enste, 2000). This avoidance lays at the foundation of the rule of law and a culture of non-compliance and corruption, which continues to lower trust in public institutions and structures of governance.

Weakening of Public Institutions: Proliferating activities within the informal sector can weaken public institutions by eroding their ability to enforce laws and regulations with much effectiveness. In this case, when a large part of the economy goes out of the formal control system, regulatory bodies are not able to monitor and control economic activities appropriately (Friedman et al., 2000).

This undermines effectiveness in government policies and might consequently lead to a vicious circle of reinforcing each other—weak institutions and rampant informality.

Security and Illicit Activities: The shadow economy may also involve criminal activities, smuggling, drug trafficking, and unaccounted monetary exchange, which present big security challenges and law enforcement implications. These activities, in their turn, will jeopardize public safety and add to general security threats, especially within fragile states. According to Feige (1990), this takes a toll on public safety and poses large-scale security threats, especially to fragile states.

1.2.4. Policy Responses and Strategies

Promotion of Formalization: Policies aimed at cutting down the underground economy usually focus on the encouragement of formalization through regulatory simplification, tax incentives, and support for SMEs. For instance, simplifying the procedures for business registration and reducing compliance expenses can make informal businesses wish to join the formal sector (Chen, Vanek, and Carr, 2004). In this light, it is proposed that enhancing access to finance, training, and market opportunities can help to bridge the

divide and connect the regulated and unregulated marketplaces and, as a result, realize economic inclusion and growth.

Strengthening Social Protection: Extending social protection to informal workers is crucial for enhancing their economic security and social inclusion. The respective government should enact policies that provide health insurance, pensions, and unemployment benefits, which could help to reduce the vulnerabilities associated with informal employment (Lund and Srinivas, 2000).

To add on that, the authorities should ensure that informal workers have access to labor rights and protections; this can promote more equitable and sustainable economic development, hence mitigating the degree of the unregulated marketplace.

Improving Governance and Reducing Corruption: Another way of controlling the underground sector is by strengthening good leadership and reducing corruption. These acts are both essential for creating an environment that attracts and fosters transparent and accountable institutions, consequently promoting greater compliance with regulations and building trust in the state, which may in turn limit the growth of the unofficial marketplace (Fisman and Gatti, 2002).

Last but not least, an attempt at reducing corruption and promoting good leadership must involve individuals being encouraged to participate in community activities while simultaneously encouraging democratic movements. This can play a crucial function in integrating informal activities into broader economic planning and development strategies and helping control the underground economy.

1.3. Underground Economy Within the OIC Nations

The aforementioned paragraphs mention the effects of the underground economy generally and why, through those lessons, it is essential for us to acknowledge the challenge of the underground economy within the OIC nations. So as to assess how the issue has deeply affected the performance of the OIC economy and propose how to curb the phenomenon within the OIC economy.

According to Khan, Abdul Hamid, and Rehman (2021), the portion of the underground economy as a percentage of GDP's is approximately 34%. The author reported that Gabon‘s the country with the highest magnitude of the underground economy within the OIC nations, and Saudi Arabia is the country with the lowest size of the underground

economy. COMCEC (2016) showed concerns with respect to the situation of the underground economy, acknowledging the fact that the underground economy should be dealt with immediately.

M.S.Sillah (2019) reported about the underground within the OIC nations in terms of industry and job contracts, whereas the study specified individuals employed within unregistered firms as employees within the unofficial sector, and employees with unofficial agreements within the official enterprise are referred to as unofficial employment. The study reported that in the underground, employment comprised over 70% of the total portion of employment, estimated to be ninety-seven percent in Benin to approximately thirty percent in Brunnei. The level of individuals employed within unregistered companies is less than unofficial employment, equivalent to seventy-four percent to eighty percent, respectively, and concluding that the average size of unofficial employment is fifty-one percent of total job availability, demonstrating a substantial amount of individuals working within the underground economy within the OIC countries. Furthermore, it has been reported that the ratio of revenue loss due to individuals and business entities avoiding taxation is 4.15% of the GDP within the OIC states, in contrast to schooling, which is almost four percent of GDP, and medical expenditure by the government, which is approximately two percent.

In Pakistan, it is estimated that the loss incurred from the prevalence of the unregulated economy is between $6 and $8 billion, or 6 and 8 percent of GDP, each year through direct tax collection. Other OIC member countries, like Bangladesh, Indonesia, and several others, have the same tendency (Pakistan Institute of Development Economics, 2013).

According to a report by Dinar Standard (2021), the OIC countries had an estimated $63 billion trade deficit in halal products. This deficit, while partly legitimate in terms of the trade imbalances, also reflects the inefficiency and unregulated trade practices normally not captured to contribute to lost revenues. Identity theft, just for itself, produces about $1 billion a year in illicit profits, according to the UNODC (2023), a share of which is bound to affect the economies of OIC countries. These figures show how detrimental the underground economy can be to the OIC nations since that is only the portion of illegal activities that has been shown to cause a leakage of a billion dollars annually. Coupled with other sources of leakages, the underground can cause a tremendous loss of public

funds, which, when allocated to the provision of public goods, may bring about a significant change to the welfare of individuals in those states. This is the reason why we chose to study this particular phenomenon. Kim et al. (2018) reported that approximately a quarter of the world population is comprised of Muslims, and the majority of them choose not to participate in the conventional banking system due to its non-alignment with sharia rules and regulations.

1.3.1. Financial Inclusion

Financial inclusion, otherwise termed inclusive finance, is described as having relevant accessibility and cost-effective financial goods and services that meet the needs of consumers. Financial inclusion entails the creation of high-standard products such as credit, coverage, payments, as well as payments in foreign currencies, and numerous other various financial services. Financial inclusion has the potential to be utilized in order to curb the magnitude of the unregulated marketplace due to the fact that it provides individuals and firms with better financing for products and services. Nevertheless, in exchange for such services, financial inclusion requires those economic units to trade off operating in the unregulated market with the regulated one, thereby impacting the magnitude of the subterranean marketplace. Scholars like Mohieldin, Iqbal, Rostom, and Fu (2011) showed how inclusive finance can promote economic growth within the OIC nations through the means of Islamic finance. Among the ways in which financial inclusion can reduce the underground economy are the following:

Accessibility to Formal Monetary Amenities: This allows the people and business organizations of an economy to have for mal access to different financial services, and thus, they have less use for informal mechanisms. People are more likely to transact through recorded and monitored channels once they have bank accounts, which reduces the size of the underground marketplace (United Nations Office on Drugs and Crime, 2023).

For instance, in Nigeria, endeavors have been made to expand more access to the money via mobile banking and microfinance banking problems to make more and more transactions formal, hence reducing the chances of cash-based transactions that cannot be traced (Enhancing Financial Innovation and Access, 2023).

Digital Financial Service: Electronic financial products such as mobile payment services, international banking, and other online services increase the chances of an audit trail of each economic activity in relation to the set tax laws and regulations. The above-discussed enhanced transparency would enhance access to legal sources of revenues, decreasing the scale of tax evasion, which is one component of the unregulated economy.

The policy implications:

There are several policy implications that may be direct or indirect results of financial inclusion. For instance, in a country like Egypt, several reforms toward more digital payments and a reduction of cash transactions have been associated with better tax collection and a reduction in the underground economy (PwC, 2019).

Access to credit: Financial inclusion gives access to credit and other financial services, enabling SMEs to grow and possibly formalize their existence. Most small businesses stay informal because of an absence of access to credit. If such businesses have access to financing, they are more likely to register officially and comply with the regulatory requirements, according to UNODC (2023).

Country Experiences: For example, in Bangladesh, microfinance initiatives have proven to be successful in enabling small loans to entrepreneurs for expansion and hence formalization of their businesses, which eventually reduces the size of the unregulated economy (Khandker, 2005).

Financial Literacy and Planning: Most financial inclusion initiatives come with financial literacy programs that train people to manage their finances better. This kind of education helps people move out of informal saving and borrowing methods, which are usually insecure, slow, and inefficient, to formal financial services, as shown in a study by Klapper, Lusardi, and Van Oudheusden (2015), which proved the ways through which inclusive finance can be promoted by advocating and acting on providing financial literacy.

Economic Growth: Finally, integrating more people into the economic mainstream acts as a stimulant to economic growth. A larger formal economy implies stronger data for the economy and ultimately better policies, leading to increased investor confidence, which together reduces the reliance on the underground economy. This phenomenon has also been revised by Beck and Demirgüç-Kunt (2008), showing how economic growth can

reduce individual engagement in the underground economy by several means, such as increasing access to finance.

Minimizing Poverty and Disparity: Reducing poverty and inequality, inclusive finance can provide a cushion for the worst-off groups within society with crucial financial services, which may result in achieving better economic status and reduce immersion in the underground economy for survival (Saha and Qin, 2023).

Gender inclusion: an analysis done in Pakistan regarding financial inclusion for women has revealed that the emancipation of women with financial resources can hugely impact the shadow economy by bringing female-led businesses and intergrating them into the formal sector (Hassan and Iqbal, 2016).

By looking at the above paragraphs, we can observe how the underground economy can theoretically be tackled by financial inclusion, and hence why this study chose to examine its relation to financial inclusion and mitigate its effects.

1.3.1.1. Islamic Finance

This study chooses to incorporate aspects of Islamic banks and conventional banks while observing all the ways financial inclusion, institutional quality, and determinant variables affect the underground economy. The inclusion of the aspect of Islamic banks can be justified by the fact that since the primary indignant of the OIC member countries are Muslims, it is not farfetched to generate a theory to observe how the introduction of Islamic banks within our model will affect the variables under investigation. The Islamic financial system is a financial system that involves financing activities in compliance with Islamic laws. The core values or philosophies embedded within the Islamic financial system are interest prohibition, risk sharing, welfare promotion, discouraging uncertainty, and speculation. Interest started to be banned gradually in the early days of Islam under an Islamic economic system that was still cultivated during Caliph Umar (634-644) (Choudhary and Malike, 1992).

In the latter part of the nineteenth century, European empires' control and colonization of Muslim countries fueled the rise of Islamic contemporary thinkers like Anwar Qureshi, who began to question the role of the modern economy. In the twentieth century, several Muslim activists tried to redefine interest and began rallying Muslims to borrow and lend at Islamic banks that did not use fixed rates. An exceptional instance of the first pilot

small Islamic bank was located in Pakistan's remote regions; the lender imposed no interest in the late 1950s (Wilson, 1983).

Ahmad Elnaggar also built the first contemporary Islamic bank in documented history in the countryside of Egypt around 1963. Despite it ceasing operation in 1963, plenty deemed it to be prosperous (Kepel, 2003). In the seventies, government agencies and private organizations attempted to put conceptual understanding into motion for the earliest no-interest banks, with one notable incident being the initial worldwide symposium on Islamic economics, where intellectuals and academics declared any sort of interest to be unacceptable (Kepel, 2003).

The Islamic Development Bank was created in 1975 with the goal of subsidizing its member states (Warde, 2000), and Dubai Islamic Bank, the first modernized corporate bank, was founded in 1979. The 1880s saw a tremendous rise in Islamic investments due to their prospect of steadiness and return. Furthermore, in the 1990s, AAOIFI was created in 1995, and 144 Islamic financial institutions were operating worldwide (Kepel, 2006). In the modern era, the Islamic banking sector emerged as the world's interest-free financial industry (Asutay, 2013).

The global market share of assets held by Islamic banks will be 19% in 2023 (Fitch Ratings, 2024). Based on the IFSB (2023) report, the Islamic banking industry is the most dominant product in contrast to other Islamic products, boasting around 2 trillion USD in assets globally. The current overview of the Islamic finance industry is expressed as the market share of Islamic banks within the OIC states. According to Al Qureshi (2010), the overall market portion of Islamic banks was approximately 17%, and the total assets held by Islamic banks are estimated to be 21% compared to conventional banks. S&P Global Ratings (2023) noted that the sector has been steadily growing at a rate of approximately 10%. This has been pegged to factors like increased requests for financial services from the Islamic banking systems caused by shifts in consumer preferences, better legal conditions, and the general expansion of the Islamic banking operations for several countries on the list of OIC. Al-Harbi (2022) reported that non-Islamic banks occupy the majority of the market share in the OIC finance markets, though Islamic banks are growing at a fast pace and Islamic banks within some of the OIC nations occupy a market share of less than 10%.

1.3.1.2. Underground Economy and Islamic Finance

Islamic finance provides a framework that can address some of the underlying causes of the underground economy in OIC countries: Islamic finance provides a framework that can address some of the underlying causes of the underground economy in OIC countries: Sharia Banking Practices**:** Shariah banking is against interest and focuses on profit-and-loss bearing to cut the cost of credit and make official loans popular among the new businesses or existing businesses involved in the informal basis (Ali and Hossain, 2020). The ban on Gharar and the requirement for a standard market price discourage the acceptance of excessive risk and uncertainty in contract terms. This policy helps promote the formal financial sector (El-Gamal, 2006).

Microfinance and Financial Inclusion**:** These are firms and financial organizations that offer financial services and products that comply with Islamic law to needy entrepreneurs and families by extending short- and long-term credit facilities and saving products without charging interest. This can assist in the formalization of informal businesses by the government (Karim, Tarazi, and Reille, 2008).

For instance, the microfinance model derived from Grameen Bank changed with Islamic banking, and Sharia law has proven effective in the delivery of cash at a low interest rate to business people in Islamic countries such as Bangladesh and Indonesia (Obaidullah, 2008).

The success of Malaysia and Saudi Arabia's Sukuk issuance for major infrastructure projects shows that the provision of such financing instruments has a positive impact on economic growth and the overall shrinkage of the informal economy (Iqbal and Mirakhor, 2011).

In summary, we include Islamic banks because of the growing nature of the industry, the population of the majority of residents living in the OIC region, and to observe the behavior of variables under investigation when there is the presence of Islamic banks rather than conventional banks.

