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Artificial Intelligence Observatory for Monitoring Financial Technologies (FinTech) in Iran

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Abstract: **Objectives:** Significant models leading to artificial intelligence (AI) are considered a milestone. Today, AI has become a widespread technology and an essential part of modern life. On the other hand, observatories have always played a crucial role in policymaking and planning processes. **Prior Work:** The Organization for Economic Cooperation and Development (OECD), one of the most influential international economic decision-making organizations, has established a specialized AI observatory to monitor and formulate policies in response to the major developments occurring in the field of AI. **Approach**: This article, using a qualitative research strategy, a library-based approach, and an analytical and systematic review method, proposes the creation of an AI observatory to monitor financial technologies (FinTech) in Iran by 2025. **Implications:** The results indicate that AI can be applied in areas such as digital payments (e-commerce, mobile payments, and digital remittances), digital capital raising (crowdfunding, peer-to-peer lending, and consumer market lending), digital investment (Robo-advisors and Neo-brokers), Neobanking, and digital assets (cryptocurrencies, non-fungible tokens, and decentralized finance). **Value:** The upward trend of published documents worldwide and in Iran regarding the application of AI in the economy and financial services, particularly FinTech, highlights the significant importance of this field both globally and in Iran.

Keywords: Artificial Intelligence; Observatory; Financial Technologies (FinTech)

JEL Classification: O3; G0

1. Introduction

The financial crises, particularly the 2008 crisis, led to a loss of trust in traditional banking systems. During this period, new startups and technology companies, collectively known as FinTech, emerged, delivering financial products and services through technology. This transformation revolutionized financial institutions, regulatory bodies, and customer and merchant interactions across various industries (Leong et al., 2017). These startups were supported by the general public, policymakers, and economists (Amer, 2017), paving the way for the transition from traditional to modern financial services (Zolfagharian et al., 2019). Mukthar et al. (2025) does a bibliometric analysis of research papers on artificial intelligence (AI) and FinTech.

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Today, most countries aim to achieve higher economic growth (Ataei Kochooei et al., 2020). To achieve this goal, monitoring developments, identifying influential drivers and environmental scanning are essential for foresight, tasks typically assigned to observatories. AI, as one of the most important drivers shaping humanity's future, is increasingly influencing decision-making and policymaking across various sectors (Bashiri, 2021), thereby impacting the functioning of observatories.

The relationship between AI and the economy manifests through various channels. Pazouki et al. (2025) highlights the significant transformational possibilities that AI and digital technologies can create for FinTech and has potential relevance for future academic researchers and policy considerations. AI's impact on the global economy is linked to the evolution of traditional tools and methods and the emergence of new ones (Takhtaei & Khatami, 2023). For instance, financial technologies, known as FinTech, are aimed to increase the speed and efficiency of financial services. These technologies are also expected to facilitate the delivery of financial services (Zivardar, 2022). FinTech has made mobile and internet-based applications accessible in banking. Another notable development is the significant increase in the number and revenue of FinTech development companies (Ghanbari et al., 2021). Also according to Ma et al. (2025) the FinTech, AI, and sustainable finance markets experience varied levels of influence at different times, which in turn impacts the connections across markets and the mechanism risks are transferred.

Based on mainstream economic theories, international trade benefits all countries. However, it is clear that this situation does not lead to the enrichment of all nations (Ghavami Pour Sarshkeh & Mahmoudi, 2024). In the realm of economic development, countries have historically sought to control systems based on available resources. As a result, conflicts of interest between nations, observed in the past, continue in the 21st century. The difference is that while in 433 BC, the Athenians imposed trade sanctions on the Megarians after defeating them in war (Kishtainy, 2012), today, such situations manifest as container crises, chip shortages, or Bitcoin and blockchain issues. Historically, wars such as the Anglo-Dutch Wars (1652–1784), the Opium War (1839–1860), the Franco-Italian Tariff War (1887–1898), the Banana Wars (1898–1934), the Smoot-Hawley Tariff Act (1930), the Anglo-Irish Trade War (1932–1938), the Chicken War (1963), the US-Canada Lumber War (1982), the Milk War (2009), the GMO Trade War (2010–2011), Trump's tariffs (2018 and 2025), the Japan-South Korea Trade Alliance (2019), and the US-China Trade War (2018–2020) were fought to maintain or gain global power (Ghanbari et al., 2021). Countries have used various tools to maintain economic power, from military force during empires to technology in the modern era (Ghavami Pour Sarshkeh & Mahmoudi, 2024). However, some countries have turned to partnerships while competing.

For example, the OECD, an international organization with 37 member countries committed to democracy and free-market economies, is a major international economic decision-making body. It provides evidence-based standards and solutions to economic, social, and environmental challenges with the help of governments, legislators, and citizens. The OECD has established a scientific hub for analyzing public policies, aiming to share experiences on global standards (Bashiri, 2021).

