# Studying The Impact of Using Financial Robots in Accounting Practices on Foreign Exchange Markets Volatility

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## Abstract

Financial robotics, sophisticated automated systems driven by advanced algorithms and machine learning, are increasingly being used in both the accounting and foreign exchange (Forex) markets to enhance efficiency and accuracy.

In the field of Forex trading, these robots independently analyze market data, execute trades, manage portfolios accurately, and leverage real-time insights to optimize investment strategies and mitigate risk. In accounting, they have revolutionized traditional practices by automating tasks such as data entry, reconciliation, and financial reporting, ensuring compliance with regulatory standards and improving overall accuracy.

**This study explores** the multifaceted impact of the use of financial robots in accounting practices on foreign exchange markets, by examining their roles in improving decision-making processes, improving operational efficiencies, and ensuring regulatory compliance.

**Importance of the study:** The current literature reveals an acute lack of theoretical or practical research on the risks or operational safeguards of the financial robot, so the importance of this research lies in trying to fill this prominent gap in knowledge about the interaction between financial robots and accounting practices in the foreign exchange market. Its results can benefit investors, companies, regulators and policymakers, ultimately contributing to more informed decision-making and the development of strong regulatory frameworks in the financial industry.

**Based on the findings**, practical guidance and recommendations are provided to investors and accounting, financial and economic policymakers, with the aim of enhancing their understanding of the impact of financial robotics on exchange markets and enhancing their future financial and economic stability.

*Key words:* Financial robots, Fintech, Forex, Accounting Practices, RPA, Artificial intelligence, Automation

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# دراسة أثر استخدام الروبوتات المالية في الممارسات المحاسبية على تقلبات أسواق صرف العملات الأجنبية.

## مستخلص

يتم استخدام الروبوتات المالية، والأنظمة الآلية المتطورة التي تقودها الخوارزميات المتقدمة والتعلم الآلي، بشكل متزايد في كل من أسواق المحاسبة والصرف الأجنبي (الفوركس) لتعزيز الكفاءة والدقة.

تقوم هذه الروبوتات بتحليل بيانات السوق بشكل مستقل، في مجال تداول العملات الأجنبية، بتحليل بيانات السوق بشكل مستقل، وتنفيذ الصفقات، وإدارة المحافظ بدقة، والاستفادة من الرؤى في الوقت الفعلي لتحسين استراتيجيات الاستثمار وتخفيف المخاطر، وفي المحاسبة، أحدثت ثورة في الممارسات التقليدية من خلال أتمتة مهام مثل إدخال البيانات والتسوية وإعداد التقارير المالية، مما يضمن الامتثال للمعايير التنظيمية وتحسين الدقة الإجمالية.

تستكشف هذه الدراسة الأثر متعدد الأوجه لاستخدام الروبوتات المالية في الممارسات المحاسبية على أسواق صرف العملات الاجنبية، من خلال دراسة أدوارها في تحسين عمليات صنع القرار، وتحسين الكفاءات التشغيلية، وضمان الالتزام التنظيمي، ويهدف هذا البحث إلى تقديم رؤى حول الآثار التحويلية والتكامل المسؤول للروبوتات المالية ضمن الأطر المالية المعاصرة.

وبالاستناد إلى نتائج الدراسة يتم توفير توجيهات وتوصيات عملية للمستثمرين وصناع السياسات المحاسبية والمالية والاقتصادية، بهدف تعزيز فهمهم لأثر الروبوتات المالية على أسواق الصرف وتعزيز استقرارها المالي والاقتصادي في المستقبل.

**الكلمات المفتاحية**: الروبوتات المالية، التكنولوجيا المالية، الفوركس، الممارسات المحاسبية، RPA، الذكاء الاصطناعي، الأتمتة.

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# I.    Introduction

In recent years, the finance industry has undergone a paradigm shift with the advent of financial robotics, also known as robotic process automation (RPA), this transformative technology has revolutionized accounting practices, particularly in the dynamic field of foreign exchange (Forex) markets. As organizations seek to enhance efficiency, accuracy, and compliance, they are increasingly turning to RPA solutions.