1.3.2. Institutional Quality

It is the quality of the institution that critically determines the prosperity of a nation, its governance, and the welfare of the community. Institutional quality, in the abovementioned context, can be regarded in terms of the effectiveness, transparency,

accountability, and stability of institutions that govern economic, political, and social interactions. Variables depicting institutional quality include the following:

Rule of Law: How laws are publicly formulated, impartially applied, and independently enforced. Regulatory Quality: The extent to which the government is capable of devising and implementing effective guidelines and statutes that allow and encourage business sector progress.

Government effectiveness is measured by the caliber of amenities provided, the public service's aptitude, and its independence from partisanship.

The oversight of fraud: a measure of that authority in the state is misused for selfish purposes, encompassing trivial and massive graft. Political Stability and Absence of Violence: Threat of state or non-state violence, including terrorism. Speech and Responsibility: measures on the capability of a nation's inhabitants to choose their leadership, as well as liberty of opinion, collective action, and an environment of independent press. For instance, Schneider, Buehn, and Montenegro (2010) observed that countries that ranked lower in terms of accountability had a higher level of underground economy due to the low trust of institutions among their citizens.

The impact of poor institutional quality on the underground economy can be regulatory burden and compliance costs, whereas poor regulatory quality is likely to make compliance costs high, thus the unregulated sector would thrive in order to evade the demand of high bureaucracy and taxation (Loayza, 1996). Also, corruption and informality: High levels of corruption could push businesses into the unregulated marketplace as a means to evade corrupt state officials and/or not be forced to pay bribes (Friedmann et al., 2000).

Weak Rule of Law: In nations with improper execution of rules and laws, enforcement of contracts and property rights is not certain; hence, the unofficial transaction is the most attractive. (Schneider and Enste, 2000).

Institutional quality and the underground economy in the context of OIC nations are unique in their economic, social, and political sceneries; this paper pursues the case of what role institutional quality shapes the underground economy. The theory is not very farfetched, whereas. For instance, in Egypt, onerous regulations and bureaucratic inefficiency have pushed many small businesses to operate informally. The World Bank has noted that reducing red tape with regulatory reforms could drastically reduce the

underground economy (World Bank, 2014). Fraud and the scope of the unregulated marketplace have been shown to have a relationship; this can be observed in OIC countries like Nigeria, where high levels of corruption have been deemed responsible for its large informal economy. Based on the report by Transparency International's Corruption Perceptions Index (2020), Nigeria has been placed very low in most years of operation; this linkage bridging embezzlement and informality is strong. To add to that, government efficiency and economic activity in Indonesia show that Indonesia has improved significantly in terms of effective governance and a reduction in informality. Efforts toward the simplification of business registration procedures and better delivery of public services have gradually formalized economic activities, as is reflected in the report of the Asian Development Bank (2016).

Political stability and informal employment Pakistan: Political instability in Pakistan has contributed to a vast informal economy. The frequent change of guards in government and the inconsistency of policies deter formal business operations, hence forcing economic activities underground (ILO, 2018).

Because of these facts we presented before, we chose to observe the role they play in affecting the underground economy.

CHAPTER 2: LITERATURE REVIEW

This section analyzes previously conducted studies on the aims of our study, which include investigating the influence of financial integration on the underground economy in a dual banking system. Second, the study examines the contribution of institutional competence in relation to the underground economy in a dual banking system, and finally, the study examines the determinants of the underground sector within the dual banking system. All of the variables studied are from OIC member states.

The research being reviewed was split into three groups. The initial segment looks at literature on financial inclusion and the underground economy. The subsequent portion investigates the prior perspectives of many scholars on the interaction involving the underground economy and the effectiveness of institutions, and the last section displays and explores scholars who highlight the drivers of the underground economy.

2.1. Financial Inclusion

Khan, Abdul Hamid, and Rehman (2021) employed the GMM methodology to comparatively observe the connection between inclusive finance and the unregulated sector between OIC and non-OIC countries. Their investigation observed 141 countries and found that the correlation between financial inclusion and the unregulated market is inverse, and they questioned the effectiveness of promoting access to financial resources in diminishing the informal economy in OIC states as opposed to non-OIC states.

Tunku Abdul Rahman, Shahimi, and Mohd Nor (2022) stated that they used the OLS technique and observed that the growth of sharia compliance banking favorably influenced women to have access to monetary amenities, hence advocating for more accessible financial services in the selected OIC member nations. This research shows how sharia compliance banks play a crucial role in creating a monetary structure that is more inclusive for females, especially those who face deterrents in financial access because of their religious beliefs.

Gharleghi and Jahanshahi (2020) obtained a dataset of 29 advanced and underdeveloped states employing the panel threshold technique to measure the nexus between the growth of finance and the unregulated economy. Their study, which used liquid liabilities, internal lending to deposited funds, and capitalization of the stock market as proxies for monetary progress, was used to calibrate the specific level and number of the GDP so as

to scrutinize the effects of the advancement of finance on the underground economy. Their study depicted that above the GDP per capita of US$33,600, the impact of financial advancements on reducing the depth of the unregulated market is staggering, suggesting countries with lower per capita income to ensure improvement of policies enabling ease and broader accessibility to financial instruments so as to attain the same results as the states with per capita income above the said threshold.

Mar'i and Cavusoglu (2021) investigated the nexus between financial progress, the unregulated economy, and the growth of the economy, employing panel quantile and vector auto regression methods to observe 156 states globally from 1991 to 2015. Based on the quantile technique, the study observed that exogenous variables, GDP growth, and financial advancement have immense implications for the unregulated economy at various quantiles. From the same perspective, the consequence of growth on the unregulated sector is opposite for all the quantiles, and the results concerning the financial development sets are fairly substantial at certain quantiles. Researchers conclude that growth in GDP has a substantial adverse effect on the informal economy, although the implications of financial development variables are ambiguous. As a result, the empirical data show that the underground economy has substantial net repercussions on GDP growth, yet it exerts a detrimental effect on financial growth.

The underground economy has also been considered by Sakanko et al. (2024) to play a moderating role in ten African countries of the western region. Using both fixed effects and pooled mean group estimators, the study used data from 2004 to 2021 to determine their conclusions. The study also applies the Pedroni cointegration and Dumitrescu-Hurlin causality tests. The findings obtained demonstrated that the underground economy and financial inclusion had a long-run linkage, along with indicating that there is a single-direction causality amidst inclusive finance and the underground economy, respectively. However, in the brief moment, an inverse and substantial linkage between the two variables was spotted.

Using panel data analysis, Bayar and Ozturk (2016) investigated the connection existing between the unregulated marketplace, the progress of the finance industry, as well as the quality of institutions in EU emerging market economies between 2003 and 2014. The outcomes of the investigation demonstrated a co-integrating relationship among the underground economy, the advancement of the finance industry, and the standard of

institutions. Additionally, the development of finance and good governance harmed the unregulated sector in the long run. According to Beck and Hoseini (2014), increasing access to finance can help mitigate the size of the underground economy in India; however, the effects are more significant with registered firms compared to those businesses that operate informally.

Syed et al. (2021) studied the consequences of inclusive finance through digital means and the underground economy on emerging nations in South Asia. Applying continuous updated and full modified examining the pressure digital finance exerts on the underground economy along with continuous updated bias corrected techniques to data from 2004 to 2018. The long-term outcomes indicate that a surge in digital finance serves to mitigate the spread of the illegitimate sector in the sample of the chosen economies. Capasso and Jappelli (2013) studied the link connecting the underground economy and the advancement of the finance industry and observed a present relationship between the two variables.

Safuan et al. (2021) measure the linkage linking the expansion of the financial sector and the unofficial economy within Indonesia using data between 1980 and 2020. The study employed an adjusted cash-to-deposits methodology and observed a nonlinear linkage amidst the magnitude of the unregulated marketplace along with the improvement of the finance industry expressed as a U-shaped curve. The extent of the subterranean economy was observed to expand in the initial phases of growth within the finance industry until it reached a point where the growth had an abrupt halt and then diminished as financial industry growth kept going.

Also, according to Ghaffar et al. (2022), which undertook an examination to observe the connection between financial integration in Western Europe and emerging Asia states by analyzing data collected annually spanning from 1990 to 2017, they applied the nonlinear cointegration method and obtained the outcomes that depicted a poor linkage among the breadth of the unregulated marketplace and integration of the finance sector. It was observed by Law and Singh (2014) that finance can stimulate economic growth, but not beyond a particular level. The researchers employed a dynamic methodology with thresholds for panel data from 87 developed and developing countries.

Financial inclusion's relation to the underground economy has also been explored by Younas and Zahid Irshad, Qureshi, Atiqa and Al-Faryan, and Mamdouh Abdulaziz Saleh

(2022); their study examines inclusive finance as well as the underground sector's effect on the prosperity of third-world states nine years from 2008. Their study employed three methodologies, including GMM, OLS, fixed effects, and a Granger causality approach. The researchers found out that promoting access to financial amenities or inclusion in the finance sector had an impact on economic growth, which is substantial and optimistic, while when it comes to nations that are developing, the degree of the unregulated marketplace has a disproportional effect and negatively impacts the growth of the economy.

Ajide (2021) reported that monetary integration could be a beneficial instrument in helping to mitigate the magnitude of the underground economy, provided that there is no rampant corruption within the country. The author conducted this study using data from sub-Saharan countries spanning from 2005 to 2015. Moreover, according to Njangang, Ndeffo Nembot, and Ngameni (2020), a connection exists between the growth of the finance sector and the underground economy, and they discovered a recessed cup (U) linkage between the two variables.

2.2. Institutional Quality

Sulehri, Ahmed, and Alim (2021) observed the relationship between the underground economy and corruption levels along with political stability within underdeveloped states from 2004 until 2019. The researchers applied fixed effect and panel Granger causality to examine the dependent variable, the underground economy, on corruption and stable politics, while the causality test was for testing the existence of a causal linkage among the variables that were chosen; hence, it was observed that corruption and political turmoil could significantly boost the underground economy.

Johnson, Kaufmann, Shleifer, Goldman, and Weitzman (1997) discuss how the unregulated economy can be triggered by economies that are transitioning, prompting fraud, and hence the underground economy thrives, giving the Soviet Union as an example while it was radically shifting from a command economy to a free market.

Dang et al. (2022) investigated the influence of corruption and the standard of establishments on the unregulated sector by studying 29 Asian nations. The author's results showed that bribery, misconduct, and quality establishments had both a favorable and detrimental effect on the unregulated economy, respectively. Furthermore, the

relationship between fraud as well as freedom of commerce possesses an adverse influence on the underground economy, while bribery and democratic systems possess an encouraging effect on the concealed economy, verifying that fraud operates more efficiently in fragile monetary structures as well as powerful political structures, respectively.

Pham (2023) analyzes the impact of institutional integrity on entrepreneurs as modulated by the underground economy in an international cohort of 79 countries from 2006 through 2018. Employing the fixed effect and GMM methodologies. Research results suggest enhanced institutional quality increases entrepreneurial activities, whereas the extended informal economy decreases business ownership efforts. Remarkably, as the underground sector grows in size, the beneficial effects of good governance on entrepreneurship will diminish.

Assidi et al. (2024) reported that the underground economy impedes long-term development in nations with ineffective leadership, but it has the reverse effect in countries with good administration, while studying the outcome of the unofficial economy on three sustainability variables is examined, with a focus on the controlling impact of the quality of governance and the stochastic nature of the interaction under analysis.

Bulut (2023) reported an adverse link between joining the unregulated marketplace and the quality of institutions. While trying to observe 67 nations in development during 2002–2017, adopting the fixed-effect to empirically examine the relationship. It has been reported that institutional quality has a negative correlation with the advancement of the unregulated marketplace, with the exception of regulatory quality, while controlling for fraud, maintaining political stability, and promoting accountability all contribute to curbing the prevalence of the underground economy. This research aimed at investigating how the integrity of establishments alters the trajectory of the underground economy for the ASEAN economies using data from 2007 to 2016 (Maulida and Darwanto, 2018). Wibowo and Indrayanti (2020) showed that there is a detrimental impact between regulatory quality and the informal economy while observing seven ASEAN nations using a multiple linear regression model.

FiroozAbadi et al. (2015) examined the association between institutional quality using three variables, including mitigation of fraud, unstable politics, and rule of law, with the

underground economy employing a dynamic panel data two-stage model to measure data from 1999 to 2008. The study determined that a poor association exists between institutional quality and the extent of the underground economy. Falahati et al., 2020, stated that there is a negative association between the underground economy and institutional excellence or quality while measuring the two variables involving 87 countries between 2000 and 2018, applying generalized moments methodology.

Khattak et al. (2024) demonstrated that the presence of institutions that had strong foundations assisted in mitigating the dimensions of the unregulated marketplace significantly. In order to measure the effect of institutional quality and banking competition on the size of the underground economies, he acquired data from 127 nations between the periods of 2000 and 2017. The researcher applied the GMM model to obtain these outcomes. A study by Remeikiene, Gaspareniene, and Kartasova (2014) reveals that taxation is an extremely significant factor contributing to the upsurge of the unregulated economy in Greece.

Huynh et al. (2019) The scientific findings demonstrate that institutional excellence is not merely an outcome but additionally a repercussion of the underground economy; incoming foreign direct investment (FDI) contributes to lowering underground economies through the route for organizational progress; and less size of the underground economy boosts institutional quality and motivates incoming foreign direct investment (FDI). Applying general methods of moments for an assortment of 19 emerging Asian nations over 2002–2015. Researchers have indicated that high standards of institutions, bureaucratic tendencies, order and rules, control of corruption, and civil wars are among the factors influencing the underground economy in 132 countries using the extreme bound analysis from 1991 until 2017 (Abu Alfoul et al., 2022).

Dada and Ajide (2021) studied the function of the caliber of establishments in the unregulated markets in Nigeria within the time frame of 1984 to 2018. The study employs an autoregressive distributive lag methodology and found that the association that exists between the effects of the underground economy as well as the integrity of institutions has a prolonged detrimental but little influence on environmental damage. These results suggest that the quality of establishments or institutions is insufficient to significantly lessen the underground economy.