The OECD has created a specialized AI Policy Observatory and is actively researching the strategies of various countries in addressing AI. Predictions suggest that AI applications will contribute approximately $15.7 trillion to the global economy by 2030. The European Commission has allocated a €2.1 billion budget for AI development from 2021 to 2027. Consequently, countries worldwide are making extensive efforts to develop AI (Artificial Intelligence Innovation and Development Center, 2022).

In this context, the Islamic Republic of Iran, by leveraging ethical AI capabilities and emphasizing domestic expertise, aims to rank among the top 10 countries in AI by 2031, leading to increased

economic growth and social welfare (Artificial Intelligence Innovation and Development Center, 2022). The following are the objectives and rationale for conducting this research in Iran:

1. Conducting 80% of AI research to address current and future national needs;

2. Creating a dynamic and responsive legal and ethical environment for AI issues;

3. Achieving 45% AI adoption in government and industry by 2031;

4. Contributing 12% to the national GDP through AI by 2031;

5. Investing $8 billion in AI by 2031;

6. Achieving a 1.8% growth rate in AI-related fields;

7. Maximizing the use of AI in solving national mega-challenges;

8. Training at least 600,000 AI specialists;

9. Establishing at least 1,000 companies with a minimum annual revenue of $1.5 million and 10 large companies with a minimum revenue of $50 million (Artificial Intelligence Innovation and Development Center, 2022).

One of the key actions in Iran's strategic AI development document is the application of AI in economic and financial services, environmental issues, energy, social issues, health, and education, which this study addresses (Artificial Intelligence Innovation and Development Center, 2022). Given the existing research gap and the need to propose and develop new concepts for better governance, this article, for the first time, studies and proposes the creation of an AI observatory to monitor FinTech in Iran. This topic is innovative and knowledge-enhancing, holding significant importance. The article first explains the theoretical foundations and research background, particularly regarding AI and observatories: their roles and objectives, as well as FinTech. Then, the research methodology is presented, followed by the explanation and interpretation of findings. Finally, the article concludes with a summary.

2. Theoretical Foundations and Research Background

2.1. Observatories: Roles and Objectives

With the increasing value of data and its importance in decision-making, coupled with the lack of precise and useful information, developing and improving accurate policies and providing appropriate services to citizens in demanded areas faces challenges. Essentially, the lack of access to detailed and accurate information on demographic, economic, cultural, physical, and environmental potentials in various sectors has caused many planners and decision-makers to act hesitantly, allocating resources to urgent and essential matters rather than long-term investments for upcoming changes (WIPO Technology Trends 2019: Artificial Intelligence, 2019).

2.2. The AI Observatory Project by the German Federal Ministry of Labor and Social Affairs

The German government launched the "AI Observatory" project under the Federal Ministry of Labor and Social Affairs. This project specifically serves the policymaking committee and aims to assist in policymaking and decision-making within the ministry. The reasons for launching this project include: "One thing is certain: AI plays a significant role for each of us, whether at work, in economic life, in science, or in the social fabric. Therefore, it is necessary to find answers too many questions, establish

connections, and participate in the discourse. The AI Observatory in Work and Society has been launched for this purpose." The project operates in five areas (The Observatory for Artificial Intelligence in Work and Society, 2021):

1. Technology foresight and impact assessment.

2. AI in labor and social affairs management.

3. Regulatory frameworks for AI and social technology design.

4. Establishing European and international structures to link German programs and topics with the EU and other international countries.

5. Social discourse and networking.

2.3. The International Observatory on the Social Impacts of AI and Digital Technology in Canada

This observatory, established as a center for discussion and research with the participation of all stakeholders related to AI, its development, and use, involves over 220 researchers from 18 universities and colleges at Laval University in Quebec, Canada. The primary goal of this observatory is to maximize the positive impacts of AI while minimizing its negative effects.

The observatory performs four main tasks:

1. Leading creative research with members and partners.

2. Monitoring events and conducting surveys to collect information.

3. Supporting public discourse and participation in discussions on AI and digital issues.

4. Providing recommendations to public policymakers.

The observatory currently focuses on seven main areas, including healthcare, employment, environment, law, cybersecurity, and ethics (About the Observatory, 2021).

2.4. The AI Observatory for European Integration

The AI for European Integration Center aims to collect information from national and international projects on AI and periodically review the state of AI research. The observatory promotes emerging topics in governance models for European integration, focusing on AI. The center brings together a network of experts to conduct interdisciplinary research on the impact of AI on European integration. The observatory aims to address public concerns about AI (technophobia) and build trust to explain how the EU will use new technologies in the future to strengthen integration (Artificial Intelligence for European Integration, Jean Monnet Centre of Excellence, 2021).

2.5. The OECD AI Observatory

Given the importance of policymaking and foresight in AI, the OECD launched an AI observatory in May 2019 on its website[1]. This observatory is a comprehensive center for public AI policies, aiming to help countries encourage, nurture, and monitor the development of trustworthy and beneficial AI systems for society. The observatory provides a real-time, interactive database of AI policies and initiatives, allowing for the comparison of programs and policies across sectors and regions. The observatory emphasizes three features:

1. Interdisciplinary: The observatory works with various policymaking institutions and domains, from digital economy policies to science, technology, employment, health, consumer protection, education, and transportation policies, to identify opportunities and challenges arising from current and future AI development in a coherent and comprehensive manner.