The use of financial robots in the foreign exchange market has become increasingly widespread, and the rapid adoption of financial robots (robotic process automation, RPA) in accounting practices has raised critical questions regarding their impact on the forex markets. While some claim that financial robots exacerbate volatility by amplifying market volatility, others suggest that they play a role in mitigating volatility by providing more efficient and rational decision-making processes.

Therefore, the problem of the study revolves around studying the actual impact of the use of financial robots in accounting practices on the foreign exchange market, including determining whether financial robots in accounting practices exacerbate volatility through algorithmic trading strategies or contribute to mitigating volatility by enhancing market efficiency and risk management techniques.

This research objective is appropriately set up intending to give an answer to the following research question:

*What is the actual impact of the use of financial robots in accounting practices on the foreign exchange market volatility?*

In order to address this enquiry, the researcher conducted a survey consist of the following sub-questions based on the main one as following:

Q1: How does financial automation enhance efficiency and accuracy in Forex accounting tasks and what are the implications for financial reporting and decision-making?

Q2: What role do financial robots play in ensuring compliance with regulatory requirements and how can internal controls be strengthened, and risk mitigated in Forex transactions?

Q3: How can organizations effectively integrate financial robots into existing accounting systems and what scalability considerations arise when deploying financial robots across different financial subfunctions?

Q4: To what extent do financial robots contribute to market volatility or stability in Forex trading?

By addressing these questions, we will explore the multiple effects of the use of financial robots in accounting practices on the Forex markets, and we will also address how financial robotics technology contributes to simplifying routine tasks, reducing operating costs, and ensuring data accuracy, in addition, we will review real-life examples of companies that have successfully integrated financial robots into their accounting workflow.

In the upcoming section, we will delve into the background, methodology of the research and discuss the findings. The research methodology outlines the systematic approach undertaken to gather, analyze, and interpret data, ensuring the reliability and validity of the study. It serves as the roadmap that guides the research process, detailing the techniques, tools, and procedures employed to address the research questions or objectives. Subsequently, the discussion of results will shed light on the outcomes of the study, presenting key findings and their implications. Through a comprehensive exploration of the research methodology and a thorough examination of the results, the following sections aim to provide a transparent and insightful account of the study's approach and outcomes.

## II.    Literature Review

Oyemade et al., (2010) introduced the topology of an expert advisor who acts as a forex trading robot, using fuzzy logic, and the results of the study showed that a fuzzy logic based expert advisor robot is able to make up to 80% of consecutive profitable trades, and this suggests that developing the skills of expert advisors who can achieve a higher percentage of profitable trades, based on this topology, is worth the effort.

Dayyani, (2016) aimed to design, develop and implement a multi-layered dynamic data analysis software platform using intelligent components. The reference software architecture proposed in this paper was used to build a software robot called YaMasuta, a software application that continuously analyses big financial data to produce investment decisions to help human analysts. The study aimed to investigate and test the optimal and effective design of the big data analytical software platform and designate it as a reference software architecture platform for dynamic big data analytics applications in various fields, and to provide the software platform for dynamic big data analytics in seven layers: data acquisition layer, data filter layer, data semantic layer, intelligence layer, model layer, control layer and dynamic display layer.

Fernandez & Aman, (2018) tried to understand the impact of robotic process automation (RPA) on global accounting services (GAS) using the lens of institutional logic, and this study used an in-depth case study approach in one of the largest global business services companies that provide global accounting services, the results of the study showed that RPA technology has significant effects on the individual and the organization that led to a change and reduction of work, thus reducing the number of employees.

Caporale et al., (2018) measured short-term price reactions after abnormal one-day price changes, and explored whether these changes create exploitable profit opportunities in various financial markets. Statistical tests confirmed the presence of exaggerated reactions and indicated the presence of "inertial anomalies." The trading robot approach was used to test two trading strategies aimed at exploiting these anomalies to achieve abnormal profits. The results

showed that a strategy based on counter-movements after overreactions does not yield profits in the Forex and commodity markets but may be profitable in some cases in the US stock market, in contrast, a strategy that exploits the "inertial anomaly" produces profits in the case of Forex and commodity markets, but not in the case of the US stock market.

According to Kaya et al., (2019) robotic process automation (RPA) is a technology that allows automation of business processes and has a significant impact on Industry 4.0 transformation, which combines the strengths of traditional industries with cutting-edge internet technologies.