Note the lack of literature that addresses the connection between the conjoining standard of establishment indicators and the unregulated market within the context of sharia-compliant banks and non-sharia-following banks separately. This stimulates us to bridge this gap by adding the aforementioned elements to our study.

2.3. Factors Affecting the Underground Economy

Elgin and Uras (2012) reported that an unfavorable correlation is present bridging taxation and the expansion of the underground economy while observing a collection of data from 152 advanced and underdeveloped countries from 1999 to 2007.

Arsić et al. (2015) studied the factors influencing the underground economy within Serbia, including the burden on taxes as one of the independent variables. The researchers therefore deduced the fact that, compared to other eastern and European nations in the central part of the vicinity, the proportion of the burden of taxes on spending in Serbia is no higher than that of the aforementioned countries, implying that the value-added tax load isn't a significant contributor to Serbia's larger underground economy.

The costs of burdening taxes might result in the development of the unregulated marketplace of the Czech Republic's underground market, using data from 2005 to 2014 (Buček, 2017). Acosta-González et al. (2014) showed that personal capital gains taxes, firm taxes on earnings, and profit margins are among the primary factors resulting in the prevalence of the subterranean market. Nikopour (2003) stated that both import duty and direct taxation lead to the burden of individuals and boost the magnitude of the unregulated market. This study was observed, particularly in Iran, using data from 1961 to 2001.

Furthermore, states with lower per capita income are more likely to have a larger GDP contribution from informal activity. This phenomenon was observed while comparing factors affecting the underground economy between other countries and the 23 countries from the MENA region, observing data from 1999 till 2015 (Ateşağaoğlu et al., 2018). Panjaitan (2015) revealed that economic policy reforms and heavy taxation also resulted in the rise of the unregulated marketplace in Indonesia. They utilized statistics from 1969 to 2004.

Khan and Rehman (2022) utilize the GMM methodology to observe the factors influencing the underground economy, making a comparison between OIC and non-OIC

countries. Their study obtained a negative relationship amongst the variables gross domestic product, taxes, and money supply with the underground economy. Gökmenoğlu and Amir (2023) attributed the burden of taxation as one of the factors influencing the underground economy after Employing panel AutoRegressive Distributed Lag, we investigated a yearly dataset for Estonia, Latvia, and Lithuania from 2009 to 2019, yielding pooled mean group forecasts.

Hallunovi and Vangjel (2023) utilized an autoregressive distributed lag and Granger causality model in order to examine how economic growth and taxation relate to an underground economy and found that an inverse relationship exists between the aforementioned parameters. Additionally, while examining the connection between inclusive finance, the nation's prosperity, and the underground marketplace within growing nations, the researchers observed that the growth of the economy reduces the size of the underground economy (Younas, Qureshi, & Al-Faryan, 2022).

Abdul Malek and Mohd Arshad (2017) found out that unofficial unemployment was a result of low effectiveness of government initiatives, faith motives, and poorness while studying what influences the underground marketplaces and also stressed the fact that to build a more wholesome Islamic economic structure, the aspects that influence the underground marketplace must be studied. Debrah (2007) reported that the unregulated market is influenced by its function as a labor market in Ghana.

Experts have primarily concentrated their research on established and transitional economies, while allocating lower priority to markets that are developing. Subsequently, it goes without saying that there exists a knowledge vacuum that exists among the OIC states' regarding the subterranean economy. Erdinç (2012) stated how vital it was to study the challenge of the underground economy and emphasizes why it is important for the developing nations to measure and study further the topic of concern.

Having observed the three parts that have delved deep into examining the previous literature, we notice that very few studies have not only incorporated the aspect of Islamic banks and non-Islamic banks within their study but also very few have discussed within the context of OIC nations the subject of underground economies directly.

After identifying that gap, the aforementioned test will help close it by being one of the few studies to investigate how financial inclusion through Islamic banks influences the underground economy. The investigation is going to contribute by inspecting as well as

reporting regarding the way the potency of institutions within OIC nations affects the underground economy while observing how the variables react in the presence of Islamic banks and conventional banks separately.

The chapter also emphasized the scale of the subterranean economy. Another contribution is that the study, apart from other analyses regarding unregulated economies, has employed a fixed effects model in order to capture the fact that, among its advantages, it is useful when there are unobserved time-invariant factors that could bias the estimates of the coefficients. By including fixed effects for each individual or entity in the analysis, the model effectively controls for these unobserved heterogeneities, ensuring that such factors do not confound the estimated effects.

CHAPTER 3: METHODOLOGY

This chapter consists of 3 parts. The first part presents the hypothesis's development. The second part shows the data origins and definitions of the utilized variables, as well as the estimating models and equations of estimations covered in the last part. Furthermore, the first part has been subdivided into three subparts: estimation equation determinants of the underground economy in both Islamic and conventional banks; estimation equation for financial inclusion effects on the underground economy; and finally, estimation equation of institutional quality repercussion on the underground economy. Similarly, the last part has one subpart, that is, a variable, and eventually concludes the chapter.

3.1. Hypothesis Development

As demonstrated in the preceding paragraphs, the underground economy has negative consequences for any country's economic performance and political stability, such as poorly adopted and inefficient legislation. The underground economy produces huge leakage in government revenue collection and tax earnings, which generally go unreported, resulting in poorly enforced policies and perpetuating the vicious circle. Furthermore, these leaks may represent a burden to the remaining population fraction that follows the regulations. Nonetheless, the informal market also has a significant impact on providing training for inexperienced and unskilled workers. Gain experience in the unregulated sector that can be applied later in the regulated sector. Similarly, inexpensive things are accessible to the less fortunate members of society.

Additionally, Carter (1984) states that one of the primary explanations as to why individuals opt for the underground economy is because it offers them favorable terms plus an appropriate working arrangement. The accumulation of fortune via the underground economy has an immense impact on the expansion of the economy.

In regard to OIC states, it has been frequently acknowledged that the majority of OIC countries remain underdeveloped and that one of the main challenges facing growing economies with regard to economic policies is the scarcity of reputable, precise, current, and coherent data.

Significantly, the OIC nations have a large portion of their economies operating underground (34.36%), which has not been acknowledged in official statistics. Despite

being in alignment with comprehensive bookkeeping specifications, the accuracy of government-released data is still doubtful.

In a comparable manner, gathering information is difficult in many nations, and estimating methodologies suffer as a result of a lack of resources. Companies and organizations from these nations maintain data hidden from government officials in OIC and non-OIC states due to the underground economy.

Because of the intricacy, fluidity, and variation of contemporary markets, numerous academics and economists have researched the underground economy from multiple viewpoints, adopting various approaches and examining various aims (Schneider, 2005). But the attributes, roots, and scale of the underground economy vary across nations. Scholars have concentrated on the underground marketplace in developed and emerging markets, with less emphasis dedicated to underdeveloped ones. More crucially, there is a scarcity of literature on OIC countries. Considering this discrepancy, this examination evaluates the implication of monetary inclusion on the underground economy to assess the impact of institutional standards and the causal factors of the underground economy. The OIC states both sharia-compliant and non-sharia-compliant banking firms in this thesis. To fill the void, the following two hypotheses have been proposed:.

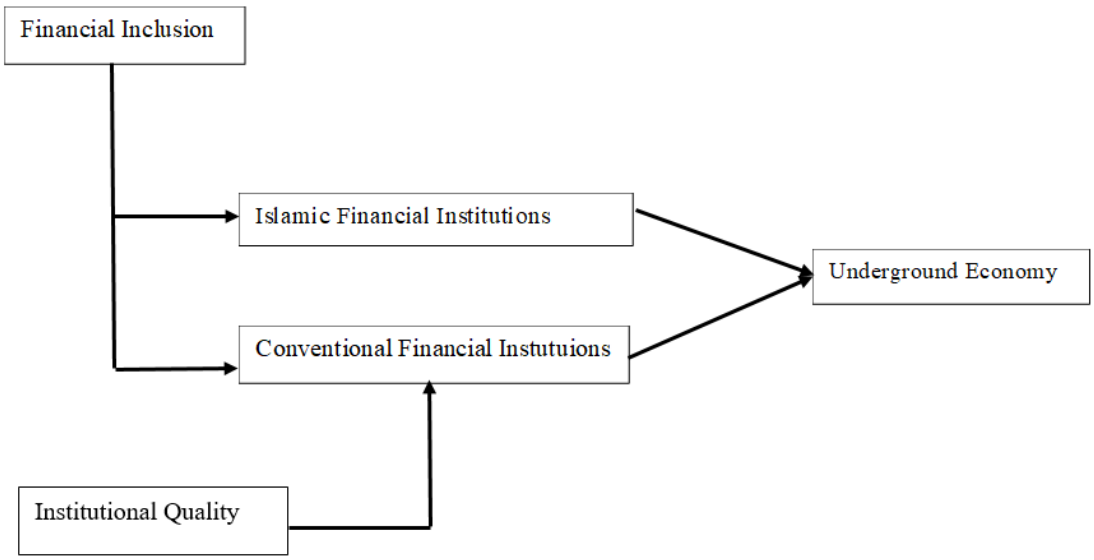

Figure 1 : Theoretical Framework

Source: Created by the author.

3.1.1. Financial Inclusion and the Underground Economy

In an attempt to address the issue of the black market economy, one of the instruments used is inclusive finance, which can generally be defined as an instance in which consumers and SMEs have a means of obtaining pertinent and inexpensive financial goods and services that satisfy their requirements. According to Oz-Yalaman (2019), given that financial inclusion can increase residents' prosperity, eradicate poverty, and advance other economic goals, the author proposes that it can be used as an instrument to help residents become financially integrated. As their disposable income increases, the amount that the government receives in taxes could grow, bringing more citizens into the tax net.

Blackburn et al. (2012) developed an empirical paradigm that included both financial proxies and tax avoidance. According to the author, economies with a nascent or less advanced monetary structure have a rising underground economy. The author further added that a more accessible financial system would diminish the extent of the underground economy. Eventually, inclusive finance aims to provide economical access to financial services, creating incentives for stakeholders to reallocate their financial assets to the regulated sector. According to Canh and Thanh (2020), the progress of finance diminishes the size of the underground sector in almost 100 states.

The negative link connecting monetary integration and the underground economy conveys the notion that a state with a well-established and deep financial system might be able to recruit companies and organizations from the unregulated marketplace to the regulated marketplace in the setting of OIC markets. As an outcome, we anticipate the underground economy to shrink as financial inclusion expands. As a result, we put the following hypothesis under scrutiny:.

H0. Ceteris paribus: Financial inclusion is negatively linked with the underground economy in a dual banking system.

3.1.2. Institutional Quality and the Underground Economy

According to Friedman et al. (2000), if the informal sector grows, the structures of politics and community that govern the marketplace must be held accountable. In essence, it is the system of justice and administrative processes that foster the underground economy to flourish and thrive. It is not only economic but also institutional architecture that exerts some degree of influence on both formal and underground commercial operations. The

executive branch, legislators, as well as political elites and civil servants, have enormous autonomy in selecting how to allocate funds and have a major influence on the effectiveness of institutions. According to Schneider (2005), the primary contributing factors to the underground economy are excessive laws and heavy taxation. According to Goel and Nelson (2016), avoidance of taxation is the main cause of underground activities in advanced nations, while bureaucratic complexity and absurd taxes have been the primary causes in less developed nations.

The institutional quality of OIC countries ought to play a crucial role in the underground economy. In particular, the standards of regulatory bodies, the observance of laws, and a stable political system are to be held accountable.

Looking at the literature, we anticipate a detrimental impact of institutional quality on the underground economy. As a result, we recommend the hypothesis below.

H1. Ceteris peribus: institutional quality is connected with the underground economy in a dual banking system.

3.2. Data and Variables

Our investigation examines 49 OIC member countries. The research project included an array of data sources, including the World Heritage Foundation. In a comparable manner, the underground economy data is sourced from the World Heritage Foundation from 2002 to 2018, and our description of the underground economy parallels that of Elgin, Kose, Ohnsorge, & Yu (2021), who defined it as an informal output percentage of official GDP, estimated using MIMIC forecasts. In an effort to estimate all of our objectives: To assess the implications of monetary integration on the underground economy in the dual banking system, To empirically investigate the function of quality of institutions in the underground economy and investigate the variables that determine or cause factors,. We used data from 2002 through 2018. In a similar vein, the accessibility of data and relevant factors influence which databases are chosen.

3.2.1. Variables

The dependent variable, undeground economy, is represented by (UE). Our study obtains data from the World Heritage Foundation from 2002 to 2018, whereas our definition of the underground economy aligns with that of Elgin, Kose, Ohnsorge, & Yu (2021), who

described the underground economy as an informal output proportion of official GDP, which was estimated through MIMIC estimates. The unregulated market score has been developed by the MIMIC approach, which is deemed by researchers to be an adequate methodology for examining the extent of the unregulated economy in contrast to money requests and electrical power usage, among other things. To measure the first objective: to explore the ramifications of financial integration on the underground mrketplace in the dual banking system. We again utilize the unregulated sector variable as a outcome variable and ATMs as a simulated for financial inclusion, which coincides with Khan, Abdul Hamid, and Rehman's (2021) research, which assumes that the size of the underground sector can be lessened when a large proportion of actors possess the means of accessing official financial amenities, which the variable ATM adults perfectly captures because it covers the quantity of consumers and companies using accounts within the regulated system of banking.