2. Evidence-based analysis: The observatory provides a platform for collecting and sharing evidence on AI, leveraging the OECD's expertise in measurement and evidence-based analysis methods.

3. Global participation: The observatory engages governments and a wide range of stakeholders, including technical sector partners, the private sector, academia, civil society, and other international organizations, providing opportunities for dialogue and collaboration (Bashiri, 2021).

2.6. Financial Technologies (FinTech) in Iran

FinTech is an innovative technology that uses computer programs and information technology to enhance traditional financial services, improve financial system efficiency, and provide on-demand services through various software applications (Shim & Choi, 2019). The Financial Stability Board of the United States defines FinTech as a technological innovation in finance that leads to new business models, applications, processes, or products with a significant impact on financial markets, institutions, and services (Liu et al., 2020). Table 1 provides a list of different definitions of FinTech.

Table 1. Definitions of FinTech (Varga, 2017)

Definition	Source	Year
FinTech describes businesses that aim to provide financial services using modern software and technology.	FinTech Weekly	2016
FinTech is a compound term of financial technology, describing the emerging financial services sector in the 21st century.	Investopedia	2016
Organizations that combine innovative business models and technology to enable, enhance, or disrupt financial services.	Ernst & Young	2016
The Islamic Parliament Research Center defines FinTech as technology-based solutions that include radical or incremental innovations in software development, processes, products, or business models in the financial services industry.	Islamic Parliament Research Center	2016

The Islamic Parliament Research Center has categorized FinTech into nine groups, adding RegTech and InsurTech to Haycock and Richmond's classification (Pahlavanian et al., 2023; Haycock & Richmond, 2015).

[1] oecd.ai.

2.7. Research Background

Table 2 summarizes some of the domestic and international research on this topic.

Table 2. Domestic and International Research Background

Researcher	Results
Ghaemi, Dehghan & Moradi (2017)	Analyzed three hypotheses regarding the position of banking startups in Iran, concluding that while startups have not fully replaced traditional banking, they have gained some trust and presence among the public and officials.
Mohaghar, Saghafi, Mokhtarzadeh & Azadegan Mehr (2019)	Found that the financial sector in Iran is a consumer of technology developed in other sectors, such as IT, and that transformative innovations are limited by regulatory frameworks and dominant industry players.
Tari & Porheim (2020)	Showed that market opportunities, financial resources, business intelligence, innovation, customer preference recognition, R&D investment, and marketing and technological capabilities positively impact the growth and survival of startups, while network capabilities and market knowledge were not significant.
Payandeh, Shahbazi & Manteghi (2021)	Developed four scenarios based on uncertainties in digital identity verification and FinTech development, recommending strategies for banks and FinTech collaboration.
Lee & Shin (2018)	Identified key challenges for FinTech startups and traditional banks, including customer management, regulations, technology integration, security, privacy, and risk management.
Capgemini et al. (2018)	Highlighted the competitive advantages of FinTech, such as agility, improved customer experience, new product development, innovation, cost reduction, and data management.
Werth et al. (2019)	Identified 15 key factors for FinTech startup success, including entrepreneurial skills, team, funding, product-market fit, continuous learning, customer usage, internationalization, and networking.
Hornuf et al. (2020)	Found that banks with a well-defined digital strategy or a chief digital officer are more likely to collaborate with FinTechs, often investing in smaller FinTechs while partnering with larger ones for product-related collaborations.
Pi et al. (2022)	Identified technology risk, moral hazard, and legal risk as the dominant factors affecting FinTech risk, accounting for 80% of risks, while credit, market, and operational risks, though less prominent, should not be overlooked.

Given the theoretical foundations and research background, the research question is: What is the role of an AI observatory in monitoring FinTech, and what are the practical applications of AI in various types of FinTech?

As evident from the theoretical and research background, no studies have been conducted in Iran on the use of AI to monitor FinTech, highlighting a significant research gap. This study aims to fill this gap by proposing the creation of an AI observatory for monitoring FinTech in Iran.

3. Research Methodology

The most appropriate method to answer the research question is qualitative research. This article, using a qualitative strategy, a library-based approach, and an analytical and systematic review method, studies and proposes the creation of an AI observatory to monitor FinTech in Iran by 2025. The subject scope includes AI observatories and FinTech, the time scope is 2025, and the geographical scope is Iran.

Haycock and Richmond (2015) identified seven categories for FinTech startups: digital currency or cryptocurrency, open banking, payments, international money transfers, wealth management, lending, and money management. The Islamic Parliament Research Center added RegTech and InsurTech to this classification, resulting in nine categories, which are discussed in the next section.

4. Findings

To answer the research questions, FinTech is categorized into nine groups, as shown in Figure 1.

