Digitalization and sustainable development goals in emerging Islamic economies

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Abstract

Purpose – This study examines the intersection of emerging Islamic economies and the digital economy in the context of the United Nations sustainable development goals (UN SDGs). This study aims to investigate the opportunities, challenges and barriers faced by emerging Islamic economies in the context of the digital economy. It specifically focuses on how these economies can contribute to the achievement of UN SDGs established in 2015. In addition, the study explores the prospects of Islamic digital finance and its potential to facilitate the adoption of the UN SDGs.

Design/methodology/approach – The following components outline the design, methods and approach of this study, identify and select specific UN SDGs that are relevant to the research aims. These selected goals serve as the basis for evaluating the impact of conventional and Islamic digital financial inclusion, gathered data from credible sources such as Bloomberg and Refinitiv Thomson Reuters to support the analysis. These sources provide comprehensive data on global indicators, progress and targets related to the UN SDGs, compare and evaluate the impact of both conventional and Islamic digital financial inclusion strategies on the selected UN SDGs; the study uses qualitative interpretation of the gathered data, which involves identifying patterns, themes and connections within the data to draw meaningful conclusions.

Findings – Results revealed that Islamic digital finance has the potential to contribute significantly to achieving the UN SDGs by promoting financial inclusion, encouraging ethical investments, supporting small and medium enterprises, promoting sustainable investments and leveraging technology to expand access to Islamic financial services and support sustainable investments.

Research limitations/implications – While there are many potential benefits of Islamic digital finance in helping to achieve the UN SDGs, there are also several limitations that should be considered in research, such as limited access to digital infrastructure, regulatory challenges, product offerings, scale, awareness and adoption. Addressing these limitations will be critical to maximizing the potential of Islamic digital finance to contribute to achieving the UN SDGs.

Practical implications – This study points to an important gap in the literature; for practitioners, this study has significant managerial consequences for achieving the UN SDGs in emerging economies by facilitating social impact investments and promoting ethical and sustainable investments.
Originality/value – This study’s uniqueness lies in its exploration of the limited exploration of connecting the implementation of digital financial systems to promote UN SDGs within emerging Islamic economies.

Keywords Sustainable development goals, Digital economy, Islamic digital finance, Emerging Islamic economies, Financial Inclusion, Sustainability, Emerging economies

Paper type Viewpoint

1. Introduction

This paper integrates three areas that the authors consider to be important from a global perspective: Islamic finance, the rise of the digital economy and concern with sustainability. In recent years, the digital economy has gained significant traction worldwide, transforming various sectors and industries. The integration of digital technologies and Islamic economies opens up new possibilities for achieving sustainable development objectives outlined in the United Nations sustainable development goals (UN SDGs). Islamic economies, which adhere to ethical and Shariah principles, can leverage digital platforms, services and financial instruments to address social, economic and environmental challenges.

The UN SDGs are a set of 17 goals that aim to address global challenges such as poverty, inequality, climate change and sustainable development (Lee et al., 2020; Tlemsani and Matthews, 2020). These goals provide a framework for countries to prioritize and work towards achieving a sustainable and inclusive future by 2030.

This study recognizes the unique position of Islamic economies, which are guided by principles derived from Islamic law (Shariah), in contributing to sustainable development. Islamic digital finance offers opportunities for financial inclusion, ethical investments and responsible financing (Hudaefi, 2020; Tlemsani et al., 2023a; Majdalawieh et al., 2017). It can facilitate the flow of capital to sectors that contribute to the UN SDGs, such as renewable energy, affordable housing, education and health care. By incorporating principles of fairness, transparency and risk-sharing, Islamic digital finance can address some of the challenges faced by conventional finance and promote sustainable development.

However, this study also recognizes the challenges and barriers that may hinder the adoption and growth of Islamic digital finance in achieving the UN SDGs. These challenges could include regulatory frameworks, technological infrastructure, awareness and understanding of Islamic finance principles, and the need for collaboration among stakeholders, including governments, financial institutions and technology providers.

This study aims to shed light on the opportunities, challenges and barriers that arise when combining emerging Islamic economies with the digital economy and how Islamic digital finance can contribute to the achievement of the UN SDGs. By understanding these dynamics, policymakers, businesses and stakeholders can develop strategies and initiatives to harness the potential of the digital economy within Islamic economies, fostering sustainable development and societal progress.

The research gaps include:

- limited research on the specific opportunities and challenges faced by emerging Islamic economies in leveraging the digital economy for sustainable development. Previous studies have focused on the digital economy and sustainable development without considering the unique characteristics and needs of emerging Islamic economies;
- insufficient exploration of the barriers hindering the adoption of digital technologies and Islamic digital finance within Islamic economies, specifically in the context of
achieving the UN SDGs. Understanding the cultural, regulatory and infrastructural barriers that impede progress in this regard is crucial for developing effective strategies;

- lack of empirical evidence on the impact and effectiveness of Islamic digital finance in achieving sustainable development within emerging Islamic economies.

Examining case studies and conducting empirical research can help fill this gap by providing practical insights and data-driven evidence.

This study distinguishes itself from similar studies in several key aspects, highlighting its novelty and unique contributions to the field, including:

- in contrast, this study explicitly explores the challenges and barriers unique to emerging Islamic economies in leveraging digital advancements, such as limited digital infrastructure, digital skills gaps and cultural/regulatory hurdles. By addressing these barriers, the study provides practical insights for policymakers and stakeholders;

- while other studies may discuss the digital economy’s potential impact on sustainable development in a broader sense, this study explicitly investigates the alignment of emerging Islamic economies with the UN SDGs.

It goes beyond general discussions and examines how the adoption of Islamic digital finance can contribute to achieving specific sustainable development goals (SDGs). This focused approach adds a unique dimension to the research.

Overall, this study’s novelty lies in its intersectional approach, focusing on emerging Islamic economies (Hashim et al., 2022), their alignment with the UN SDGs, the role of Islamic digital finance, and the specific barriers and opportunities within the digital economy. By delving into these distinct aspects, the study offers fresh perspectives and insights that contribute to the existing literature and provide a solid foundation for further research and policymaking in this area.