Another proxy we use to represent financial inclusion is borrowers from commercial banks denoted by BCB, which was also utilized by Khan, Abdul Hamid, and Rehman (2021) as an estimate to depict the rate at which financial institutions have penetrated the general public. We also include domestic credit to the private sector (DCPS). This variable was utilized by Bayar and Aytemiz (2017) to measure progress of the financial sector in relation to the underground economy. Bank capital to assets ratio (%), represented by CAP, is one of the parameters that we included in our model, indicating the proportion of total wealth to bank equity and savings. Equity and savings comprise the entirety of the following: owner investments, profits kept, basic and exceptional savings, allowances, and monetary alterations. The first tranche of capital (bought stakes and regular shares) is widespread in all financial frameworks, while the entire regulated capital contains different kinds of subjugated obligations that have no need to be promptly settled in the event the assets must comply with the requisite thresholds of capital (second tranche and third tranche capital). Total assets comprise both non-monetary and financial investments. We also considered commercial bank branches (per 100,000 adults) denoted by the letter CBB, which was utilized by Saha & Qin (2023) to depict access to finance. Furthermore, we include depositors with private banks denoted by DEP as a proxy for measuring inclusive finance. We further incorporate broad money growth (annual%) denoted as (BM), that is employed by Hassan and Schneider (2016) along with Elgin and

Uras (2012). The real effective exchange rate index, denoted by RFX, is also included in our model. The unemployment variable denoted by UNEMP is used as a control variable, as are taxes on products and amenities denoted by TAX. Evidence shown by Tan, Habibullah, and Yiew (2016), as well as Schneider (2005), respectively, depicts the aforementioned variables having a relationship with the underground economy.

Second, empirically evaluate the function of institutional excellence in the underground industry. We use variables to represent the role that governing bodies play in influencing the black market when Islamic institutions are present or absent in OIC countries. Previous research has stressed the significance of establishments in determining the scale of the underground economy.

For instance, Dreher and Schneider (2006), Abdih and Medina (2013), and Khan, Abdul Hamid, and Rehman (2021) have depicted how institutional quality impacts the underground economy. We have used Regulatory Quality: Estimate, denoted by RQ, as employed by Schneider (2010). We also utilize Voice and Accountability: Estimate, denoted by VA, as observed by Dreher and Schneider (2006). For the control variables, we took into consideration employment to population ratio, denoted by EMP.. We are intrigued by addressing the breadth of the unregulated sector via the quality of institutions within OIC states, as well as contrasting how it is altered by the existence of Islamic and conventional banks in the region. All of the parameters were chosen because they were significant within OIC states and covered lengthy periods.

For the final objective, we encompass the control of corruption (COC) factor, a substitute indicative of views on the manner in which public power is used for private gain, involving either the minor and major areas of misconduct, plus the "seizing" of the state's resources by the privileged and vested interests. We also use PS, which assesses feelings about the likelihood of political upheaval and/or ruthlessness with partisanship, like terrorism. Voice and Accountability, which includes information about a country's residents' ability to pick their representatives, as well as liberty of speech, affiliation, and the availability of a free press, We also have ATMs, which are virtual communication technologies that allow clients of banks to carry out monetary transactions in public, according to the World Development Indicator. We consist of The physical stores of local business banks, along with other domestic banking institutions that serve as commercial banks and offer monetary amenities to clients, are referred to as CBBs. These locations

are physically isolated from the headquarters but are not set up as legally autonomous affiliates. DEP refers to the declared quantity of deposit accounts maintained at commercial lending institutions and other resident banks serving as commercial lending institutions for local non-monetary firms and individuals. In consequence of a dearth of data pertaining to account owners, records in lots of nations are limited to providing the aggregate amount of bank accounts for deposits. We observed the World Development Indicators' real effective exchange rate indices, represented as FX. It is calculated by dividing the nominal effective swap rate—a measurement of what a currency is worth relative to the cumulative mean of multiple non-local currencies—by an expense index. To further represent general sales and turnover, we also use taxes on goods and services, value-added taxes, selective excise on commodities, particular charges on offerings, tax payments on the utilization of items or assets, fees on the extraction and generation of mineral content, and the revenues of fiscal oligarchy. We also include GDP per capita growth (annual%), as Hassan and Schneider (2016) define it, with GDP defined as the yearly proportion rise of GDP per capita computed using a fixed currency denomination designated by GDP. We will also generate dummy variables so as to make comparisons on how Islamic conventional institutions affect the underground economy within OIC member states.

Variable	Description	Definition	Source
Automated teller machines (ATM)	Automated teller machines (ATM) (per 100,000 adults)	Are digital telecommunications devices that allow bank clients to conduct financial transactions in the open.	World development indicators (WDI)
Underground economy (UE)	Percentage (%) of grossdomestic product (GDP)	Underground economy comprises products and offerings produced in a country, that are not included in national database	
Commercial bank branches (CBB)	Commercial bank branches (per 100,000 adults) (CBB)	Physical branches of based commercial banks and other residing banks which serve as commercial banks and offer financial services to clients and are physically separated from the main branch but not established	World development indicators (WDI)

		as independently operating subsidiary companies.	
Domestic credit to the private sector (DCPS)	Domestic credit to the private sector (% of GDP)	Financial instruments offered by financial firms to business entities, such as loans granted, acquisitions of non-equity investments, trade financing, and other receivables from clients that set up an entitlement to reimbursement,.	World development indicators (WDI)
Bank capital to assets ratio (CAP)	Bank capital to assets ratio (%)	The proportion of total assets to bank capital and reserves. Proprietor contributions, retained earnings, general and special reserves, provisions, and value adjustments are all included in capital and reserves.	World development indicators (WDI)
Borrowers from commercial banks (BCB)	Borrowers from commercial banks (per 1,000 adults)	Referred to as the publicly available count of non-financial companies (public and private) and family units who acquired credit from commercial lenders and other banks acting as lending institutions.	World development indicators (WDI)
Depositors with commercial banks (DEP)	Depositors with commercial banks (per 1,000 adults),	The official count of deposit customers at commercial banks and other citizen banking institutions operating as business banks who are resident nonfinancial corporations (public and private) and households.	WDI
Broad money growth (BM),	Broad money growth (annual%)	Total amount of currency outside banking institutions; demand deposits apart from the ones held by the central government; time, savings, and foreign currency deposits of non-central government based industries; bank and traveler's checks; and other assets including certificates of deposit and banknotes.	WDI

Real effective exchange rate index, (RFX)	Real effective exchange rate index (2010 = 100)	The nominal effective exchange rate (a measure of the value of a currency against a weighted average of several foreign currencies) divided by a price deflator or index of costs.	WDI
Regulatory quality (RQ)	Gives the country's score on the aggregate indicator, in units of a standard normal distribution, i.e. ranging from approximately -2.5 to 2.5.	Encapsulate judgements regarding the capacity of the government to enact and execute astute strategies and guidelines which grant and encourages the growth of free entreprises	World Governance Indicators (WGI)
Control of corruption (CC)	Provides the nations's score on the aggregate indicator, in units of a standard normal distribution, i.e. ranging roughly -2.5 to 2.5.	Reflects insights on the extent state authority is exercised to garner individual interests, including both small and big facets of corruption as well as the seize of the state by elites and private interests	WGI
Political stability and the absence of violence or terrorism	Provides the nations's score on the aggregate indicator, in units of a standard normal distribution, i.e. ranging from about -2.5 to 2.5.	perceptions regarding the likelihood of political instability and/or politically motivated violence, including terrorism	WGI

Voice and accountability (VA)	Estimate gives the country's score on the total indicator, in units of a standard normal distribution, i.e. ranging from roughly -2.5 to 2.5.	Insights of the extent to which a nation's residents have the ability to engage in choosing their government, along with freedom to express themselves, freedom of association, and the presence of free media.	WGI
Unemployment (UNEMP)	Unemployment, total (% of total labor force)	Proportion of the workforce that is unemployed but readily accessible for and seeking work	WDI
Employment (EMP)	Employment to population ratio variable	The portion of a nation's inhabitants that is employed	WDI
Gross Domestic Product (GDP)	GDP per capita	The yearly rate of growth of gross domestic product at the market rate using fixed country-specific currencies	WDI
Taxes on goods and services (TAX)	Percentage (%) of revenue	Overall earnings and turnover or added worth duties, specific excise on merchandise, targeted levies on amenities, fees on the use of products or belongings, taxes on resource extraction and output, and taxation on profits generated by monopolies.	WDI

Table 1: Variable Description

Source: https://databank.worldbank.org/source/world-development-indicators Access Date 07/08/2023

3.3. The Estimating Models

The formulas utilized to accomplish the study's goals are clarified in this chapter. The explanation of each equation is linked to the relevant hypothesis.

Estimation Equation: Financial Inclusion Impact on the Underground Economy

To accurately evaluate the implications of inclusive finance on the underground economy within the dual banking system and measure the H0 hypothesis, we have stated the following equation:

$$UE_{it} = \beta_0 + \beta_1 ATM_{it} + \beta_2 BCB_{it} + \beta_3 DCPS_{it} + \beta_4 CAP_{it} + \beta_5 CBB_{it} + \beta_6 DEP_{it} + \beta_7 BM_{it} + \beta_8 FX_{it} + \beta_9 TAX_{it} + \beta_{10} GDP_{it} + \beta_{11} UNEMP_{it} + u_{it} \quad (1)$$

In the above equation (1), UE denotes the underground economy. Our study used four proxies, ATMs, which also include borrowers from commercial banks denoted by BCB. According to the World Development Indicator, they referred to BCB as the publicly accessible count of non-financial companies, both listed and non-listed households, who obtained loans from private lenders, and banks acting as financial intermediaries that are included in the dataset. In numerous nations, the information pertains to the overall count of outstanding loan accounts, as details on individual account holders are often unavailable.

In addition, we take into account the GDP share of DCPS, a measure presented by Bayar and Ozturk (2016), CAP, CBB, and DEP, and we also included FX. These variables have already been defined in the aforementioned paragraphs.

We further incorporate BM, as Khan, Abdul Hamid, and Rehman (2021) defined it as the largest gauge for estimating the money supply. It includes M1 and M0, which can be known as narrow money (such as cash), as well as harder-to-liquidate assets including foreign currencies, convertible securities, bills of exchange, and additional assets that could be readily transformed into cash (except for firm shares). As for the control variables, we took into consideration the unemployment variable denoted by UNEMP, referred to as the segment of the labor market that is jobless but readily accessible and seeking jobs, which was also utilized by Khan, Abdul Hamid, and Rehman (2021). Since the underground economy and joblessness have a notable linkage, as reported by Hassan and Schneider (2016), we include TAX as a control variable in our model. We use a dummy to differentiate between Islamic and conventional banks. If the country has

Islamic banks, we assign 1; otherwise, we assign 0. The dummy variable reveals the variation between Islamic banks as well as conventional banks within the OIC.

Estimation equation: Institutional Quality's Impact on Underground Economy

To assess the conjecture regarding the function of institutional quality on the underground economy in the dual banking system, we have stated the following equation:

$$UE_{it} = \beta_0 + \beta_1 RQ_{it} + \beta_2 VA_{it} + \beta_3 PS_{it} + \beta_4 EMP_{it} + \beta_5 GDP_{it} + u_{it} \quad (2)$$

In the above equation (2), UE denotes the underground economy and t indicate years, u is the residue, while i translate to nations. To test the effects of the role of institutions' quality in the underground economy nexus., we have used regulatory quality: Estimate denoted by (RQ) as employed by Schneider (2010), this estimate We also utilize voice and accountability. The estimate denoted by VA, as observed by Dreher and Schneider (2006), and the control variables we took into consideration Employment-to-population ratio, 1 is a variable denoted by (EMP) and can be defined as the portion of a nation's inhabitants that is employed.

The World Development Indicators define employment as the total number of people of working age (those aged fifteen or older) who perform any kind of endeavor for the intent of manufacturing merchandise or delivering amenities in return for compensation or gain over a brief period of time, regardless of whether they were employed (e.g., working for at least an hour) or not (e.g., due to a working-time arrangement or a temporary absence from an employment site). This model includes GDP per capita, usually known as GDP, because of the connection between GDP and employment. Studies like Schneider and Hametner (2014) found directly proportional evidence between GDP and the underground economy. The study includes a dummy variable that assumes the number one provided the nation has Muslim banks as well as zero otherwise to construct a guarantee that reflects the outcomes of the dependent parameter comparing conventional banks and Islamic banks.

Estimating Equations: Causal influencing the Underground Economy

We build the mathematical model below to empirically explore the contributing factors of the underground economy in OIC states with sharia-compliant banks vs those with traditional banking institutions. The subsequent function was stated:

$$UE_{it} = \alpha_0 + \alpha_1 TAX_{it} + \alpha_2 GDP_{it} + \alpha_3 FX_{it} + \alpha_4 ATM_{it} + \beta\alpha_5 CBB_{it} + \beta\alpha_6 DEP_{it} + \alpha\beta_7 VA_{it} + \alpha_8 PS_{it} + \alpha_9 COC_{it} + u_{it} \quad (3)$$

Undeground economy is signified by UE, u is a residue , it reflects nations, and symbolizes time. Taking the legalist school of thought into consideration, more regulation is directly proportional to the underground economy, both theoretical and emperical, where significant associations have been discovered linking the underground sector and establishments (Abdih and Medina, 2013). Similar to Hassan and Schneider (2016), we additionally factor growth in GDP per capita into account.

We include the control of corruption (COC) as a control along with variables such as, political stability, voice, and accountability. We also include ATMs. This investigation includes CBB, depositors for commercial banks, which are also considered real effective exchange rate indexes and are depicted as FX (Khan, Abdul Hamid, and Rehman, 2021).

3.4. Methods of Estimations

Since our examination has employed longitudinal data, the models specified are estimated using fixed effects and random effects techniques. Comparing longitudinal data to time series has numerous rewards (Baltagi et al., 2005). Methodologies for measuring longitudinal data, for example, disregard the homogeneity premise and take notice of the inherent variability of nations. As a result, national diversity is managed. Conversely, sequential data and cross-sectional data are susceptible to unreliable prediction because they fail to account for variability. Second, contrasted with utilizing primarily time- and cross-sectional data, longitudinal data indicates efficient predictors, a wider amount of autonomy, as well as variance. Moreover, longitudinal data assists the detection and computation of various effects.

In addition to the benefits mentioned above, longitudinal data appears to be harmonious with regard to comprehending shifting patterns and accounting for the span of socioeconomic variables.

Focusing on the benefits to longitudinal data and the nature of our variables, especially the underground economy index, we employ the fixed effects technique, which permits our study to arrive at unbiased and reliable estimators for the betas even when there are

cross-sectional variations between predictor variables and cross-sectional error terms, since we are interested in analyzing the impact of variables that are time invariants.