Caporale et al., (2019) aimed to find out long-term overreactions to prices in various financial markets (commodities, US stock market, Forex), and evidence of anomalies was found mostly in the case of weekly data. In most cases, strategies based on overreaction anomalies are not profitable, and therefore the latter cannot be considered inconsistent with the Efficiency Market Hypothesis (EMH).

Rundo et al., (2019) indicated that according to specific rules that have been properly processed by trading robots, an order may or may not be opened. In particular, the trading robot may propose setting a certain stop loss and/or a certain level of take profit in order to maximize performance and minimize losses or general drawdowns, and the study aimed to provide an innovative algorithmic network capable of negotiating in the complex OTC (over the counter) market.

Kaya et al., (2019) attempted to analyse the areas of implementation and improvement of RPA in enterprise resource planning (ERP) and material resource planning (MRP) within the scope of financial reporting systems in the context of variable cost accounting systems and identifies the effects of RPA techniques in traditional accounting and cost accounting processes and identifies the overall relationship between accounting systems, industry 4.0 and RPA technology.

Kocian & Chessa, (2019) argue that with cloud computing organizations offering a level of scalability and power, we have finally reached a point where the use of machine learning to support human financial analysts in the foreign exchange (FOREX) markets is essential, however, the accuracy of existing robot trading remains limited.

Alam & Runturambi, (2021) considered that successful currency trading in the long term goes far beyond the tactical analysis of forex trading and the use of trading robots. This system requires constant human adaptation and supervision. The public wishing to use trading robots should be fully aware of the risks and robot systems, as there are no guarantees that using the trading robot will be 100% profitable. They also consider it necessary to emphasize that the trading robot makes decisions based on current circumstances and the right decisions at that moment, therefore, no forex regulator dares to provide absolute guarantees.

Remlein et al., (2022) discussed the concept of robotic process automation (RPA) and the level of its application in the field of financial accounting in Polish companies, and the research showed that among the entities that use RPA in

Poland, robot is mainly used in the field of financial accounting. Further analysis indicated that robots are mainly implemented either in processes with a high volume of transactions (such as sales or purchases) or in processes determined by internally generated data (month-end close, financial reporting), and also shows that the entities that implemented RPA technology have a long history of operation and are large companies employing more than 1,000 employees.

Borowiec, (2022) presented the changes in the direction of automation and robotics in accounting processes and the analysis of costs and financial benefits to implement these improvements on selected examples and the study found that the automation of accounting processes and the implementation of robots allows reducing the costs of accounting performance while increasing control over accounting processes and quality.

Chung & Lin, (2023) aimed to help consumers have the ability to choose financial robots and improve their continuous expectations through financial literacy and the suitability of technological tasks, as it is seen that most consumers get financial advisory services from financial robots and determine their investment directions based on the data provided by those robots. The results of the study showed that financial and technological self-efficacy positively affects customer persistence intent. This study will help consumers have the ability to choose financial robots and improve their continuous intentions through financial literacy and the suitability of technology tasks (task-technology fit (FTT).

Dakalbab et al., (2023a) aimed to introduce a forex trading robot that uses standardized learning to compile trading analysis methodologies, specifically analysing market news sentiment and technical calculations based on historical prices of certain currencies to determine when to buy or sell that makes the most profit.

## III.     Theoretical Framework & Hypothesis Development

The integration of financial robots into Forex (Forex) trading represents a significant advance. This study aims to explore the theoretical foundations and practical applications of this integration. By creating a robust theoretical framework, we can systematically examine the key concepts and relationships that determine the impact of financial robots on forex trading. This framework will guide the formulation of hypotheses, which are key to testing expected outcomes and understanding the broader implications of financial automation in financial markets. Through this approach, we seek to contribute to enhancing existing knowledge and providing actionable insights to practitioners and policymakers.

### 3/1- Financial robots.

In the era of technological innovation and the development of smart systems, financial markets have witnessed huge transformations in how financial operations are carried out and data analysis, among the main developments in this context emerged the importance of financial robots, which have become an

essential element in trading and investment operations, as these robots provide a new model for trading and forecasting exchange rates, as they rely on artificial intelligence and machine learning technology to make financial decisions quickly and effectively without direct human intervention, and with the advent of RPA, most companies relied primarily on ERP or ERP-like systems to handle finances (X. Li, 2021).