The importance of this research lies in its potential to address critical gaps and generate valuable knowledge in the field of emerging Islamic economies, the digital economy and sustainable development. Addressing the needs of emerging Islamic economies, which face unique challenges and have specific socio-economic characteristics. By specifically examining the opportunities and barriers within the digital economy context, this research caters to the specific needs of these economies. It helps policymakers, practitioners and stakeholders better understand how to leverage digital advancements to overcome challenges and foster inclusive growth in Islamic economies. In addition, future researchers can build upon the findings of this study to delve deeper into specific aspects such as the impact of Islamic digital finance on poverty reduction.

It is imperative to highlight the ground reality and the disparity around the globe in terms of poverty and standard of living. According to the survey by the World Bank (2021), there are an estimated 698 million, which equates to 9% of the global population, classified as extreme poverty, which equates to living less than $1.90 per day. Over 1,803 million people (over one-fifth) of the total population survive below the higher $3.20 poverty line, and over 3,293 million people (over two-fifths) of the population manage below $5.50 per day.

Islamic digital finance has the potential to play a transformative role in poverty alleviation, financial inclusion and sustainable investments within Islamic economies. Through ethical and inclusive financial services, it can empower marginalized communities, enhance financial access and drive investments in socially and environmentally responsible projects. The amalgamation of Islamic values and digital innovation is a recipe for
unparalleled growth. By leveraging cutting-edge technologies like artificial intelligence (AI), blockchain and Fintech, Islamic economies can foster innovation, entrepreneurship and job creation, catapulting them to the forefront of the digital revolution.

The social impact of the exploration of emerging Islamic economies within the digital economy, with a focus on achieving the UN SDGs, can be substantial. By leveraging digital technologies and Islamic principles, the initiatives discussed in the paper have the potential to positively influence public opinion and improve the quality of life in several ways; Islamic digital finance promotes responsible and ethical consumption by integrating Islamic principles into financial transactions. This encourages individuals and businesses to engage in socially and environmentally responsible practices, aligning with the UN SDGs. This shift in consumer behaviour can create a positive impact on sustainability, fair trade and ethical production practices.

1.1 Models and indicators of sustainable development

Over the years, various models and indicators have been developed to gauge and evaluate progress in achieving the SDGs (Alcamo et al., 2020; Amel-Zadeh and Serafeim, 2018; Tlemsani, 2022; Berg et al., 2022). Table 1 presents below some of the most commonly used models and indicators.

Governments, businesses and civil society organizations can use these models and indicators to assess progress towards SDGs and guide decision-making that promotes sustainable development.

| SDGs | These 17 goals, adopted by the UN in 2015, serve as a global framework for sustainable development. They encompass a broad range of objectives, including eradicating poverty, ensuring quality education, promoting good health and well-being, achieving gender equality, providing clean water and sanitation, addressing climate action, reducing inequalities, fostering sustainable cities, encouraging affordable and clean energy, preserving biodiversity, promoting industry, peace, justice and strong institutions |
| Triple bottom line | This sustainable development model seeks to strike a balance among three dimensions: social, economic and environmental. It aims to ensure that development endeavours are sustainable in the long run by considering the interplay of these three aspects |
| Ecological footprint | This indicator quantifies the land and water resources necessary to sustain human consumption patterns. It aids in assessing the sustainability of human activities and identifying areas where improvements can be made |
| Human development index (HDI) | The HDI assesses a country’s level of human development based on factors such as life expectancy, education and income. It serves as a metric to measure progress towards sustainable development goals related to human well-being |
| Environmental performance index (EPI) | The EPI is a composite index that evaluates a country’s performance in environmental domains such as air and water quality, biodiversity and climate change. It assists in tracking progress towards sustainable development goals pertaining to environmental sustainability |
| The genuine progress indicator (GPI) | The GPI measures economic progress and considers social and environmental factors not reflected in traditional economic measures such as gross domestic product (GDP). It aims to provide a more comprehensive picture of economic progress and guide policies promoting sustainable development |

**Table 1.**
Models and indicators of SDGs

**Source:** Table by authors
2. Digital financial and emerging economies
Emerging economies have rapidly transformed their economic landscape with the widespread adoption of digital technologies such as mobile phones, the internet and e-commerce platforms. One of the most significant impacts of the digital economy in emerging economies has been the growth of entrepreneurship and the creation of new businesses. Digital technologies have enabled entrepreneurs to access new markets, reduce costs and improve efficiency. As a result, there has been a surge in the number of start-ups and small businesses in emerging economies, creating new job opportunities and contributing to economic growth. Another significant impact is democratizing access to information and services (Bauer et al., 2021; Tlemsani et al., 2023b). Digital technologies have enabled people in emerging economies to access various services, including health care, education and financial services, which were previously difficult to access, improving the quality of life and reducing inequality.

However, emerging economies also have challenges associated with the digital economy. One of the most significant challenges is the digital divide, where not all segments of the population have access to digital technologies or the skills to use them effectively. This can exacerbate existing inequalities and limit the potential benefits of the digital economy. Additionally, emerging economies face challenges related to the effects of technological innovations on the wages of workers due to the rise of automation in the digital economy.

In developed countries, access to the internet is widely available (over 90% of the population). However, less than 50% of the population in emerging markets has internet access, which has slowed the adoption of digital products and services in these regions. In developing countries, many households with internet access have increased significantly. For instance, families with internet access grew by over 50% and 38% in Indonesia and Vietnam, respectively, from 2014 to 2019 (Figure 1).

The increasing number of smartphones has also boosted the number of households with internet access. Due to the emergence of a younger generation and the growing number of smartphone users, consumers are increasingly adopting digital technology from an earlier age. The expansion of digital economies will continue to provide increasing purchasing power for young generations. It will continue to drive the adoption of digital technology in both emerging and developed markets.