With this kind of data, we can extend our original OLS model to relax the 0 conditional average conjecture and allow for cross-sectional correlation between our predictor variables and our term for error.

A particular dummy variable has been inducted as recorded by Brüderl and Ludwig, (2014) within each category since this investigation is utilizing the fixed-effect methodology to generate the subsequent equation:

$$Y_{it} = \alpha_1 + \beta_1 X_{1it} + \beta_2 X_{2it} + \cdots + \beta_k X_{kit} + u_{it} \quad (4)$$

Which can be written in matrix notation as:

$$Y = D\alpha + X\beta' + u \quad (5)$$

$$Y = \begin{pmatrix} Y_1 \\ Y_2 \\ . \\ . \\ . \\ Y_N \end{pmatrix}, \; D = \begin{pmatrix} i_T & 0 \ldots . & 0 \\ 0 & i_T & 0 \\ 0 & 0 & i_T \end{pmatrix}_{NTxk}$$

$$X = \begin{pmatrix} x_{11} & \cdots & x_{1k} \\ \vdots & \ddots & \vdots \\ x_{N1} & \cdots & x_{NK} \end{pmatrix}_{NTxk}$$

$$\alpha = \begin{pmatrix} \alpha_1 \\ \alpha_2 \\ . \\ . \\ . \\ \alpha_N \end{pmatrix}_{Nx1} \qquad \beta' = \begin{pmatrix} \beta_1 \\ \beta_2 \\ . \\ . \\ . \\ \beta_k \end{pmatrix}_{Nx1}$$

The dummy variable is used individually for each part, as opposed to the group's specialized computation process. So, to verify the fixed effects procedure, we could apply the Hausman test.

Since we have longitudinal data, each observation is indexed by unit i, which represents a country and a time period. The target variable UE is dependent on a variety of predictor variables in the stochastic residue u. Since we are employing a fixed effects model, the model will remove the duration-constant parameters, swapping the word using the phrase AI, which represents a distinct value for each component or element in a panel. This is occasionally labeled a fixed effect or an individual effect. When it comes to our models, AI represents the effects of our dependent variable that do not change over time. Furthermore, we also add more terms as a time-confined interception that reflects variation in the outcome within duration but does not vary within nations. For example, in our study, where the underground economy is the dependent variable, the δt variable captures microeconomic conditions that affect the overall underground economy.

By applying the inside-group fixed effects approach, in which we reduce the outcome variables throughout every component prior to forecasting the model's parameters,.

$$Y_{it} = \beta_1 + \beta_2 X_{2it} + \cdots + \alpha_i + \delta_t + \mu_{it} \qquad (6)$$

By taking the the median every variable in our predictive equation for one individual entity i but spanning every point in time, we will obtain the following:

$$\overline{UE}it = \beta_1 + \beta_2 \overline{X}_{2it} + \cdots + \alpha_i + \overline{\delta}_t + \overline{\mu}_{it} \qquad (7)$$

Equation 7 represents the average figure of the predictor variable for countries, i.e., the median magnitude of the unregulated marketplace across the years of states surveyed. While the average of α_i remains unchanged because this individual (country) impact is already time-invariant, we subsequently compute the discrepancy of the means from each value or simply subtract the latter equation from the former, obtaining this model. In other words, FE estimation applies POLS to altered data where the transformation (called

'demeaning' or 'within transformation') recovers variance within individuals over time but discards variation across units.

$$\left(UE_{it} - \overline{UE}_{it}\right) = \beta_2(\beta_2 X_{2it} - \beta_2 \overline{X}_{2it}) + \cdots + (\delta_t - \overline{\delta}_t) + (\mu_{it} - \overline{\mu}_{it}) \qquad (8)$$

Based on Brüderl and Ludwig (2014), α_i is time-constant for every individual and corresponds to that person's mean. Thus, by deducting solution (7) from formula (6), α_i and any potential bias arising from its connection with regressive variables is eliminated. The standardized measure of y across an observation or an ensemble of samples attributable to an identical unit or other selected unit i is what we call this after subtracting the average. For the same basic reasoning, we compute the demeaned independent variables. The removal of both of the αi terms, which eliminates any of the fixed effect terms in the calculation using the demeaned variables, is a significant result of the subtraction. We can estimate the parameters by taking the fixed effect elements out of the equation (Brüderl and Ludwig, 2014).

The standard FE estimator is achieved by applying the pooled least squared model estimator to the figures that have been demeaned. As previously outlined in the statistical groundwork for the subsequent part, the consistency of the FE estimator is contingent upon the strict exogeneity postulation (Brüderl and Ludwig, 2014).

The rationalization for generating such a conjecture of no country-specific undetected heterogeneity $E(X'_{it}\ \alpha_i) = 0$ has diminished significantly.

In such cases where the predicted mean does not equal zero, the fixed effects predictor is consistent. Thus, using longitudinal data alongside the FE model makes it possible to identify causal effects under looser constraints than when using ordinary least-squares estimators. Overall variation is minimized using data demeaning, leaving only variation within a group for estimation. Therefore, using FE estimation, individual-specific undetected variation has no effect on the estimate, so the influence of nation-specific variability is not as much an issue (Brüderl and Ludwig, 2014).

The key distinction is that, instead of comparing across countries, FE modeling signifies the effect of causation through contrasting alterations that occur inside a country as an outcome of an intervention event. Therefore, the FE approximation ceases to demand the robust as well as, in numerous instances, unrealistic supposition of unit homogeneity.

The presumption of temporal homogeneity is necessary, which means, according to Jensen and Snodgrass (2018), a spatial association that occurs when tuples' attribute

values are (partial) mappings spanning a single time domain into a different value domain. Such constitutes a widely held idea considering a lot of variables evolve over time. Nonetheless, the FE estimator works effectively because it presumes that remains valid when using our refined variables. Furthermore, it is simple to relax the presumptions of time-based homogeneity by offering a control sample of units that it were not treated.

The treatment category's within-group relationship is subsequently employed to separate out the pattern. It is hardly sufficient to presuppose that there are no changes substantially occurring throughout time; rather, one need only assume that both the experimental and control groups' time trends are congruent.

More formally, this is the strict exogeneity assumption introduced above. In numerous social science study scenarios, the unit homogeneity assumption tends to be less robust compared to other assumptions. Consequently, employing panel data and fixed effects (FE) estimation enables the determination of the causation effect with less stringent conditions than those required in regular regression analysis using cross-sectional data.

Also, because of the volatility of our economic factors, particularly the underground economy, the previous year's underground economy may influence the current underground economy. Panel approaches are ideally suited for estimation in order to appreciate such dynamic tweaking. The tenacity of the underground economy can also be depicted via dynamic techniques.

Furthermore, if there is a single dependent variable, an independent variable, and independent variables, a dynamic relationship emerges. So, here is the link between dependent variables and independent factors, as well as lagged dependent variables:

$$UE_{it} = \theta UE_{i,t-1} + \beta x'_{it} + \mu_{it} \quad (9)$$

$$i = 1, \cdots, N; t = 1, \cdots T$$

In equation 9, $\theta$is a scalar, where β is M × 1 while x'it is 1 × M. Likewise, μ_{it} has its foundation from the conjecture of the residue:

$$u_{it} = \mu_{it} + \gamma_{it} \quad (9.1)$$

In the above equation, u_{it} is a residue, that is spread uniformly, while μ_{it} reflects the variabilty of the individual, that is undetected traits, and the lingering disturbance is

marked as γ_{it}. Equation 9.1 is robust across time due to two aspects: diversity and temporal correlation. Unobserved traits guarantee mitigation of variation, whereas the lagged covariate eliminates serial dependence $(UE_{i,t-1})$. Consequently, serial dependence arises across uit as well as $(UE_{i,t-1})$. So since the model consists of these two issues, we will use FE to ensure our results are consistent and robust.

To summarize, our data collection contains many N (49 countries) and spans for extremely long time period (T M). As a result, a within-effect or random effects framework is considered for final analysis, and the Hausman test has been used to achieve this goal. We use system fixed effects as a key statistical technique since the calculated outcome of the Hausman test suggests that it is substantial at the five percent threshold, which signifies why the within effect model suits well with our longitudinal of OIC nations with dual banking systems. In this work, we used not only GMM as a secondary statistical tool but also random effects and pooled OLS methods to test the reliability of our models.

CHAPTER 4: RESULTS AND DISCUSSIONS

We addressed the evidence base, experimental parameters, produced models to be predicted, and an explanation of the investigation's procedure in earlier sections. We introduce correlational evaluation and descriptive data in this portion of the text. The chapter also includes thorough assessments and projections. There are four parts in this subsection. The effects of financial integration on the unregulated market in the OIC and in two separate banking structures are covered in the first part. The subsequent part presents the outcomes of the elements impacting the black market economy, which is followed by the significance of institutional quality in the context of Islamic banks and traditional banking institutions. Finally, robustness testing and closing thoughts are covered in the last part.

4.1. Descriptive Statistics

We begin by showing descriptive data in Table 2 before moving on to predict the causes of the unregulated marketplace, the impact of financial inclusion, and the influence of institutional quality on the underground economy in a dual banking setting in the OIC region. The average amount of the underground marketplace (UE) is 34.7 as well as exhibits a variation around the mean of 9.8, as is the average figure of the CAP, which has an average of 42.03 and a normal deviation of 72.3. The highest value of the underground economy (UE) is 59.3, while the minimal figure is 16.7. The mean rating of borrowers from commercial banks (BCB) is 88.2, with a standard deviation of 120.2. The average figure for broad money growth (BM) is 393.013, with a standard deviation of 237.468. The mean amount for commercial bank branches (CBB) is 240.9, with a dispersion of 186.6. The average control of corruption (COC) is -0.558, with a standard deviation of 0.603. The median estimate of internal lending to the private sector (DCPS) is 394.3, while the spread is the arithmetic mean of the EMP, which is 54.896, and the standard variation is 13.453. The average number of the Real Effective Exchange Rate Index (FX) is 45.918, with a normal variability of 78.59. The mean amount of GDP is 1.903, with a standard deviation of 6.76. The average score of TAX is 58.126, with the deviation around the average figure being 92.172. The median score of PS is -0.543, with a statistical variance of 0.882. The number of regulatory quality indicators, indicated by RQ, is -0.425, with a statistical variance of 0.617. The unemployment variable (UNEMP)

has an expected value of 7.2 and a variability around the mean of 4.8. The average figure for Voice and Accountability: Estimate is -0.722, while the statistical variance is 0.552.

Variable	Obs	Mean	Std. Dev.	Min	Max
UE	833	34.698	9.846	16.7	59.3
ATM	833	205.661	182.202	1	552
CAP	833	42.035	72.381	1	258
BORR	833	88.224	120.203	1	379
BCB	833	393.013	237.468	1	807
CBB	833	240.844	186.647	1	579
COC	833	-.558	.603	-1.664	1.567
DCPS	833	394.331	240.057	1	810
EMP	833	54.896	13.453	31.367	88.103
FX	833	45.918	78.59	1	274
GDP	833	1.903	6.76	-62.378	121.779
TAX	833	58.126	92.172	1	309
PS	833	-.543	.882	-3.006	1.388
RQ	833	-.425	.617	-2.284	1.206
UNEMP	833	7.216	4.816	.11	25.9
VA	833	-.722	.552	-1.987	.606

Table 2 : Descriptive Statistics

Source: Created by the author.

Variables	*(1)*	*(2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*	*(9)*	*(10)*	*(11)*	*(12)*	*(13)*	*(14)*	*(15)*	*(16)*
(1) UE	1.000															
(2) BCB	-0.036	1.000														
(3) DCPS	-0.187	-0.031	1.000													
(4) CAP	-0.017	0.320	-0.090	1.000												
(5) DEP	0.102	0.315	-0.045	0.063	1.000											
(6) TAX	-0.106	0.005	0.123	0.059	0.056	1.000										
(7) GDP	0.107	0.034	-0.043	-0.017	0.032	0.055	1.000									
(8)UNEMP	0.019	-0.036	-0.007	-0.050	-0.105	0.099	0.010	1.000								
(9) RQ	-0.332	0.013	0.227	0.091	-0.078	0.170	-0.039	-0.240	1.000							
(10) PS	-0.146	-0.133	0.139	-0.045	-0.122	-0.006	-0.017	-0.091	0.580	1.000						
(11) VA	0.209	-0.003	-0.042	0.048	-0.040	0.167	0.080	-0.086	0.207	0.216	1.000					
(12) EMP	0.061	-0.063	0.053	0.004	0.028	-0.097	0.010	-0.760	0.324	0.322	0.155	1.000				
(13) BM	0.052	-0.023	0.097	-0.043	-0.004	-0.003	0.048	-0.058	0.068	0.099	0.106	0.114	1.000			
(14) CBB	0.062	0.294	-0.093	0.199	0.140	0.090	0.058	0.106	-0.069	-0.132	0.001	-0.189	-0.004	1.000		
(15) FX	0.024	-0.099	-0.030	0.099	-0.060	0.057	-0.011	0.018	-0.021	-0.062	-0.064	-0.087	0.081	0.088	1.000	
(16) COC	-0.484	-0.022	0.236	-0.009	-0.116	0.092	-0.085	-0.175	0.807	0.639	0.201	0.223	0.070	-0.124	0.009	1.000

Figure 2 : Correlation Matrix

Source: Created by the author.

The degree of association across the parameters is shown in Table 3. Three types of factors were used in this study: variables related to institutional quality, a substitute for financial accessibility, and causative parameters. The financial integration variables exhibit reliable connection indicators due to their substantial coefficients.

Table 3 provides the descriptive statistics, including average values and standard deviations, for countries in the OIC with Islamic banks and those with conventional banks. The median number of unregulated marketplaces in OIC nations with Islamic banks is small compared to the average of the subterranean economy with conventional banks within the same region. On the contrary, the averages of almost all other variables are greater in OIC countries with conventional banks than in those with Islamic banks. Additionally, it seems apparent that there is substantial variation across the parameters in both of these subcategories.