Financial robots have the ability to analyse huge amounts of financial data very quickly and with high accuracy, enabling them to detect patterns and trends in the movement of exchange rates, thanks to these capabilities, financial robots can predict future exchange rate changes more accurately than humans can provide, which provides opportunities for trading smarter and effectively, and the integration of financial robots, which are characterized by automated trading systems and automated advisors, represents a fundamental shift in modern finance, especially in the areas of Forex markets and accounting practices. These advanced technologies harness sophisticated algorithms and machine learning capabilities to execute transactions, manage portfolios and optimize financial operations with minimal human intervention to take advantage of opportunities and mitigate risks effectively, at the same time, within the accounting fields, these robots simplify tasks such as data entry, reconciliation and regulatory compliance, thus enhancing operational accuracy and efficiency, However, the proliferation of financial robots poses issues such as algorithmic reliability and risk management in automated decision-making processes and regulatory compliance, and many critical questions that require thorough consideration, as understanding the implications of deploying financial robots in both forex trading and accounting is essential to overcome these challenges and maximize the potential benefits of automation in financial management (Balamurugan et al.,  2022; Fernandez & Aman, 2018; Harrasset, 2020).

Financial robots, also known as automated advisors or financial robots at FinTech, can be defined as automated platforms that provide financial advice or manage investments with minimal human intervention, through the use of algorithms and data analysis, to provide financial planning, investment management and other financial services, robotic advisors also produce timely financial forecasts and reduce choice biases (Chung & Lin, 2023).

Advances in robotic technology in recent years have led to significant increases in the use of robots worldwide, transforming industrial production and the labour market, with some 46,100 industrial robots shipped to the United States in 2017, up 12% from 2016, reaching a new peak for the seventh consecutive year (International Federation of Robotics, IFR 2018).

Financial robots are divided into several types, including:

- Robo-Advisors: These platforms manage investment portfolios based on an individual's risk tolerance, financial objectives, and time horizon. Examples include optimization services, Wealthfront, and Vanguard Personal Advisor.

- Trading robots: They are automated systems that execute transactions in the financial markets. It can operate in different markets including stock, forex, and cryptocurrency markets, examples of which are MetaTrader, Cryptohopper, TradeSanta.
- Chatbots: AI-powered assistants provide financial advice and customer support. They can help with tasks such as budgeting, tracking expenses, and answering financial questions, examples of which are Cleo, Erica by Bank of America, and Plum.

IBM's 2016 report, Facing the Storm, which focuses on the global skills crisis and is based on a study of more than 5,600 executives from various industries, government and education sectors in 47 countries, notes that there are three main factors leading to unprecedented disruption in the labour market: (1) rapid advances in digital technology, (2) radical changes in business models and industrial value chains, and (3) increased globalization and social interaction. The report also pointed out that the demand for skills and types is constantly changing, that the availability of skills in labour markets is uncertain, the quality of skills is being challenged, and executives believe that technological and industrial changes and globalization will significantly affect the skills required in the coming years.

The report also shows that there is a lack of leadership to address skills challenges, as educational institutions struggle to adapt to changing industry needs, and the private sector has not invested enough in the necessary training and development (Institute for Business Value, 2016).

The IBM report "The Enterprise Guide to Closing the Skills Gap" made it clear that the skills gap is not just a myth, but can be addressed with realistic solutions, and the report also noted that up to 120 million workers in the world's 12 largest economies may need to be retrained or acquire new skills within the next three years due to artificial intelligence and intelligent automation (Institute for Business Value, 2019).

In a webinar on robotic process automation hosted by the Institute of Management Accountants (IMA) recently with the participation of nearly 1,500 finance and accounting professionals from around the world, 34% of respondents said robotic process automation will be the emerging technology with the greatest impact on the profession in the next three years.

## 3/2- Financial robots' technologies

Financial robots rely on a set of advanced technologies to analyze data and execute trades in the financial markets. Here are some of the key techniques used:

- Artificial Intelligence (AI)
  - Machine Learning: Used to analyse historical data and predict future trends. Robots can improve their performance over time by learning from new data.