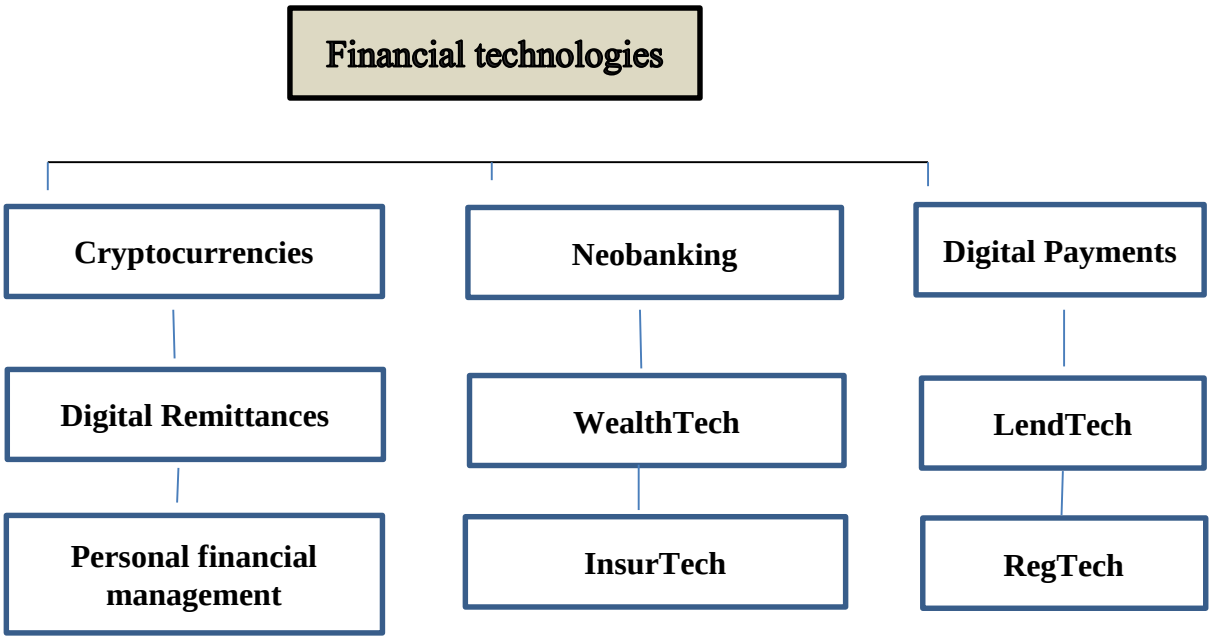

Figure 1. Nine Categories of FinTech

4.1. First Category: Digital Currency

This category of technologies aims to transform the nature of money. While other categories deal with existing money, this one revolutionizes money itself. Contrary to common belief, money is not just a simple transaction tool. Table 3 lists the most popular digital currencies.

Table 3. Popular Digital Currencies (Rouhani Rad, 2020)

Definition	Digital Currency	Year
Bitcoin, the first and most popular digital currency, was introduced by an anonymous individual (or group) named Satoshi Nakamoto.	Bitcoin	2009
Ripple, another popular decentralized platform, was designed to enable high-capacity transactions.	Ripple	2012
Litecoin, with modifications to Bitcoin such as faster transactions and easier mining, was introduced.	Litecoin	2013
Ethereum has its own blockchain, often referred to as Blockchain 2.0. It supports decentralized smart contracts, with over 90% of tokens operating on its platform.	Ethereum	2015

The services offered in this category are outlined in Table 4.

Table 4. Digital Currency Services (European Parliament, 2018)

Digital Currency Services	Description
Cryptocurrency Wallets	Allows customers to store cryptocurrency units in these wallets.
Cryptocurrency Payments	Enables customers to make payments using cryptocurrencies.
Cryptocurrency Exchanges	Allows customers to buy, sell, and exchange cryptocurrencies.
Cryptocurrency Mining	Verifies transactions and confirms the public ledger (using blockchain).

Applications of AI in Digital Currency

The use of AI in digital currencies improves market performance and efficiency. AI algorithms identify trading patterns and buy/sell signals, assisting traders in decision-making. With AI, trading decisions are based on more accurate data. AI's role in digital currencies is inevitable, and the execution of trades or creation of smart tokens using AI is on the horizon. AI will be a crucial technology in digital currencies, as it has the potential to revolutionize how trades are executed, assets are managed, and investment decisions are made. With AI, the use of digital currencies can become faster, more secure, and more efficient for individuals and businesses. Additionally, AI can help reduce fraud, market manipulation, and human error, making cryptocurrency investments more reliable. Below is a list of key challenges that AI, once fully implemented, will address in the crypto industry:

a) **Market Prediction**: AI-based computational technologies enable the prediction of cryptocurrency prices and provide comprehensive analysis of data to improve interaction mechanisms with financial market elements. At this stage, cryptocurrency investments rely on technical and fundamental analysis, offering a rough idea of market direction. AI analyzes vast amounts of data, such as news and forums, to quickly and accurately predict market trends for each cryptocurrency.