	MEAN		SD	
Variables	**Islamic banks**	**CB**	**Islamic banks**	**CB**
UE	30.686	34.929	8.586	10.034
ATM	205.482	209.542	196.881	180.556
CAP	52.12	41.767	74.55	72.816
BCB	101.723	85.508	104.478	120.691
BM	351.06	395.258	257.696	233.672
CBB	282.988	239.937	225.333	180.774
COC	-.419	-.555	.514	.615
DCPS	390.831	398.435	244.74	238.644
EMP	48.955	55.848	11.06	13.489
RFX	90.687	42.745	84.613	77.563
GDP	1.246	1.99	3.029	7.176
TAX	43.181	61.577	74.004	94.335
PS	-0.962	-0.49	0.915	0.88
RQ	-0.248	-0.412	0.551	0.613
UNEMP	7.413	7.185	5.304	4.82
VA	-0.985	-0.693	0.502	0.557

Table 3 : Islamic and Conventional Banks Summary Statistics

Source: Created by the author.

4.2. Findings

This section addresses the hypothesis 0–1 put forth so as to measure the findings of the financial integration, function of institutional qualities, and causal factors of the underground economy. Different econometric models are employed so as to obtain robust results. As shown before, within the OIC countries, Islamic banks and conventional banks make up the two separate samples of the data utilized by this study.

4.2.1. Financial Inclusion's Impact and the Underground Economy

In this section, we examine the response to Hypothesis 0 and give findings on the implications of financial integration for the underground sector. Table 6-8's dependent variable is the underground economy. All of the required diagnostic procedures have been completed, and the model's decision is validated by the Hausman test. Similarly, with the

other GMM methodology that we used to test for robustness, the exaggeration constraints were displayed as accurate, as proven by the Hansen and autocorrelation checks.

Considering Islamic Banks: The table below discusses the implications of financial inclusion for countries within the OIC_region that have Islamic banks. As discussed below, we employ a fixed effect model, which is base-line regression, so as to prove our hypothesis. However, GMM and random effects results are presented. The responding variable is the underground sector, and all the screening tests have been done.

We find an unfavorable connection connecting financial integration and the underground economy, supporting hypothesis 0, which anticipates a comparable relationship between the two. We established a dummy variable called Islamic dummy 1 (ISD1) to reflect the impact of our proxies in the presence of Islamic banks. The BCB coefficient is significant and adverse, implying that as the assortment of borrowers increases, the unregulated sector diminishes, demonstrating that Islamic banks can help shrink the underground economy in OIC states.

Furthermore, the ATM coefficient is negative in relation to the unregulated sector, implying that a rise in the number of ATMs inhibits the expansion of the subterranean economy. Furthermore, the DCPS coefficient is negative and has a reverse connection with the extent of the underground economy for Islamic banks in OIC countries. This means that if internal lending given to the corporate sector increases, the size of the underground sector will shrink. Similarly, our analysis discovered a negative and significant coefficient of the aforementioned variable, revealing that the scale of the unregulated sector and bank capital-to-asset ratio are inversely linked within the framework of Islamic banks. The findings are corroborated with findings from the Capasso and Jappelli (2013) study.

Furthermore, the CBB coefficient is undesirable and noteworthy at 10%. This shows that as the quantity of banks of commerce grows, the breadth of the underground economy decreases. Other methods have independently corroborated the findings. This finding also demonstrates a negative and substantial association between commercial bank depositors (DEP) and the scale of the unregulated economy. This suggests that as the quantity of depositors grows, the underground economy shrinks.

When it comes to conventional Banks: The seventh table shows the impact of financial integration between OIC governments and traditional banking institutions. We utilize the

fixed effect model as the base-line regression, as mentioned above; however, GMM and random effects findings are presented in appendices. The underground economy is the dependent variable, and all diagnostic tests have been completed. We see a link connecting financial inclusion and the unregulated sector. We developed a dummy variable called non-Islamic dummy to reflect the impacts of our proxies in the presence of conventional banks. In Islamic banks, the ATM coefficient is inverted in correspondence to the underground economy, which means that the proportion of the unregulated economy decreases as the array of ATMs grows. Though the impact between ATMs and the OIC nations with Islamic banks is similar to that with OIC nations with conventional banks, the difference is that the coefficient of ATMs within Islamic banks is smaller (-0.054) compared to the coefficient of ATMs within conventional banks within OIC states. This means that the increase in computerized banking terminals for every one hundred thousand seniors negatively affects the surrounding economy, but the implication is weaker when there are Islamic banks than conventional banks. The results are consistent with the proposed hypothesis H0, which predicted an inverse connection linking the underground economy and inclusive finance. The BCB coefficient is negative pertaining to the unregulated sector, stating that as an assortment of borrowers from commercial banks increases, the size of the underground economy decreases. The outcome indicates the impact of borrowers from commercial banks on the OIC nations with conventional banks is similar to that of the OIC nations with Islamic banks; however, notice how the magnitudes of the coefficients differ, whereas the coefficient of BCB within Islamic banks is smaller (-0.031) compared to the coefficient of borrowers, which is (-0.033). This suggests that an increase in borrowers (BCB) has a detrimental ramification for the unregulated economy; however, the effects from conventional banks are more effective than those from Islamic banks. The coefficient of DCPS is negative, meaning that it is inversely proportional to the underground economy, and an upsurge in a certain proportion of commercial bank borrowers would correspondingly shrink the informal marketplace. The findings show that the impact of DCPS on OIC nations with conventional banks is roughly equivalent to that of OIC nations with Islamic banks; nonetheless, the degree of the coefficients varies, with the coefficient of DCPS across Islamic banks being smaller (-0.046) than the coefficient of DCPS (-0.084). This shows

that a surge in DCPS has an undesirable effect on the underground economy; however, the impacts are more effective for regular banks than Islamic institutions.

Next, the results we obtained showcase that the coefficient of CAP is not favorable as well as substantial, meaning that it is inverted in regards to the unregulated economy and that an increase in a given percentage of capital split by assets will result in a proportional fall in the regulated economy. The findings of the present research indicate the consequence of CAP on OIC countries with conventional banks is comparable to that of OIC countries with Islamic banks; yet, the numerical value of the coefficients varies, with the coefficient of CAP across Islamic banks being smaller (-0.057) than the coefficient of bank capital to asset ratio (CAP), which is (-0.065).

This implies that a rise in CAP has an adverse association with the underground economy, despite the fact that conventional banks' influence is more potent than that of Islamic banks. We observe that the CBB coefficient is negative. As commercial bank branches (CBB) become more accessible to the public, the underground economy decreases, similar to the prior finding with Islamic banks. Both slamic and conventional banks have the same negative impact on the subterranean economy. The difference in their coefficients explains the degree of the impact between the two, although the coefficient of bank branches (CBB) (-0.7) is bigger than that of Islamic banks (-0.062), indicating that the underground economy is more affected by the former than the latter. Finally, as with the other variables discussed, the connection between DEP and the extent of the subterranean economy is both unfavorable and substantial. This suggests that as the total number of depositors grows, the dimension of the unregulated sector decreases. The coefficient of depositors is (-0.016), which is less than the coefficient observed with introducing Islamic dummy 1 (ISD1), which is (-0.011). The findings are consistent with preceding investigations, suggesting that financial integration has a greater influence on the underground economy when there are conventional banks than when there are Islamic banks. These results match up with the outcomes of Khan and Rehman (2022).

Our data suggest that there is a detrimental association between underground economic integration and the presence of Islamic banks compared to regular banks. The results corroborate our H0 hypothesis, showing an identical connection between the developing economy and financial inclusion. The relatively low coefficients inside OIC member states with banks that comply with Sharia standards may be attributed to the realization

that the financial systems in these areas are less developed than those in OIC nations with conventional banks. Another probable reason is that the number of Islamic banks and their penetration into various locations is quite low compared to conventional banks, which are present in a lot of OIC member nations, resulting in only a handful of individuals being served.

UE								
	Islamic banks				**Conventional banks**			
	FE (1)	RE (2)	GM (3)	RG(4)	FE(5)	RE(6)	GM(7)	RG(8)
L.UE			0*** [1.006]				0*** [1.057]	
ATM	-0.054* [0.001]	-0.001*** [0.02]	0.881 [0]	0.154 [0.001]	-0.015** [0.023]	-0.013** [0.001]	0.701 [0]	0.015** [0.001]
BCB	-0.031* [0.003]	-0.019** [0.021]	-0.068* [0.001]	-0.033** [0.003]	-0.033** [0.011]	0.034** [0.001]	0.098* [0.001]	0.031** [0.001]
DCPS	-0.046* [0.10]	-0.134 [0.006]	0.067* [0.001]	0.546 [0]	-0.084** [0.016]	0.098* [0]	-0.096* [0.001]	0.084* [0]
CAP	-0.057* [0.004]	0*** [0.053]	0.738 [0]	-0.157 [0.004]	-0.65** [0.034]	0.573 [0]	0.995 [0]	0*** [0]
CBB	-0.07* [0.001]	0.087* [0.006]	0.945 [0]	-0.107 [0.001]	-0.62*** [0.021]	-0.63*** [0.001]	-0.612 [0.001]	-.0.02** [0.001]
DEP	-0.010** [0.002]	-0.463 [0.004]	0.43 [0]	0.016** [0.002]	-0.16*** [0.015]	0.11*** [-0.002]	0.928 [0]	-0.001*** [0.002]
BM	0.628 [0]	-0.494 [0.003]	0.076* [0.001]	0.628 [0]	0.155 [0]	0.155 [0]	0.099* [0.002]	0.155 [0]
FX	0.878 [0]	0.073* [0.018]	0.511 [0.001]	0.878 [0]	0.627 [0]	0.635 [0]	0.892 [0]	0.627 [0]
TAX	0.223 [0.003]	-0.053* [0.024]	0.564 [0]	0.223 [0.003]	-0.055 [0.001]	-0.052* [0.001]	0.891 [0]	-0.055* [0.001]
UNEMP	0.668 [0.048]	0*** [1.206]	0.661 [0.022]	0.668 [0.048]	0*** [0.237]	0*** [0.234]	0.292 [0.07]	0.178 [0.237]
GDP	-0.213 [0.045]	0.022** [0.541]	-0.002*** [0.116]	0.213 [0.045]	0.006*** [0.015]	0.007*** [0.015]	0*** [0.167]	0.006*** [0.015]
Constant	0*** [31.763]	0*** [21.956]	.0*** [3.817]	0*** [19.9]	0*** [33.713]	0*** [33.443]	0.085* [3.324]	.0*** [30.927]

Observation	83	83	735	83	718	718	735	718
Aellano-Bond: (AR1)			0.069				0.009	
Aellano-Bond: (AR2)			0.615				0.197	
Hansen Test(p-Val)			0.546				0.118	
F-stats(p-value)			0.000				0.000	

Table 4 : Impact of Financial Inclusion on the Underground Economy

Source: Created by the author.

Note(s): *, ** and *** along with the coefficient values of variables represent 10%, 5% and 1% significance levels. The outcome variable is UE Column 1 and 5 illustrates the baseline results obtained using Fixed effects

4.2.2. Impact of Regulatory Institutions on the Underground Economy

Continuing our inquiry, we will now look at the outcomes of the third aim, which is how regulatory institutions affect the underground economy in the setting of Islamic banks and conventional banks. In addition to fixed effects, prior estimations have presented random effects, GMM, and regression results with the subterranean market as the dependent variable. The table below displays the outcomes of both Islamic and conventional banks. In case of Islamic banks: As shown in Table 6 above, in our fixed effect model, the coefficient of regulatory quality (RQ) is substantial and favorable. These findings imply that as regulatory authorities' efficiency grows, the scope of the unregulated sector increases. The findings do not support our H1 hypothesis, which predicts an unfavorable correlation between the effectiveness of institutions and the unregulated economy. This could be attributed to the fact that most hidden economies are underdeveloped and have inferior institutions. Additionally, the voice and accountability estimate (VA) coefficient is significant as well as positive. The findings show that when people's voices are heard and held accountable, the extent of the underground market grows. Furthermore, like with the previous variable, the coefficient of stability in politics and zero incidents of assault or terror (PS) is positive with regard to the unregulated marketplace in OIC member nations. This observation allows us to conclude that the level of political equilibrium and the dearth of violent acts or extremism (PS) prompt an increase in the extent of the unregulated economy. Finally, the employment-to-population ratio (EMP) coefficient has an undesirable and important relationship with the subterranean economy. This demonstrates a reverse correlation between the EMP and the unregulated economy; thus, as the EMP rises, indicating a surge in the number of people with jobs, the underground economy diminishes. The justification for these outcomes is that a large number of OIC states are poor countries, along with the limited presence of Islamic institutions, which mitigates the impact of those institutions as a whole on the diminution of the underground economy.