- Deep Learning: An advanced type of machine learning that uses deep neural networks to analyse complex data and make accurate trading decisions.
- Natural Language Processing (NLP)
- Text analysis: NLP financial robots are used to analyse news, financial reports, and comments on social media to identify trends and sentiment that may affect markets.
- Big Data Analytics
- Real-time data analysis: Robots can process huge amounts of data in real-time to make informed and fast trading decisions.
- Statistical models
- ARIMA and GARCH models: used to analyse time series and predict volatility in financial markets.
- Robotic Process Automation (RPA)
- Trade execution: RPA robots are used to execute trades quickly and accurately, reducing human error and improving operational efficiency.
- Cloud Computing
- Data storage and processing: Cloud computing provides a flexible and scalable infrastructure to store and process the big data needed by financial robots.

These technologies help financial robots significantly improve the efficiency and accuracy of financial operations.

## 3/3- The use of financial robots in accounting practices

Financial reports are not only reports of solid figures, but a vital tool that affects the foreign exchange market and shapes the expectations of investors and markets in general, therefore, institutions that have financial and accounting departments supported by employees with a high degree of experience in doing business, and have multidisciplinary training, find themselves far ahead of their peers, and able to direct their focus towards other tasks that add the desired value. The nature of financial and accounting tasks dictates the need to rely on repetition and fixed rules, and these two features are among the most important criteria for determining the need to implement the robotic process automation system, and therefore, it was not surprising that this system is more prevalent in the financial and accounting operations departments than in any other field of work.

Robotic process automation is transforming the world of work for accounting professionals and other information professionals into a more accurate and faster world, where the collection of data that used to occupy a large part of the workday is automated and entered by programmable robots, and for many companies, RPA technology is exactly what they were looking for to achieve higher efficiency in information processing. (Harrats, 2020)

Before the advent of RPA, most companies relied mainly on enterprise resource planning (ERP) or similar systems for enterprise resource planning to

handle financial business (X. Li, 2021), and robotic process automation (RPA) enhances accounting by completing repetitive tasks that do not require skills such as collecting financial data from email, spreadsheets, and entering into the general ledger, directing invoices through PDF files, supporting the processes of entering orders in accounting systems, following up on accounts receivable, inventory of commodity inventory for pricing, collecting the necessary data to close accounts, collecting data from different departments and sections in the company to help develop operational and financial plans, comparing and processing these data, extracting important data from the statement of accounts for the preparation of settlement notes, and distributing internal financial reports to the various units within the company, thus, it gives accountants the freedom to be more analytical and forward-thinking, and allows qualified employees to provide strategic services to their department and the company in general (Balamurugan et al., 2022), as for auditing, the use of robotics technology enhances reliability, makes audits more efficient, improves the quality of audit services and raises the level of security, and with proper training, robots can perform audit tasks with high accuracy and without errors, resulting in high-quality output. This is because the bots run within the predefined script range. (ICAEW, n.d.), and therefore robotics technology has become used in major global accounting and auditing firms, which represents a qualitative development in both fields. Despite the introduction of this technology, the objectives of accounting and auditing have not changed, as robots do not aim to replace accountants and auditors, but rather serve as an auxiliary tool for them in accomplishing their tasks, and robots can be part of the accounting or auditing team, or an element of accounting information systems, where robots contribute to directing the attention of accountants and auditors towards developing critical thinking and analysis skills, and freeing them from traditional routine tasks, this transformation makes accounting and auditing functions more advisory, as accountants and auditors focus on adding value rather than just verifying the validity of data, in addition, robots improve data collection, summarization and entry processes, and perform audit tasks more accurately, which increases the quality of accounting and auditing services. (Al-Gnbri, 2021)

On the other hand, the increasing use of financial robots in financial markets raises many regulatory considerations and regulators need to understand how these technologies affect market dynamics and whether they contribute to or mitigate volatility.

> *H1:* The integration of financial robots into accounting practices improves overall accuracy in financial reporting and reconciliation processes.