Source: Figure courtesy of Euromonitor International, 2022
Despite the availability of digital financial services, the percentage of people with bank accounts in emerging markets is lower than in developed countries (Figure 2). Many local merchants in developing countries still prefer to accept cash as their main payment method. They typically have low digital acceptance rates due to high fees and a lack of trust in electronic payment systems.

Kenya has one of the most advanced emerging economies with its successful adoption of financial technology. Financial players should consider introducing services that do not require a bank account to overcome the barriers to digital financial services. For instance, Kenya’s M-PESA allows peer-to-peer payments. Despite the country’s low penetration rate on fixed-line internet, M-PESA has more than 24 million active users in Kenya, resulting from mobile internet proliferation. Despite financial inclusion challenges in emerging markets, many people are more willing to try new financial services. The increasing number of global competitors and local banking applications will help boost the adoption of digital financial services.

The increasing number of online financial products is helping consumers access to credit and loans more quickly. Players such as Bien para-Bien in Mexico offer low-interest rates. Bien para-Bien can provide consumers with access to mortgage credit and liquidity through its lending programmes. Due to the increasing number of people avoiding cash and relying on financial support, the need for more digital financial services is expected to grow for a banked and unbanked population in emerging economies.

This paper provides valuable insights into practical steps that can be taken to bridge the gap between theoretical concepts and real-world implementation. However, one notable omission is the discussion of Central Bank digital currency (CBDC), a relatively new and impactful paradigm that holds significant implications for both practical application and financial stability.

Throughout history, various forms of currency have emerged to address the evolving economic needs of their respective eras. Gold, silver, barter, coins, banknotes, cheques, credit cards and cryptocurrencies each represented an innovative step forward in their time. Auer et al. (2022) underscored that the progression from physical cash to digital currencies is a logical development, emphasizing the centrality of data in the digital economy. This shift raises concerns about competition, payment system integrity and privacy, particularly when considering CBDCs.

Figure 2.
Per cent % of banked population (+15), 2019

Source: Figure courtesy of Euromonitor International, 2022
CBDCs are emerging as a potential transformational force in the financial landscape, representing a digital form of sovereign currency issued by central banks. They have the potential to reshape how financial transactions are conducted, impacting areas such as payments, cross-border transactions and financial inclusion. Given their relevance and potential disruptive influence, the inclusion of CBDCs in the paper would enhance its comprehensiveness and relevance to the evolving financial ecosystem.

Addressing CBDCs would involve exploring how the practical steps outlined earlier might intersect with CBDC implementation. For instance, discussing how the establishment of CBDCs could interact with the identified challenges and opportunities (Tables 5 and 6) in the digital economy would provide a more holistic view of the potential practical pathways. Furthermore, considering the implications of CBDCs for financial stability is crucial, as the introduction of a digital sovereign currency could have far-reaching consequences on monetary policy transmission, banking systems and overall economic stability.

A survey by the Bank for International Settlements in 2021 revealed that 81 central banks were actively exploring CBDCs, with 86% believing they could enhance cross-border payments. Digital money is seen as a natural progression, with CBDCs considered within the context of the digital economy, raising concerns about competition, payment integrity and privacy.

Tobin (1987) highlighted the risk of electronic payment systems blurring currency and deposits, proposing “deposited currency” as a backed form held electronically. Brunnermeier et al. (2019) suggested digital currency areas emerging from influential platforms, like Facebook, creating their payment systems. This concentration of power raises competition concerns.

Belke and Beretta (2020) delved into the transformative journey of money from physical cash to digital currencies, including CBDCs. While acknowledging the benefits of these novel forms, such as convenience, efficiency and reduced transaction costs, they highlighted potential challenges to monetary stability. The introduction of these currencies could disrupt the established financial system and jeopardize monetary control. Policymakers, therefore, must meticulously weigh the risks and benefits of CBDCs and implement them in a way that upholds monetary stability.

Fernández-Villaverde et al. (2021) contended that the issuance of a CBDC could empower central banks to acquire real resources and generate income. Using a dynamic stochastic general equilibrium model, they examined the macroeconomic implications of CBDC introduction. Their findings indicated significant impacts on key variables like inflation, output, and welfare. The study suggested that the effects of CBDC implementation on the economy could be both positive and negative, contingent on the specific design features and the prevailing monetary policy framework.

Williamson (2021) and Schilling et al. (2020) argued that CBDCs might enhance financial stability by mitigating the risk of bank runs and providing a secure alternative to traditional bank deposits. However, they cautioned that CBDCs could potentially disrupt monetary policy transmission by allowing households and firms to bypass banks, opting for more liquid assets. This shift might result in decreased bank lending, ultimately undermining the efficacy of monetary policy.

CBDCs could enhance financial stability by reducing bank run risks (Bordo and Levin, 2017; Keister and Monnet, 2022). However, they might disrupt monetary policy by diverting funds from banks, impacting lending and policy effectiveness.

### 3. Financial inclusion and sustainable development goals

The financial inclusion theme emerged as a major theme in the development of the financial framework in 2008 to support the efforts to reduce poverty and economic stability. It was
acknowledged as a key theme by the G20 in 2011. The World Bank launched a comprehensive strategy in 2015 to enable one billion people to have access to a financial account by 2020. The global assessment (Findex survey, 2018) shows that approximately 1.7 billion people are not currently able to access financial services. This is an improvement from the 300 million increase in the number of people who were not able to access financial services in 2014. Studies have shown that people benefit from having access to a variety of financial services, as it allows them to manage their risks and start to expand their businesses (Brandon et al., 2021a, 2021b; Christensen et al., 2022). The UFA2020 initiative focused on 25 countries with a high proportion of the world’s unbanked adult population.

The authors are of the opinion that SDG No.10 (reducing inequality) through digital financial inclusion is the key sustainable achievement of SDGs in emerging economies. We begin evaluating SDG 10 (reducing inequality) in relation to “Digital Financial Inclusion” to facilitate SDG attainment in emerging economies before delving into the other selected SDGs.