b) **Development of Automated Trading**: The introduction of AI in digital currencies will significantly improve algorithmic trading, undoubtedly increasing the profitability of trading strategies. Currently, algorithmic trading relies on complex mathematical models developed by ordinary individuals, making it significantly less efficient than AI. AI eliminates this issue and allows users to select the best trading strategy for their risk level.

c) **Enhanced Crypto Security**: The collaboration between Blockchain and AI will help combat cybercrime and fraud in all its forms. By introducing machine learning algorithms to identify suspicious activities, the security of transaction processes becomes highly reliable and advanced. AI also enables the creation of solutions for identity management during registration, automating KYC (Know Your Customer), and analyzing market data to prevent fraud. Blockchain transactions, combined with existing security measures in the cryptocurrency market, enhance AI's ability to fight cybercrime.

d) **Development of Smart Contracts**: Currently, smart contracts are programmed by individuals, meaning there is a likelihood of inefficiencies and errors. The use of AI in these processes can ensure flawless smart contracts and the realization of Blockchain 2.0, which can be activated or enhanced by various AI technologies. AI can also be used to test smart contracts, particularly for formal verification, automated debugging, and root cause analysis, using search-based software engineering (SBSE).

e) **Development of Mining**: Mining is the process of extracting new blocks of information in a Blockchain network. This process is common for many cryptocurrencies in today's market and is often costly, both financially and in terms of hardware. AI reduces energy consumption in the mining process and significantly increases mining speed by optimizing computational models and algorithms in the software code used for mining. Such solutions are actively being explored and implemented today.

f) **Data Analysis and Insights**: Fully implemented AI in the crypto space optimizes trading activities by analyzing the market and constructing all possible event scenarios, helping traders select the ideal trading strategy based on market sentiment indicators. This significantly reduces the percentage of losing trades and aids in learning not only manual trading styles but also predicting price movements based on AI-driven data analysis. Additionally, AI minimizes the risk of losing capital while aiming for profit.

g) **Optimization of Investment Activities**: Fully implemented AI in digital currencies optimizes trading activities by analyzing the market and constructing all possible event scenarios, helping traders

select the ideal trading strategy based on market sentiment indicators. Natural language processing-based sentiment analysis can recommend which cryptocurrencies are better to buy or sell.

4.2. Second Category: Neo-Banking

According to the European Parliament (2018), banking refers to all retail financial services traditionally provided by financial institutions, divided into two main categories: savings, where customers deposit funds for security and earn interest, and loans and shares, which include financial services for individuals and companies, with lenders benefiting through interest rates or equity shares.

Applications of AI in Neo-Banking

a) **Operational Risk Management**: AI and machine learning can be used in banking operations to reduce risks by identifying and preventing potential issues. In operational risk management, apart from cybersecurity, machine learning primarily focuses on detecting fraud and suspicious transactions.

b) **Customer Credit Scoring**: AI can automate the process of evaluating and scoring customers before granting loans or credit cards. This is one of the most important applications of machine learning in finance, though it raises concerns about replacing humans with machines. In large banks, machine learning algorithms can analyze customer data and financial loans to assess repayment ability and identify trends influencing future loans. These algorithms can automate tasks such as matching data records, identifying exceptions, and determining creditworthiness.

c) **Regulatory Compliance**: AI-powered software actively identifies and aligns banking activities with regulations. AI enhances the skills of compliance officers, enabling them to scale their operations. Natural language processing (NLP) can also be used to analyze phone conversations between employees and customers, as well as internal employee communications. NLP and text mining can interpret regulations and guidelines.

d) **Personalized Services and Virtual Assistants**: AI-powered chatbots are modernizing how businesses serve customers. They assist customers in various ways, such as answering questions and providing personalized experiences. As customers increasingly use mobile apps for banking, the banking sector is integrating chatbot services to attract attention and expand their brand presence.

e) **Credit Risk Management**: AI can rank customers based on credit scores, estimate credit risk, and categorize them. Credit risk assessment, predicting customer bankruptcy, stress testing, and forecasting loan defaults are other applications of AI in credit risk management. AI methods analyze financial data and customer activities to predict their future status. More accurate information about customers' future status enables banks to manage credit risks better and develop optimal strategies.

f) **Market Risk Management**: Risk can be measured by the standard deviation of unexpected outcomes, known as volatility. Value at Risk (VAR) calculates the worst-case loss within a target horizon; ensuring losses do not exceed a certain confidence level. VAR also considers the combined effect of volatility and exposure to financial risks. Predicting volatility in financial markets is crucial for risk management and asset pricing. Market risk includes interest rate and capital risk, and yield curves, which show the relationship between interest rates and the maturity of a borrower's debt, are widely used in financial engineering and market risk management.

g) **Liquidity Risk Management**: Liquidity risk is a devastating financial threat for banks, and underestimating it can lead to irreversible consequences. Optimal control of liquidity risk requires precise measurement methods. However, liquidity risk is complex, and defining its determinants and

formulating appropriate functional models for approximation and prediction is challenging. AI-based models can effectively address these issues.

h) **Digital and Online Banking**: Over the decades, banks have improved their customer interaction methods and personalized modern technologies based on their specific operational characteristics. For example, the first ATMs were installed in the 1960s, and payment cards emerged a decade later. At the beginning of the 21st century, users became familiar with 24/7 online banking, and mobile banking gained popularity in 2010. However, the development of financial systems did not stop there, as the digital age has created new opportunities, including the use of AI in banks and financial institutions. According to predictions, by 2023, banks can reduce costs by $447 billion by developing and implementing AI-based applications. Some applications of AI in digital and online banking include mobile banking, data collection and analysis, enriching transaction data, secure login for internet and mobile banking, chatbots, risk management, and data security.