When it comes to conventional banks: As seen in the table below, we employ the fixed effects model while also testing for resilience using other models. Table 6 shows a significant and adverse coefficient of regulatory quality (RQ), indicating that as regulatory quality increases, the volume or size of the underground sector declines. These findings validate our H1 hypothesis regarding conventional banks, which reveals an

adverse link connecting the subterranean economy and institutional quality. Additionally, there are voice and responsibility coefficients. The estimate (VA) is both adverse and noteworthy in virtually all of the models, showing that the scope of the unregulated economy decreases when the opinions of others are acknowledged and individuals are held accountable. Likewise, our study revealed a negative and substantial association between political security and the absence of threats and violent acts (PS), implying that stable politics and the lack of aggressive behavior constrain the expansion of the underground sector. Finally, the employment-to-population ratio (EMP) coefficient is both negatively and substantially correlated with the surrounding economy. This shows that there is an inverse relationship between the EMP and the unregulated sector; that is, as the EMP grows, the unregulated sector shrinks. The discoveries coincide with previous work by Schneider (2010)

UE								
	Islamic Banks				**Conventional Banks**			
	FE(1)	RE (2)	GM(3)	RG(4)	FE(5)	RE(6)	GM(7)	RG(8)
L.UE			0*** [0.933]				0*** [1.204]	
RQ	0.742* [0.59]	0.792* [0.598]	0.449 [0.891]	-5.3** [2.24]	-1.66** [0.24]	-1.70*** [0.598]	0.574 [0.427]	-6.28*** [0.737]
VA	0.824*** [0.307]	0.807*** [0.312]	0.084 [0.414]	7.95*** [1.409]	-0.506** [0.228]	-0.134 [0.225]	-0.81 [0.243]	-4.514*** [0.649]
PS	0.134* [0.105]	-0.471 [0.582]	0.085* [0.248]	-0.437 [0.515]	-0.134* [0.105]	-0.471 [0.582]	0.323 [0.176]	-0.437 [0.515]
EMP	-0.004*** [0.001]	-0.003*** [0.001]	0.641 [0.082]	-0.001 [0.001]	-0.001*** [0.002]	-0.001*** [0.0]	-0.741 [0.14]	-0.001*** [0.0]
GDP	0.812 [0.008]	0.873 [0.005]	0.12 [0.161]	0.812 [0.008]	-0.002*** [0.014]	-0.02** [0.013]	-0.03** [0.101]	-0.02** [0.014]
Constant	0.051* [10.645]	0.017** [14.337]	0.0*** [3.817]	0*** [-10.1]	0*** [29.701]	0*** [29.296]	0*** [30.613]	.0*** [30.927]

observation	83	83	735	83	718	718	637	718
Aellano-Bond: (AR1)			0.090				0.004	
Aellano-Bond: (AR2)			0.333				0.549	
Hansen Test(p-Val)			0.698				0.271	
F-stats(p-value)			0.000				0.000	

Table 5: Institutional Quality and the Underground Economy

Source: Created by the author.

Note(s): *, ** and *** along with the coefficient values of variables represent 10%, 5% and 1% significance levels. This table depicts the regression estimations of the function of regulatory authority on the UE. The dependent variable is UE, which reflects the magnitude of the underground economy. Columns 1 and 5 show the baseline findings derived using fixed effects.

4.2.3. Factors Influencing the Underground Economy

Table 7 provides results and discusses the factors influencing the underground economy in sharia-compliant banking institutes and non-sharia-compliant banks. Variable selection is based on both theoretical and empirical literature (Khan, Abdul Hamid, and Rehman, 2021; Eilat and Zinnes, 2000; Schneider et al., 2010; Hassan and Schneider, 2016; Schneider and Enste, 2000; Torgler and Schneider, 2009; Abdih and Medinah, 2013). We justify using the fixed effects model since it is the appropriate methodology to use when dealing with panel data. We chose to utilize the fixed effects model after the Hausman tests showed its suitability. Furthermore, the study included random effects, GMM, and pool regression to ensure that the outcomes were reliable.

Prior investigations indicate that a variety of elements influence the subsurface environment. For example, Khan, Abdul Hamid, and Rehman (2021) identified three factors that influence it: macroeconomic variables, the degree of freedom to conduct company operations in the regulated economy, and organizational quality, which can be measured by control of statute, stable politics, fraud oversight, voice, and responsibility. Since we are watching the consequences of unregulated markets in the presence of Islamic banking firms, we report findings that illustrate how the subterranean economy operates in the presence of traditional banks

UE								
	Islamic Banks				**Conventional Banks**			
	FE(1)	RE(2)	GM(3)	RG(4)	FE(5)	RE(6)	GM(7)	RG(8)
L.UE			0*** [0.87]			0*** [0.864]		
CBB	-0.001 [0.001]	0.488 [0.003]	0.64 [0]	-0.565 [0.001]	-0*** [0.001]	-.0*** [0.001]	0.568 [0.001]	0*** [0.001]
ATM	0.565 [0]	-0.74 [0.002]	0.256 [0.001]	0.179 [0]	0*** [0.001]	-0*** [0.001]	-0.387 [0.001]	-0*** [0.001]
DEP	-0.041 [0.002]	0.462 [0.003]	0.047** [0.002]	-0.041* [0.002]	-0.005*** [0.001]	-0.006*** [0.001]	-0.065* [0.002]	-0.005*** [0.001]
COC	0.025** [1.57]	0*** [13.48]	0.035** [1.577]	0.025** [1.57]	-0*** [0.873]	-0*** [0.981]	-0.027*** [1.618]	0*** [0.873]
PS	0.054** [-0.14]	0*** [4.527]	0.034** [0.57]	-0.654 [0.14]	-0.001*** [0.336]	-0.001*** [0.327]	0.025** [0.595]	-0.001*** [0.336]
VA	-0.898 [0.052]	0*** [9.824]	0.40 [0.24]	-0.898 [0.052]	-0.097* [0.367]	-0.172 [0.305]	0.848 [0.12]	-0.097* [0.367]
FX	0.024** [0.001]	0.02** [0.018]	0.187 [0.003]	-0.624 [0.001]	-0.054** [0.001]	-0.067* [0.001]	0.013** [0.003]	-0.054* [0.001]
TAX	0.002* [0.002]	0.002* [0.002]	0.097 [0.001]	-0.027* [0.012]	0.076* [0.001]	0.078* [0.001]	-0.473 [0.001]	0.076* [0.001]
GDP	0.01* [0.006]	0.01* [0.006]	0.002*** [0.078]	0.088* [0.048]	-0.011** [0.035]	-0.011* [0.033]	-0.004 [0.078]	-0.245 [0.226]
Constant	0*** [31.945]	0*** [36.343]	0.055** [3.817]	0*** [19.2]	0*** [34.87]	0*** [34.485]	0.035** [3.906]	0*** [34.414]
Observation	83	83	735	83	718	718	735	718

(AR1)			0.000				0.009	
(AR2)			0.277				0.197	
Hansen Test(p-Val)			0.474				0.118	
F-stats(p-value)			0.000				0.000	

Table 6 : Factors Influencing Underground Economy

Source: Created by the author.

Note(s): *, ** and *** along with the coefficient values of variables represent 10%, 5% and 1% significance levels. This table depicts the regression estimations of factors influencing the underground economy. Column 1 and 5 illustrates the baseline results obtained using Fixed effects.

In the case of Islamic banks the following results were obtained;

Fiscal instrument and the Underground Economy: The table above shows the subsample outcomes for the causal factors influencing the underground economy in the OIC member nations. Aside from the fixed effects model, our study also includes random effects, GMM, and pooled regression results. We find that the TAX coefficients are beneficial and substantial across all model settings except for the conventional bank subsample. It indicates that there is an advantageous connection between the subterranean economy and fiscal instruments such as taxes. The presence of a tiny tax coefficient indicates that it has a small effect on the underground economy. The observations are identical to those of Schneider (2005), who observed that the growth and prominence of the underground industry boom when the gap between taxable income and payroll expenses in the legal sector is considerable. The results are also consistent with Hibbs and Piculescu (2009), who suggested that once taxes arise and are burdensome to firms, many firms will choose to reallocate their resources in order to operate in the underground marketplace.

Our assumption behind this finding is that because there are fewer Islamic banks in OIC nations, which are mostly underdeveloped, and banks play a crucial role in catching tax evaders, providing information, and thus collecting taxes, taxation has a positive impact on the underground economy. This can be backed up by the fact that the total assets of conventional banks within the OIC region still possess the majority of the market share (Al-Harbi, 2022).

GDP and the Underground economy: Similarly, Table 6 shows that GDP per capita growth corresponds positively with the underground economy. At the 1% significance level, the discovered parameter is positive and noteworthy in virtually all of the models, implying that an increase in GDP per capita would result in an improvement in the fraction of the economy operating under the radar. Our discoveries counter the majority of previous research, which found a detrimental connection involving variables of focus and the unregulated sector (Eilat and Zinnes, 2000; Schneider, 2010).

We assume that the logic behind our findings is that the penetration level of Islamic banks within OIC nations is still low, the quantity of Islamic banking corporations relative to non-Islamic banks is small, and the nations are underdeveloped, resulting in a positive influence on the unregulated market. The reason for this assertion is because the portion

of the markets in that Islamic banks occupy compared to normal banks is around 17% compared to the latter (Al Qureshi, 2010).

Monetary Instruments on the Underground Economy: Table 6 also suggests the coefficient of the FX is favorable as well as substantial across all models. This exhibits that a unit rise in the FX will in turn increase by about 0.054 in the magnitude of the underground economy. The reason behind our outcomes is that the penetration level of Islamic banks within the OIC nations is still at a low level, the number of sharia-compliant banks relative to typical banking companies is still few, and the nations are underdeveloped, having an encouraging influence on the underground economy.

Furthermore, COC is large and positive, whereas the majority of models provide similar results. The findings show that as efforts to control corruption increase, the totality of the underground sector increases. Among the possible justifications is that the level of underdevelopment within the majority of OIC member states with Islamic banks offsets the effect that fewer Islamic banks require to reduce the underground economy, resulting in the control of corruption and the underground economy being directly proportional. On the contrary, PS possesses an unfavorable connection with the underground economy variable, implying that as stable politics and a lack of brutality boost within the OIC states, the dimension of the subterranean economy decreases, stating an inverse relationship between the two parameters. The reported outcomes accord with the observations of Dreher and Schneider (2006), whose study tends to exhibit the function that social institutions play in the OIC territory, where there are Muslim catering finance banking facilities.

In the context of Conventional Banks the following happens:

Fiscal Instrument and the Underground economy: The above table 6 represents the other sample utilized to compute the causal factors influencing the underground sector within the OIC member states, which have conventional banks. Similarly, we not only employed a fixed effects model in our study but also presented random effects, GMM, and pooled regression results so as to check the consistency of the obtained findings. This examination notices that TAX coefficients are favorable and statistically substantial across all models' for the subsample of conventional banks. The data imply that as levies rise, the extent of the subterranean economy reduces in the OIC region with conventional

banks. This could be related to the fact that there are a larger number of traditional banks in OIC nations than Islamic banks. Cebula (1997) results also corroborate our findings.

GDP and the Underground economy: Similarly, Table 7 indicates an opposite interaction between GDP per capita and the underground economy. The observed coefficient is unfavorable and substantial across most models at the 1% level, demonstrating an uprise in GDP reduces the size of the subterranean industry. The findings agree with most of the previous findings, whereas most of the previous studies (Eilat and Zinnes, 2000; Giles and Tedds, 2002; and Schneider, 2011) found an inverse correlation between national development and the underground economy. We presume the logic behind our findings is that the penetration level of Islamic banks within the OIC nations is still at a low level, and the number of mainstream banks relative to sharia-compliant banks is large enough to create a negative impact on the underground economy.

Monetary Instruments on the Underground Economy: Table 6 also indicates that the effective exchange rate index parameter is negative and significant across the fixed effect model. This demonstrates that an additional unit in the FX results in a 0.054 unit decrease in the unregulated sector. The theoretical basis for our findings is that the exposure and participation level of conventional banks inside the OIC nations remains high, but the number of sharia-compliant banks opposite conventional banks remains low. Non-Islamic banks' exposure to the exchange rate market is a crucial factor negatively influencing the underground economy.

We discovered that DEP had a negative association with the underground sector, implying that as the number of depositors progresses, so does the extent of the underground. Similar to the findings in Islamic banks, we find that DEP are adverse and noteworthy, leading us to believe that the presence of traditional banks aids in the integration of individuals into the official sector.

Furthermore, the coefficient of control of corruption (COC) is significant and negative, whereas most models have similar corroborated results. The findings show that efforts to control corruption mitigate the magnitude of the unregulated sector. This study aligns with other investigations that identify the role of misconduct mitigation in lessening the scope of the unregulated sector. On the contrary, the underground economy variable has negative coefficients and a significant value, demonstrating that as political balance and lack of bloodshed strengthen within the OIC states, the magnitude of the black market

decreases. The implication of the findings is that the two variables have an inverse relationship. This outcome corresponds with the observations of Dreher and Schneider (2006), whose study tends to exhibit the functions that social institutions play in the OIC region, where there is the presence of Islamic banks.

Furthermore, CBB has a strong negative correlation with the scale of the underground sector. This entails that when the number of business branches grows, the size of the unregulated economy decreases. We assume that the widespread existence of conventional banks in most OIC countries has a negative implication for the subterranean sector. ATMs have a negative ramification on the underground economy at 1% significance. This reveals that as the quantity of ATMs in the OIC countries grows, the amount in the subterranean sector decreases due to the presence of several conventional banks. Finally, the VA coefficient exhibits a negative and substantial relationship with the scale of the underground sector. Thus, when the habit of holding individuals accountable grows, the proportion of the unregulated sector shrinks when the OIC region has conventional banks.

4.3. Robustness Checks

To monitor the quality of its outcomes, a thorough evaluation was undertaken. For the purpose of making an assessment regarding the factors influencing the underground economy, we initially examined the implications of inclusion in finance. Next, we looked at the impact of institution quality in a dual banking system setting. Finally, we used a combination of pooled regression as well as random effect (RE) in conjunction with GMM to assess the aspects effecting the underground economy. The contents of Table 7-8 display the consistency of our variable's coefficients in terms of direction along with their validity (α), which serves as a gauge for the strength of the evidence against the null hypothesis.

When exploring the financial inclusion impact when it pertains to Islamic banks, The BCB coefficient is negative and significant, implying that as the number of borrowers increases, the extent of the unregulated sector shrinks, demonstrating that Islamic banks can help reduce the underground marketplace within OIC countries. The ATM statistic is unfavorable in respect to the unregulated economy, implying that as the number of ATMs increases, so will the amount of the underground economy. Similarly, for Islamic banks

in OIC countries, the DCPS coefficient is unfavorable and inversely related to the black market. As internal lending is extended to the commercial sector, the extent of the underground economy will decrease. Similarly, our study revealed a negative and significant factor for the aforementioned parameter, displaying that the magnitude of the unregulated sector and bank capital-to-asset ratio are negatively proportional within the framework of Islamic banking. Finally, the CBB statistic is harmful and significant at the ten percent threshold. This shows that as the number of commercial banks grows, the underground economy shrinks. Other models have also verified the results. These findings also demonstrate a troubling and important association between DEP and the dimensions of the underground economy. This suggests that as the quantity of depositors grows, the size of the subterranean economy decreases. The influence of monetary integration on the underground economy is comparable for conventional banks. However, conventional banks experience a considerably bigger impression on the subterranean market than Islamic organizations. To possess an exhaustive overview of what happens in the presence of OIC nations, we replaced RQ for COC in equation 2 as a new substitute for institutional quality. The conclusions are identical with those reported in Table 7, in which the estimates of RQ for conventional banks remain significant but not favorable across all models. However, when we insert the Islamic substitution factor, the RQ coefficients become positive.