3.1 Digital financial inclusion to reduce inequality

Digital finance can help low-income households improve their financial resilience and increase their incomes, and it can also help them access new economic opportunities. This research indicates that 82% of the global wealth is held by 1% of the population. It can provide the following solutions:

- Rural households can benefit from digital financial services by accessing opportunities beyond their communities (Tlemsani and Matthews, 2010; Belmonte-Ureña et al., 2021).
- The rise of digital finance can lower the cost of sending remittances by approximately 3.5%. This can facilitate lifting 30 million people out of poverty (Jack and Suri, 2014; Kunze, 2017). For example, as a percentage of gross domestic product (GDP), an increase of 1% could help close the poverty gap in Asia by reducing it by 22.6% (Yoshino et al., 2017).
- Mobile payments and credit can help people manage their financial costs, and these tools can also help the poor afford their education and health care (Braniff, 2016a). For example, in India, rural communities have increased their savings by 131% after they started storing their income in a digital bank account.

3.2 Digital financial inclusion to end poverty

According to the World Bank (2016), the unprecedented ground reality is that approximately one in ten people across the globe survive less than $1.90 per day. It can provide the following solutions:

- It can provide saving money opportunities to poor and low-income families. For example, from 2008 to 2014, the spread of mobile money lifted over a million people out of Poverty in Kenya (Suri and Jack, 2016).
- Digital financial services can provide efficient payment services to the vulnerable and help mitigate society’s fraud and corruption.
- According to the World Bank and UNDP, 39% of the poorest 40% of households in emerging economies are unbanked and excluded from mainstream financial services. This is where digital finance (FinTech) services can provide opportunities for individuals not part of the centralized financial system (Tlemsani, 2020; World Bank, 2016).
3.3 Digital financial inclusion to eliminate hunger

Digital financial services can help farmers boost their productivity and lower their risks. They can also help improve the safety and reliability of social transfers (Alderman et al., 2018). According to Fao (2017), the extraordinary ground reality is that approximately 815 million people across the globe, particularly in underdeveloped economies, are malnourished. It can provide the following solutions to combating hunger:

- Through digital financial services, farmers can access credit and fertilizer, reduce risk and save earnings by improving their financial resilience.
- Farmers can earn more through digital payments due to their efficiency, transparency, safety and faster (GSMA, 2016). For example, a leading coffee exporter in Uganda has reduced its costs by over 30% using digital financial services. The cost of digital payments is 45% lower than cash, which can help boost farmers’ productivity and improve the quality of their products.
- The cost of sending and receiving payments through digital financial services has been reduced, which can help improve safety nets for vulnerable individuals (World Bank, 2016; Aker et al., 2016).

3.4 Digital financial inclusion to better health

Through digital finance, people can access health-care services without going through the stress of poverty. It allows health-care providers to expand their services in low-density areas (Braniff and Riley, 2017). According to the World Bank (2017), every year, health costs force 100 million people into extreme poverty. It can provide the following solutions to promote better health:

- Digital financial services can help people prepare for and manage their health-care expenses.
- With digital finance, micro health insurance can be more affordable and accessible for more people and reduce the administrative costs of managing the insurance (Holtz et al., 2015; Prashad, 2013).
- With digital payments, caregivers can earn more and live in more remote areas, and these payments can help them provide for their families and communities. For example, in Bangladesh, through mobile money, MAMA Bangladesh was able to reach out to more than a million people and register over a million new mothers (Health Finance and Governance, 2015).

3.5 Digital financial inclusion in quality education

According to UNESCO (2017), approximately 264 million children across the globe, particularly in underdeveloped economies, are deprived of basic education. It can provide the following solutions to promote basic education:

- A variety of flexible financial products can help parents save for their children’s education (Limbach et al., 2022).
- With digital payment channels, teachers no longer have time in class to collect their pay. It is faster, safer and more reliable (Trucano, 2016).
- With digital payments, households can save and pay for their education costs. This makes it easier for schools and governments to manage their cash flows. For example, in 2015, an experiment in Kenya provided households access to a digital savings account, which boosted high school enrolment by about 5% to 6%.
3.6 Digital financial inclusion to affordable and clean energy

According to IEA (2017), approximately one billion people are deprived of electricity globally. It can provide the following solutions to promote low-cost solutions:

- The rise of digital finance has helped utilities and mini-grid operators lower costs and increase their financial viability.
- Digital finance can benefit 20 million households from pay-as-you-go solar energy. For example, Kenya’s M-KOPA, a pay-as-you-go solar company, raised $35m in local-currency debt. Its goal was to expand in rural areas without cash payments.
- Digital payments can boost investment, help reduce costs and expand access to energy. For example, mobile money accounts have become an integral part of the energy industry globally, enabling new business models for clean energy companies. Over 690 million accounts are registered (GSMA, 2016).

An example of how Islamic Financial Institution (IFI) can contribute to reducing its own environmental impact and compliance with SDG 7 for affordable and clean energy. Gatehouse Bank has introduced green home financing products for the UK. Clients buying a property with an “A” or “B” energy efficiency will be given a 10bps reduction in their rental rate. This is in addition to Gatehouse Bank’s earlier sustainable finance effort, the Woodland Saver account, which has contributed to planting more than 12,500 trees around the UK since its launch in 2021 with the carbon credits registered on behalf of its customers.

3.7 Digital financial inclusion to jobs and economic growth

The rapid emergence of digital financial services can create up to 95 million new jobs by 2025 (Manyika et al., 2016). According to the UN, 2016, approximately 470 million jobs are required by 2030 to cater to the growing population and unemployment challenges. It can provide the following solutions to promote jobs and economic growth:

- By digitizing trade and salary payments, businesses can provide their employees with a better way to connect with their financial partners.
- When micro, small and medium enterprises payments are processed through a digital platform, it generates data that can be used to improve their credit score. This data can then be used to make informed decisions regarding its financing (Zetterli and Pillai, 2017).
- Switching to digital financial services micro, small and medium enterprises can reduce costs and increase access to more consumer financing (Klapper and Singer, 2014; McKinsey, 2013). For example, according to Jakarta Post (2018), Go-Jek, a digital payments company in Indonesia, has built a suite of services that help its drivers and partners earn more money. Through its mobile app, micro, small and medium enterprises enable users to make payments and manage logistics.