4.3. Third Category: Payments

Most FinTech startups in Iran focus on this sector. With the expansion of financial markets and mechanized administrative services, financial and accounting companies in Iran have shifted towards electronic financial and accounting services. Online payment systems for customers, e-commerce purchases from various businesses, financial services for companies and seminars, customized accounting and financial software for factories, insurance companies, and other firms, money transfer services, personal finance and income management apps, and even the launch of online financial magazines and databases are part of FinTech activities in Iran.

Some successful examples of Iranian FinTech include:

- **Shaparak**: Provides interfaces for small businesses.
- **ZarinPal**: Offers services such as payment gateways, wallets, and online wallets.
- **Online Payment Services (Peyping)**: An online payment gateway suitable for small businesses and individuals.
- **Maniar**: A financial management system for building and residential complex charges.
- **Fundoran**: A platform aimed at attracting financial support for creative projects (Modanlou Jouybari et al., 2018).

The Evolving FinTech Sector in Iran

The FinTech sector in Iran is still in its early stages of development, with some companies having started their efforts to invest in this domain several years ago. The European Union has outlined the range of possible services in this field, as shown in Table 5.

Table 5. Payment Services (European Parliament, 2018)

Payment Services	Description
Mobile Wallets	Allows customers to make payments through their mobile devices (storing mobile money).
Peer-to-Peer Mobile Payments	Enables customers to transfer money to other users via mobile devices.
Instant Payments	Allows individuals and institutions to send and receive payments in real-time.

Applications of AI in Payments

Ten primary applications of AI in the payment industry have been identified:

a) **AI for Cybersecurity in Payments**: Cybersecurity is a top priority for banks, financial institutions, payment companies, and users. One of the most critical applications of AI in payments is detecting and preventing fraudulent activities. AI-powered programs can track user activity, identify suspicious patterns, and minimize risks by alerting authorities and customers in case of fraudulent activities. For example, companies like Datavisor provide AI-based solutions for detecting financial fraud, claiming to identify 30% of fraudulent transactions with approximately 90% accuracy.

b) **Chatbots: AI-Powered Assistants**: Chatbots demonstrate how AI can replace human assistance while operating with high precision. Available 24/7, chatbots appear immediately upon entering a banking app, offering a seamless and hassle-free experience. By integrating chatbots, banks convey their round-the-clock availability. Additionally, chatbots can track user request patterns and provide customized solutions based on customer needs. For example, Erica, a virtual assistant at Bank of America, helps users manage cards, retrieve account information, and handle payments.

c) **Financial Planning with AI**: Many people struggle with financial planning. Banking and payment apps can now understand users' financial behavior and suggest investment plans based on their budget and habits. Previously, creditworthiness assessments were based on credit history and scores, but AI in banking apps can now go beyond these metrics. For example, Ocrolus, a New York-based company, develops intelligent automation software to help lending institutions make smarter decisions when evaluating customers.

d) **Tracking Financial Trends with AI**: Individuals who track financial trends often rely on AI-based programs for decision-making. Advanced machine learning helps these programs process vast amounts of data to predict market trends for various financial instruments, such as stocks and investment plans. These programs not only track daily, weekly, and monthly trends but also alert users to potential risks based on data reports. For example, Alphasense, an AI-powered search engine, helps banks and financial institutions discover changes in financial market trends, benefiting traders and brokers.

e) **Automated Bill Payments with AI**: AI-powered apps allow users to automate bill payments. They synchronize billing cycles to create optimal payment schedules, ensuring no late payments. Since bills are generated at different times during the month, automating payments is a highly popular feature in payment apps.

f) **Enhanced Security with AI**: If you use a banking or payment app, you have likely encountered biometric login as a leading security feature. AI adds an extra layer of security by using biometric data from users' mobile devices, eliminating the need to re-upload biometric information. Many banks worldwide, such as Bank of America and Standard Chartered, have adopted this technology to prevent unauthorized access to user accounts.

g) **Data Collection and Analysis with AI**: Banks and financial institutions record and track millions of transactions daily. Collecting and storing such vast amounts of data is impossible for human staff. AI not only collects and stores this data but also helps analyze it to generate precise financial reports for auditing. Structured data can be used for credit risk assessment, fraud detection, financial stability, debt and equity statements, and future strategic planning. For example, Kensho, a strategic partner of global financial companies like JP Morgan and Bank of America, provides machine intelligence and data analytics to reduce financial risks.