Observing the elements impacting the underground economy in Islamic nations, our outcomes indicate that service tax is advantageous and statistically significant across GMM and random effects model specifications. The findings are similar to those of Schneider (2005), who discovered that the expansion and scope of the underground industry increase when the disparity between after-tax earnings and wage rates in the legal economy is large.

Furthermore, with FX, the variable is positive and significant across all models for Islamic banks but negative for conventional banks. Finally, this study includes the country's earnings (GDP) as a baseline element, as many investigations consider GDP to be one of the most important factors changing the unofficial marketplace. After accounting for the influence of GDP on the unregulated market, Table 9 reveals that all tax coefficients are noticeable and beneficial. The tests disclose that GDP is tightly linked to the underground economy in Islamic banking; however, assessments diverge significantly in the remaining

simulations. However, GDP for conventional banks is negative, which is consistent with other studies, such as Eilat and Zinnes (2000), Giles and Tedds (2002), and Scheineder (2011), who discovered an unfavorable linkage amid the unregulated market and national progress.

4.4. Discussions

This study is aimed at investigating the determinants of the unregulated marketplace, the impact of financial inclusion, and institutional quality within the presence of Islamic banks and mainstream banking firms. In reviewing the literature, we have discussed the controversies regarding the underground economy and noticed that the underground economy has a sophisticated and latent nature. It has been noticed and recorded since the mid-twentieth century but is well documented in academic records by Keith Hart (Chen, 2007). Our study further inquired regarding the evolution, conceptual structure, the Islamic perspective, and the consequences of the unregulated economy. It is a well-documented fact that OIC states are third-world states, but also that Islamic banks are very few compared with conventional banks. Indeed, one of the primary obstacles when designing policy is the dearth of accurate, up-to-date, trustworthy, and uniform details. However, even though the government maintains an account of all statistics that are accessible and compliant with the national accounting system, a sizeable portion of the underground economy—roughly 34.36% in OIC states, according to Khan and Rehman (2022)—is not reflected in the public records. The precision and sufficiency of the appraisal of macroeconomic indicators and business operations continue to decrease. Similar issues with data gathering and inadequate estimating techniques exist in these nations. Due to their participation in illegal and subterranean markets, companies and corporations in these nations withhold details from official authorities. In order to execute and create effective economic policies and distribute resources appropriately, economic data and statistics need to be trustworthy as well as precise. A thriving underground economy raises issues with governance by indicating the existence of onerous restrictions, an understatement of the financial standing of the nation, and other socioeconomic parameters. Policies based on macroeconomic metrics will be inaccurate and ineffective if they convey inaccurate details.

It may be said that underground economies encompass all forms of economies, in unanticipated places, and in a variety of structures. Because modern economies are intricate, fluid, and diversified, several scholars and economic experts have examined the underground market from numerous vantage points, employing a variety of approaches to accomplish their various goals. Schneider (2005) and Becker (2004) reported that each nation has a distinctive underground economy with unique traits, dynamics, and dimensions. While low-income nations have received less attention, mature and transitional markets have frequently been the focus of research on the black market. It is also observed that, regarding both conventional and Islamic banks, there is less of an information deficit concerning the states under this investigation.

Drawing insights from the academic work, it is possible to imply that underground economies exist in many economies. Nevertheless, the traits and basis of the surrounding economy differ depending on the respective area that is considered.

We measured the influence of inclusive finance on the underground economy. The coefficient of inclusive finance is revealed to be negative relative to the scope of the underground marketplace, which suggests that as the level of financial inclusion deepens, the size of the underground marketplace declines, notwithstanding the minimal implications for Islamic banks. The outcomes correspond with Khan, Abdul Hamid, and Rehman (2021), highlight a detrimental effect on the unregulated marketplace. Bayar and Ozturk (2016) study outcomes also concur with these examination findings, solidifying the fact that the underground economy can be mitigated through promoting inclusive finance. Moreover, Berdiev and Saunoris (2016) results show how the advancement of the finance industry will enable the deterioration of the unregulated economy. As an outcome, changes to the monetary structure are necessary. Despite the fact that this is not a powerful tool—the parameter of monetary integration with Islamic banks is low—the administrations of the Organization of Islamic Cooperation (OIC) member states may take financial participation into account when planning for the broader economy.

Efforts for Islamic banks to spread and penetrate more places should be made in order to include even those individuals who exclude themselves by choice, and the government should put favorable policies in place to ensure this.

We also probed the repercussions between the underground economy and the caliber of institutions, and we found out that there is an inverse association between the two

variables in conventional banks, but in Islamic banks, institutional quality exhibits an advanteged connection when it comes to the underground economy and institutional quality. The estimates do not coincide with the findings of Wiafe et al. (2023), which depict an unfavorable link between the quality of institutions and unregulated markets. We include variables such as regulatory authority (RQ), which positively affect the dependent variable, voice, and accountability in Islamic banks. The estimate (VA) coefficient is beneficial and substantial. The results reveal that as the level of voice holding individuals accountable increases, the size of the underground economy also increases. Similar to the previous variable, the coefficient of stable politics and violence absence is also positive in Islamic banks. The justification for these findings is that there are few Islamic banks and weaker institutions within OIC nations, which are mostly developing and have a negative impact on the underground economy. It can further be substantiated by the estimated amount of market share shown by Al Qureshi (2010) to be between 17% and 83%, which comprises the remaining portion that is occupied by non-Islamic banks. Furthermore, Al Harbi (2022) showed that traditional banking establishments occupy the majority of the market in the OIC region.

Last, observing the factors influencing the underground economy in Islamic countries, we observe that services (TAX) are positive and statistically significant across GMM and random effects model specifications. The findings are consistent with Schneider's (2005) finding that the expansion and size of the underground economy will increase if the gap between receipts after taxation and the rate of wages in the regulated market is enormous. Khan, Abdul Hamid, and Rehman (2021) reported a direct connection between taxes and the underground economy in their study concerning the factors affecting the informal market, making a comparison between the OIC and non-OIC states. Wiafe et al. (2023) report that tax burden is influential in the underground's prevalence economy in Ghana.

For Islamic banks, the real effective exchange rate index (FX) variable is positive and significant across all models, whereas for conventional banks, it is negative. Subsequently, since GDP is regarded by most research as being among the primary causative variables of the unregulated marketplace, we incorporate it to operate as a parameter for control. After adjusting for the GDP's effect on the black market, Table 8's findings show that all the tax coefficients are significant and positive for all the parameters. The results illustrate how GDP has advantageously influenced the black

market sector when Islamic banks are present, but they disagree with the two other models.

However, for conventional banks, GDP is negative, and in line with other studies (Eilat and Zinnes, 2000; Giles and Tedds, 2002; and Schneider, 2011), they found an unfavorable connection between economic growth and the unregulated marketplace.

A poor economy lowers government revenue and leads to larger and more expensive government expenditures from the standpoint of budgetary considerations. To address such problems, the government must be aware of the scale of the black market economy in order to control spending. Contemplating all of these issues, it has been found that one of the primary issues and a significant worry for lawmakers is the underground economy. The wide presence of the underground economies leads to issues with administration, highlights the existence of onerous rules, and inflates other macroeconomic factors such as countries' revenue. The policy pertaining to these factors is thus going to be deceptive, inept, and ineffective if the macroeconomic variables provide false information.

So, when developing monetary policies, take the underground economy into account. Similarly, the creation of quality agencies is essential for structuring job and product exchanges. When drafting legislation, optimization of funds ought to be a top priority, particularly in light of the shadow economy. In a similar vein, nations that make up the OIC ought to prioritize financial depth and expand the array of Islamic institutions in light of the effects of financial accessibility on the black market.

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Since the macroeconomic coefficients and fiscal instruments contained in this study do not considerably lower the scope of the unregulated economy in OIC nations, the main conclusion drawn from it is to improve the quality of Islamic institutions. Despite the noted contrary association, the coefficients for monetary integration are insufficient to mitigate the extent of the unregulated market sector.

The substantial shadow economy has the potential to trigger communal and financial concerns. Achieving stable macroeconomic conditions may be more difficult for legislators if monetary policy is less efficacious. Government figures will give a misleading impression of the economy when there is a large overall prosperity. When resources are spread out properly, the subterranean economy causes disturbances in the smaller-scale domain.

We may infer that the evolution into commercial operations and the drawing in of businessmen from the underground economy to the legitimate economy are vital in order to eliminate unjust rivalries among the actors in the formal sector and to improve the income generated by the government. Similarly, building strong institutions is the only method to lessen the extent of the black market economy in the OIC countries, owing to the analysis's inferences.

In order to set up a comprehensive macroeconomic policy paradigm, this investigation may be employed as a reference to consider the underground market along with the formal marketplace. In the same way, the recognition of causal factors of the underground economy within the setting that has Islamic institutions will help us better understand the impact of the presence of those institutions and raise efforts to build more Islamic financial institutions apart from banks, which are very few, hence why we observe a weak influence on the underground economy.

Moreover, empirical findings of financial inclusion can be used to reduce the size of the underground economy through financial market development and making policies that reduce financial exclusions, build more Islamic banks, and build strong Islamic institutions. Ultimately, the results of this investigation may be employed as an outline for forthcoming investigations.

CONCLUSION

The study's goal is to evaluate the influence of financial inclusion on the subterranean marketplace, then the function of institutional quality on the underground economy, and finally the underground economy's causal elements. This dissertation adds to the body of work by forecasting estimates backing how influential inclusive finance is in the mitigation of the unregulated market when there is the existence of Islamic banking firms and non-Islamic banks, highlights the function standards of institutions perform on mitigating the underground economy in the setting of Islamic banks and traditional banking companies, and lastly adds to an existing body of work by measuring factors affecting the underground economy in a setting with Islamic banks and conventional banks separately. This study differs from previous works since it makes a comparison of the aforementioned goals in a setting where there are Islamic banks against a setting where there are conventional banks within the OIC countries. We chose to include Islamic and non-Islamic since banks are usually tools used as a tool to implement policies such as financial inclusive policies and policies enacted to improve the standard of establishments.

The structure of this investigation begins with an introduction that provides a comprehensive overview of the themes to be studied. The initial part shows the conceptual framework. This is followed by the introduction of two independent variables: financial inclusion and institutional quality. It is followed by a literature review in the second part. In the third chapter, we build our hypothesis, identify relevant data sources, and define our variables. Furthermore, we create our models and equations to evaluate the hypothesis. The fourth chapter begins by presenting descriptive statistics, followed by estimations based on hypothesis 0-1, as well as robust checks, and the chapter concludes with policy recommendations.

When checking for the implication of financial integration or inclusion, we observed that it hurts the size of the underground economy, whether there are Islamic or conventional banks. The parameters we use to capture financial inclusion, such as borrowers from banks, ATMs, local credit allocated to private industries, and capital-to-asset ratio, reveal a negative association with the size of the unregulated marketplace, which comprises either Islamic or conventional banking firms. However, the incidence of the implication imposed by financial inclusion on the size of the black market differs, whereas the

magnitude of coefficients observed when Islamic banking institutes are introduced is less compared to when regular banking firms are introduced. The situation has been ascribed to the lower infiltration prevalence of Islamic banking firms in contrast with mainstream banks.

The study demonstrates a direct association between the unregulated economy and institutional excellence in the presence of Islamic banking enterprises, which is relevant to the second purpose of the study, which is to evaluate the function of institutional excellence in the unofficial marketplace. Nonetheless, a negative correlation is noted when non-Islamic banks are present. These estimations are validated by the fact that the poorer countries of the OIC are primarily affected, and the black market is negatively impacted by the OIC's few banks of Islamic nature and subpar institutions.

Last, we obtained a favorable connection between taxes and the underground economy for both Islamic and conventional banks. The outcomes reveal how the inclusion of Islamic banks has benefited the black market sector's GDP, yet the GDP variable is opposite that of conventional banks. The effective real exchange rate component is significant and beneficial for Islamic banks in all models, while the value is opposite for traditional banking institutions.

Study Limitations

The primary challenge while conducting this study includes the inadequate amount of relevant data existing pertaining to Islamic financial institutions, especially in developing economies. Which has restricted our observation to fewer economies and fewer times. The data this study used is not sufficient since records of many nations are not available, hence limiting the scope of our analysis. There are few relevant and updated studies that discuss the informal economy and financial inclusion, which makes it difficult to capture the effects of the two variables in current times and build upon existing literature.

Policy Recommendation.

Due to the detrimental effects the underground economy has on economies and based on the study’s findings, this study recommends governments among the OIC member states pool and mobilize resources and reallocate the resources to increase the level of Islamic banks and other Islamic finance institutions within the region so as to increase the level of financial inclusion, as it has been shown to have a negative influence on the

underground economy. Though the impact of financial inclusion exerted by the Islamic bank is low compared to conventional banks, we recommend more resources be invested in the sector considering the primary objective of Islamic finance is to serve the entire community without discriminating against the impoverished according to Sharia rules. It is much more logical to promote it within the OIC region because it will attract both sections of society from the underground economy as well as those who were morally exempted themselves due to religious convictions.

Future Studies

The underground economy is unlikely to be resolved anytime soon. This opens up the possibility of expanding the scope of future studies by expanding the range of data, utilizing new updated procedures, and including additional variables in order to achieve more accurate conclusions. Future studies should take this into perspective and observe how the definition of the underground marketplace has changed due to frequent law changes and how some illegal stuff can become legal.

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