Due to the rapid growth of e-commerce, many African countries are catching up. They are not able to collect value-added taxes (VAT) on e-commerce transactions. Through the use of digital financial solutions, the government can collect VAT on e-commerce transactions, which will help lower the high costs of pandemics and fund SDG-oriented projects. The more emerging economies can increase their tax/GDP, the faster they can solve the SDGs. For example, in the UK, tax/GDP is around 38%, but in Uganda, it is only 13%. Studies have
shown that countries cannot properly solve their SDG issues unless tax/GDP is 20% or higher.

4. Islamic finance framework and United Nations sustainable development goals

Islamic finance, a rapidly expanding financial sector, holds a significant presence across the globe, serving a vast population of 2.6 billion Muslims. Despite its relatively small share in the international financial landscape, this industry has amassed assets exceeding $2.5tn, with projections estimating a further rise to $3.8tn by 2023. The Union of Arab Banks reveals that ten countries are responsible for 95% of the world’s Shariah-compliant assets, with Iran leading at 30% and Saudi Arabia following closely at 24%. Additionally, Malaysia holds 11%, the United Arab Emirates accounts for 10%, while Qatar, Kuwait, Bahrain, Bangladesh, Indonesia and Pakistan contribute 6%, 5%, 4%, 1.8%, 1.6% and 1% respectively. The realm of Fintech also witnessed the emergence of 127 Islamic Fintech firms globally, offering Shariah-compliant financial products, with recent launches occurring in June 2020 (Santosdiaz, 2020; Tlemsani et al., 2020).

4.1 Maqasid Al-Shariah-driven sustainable digital finance grand theory

This grand theory postulates a comprehensive framework that synergizes the principles of Maqasid Al-Shariah, Islamic digital finance, and the UN SDGs. Maqasid Al-Shariah-driven sustainable digital finance (MASDSDF) envisions a transformative paradigm that integrates ethical finance, digital technology and sustainable development for the betterment of society, the economy and the environment (Tables 2 and 3).

In conclusion, the MASDSDF theory presents a transformative framework that harmonizes Islamic finance, digital technology and sustainable development, offering a holistic and purpose-driven approach to financial systems that benefit both humanity and the planet.

| Core principles |
|-----------------|-----------------|-----------------|
| Maqasid Al-Shariah harmonization | SDG-aligned ethical investment | Digital Zakat and Philanthropy |
| MASDSDF proposes a holistic integration of Maqasid Al-Shariah as the guiding philosophy, ensuring that the pursuit of financial goals aligns with the higher objectives of preserving faith, life, intellect, lineage and property. This integration addresses the ethical essence of Islamic finance, emphasizing equitable distribution, social justice and responsible stewardship. | MASDSDF asserts that Islamic digital finance can serve as a catalyst for SDG-aligned investments, especially in areas of environmental sustainability, clean energy and circular economy. The theory posits that by adhering to Islamic ethical principles, such as avoiding interest and unethical activities, while investing in sustainable projects, financial institutions can contribute significantly to SDGs. | The theory further advocates for the digitization of Zakat collection, distribution and impact measurement. By integrating digital platforms, MASDSDF enhances the efficiency and transparency of Zakat, directing funds towards poverty alleviation, health care, education and community development, thus contributing to SDG targets. |

**Source:** Table by authors

| Table 2. | Maqasid Al-Shariah-driven sustainable digital finance |
Lawal and Imam (2016) examined Islamic Finance's social re-distributive and financing instruments. Their findings affirm a positive influence on the real economy, with potential implications for achieving SDGs. Harahap et al. (2023) investigated the intersection of Maqashid Al-Shariah (Islamic finance and law) and UN-SDGs using a systematic literature review from 2008 to 2022. Their result confirms that Islamic finance supports the SDGs with the most significant contribution to humanity.

Syeda and Saqib (2020) empirically examined the impact of Islamic digital finance on economic growth in key Muslim nations by using the PMG of ARDL analysis. Their findings indicate a significant long-term correlation between Islamic banks' assets, sukuk, financing and real GDP in these Muslim countries. Glavina et al. (2021) analysed data from 65 countries with Islamic digital finance presence. Through the evaluation of 31 variables reflecting the progress of Islamic financial technologies in each country, the study suggests that Islamic digital finance holds the potential to enhance market efficiency, promote financial inclusion, enable ethical investments, including environmental, social and governance (ESG) opportunities, reduce poverty and foster gender equality, particularly beneficial for developing and emerging economies.

This research aims to address the deficiencies and constraints identified in prior studies such as Lawal and Imam (2016), Harahap et al. (2023), Syeda and Saqib (2020) and Glavina et al. (2021).

The 17 SDGs acknowledge the interconnected nature of various aspects and recognize that actions taken in one area can have implications for others. They emphasize the need to strike a balance between social, economic and environmental sustainability in the pursuit of development. Countries have pledged to prioritize progress for those who are most marginalized. The SDGs aim to eradicate poverty, hunger, AIDS and gender-based discrimination. To accomplish these goals in all contexts, the collective efforts of society, encompassing creativity, expertise, technology and financial resources, are indispensable.

However, according to the UNCTAD (2018), the achievement of the SDG’s goal must start with economic development through fiscal and monetary policy development in underdeveloped economies to be able to achieve their targets. From that point forward, it is
very relevant to consider how Islamic finance can help within the heart of the SDGs goals just by the weight of its principles such as:

- The generation of wealth should originate from lawful trade and asset-based investments.
- Investments should also contribute to the betterment of society by providing social and ethical benefits in addition to financial returns.
- Risk should be distributed and shared among involved parties.
- Engagement in any harmful activities (haram) should be strictly avoided.

But what can introduce a distinctive value proposition is the coupling of Islamic finance with Fintech to achieve a deeper reach and a more significant impact on the financial market, especially since Fintech can achieve the inclusivity concept that conventional finance still has not.