h) **Reducing Operational Costs with AI**: When used internally, AI helps reduce errors caused by manual processes. It eliminates unnecessary data or processes, saving time and energy for employees while suggesting efficient resource utilization. AI assistants, such as voice assistants, can reduce the burden of repetitive tasks, allowing staff to focus on higher-priority tasks requiring human intervention. According to Accenture, AI in banking can reduce operational costs by up to 30%.

i) **Regulatory Compliance**: Regulatory compliance in online banking and transactions ensures a safer and more complete user experience. However, it can sometimes be cumbersome. For example, when attempting a quick online transaction, users might encounter a KYC (Know Your Customer) notification. While this may be frustrating, AI can complete the process online within seconds, allowing users to resume their transactions. Banks, as regulatory entities, frequently update policies, and AI ensures users are only informed of relevant changes, streamlining compliance for both users and bankers.

j) **Enhancing Customer Experience with AI in Payments**: Technology evolves to provide better and more convenient experiences for customers. AI in payments is no exception. A pleasant and secure experience that improves the relationship between banks and their customers is the ultimate goal of AI applications in payments.

4.4. Fourth Category: International Money Transfers (Remittances)

While payment services focus on domestic money transfers, this category simplifies international money transfers. Before the rise of remittance startups, such transfers were costly and handled by banks and exchange offices. Remittance services have significantly reduced these costs (Azadegan Mehr et al., 2019).

Applications of AI in International Money Transfers

With the growing popularity of cryptocurrencies, the number of users in the crypto industry continues to rise. This section highlights the advantages of cryptocurrency transactions:

a) **Transparency and Security in Cryptocurrency Transactions**: One of the most important features of cryptocurrency transactions is their transparency and security. Altering or manipulating crypto transactions is nearly impossible, as cryptocurrencies require validation from all Blockchain blocks. This ensures secure and worry-free transactions.

b) **Ease of Cryptocurrency Transfers**: Working in the cryptocurrency market and transferring funds is relatively easy. Users can send large amounts of cryptocurrency quickly to any part of the world. By participating in this market, users can easily convert their income into cash. Note that such transfers require a small fee.

c) **Cryptocurrency and Banking Barriers**: One of the rules of the crypto market is that users must have a private wallet. With a private wallet, users can bypass or reduce banking barriers.

d) **Global Access to Cryptocurrencies**: The decentralized nature of cryptocurrencies has increased global access to this market. In contrast, traditional money transfers, which are centralized and regulated, require bank approval.

4.5. Fifth Category: Wealth Management (WealthTech)

This category includes savings and investment management, although many Iranians prefer non-productive investments like real estate and gold. The European Union has outlined the range of possible services in this field, as shown in Table 6.

Table 6. Wealth Management Services (European Parliament, 2018)

Wealth Management Services	Description
Comparison Websites	Websites that compare prices and features of investments before making a decision.
Financial Aggregator Platforms	Provides an overview of investments, extracts information, and offers investment recommendations.
Social Trading and Investment Platforms	These platforms rely on the wisdom of the crowd, offering a social approach to investing.
Algorithmic Platforms	A computer algorithm automatically determines individual investment order parameters without human intervention.

Applications of AI in Wealth Management

a) **Fraud Detection**: Fraud is a serious issue for banks and financial institutions, prompting the use of AI to prevent it. Machine learning algorithms analyze vast amounts of transaction data to identify suspicious activities and potential fraud. These algorithms can suggest risk rules to banks to prevent unauthorized access, identity theft, and fraudulent transactions.

b) **Algorithmic Trading**: AI is widely used in algorithmic trading, where complex algorithms analyze large volumes of financial data, market trends, and historical patterns to execute trades at optimal times and prices. This automated approach increases efficiency and can lead to more profitable outcomes.

c) **Personalized Financial Planning**: AI analyzes individuals' financial data and preferences to provide personalized investment advice and portfolio management tailored to their financial goals and risk tolerance.

d) **Customer Service and Chatbots**: AI-powered chatbots provide 24/7 support to customers, answering queries, guiding them through services, and assisting with account management, significantly improving customer experience and engagement.

e) **Cybersecurity**: AI-powered chatbots also help prevent cyberattacks by providing immediate support and ensuring secure transactions.

4.6. Sixth Category: Lending

Banks act as intermediaries trusted by investors and borrowers, but these intermediaries can be eliminated by directly connecting investors and borrowers. Crowdfunding for entrepreneurial projects falls under this category. In Iran, platforms like Fundooran, Hamijoo, and Mehraneh have made significant strides. Globally, platforms like LendingClub, Funding Circle, and Zopa are well-known.

Applications of AI in Lending

AI-powered microloans offer several advantages:

a) **Speed and Ease of Processing**: These loans are processed automatically and quickly, reducing wait times for applicants.

b) **Access to a Broader Range of Borrowers**: AI-powered microloans are accessible to a wider range of borrowers, including those with poor credit histories.

c) **Cost Reduction for Banks**: These loans reduce banks' operational costs by minimizing the need for human intervention and speeding up the lending process.