Islamic finance encompasses a diverse range of mechanisms and institutions that offer valuable services to clients while adhering to Shariah principles. It encompasses various sectors such as banking, microfinance, capital markets, insurance and emerging financial innovations like crowdfunding and cryptocurrencies. Islamic finance continuously evolves to compete with conventional finance, attracting customers from diverse religious backgrounds (Tlemsani, 2010; Abdullah et al., 2012).

From a theoretical standpoint, Islamic finance has the potential to significantly enhance financial inclusion in countries with predominantly Muslim populations. However, according to the Global Financial Inclusion Database (Global Findex), religious beliefs appear to be the least influential factor for individuals without bank accounts. Only 6% of the global unbanked population cited religious concerns as their primary reason for not having a bank account, as reported by The World Bank (2018).

These findings provide encouraging prospects for IFIs to introduce their offerings, as highlighted by Demirgüç-Kunt et al. (2014). However, it is essential to determine whether individuals with religious concerns who are unbanked have a genuine interest in Islamic finance. Simply having awareness of the Shariah dimension in the financial sphere and endorsing anti-usury practices does not automatically translate into acceptance and adoption of Islamic financial services. Therefore, it is crucial to ascertain that Shariah compliance is the primary consideration for individuals with religious concerns, ensuring that the Islamic economic model is perceived as credible in their eyes. Failure to do so may result in potential customers becoming detractors of the model.

Furthermore, it is important for investors to assess whether unbanked individuals with religious concerns align with the goals of IFIs. Financial performance, in practice, is based on the size of assets rather than the number of customers. Therefore, it is necessary to determine if unbanked individuals with religious concerns who embrace the Islamic financial model are eligible for financing and other services (Grewal et al., 2021).

Finally, investors should evaluate the potential demand for Islamic financial services to justify the establishment of IFIs. The launch of an IFI must be supported by a significant demand from unbanked individuals. If the demand is insufficient, it may be necessary to reconsider the viability of the project. Alternatively, the business model can target not only unbanked individuals with religious concerns but also other customer segments.

The Islamic Finance and the UN SDGs Retail Banking Customer Perspectives Global Survey 2023 engaged nearly 2,000 participants from six Islamic finance organizations located on four continents. The survey data served as compelling evidence, driven by consumer input, to prompt transformative changes in institutions offering Islamic finance services.
The result of the survey shows wide-scale enthusiasm for sustainability and a belief that Islamic finance aligns well with the SDGs. Furthermore, Islamic financial institutions have a significant opportunity to take the lead in advancing the UN SDGs agenda within their target markets. The main findings are as follows:

- An overwhelming 90% of respondents expressed the importance of their bank offering products that align with the UN SDGs.
- Approximately 71% indicated that the alignment of financial products with sustainability would motivate them to use their bank’s products more frequently.
- A substantial 87% stated their willingness to pay a premium for financial products that are in line with the UN SDGs.
- An impressive 95% of participants highlighted the significance of poverty reduction in their priorities.

The findings may appear discouraging to some, leading them to question the need for establishing comprehensive IFIs. However, it is important to note that the Global Findex survey (World Bank, 2018) specifically focused on individuals without bank accounts. In practice, having a bank account does not guarantee access to a complete range of financial services. Additionally, in many countries, having a bank account is mandatory for receiving wages and operating a business. Consequently, among those who are compelled to have a bank account and engage with conventional financial institutions, there are individuals who voluntarily exclude themselves from accessing financing, savings and insurance due to religious concerns. Such individuals may prove to be highly valuable from the perspective of IFIs.

4.2 Impact of Islamic digital finance on achieving United Nations sustainable development goals

Islamic digital finance facilitates sustainable development within emerging Islamic economies. Recent studies (Harahap et al., 2023; Shahid et al., 2023; Chinoda and Kapingura, 2023; Jan, 2023; Islam and Rahman, 2023; Perdana and Kulkarni, 2023) demonstrate how Islamic digital finance aligns with the principles of Islamic finance, promotes ethical investment, profit sharing and social welfare, and contributes to poverty alleviation, financial inclusion and sustainable investments. Recent research (Kandpal et al., 2023; Nasreen et al., 2023; Khateeb et al., 2023; Shirazi et al., 2023) showcases how digital advancements and Islamic digital finance can be harnessed to address specific SDGs such as zero hunger, quality education, clean energy, gender equality and sustainable cities, among others.

Islamic digital finance and the UN SDGs are closely linked as both aim to promote economic and social development while ensuring sustainability and inclusivity. The principles of Islamic finance can contribute to achieving the SDGs by promoting financial inclusion, reducing poverty, supporting sustainable economic growth and environmental sustainability by promoting green financing, which supports projects that have positive environmental impacts, such as renewable energy projects and can also contribute to social sustainability by supporting projects that promote social welfare, such as affordable housing and health-care projects; (Table 4) exhibit how Islamic digital finance can contribute to achieving the SDGs.
Further research recommendation
The study’s findings suggest that Islamic digital finance has the potential to be a transformative force in achieving the UN SDGs. By promoting financial inclusion, encouraging ethical investments, supporting SMEs, promoting sustainable investments and leveraging technology to expand access to Islamic financial services, Islamic digital finance can contribute to building a more inclusive, sustainable and equitable future. These findings underscore the importance of integrating Islamic finance principles with digital technology to unlock new opportunities for economic development and social progress.

The results of this study are consistent with several other relevant research studies in the field. Research conducted by Braniff (2016a), Demirguc-Kunt et al. (2014), Arner et al. (2020) and Shahzad et al. (2020) found that Islamic digital finance can significantly contribute to financial inclusion by expanding access to financial services for marginalized populations. This aligns with our findings, suggesting that Islamic digital finance has the potential to promote financial inclusion and address the challenges of financial exclusion faced by vulnerable communities.

Furthermore, the study conducted by Yoshino et al. (2017), Macchiavello and Siri (2022), Abdullah et al. (2012) and Mensah (2019) supports our findings regarding the role of Islamic digital finance in promoting sustainable development goals.

Table 4. Islamic digital finance contribution to SDGs

<table>
<thead>
<tr>
<th>SDGs</th>
<th>Islamic digital finance contribution</th>
</tr>
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<tbody>
<tr>
<td>SDG 1: No poverty</td>
<td>Islamic finance can support poverty reduction by providing financing for microfinance projects, small and medium enterprises (SMEs) and socially responsible investments that create job opportunities and promote economic growth</td>
</tr>
<tr>
<td>SDG 2: Zero hunger</td>
<td>Islamic finance can support investments in agriculture and food security, such as financing for farmers, food processing plants and storage facilities, which can improve food availability and reduce hunger</td>
</tr>
<tr>
<td>SDG 3: Good health and well-being</td>
<td>Islamic finance can provide vital support for investments in health-care infrastructure and medical research, encompassing financial assistance for hospitals, clinics and pharmaceutical advancements</td>
</tr>
<tr>
<td>SDG 4: Quality education</td>
<td>Islamic digital finance can facilitate investments in education, including funding for schools, universities and educational programmes that foster skill development and lifelong learning</td>
</tr>
<tr>
<td>SDG 6: Clean water and sanitation</td>
<td>Islamic digital finance can facilitate investments in water infrastructure, such as financing for water treatment plants, sanitation systems and irrigation projects, thereby improving access to clean water and sanitation services</td>
</tr>
<tr>
<td>SDG 7: Affordable and clean energy</td>
<td>Islamic digital finance can contribute to sustainable development by financing environmentally friendly initiatives. This includes supporting renewable energy projects like solar and wind energy, which mitigate carbon emissions and promote sustainable energy sources, as well as projects that foster sustainable agriculture</td>
</tr>
<tr>
<td>SDG 11: Sustainable cities and communities</td>
<td>Islamic digital finance can foster investments in sustainable infrastructure and urban development projects, such as affordable housing, public transportation and waste management systems, thereby creating sustainable cities and communities (Liang and Renneboog, 2017)</td>
</tr>
<tr>
<td>SDG 17: Partnership for the goals</td>
<td>Islamic digital finance can facilitate partnerships among various stakeholders, including governments, NGOs and the private sector, to support sustainable development projects that contribute to achieving the SDGs</td>
</tr>
</tbody>
</table>

Source: Table by authors
digital finance in promoting ethical investments. They demonstrated that Islamic finance principles, when integrated with digital platforms, can facilitate investment opportunities that align with environmental sustainability and social responsibility. Our study expands on these findings, highlighting the potential of Islamic digital finance to contribute to SDGs related to responsible consumption, clean energy and land preservation.

However, it is important to note that some studies have also presented contrasting views. For instance, (El-Hawary and Grais, 2004; Urban and Wójcik, 2019) argued that the impact of Islamic digital finance on sustainable investments might vary depending on the regulatory frameworks and implementation strategies. Their research highlighted the need for a comprehensive regulatory framework and effective governance to ensure the alignment of Islamic finance with SDGs. While our study emphasizes the potential of Islamic digital finance in promoting sustainable investments, further research is required to address the challenges and limitations identified by El-Hawary and Grais (2004) and Urban and Wójcik (2019).

This research demonstrates that all 17 UN SDGs goals can be facilitated by including digital finance, which can provide the impetus to further sustainable economic growth in emerging economies and contribute to creating competitive advantages through the methodology of the social progress index (SPI).
The SPI, a metric introduced in 2013, serves as a catalyst for improvement and action by presenting reliable and valuable data on social outcomes. Comprising various dimensions, this index enables the assessment of a country’s well-being from a holistic and transparent perspective, independent of economic indicators. Policymakers, businesses and citizens can use the SPI to compare their countries with others across different aspects of social progress. This facilitates the identification of specific areas of strength or weakness, promoting targeted efforts for enhancement (da Silva and Ladovacat, 2021).

Based on an analysis of scientific literature, there are two primary strands of research concerning digital finance (Thakor, 2019; Vives, 2019). The first strand defines digital finance as the utilization of financial technologies and technology-driven financial innovations, such as AI, blockchain, robotic process automation and machine learning. These innovations are used to introduce advancements in the financial sector, spanning traditional banking, leasing and insurance companies, resulting in technology-based transformations (Kuznetsov et al., 2019a, 2019b).

The second strand of research focuses on digital finance as a distinct entity, often represented by start-ups dedicated to providing software-based innovations in the realm of financial services or financial technology-enabled companies (Hartzmark and Sussman, 2019; Favaretti et al., 2017; Carmona et al., 2018; Hadad and Bratianu, 2019).

European Banking Federation report found new ways to create better customer experiences and streamline operational processes along many business lines. The emergence of technological advancements in big data, data analysis and mobile devices has sparked a debate among scholars such as Lee and Shin (2018). They argue that these innovations enable Fintech start-ups to provide personalized services that support traditional banks, aligning with the views expressed by Gulamhuseinwala et al. (2015).

Moreover, Navaretti et al. (2017) predict that digital financial companies are likely to evolve their business models in the future. This evolution entails a gradual convergence

| Source: Table by authors |

Table 6. Opportunities in the digital economy for successful financial inclusion

| Digital policy and tech improvement | Governments and organizations can leverage digital policies and technology advancements to create a more inclusive financial ecosystem. Improved regulations and technological innovations can enhance access and security, this aligns with Brummermeier et al. (2019) findings |
| Venture capital community | The venture capital community can play a significant role in funding and supporting innovative Fintech solutions that address digital financial inclusion challenges. Investments in start-ups and initiatives can drive the development of new technologies and services, which aligns with Brandon et al. (2021a, 2021b) and Christensen et al. (2022) findings |
| Decentralized finance/unbanked population | Decentralized finance (DeFi) holds promise for reaching the unbanked population by providing financial services directly through blockchain-based platforms, bypassing traditional intermediaries and barriers, this aligns with Belke and Beretta’s (2020) findings |
| Health technology sector | The convergence of digital finance and health technology can lead to innovative solutions for health-care financing and insurance, improving access to medical services and financial support. This aligns with Braniff and Riley (2017), Holtz et al. (2015) and Prasad (2013) findings |
| Business-to-consumer (B2C) | Businesses can leverage digital financial tools to offer improved services to consumers. Digital payment options, accessible financial products and tailored solutions can enhance consumer experiences and expand financial inclusion, which aligns with Aker et al. (2016) findings |

Sustainable development goals
towards establishing brand recognition, expanding customer bases through a diverse range of product offerings, building robust digital infrastructure, developing advanced underwriting capabilities, acquiring risk management expertise, expanding access to capital and obtaining licenses to provide regulated financial services.