4.7. Seventh Category: Money Management

This category helps individuals better manage their finances, often relying on AI and business intelligence.

Table 7. Personal Asset Management Services (European Parliament, 2018)

Personal Asset Management Services	Description
Budgeting	Users can monitor and plan their financial status by integrating and comparing information from various financial accounts (bank accounts, credit cards, loans, etc.).
Financial Service Comparison Platforms	Users can compare the terms and conditions of various financial services offered by different institutions.

Applications of AI in Money Management

a) **Financial Goal Setting**: AI helps individuals set realistic financial goals by analyzing their financial data and identifying future opportunities.

b) **Budget Estimation**: AI assists in creating realistic budgets by analyzing income, expenses, and potential costs.

c) **Savings Management**: AI provides insights into how much individuals should save and suggests the best savings strategies.

d) **Financial Advice**: AI offers personalized financial advice, helping individuals make informed decisions.

e) **Expense Control**: AI analyzes spending patterns, identifies unnecessary expenses, and suggests ways to save money.

f) **Smart Investing**: AI analyzes financial data, market trends, and investment opportunities to help individuals make smarter investment decisions.

4.8. Eighth Category: InsurTech

This category includes insurance-related services, with most Iranian startups focusing on online insurance sales.

Table 8. InsurTech Services (European Parliament, 2018)

InsurTech Services	Description
Insurance Product Comparison Platforms	Users can compare the terms and conditions of various insurance products offered by different providers.
Peer-to-Peer Insurance	A risk-sharing network where a group of related or interested individuals pool their premiums to insure against a specific risk. This service allows network members to pay more accurate premiums. If the pooled premiums are not fully used after the coverage period, the insurer refunds the members. If the pooled premiums are insufficient, additional coverage is obtained through reinsurance.
Usage-Based Insurance	A type of vehicle insurance where the premium is determined based on the distance driven and the driver's behavior.

InsurTech Services	Description
On-Demand Insurance	Customers can easily purchase insurance for individual cases through mobile apps or digital platforms.

Applications of AI in Insurance

a) **Claims Processing**: AI automates repetitive tasks in claims processing, speeding up the process and allowing human staff to focus on critical decisions.

b) **Loss Prediction**: Accurate loss predictions help insurance companies set competitive premiums and improve pricing models.

c) **Automated Underwriting**: AI automates the underwriting process, reducing errors and improving efficiency.

d) **Pricing**: AI helps set accurate insurance premiums by analyzing data and trends.

e) **Fraud Detection**: AI identifies fraudulent claims by analyzing patterns and anomalies in data.

f) **Personalized Services**: AI provides customized insurance products based on individual needs and lifestyles.

g) **Insolvency Prediction**: AI predicts the risk of insurance company failures, helping regulators and stakeholders take preventive measures.

h) **Loss Reserve Calculation**: AI improves the accuracy of loss reserve calculations, ensuring financial stability.

i) **Reinsurance and Investment Strategies**: AI optimizes reinsurance and investment strategies to maximize returns and minimize risks.

4.9. Ninth Category: RegTech

RegTech companies help banks reduce costs related to fines and compliance by using technology to align banking activities with regulations.

Applications of AI in RegTech

a) **Regulatory Compliance**: AI ensures that banks comply with regulations by identifying areas of non-compliance and suggesting corrective actions.

b) **Risk Assessment**: AI evaluates risks and helps banks implement measures to mitigate them.

c) **Cost Savings**: AI reduces operational costs by automating compliance processes and minimizing errors.

5. Conclusion

Historically, globalization has benefited countries economically. In this process, countries with technological innovation have an economic advantage over others. AI and its derivatives have permeated all aspects of life, from simple social media applications to tools used in advanced research.

Establishing an AI observatory helps researchers and policymakers in AI and foresight better understand developments in this field. Given the importance of the financial sector as a foundational part of economies, governments often impose strict regulations to control its activities. Leveraging FinTech innovations can make financial systems smarter and more agile, significantly improving financial inclusion worldwide.

This article aimed to explain global developments in observatories and FinTech to provide lessons for Iran's policymaking. The results show that AI can be applied in various FinTech areas, including digital payments, digital capital raising, digital investment, Neobanking, and digital assets. The FinTech sector in Iran is still in its early stages but holds significant potential for growth. AI plays a crucial role in enhancing payment security, improving customer experience, and optimizing financial services. By leveraging AI, Iran can develop a more efficient and inclusive financial ecosystem, benefiting both individuals and businesses.

However, the impact of resources facilitating FinTech development in each country cannot be overlooked. Factors such as market size, a favorable business environment, and the presence of venture capitalists play a crucial role. Countries have recognized the importance of microloans, peer-to-peer lending, and crowdfunding in financing small businesses, improving money circulation, and promoting productive investments. At the same time, due to associated risks, precise regulations are necessary to protect consumers, strengthen identity verification and credit scoring systems, limit services to small amounts, and enforce anti-money laundering laws.

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