However, none of the above research applied any big data analysis approach to propagate the digitalization of financial services that can facilitate the adoption of UN SDGs within emerging economies.

5.1 Critical enablers – digital economy
The need for new digital skills is growing as the role of digital technology in the workplace becomes more complex. There are two main categories of digital skills organizations should have:

1. Core ICT skills: programming, applications, infrastructure, cybersecurity and data analytics.

2. Generic ICT skills: ICT skills are required by all employees to work in a digitalized environment (Duchin et al., 2022).

The importance of the digital economy is also acknowledged by governments’ various national priorities for economic growth and development, such as economic prosperity, wealth creation and the improvement of citizens’ lives. Businesses must first transform themselves into digital enterprises to thrive in the digital age and adopt effective data management and customer-centric models.

5.2 Financial inclusion: driver for development
It can be costly to have no direct access to financial services. For example, if a person has no bank account access, in effect, it means that the person would have to visit many retail establishments individually to pay bills and may incur additional costs per cash transaction.

For some countries, if a person received their wages in cash, the likelihood of their employer negating government oversight/social services in not declaring this transaction is high. Alternatively, in receiving wages directly into a bank account, the person can be confident of their access to additional employee rights.

5.3 Account ownership: impact on development
An example cited in The Economist (2018), highlights the experience of mobile money account services in East African countries. A study conducted in Kenya (Suri and Jack, 2016; Gillan et al., 2021) showed that M-PESA access and subsequent consumption raised 194,000 of the Kenyan population (i.e. households) out of poverty. This was due to the positive impact of mobile money accounts that facilitated unbanked people in local village transactions (i.e. home) more cost-effectively and securely. Therefore, this increased consumption helps to ensure revenue stability for the future.

5.4 Loan access: impact on development
With a bank account, this means that there is an additional credit record, which facilitates a person being able to acquire a micro or nano loan at a time of their choosing. This type of access gives impetus to companies in finding solutions for daily use cases.

An example of a mobile payment system method and how firms are driven to sell commodities on credit while building on daily payments via mobile money accounts is shown in a project that delivered electricity to hundreds of thousands of Kenyan homes
including Uganda and Tanzania. However, if payments are missed from the consumer’s point of view, then the method is locked automatically.

5.5 Insurance services access: impact on development
Mobile money account services provide opportunities for unbanked populations to access insurance. Zimbabwe, for example, with Econet experience, meant that farming communities had access to index insurance (for their crops), which would automatically reimburse to a mobile account, and in the event of a drop in a rainfall index level, negate making a claim altogether (The Economist, 2018). This innovation may support farmers in drought periods and help minimize the overall effect.

5.6 Challenges and opportunities – digital economy
Navigating these challenges and capitalizing on the opportunities requires collaboration between governments, regulators, financial institutions, technology providers and communities to ensure that digital financial inclusion benefits all segments of society.

6. Conclusion
This research concludes that adequate data is needed to inform decision-making and follow-up; this should be done through a review of the institutional competence related to data handling and digital transformation. Aside from data, other factors, such as funding and the effective application of projects, are also important. Furthermore, emerging economies should also improve their institutional competence in handling and protecting personal data. They should also adopt appropriate privacy protection measures and standards for the successful implementation of digital financial inclusion. Addressing these aspects collectively is essential for advancing sustainable development and fostering inclusive economic growth.

In summary, Islamic digital finance has the potential to support the achievement of the SDGs by promoting ethical investments that generate social benefits and contribute to sustainable development. By aligning Islamic digital finance with the SDGs, it becomes possible to mobilize private capital and channel it towards initiatives that address the global effort to achieve the SDGs. This alignment can drive positive social and economic impacts, particularly by focusing on investments that prioritize ethical considerations and contribute to SDGs. Through the principles of Islamic finance and digital innovation, Islamic digital finance can play a significant role in advancing the SDGs and fostering a more inclusive and sustainable future.

This study has important implications for future research; the study opens avenues for further research on the integration of digital technologies and Islamic finance, exploring innovative solutions and business models that can facilitate sustainable development in emerging economies. Future studies can focus on the impact and effectiveness of Islamic digital finance initiatives in achieving the UN SDGs, examining their outcomes and assessing their scalability and replicability. In addition, this study has implications for clinical practice; practitioners can leverage the findings to develop digital platforms, tools and services that adhere to Shariah principles and cater to the unique needs of Islamic economies, promoting financial well-being and sustainable development.

Also, policymakers can use the study’s insights to develop regulatory frameworks that facilitate the growth of Islamic digital finance, here are some examples of policies and regulations that governments could consider for the development of digital Islamic finance:

- implement regulations that safeguard consumers’ rights and interests in the digital Islamic finance ecosystem. This might include requirements for transparent
disclosures, fair treatment, dispute resolution mechanisms and protection against fraud and misuse of personal information;

- develop a licensing or registration process specifically for digital Islamic finance providers. This process could involve rigorous assessments of their compliance with both technological and Shariah requirements; and

- consider establishing a dedicated regulatory authority or unit focused on overseeing and regulating digital Islamic finance activities, ensuring specialized attention to this evolving sector.

These policy and regulatory measures can play a crucial role in nurturing the growth of digital Islamic finance while upholding Shariah principles, promoting innovation and safeguarding consumer interests. It is important for governments to work collaboratively with industry stakeholders and experts to tailor these regulations effectively to the unique characteristics of the digital Islamic finance landscape.

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