According to L'Oréal R. Giles, Director of Digital Technology Research and Financial Transformation, Institute of Management Accountants, companies that hired finance and accounting specialists under the robotic process automation program were able to achieve significant benefits, including more advanced automation solutions, lower execution costs, and significant improvements in

employee satisfaction. Contrary to popular belief, the adoption of RPA at scale or in full can be an ideal solution for SMEs whose finance and accounting teams are facing backlog tasks and a constant need for assistance, while executives seek to improve their offerings within their limited resources. In large companies, the system can become a massive initiative that drives transformation by highlighting promising opportunities in other departments, and for accounting and finance departments in particular, team members who have acquired the skills to work on these technologies through training, who have proactively acquired them, or who lead robotic process automation programs, will be able to reap more benefits of this system both professionally and organizationally, compared to those who only benefit from automation solutions. (ICT Business Magazine, n.d.)

Contrary to the widespread belief that the automation of financial processes will replace accountants, it should be noted that some statistics predict that the accounting profession will grow by 11% over the next ten years, an increase of more than 142,000 new jobs in the field of accounting and auditing.

In addition, robots can analyse huge amounts of financial data very quickly, allowing them to provide accurate insights and analysis, and can also predict future financial trends based on historical data and advanced analysis, which helps companies make informed strategic decisions, and ensures that all accounting operations are carried out in accordance with financial standards and laws, reducing the risk of non-compliance and exposure to sanctions.

## 3/4- Robotic accounting practices and foreign exchange markets

The relationship between accounting practices and foreign exchange markets is complementary and complex, as they affect each other directly and indirectly, as accurate and effective accounting practices contribute to enabling companies to adapt to exchange rate volatility and achieve greater financial stability, in turn, changes in exchange rates affect how financial reports are prepared and analysed, this mutual interaction enhances the importance of accurate accounting and wise financial management to achieve the success of companies in global markets.

The Forex market, known for its volatility and dynamism, presents many opportunities and challenges for traders around the world, in this complex trading environment, there is a clear divide between lovers of traditional manual trading and supporters of the modern technology-driven approach, automated trading using Forex trading robots, also known as Expert Advisors (EAs) (Dakalbab et al., 2023b)

The relationship between financial reports and volatility in foreign exchange markets is the core of many studies and research in the fields of economics and finance, as financial reports reflect the financial performance of companies and institutions, and include information about revenues, costs, profits, and cash flows. In addition, financial reporting also reveals financial management strategies and outlooks for the future, directly affecting investors' valuation and investment decisions.

On the other hand, volatility in foreign exchange markets reflect changes and volatility in the values of national currencies against each other or against other currencies. This volatility can be influenced by multiple economic and political factors, such as changes in interest rates, monetary policies, international trade, and global events, hence the importance of understanding how financial reporting affects currency volatility in global markets. For example, if a company's financial reports show profits below expectations, it can cause the company's currency to depreciate against other currencies. Similarly, strong financial reports can lead to currency appreciation, and by studying this relationship, financial analysts and investors can predict the future of foreign exchange market volatility based on their analysis of financial reports, helping them make smarter and more effective investment decisions.

As asset allocation becomes more international and more countries open up their financial markets, investors are increasingly preferring investments that include foreign exchange exposure, at the same time, investors place higher demands on trading systems, products and services, and their diverse and personal demands symbolize their pursuit of efficiency and improved experience. A series of technological innovations brought by fintech can solve some of the problems in the forex market and meet the needs of customers and markets well.

According to the International Accounting Standard (IAS 21) "The Impact of Changes in Foreign Exchange Rates", there are several important accounting practices that must be followed in the foreign exchange markets to ensure accuracy and transparency in financial reports, the most prominent of which are:

1) Functional Currency: The functional currency is the currency used in the basic economic environment in which the entity operates, and it is determined based on several factors such as the currency in which expenses and revenues are paid or in which financing is made (issuance of shares, loans).

2) Translation of financial statements: When preparing financial statements, transactions in a foreign currency must be translated into functional currency using the spot exchange rate on the date of the transaction, and at the end of the financial period, cash items are translated using the closing rate, while non-cash items are translated on the basis of historical cost.

3) Currency Differential Treatment: Currency differences are recognized in the P&L statement, except in certain cases such as currency differences for non-cash items that are recognized in other comprehensive income.

4) Disclosure: Foreign currency conversion differences fixed in surplus, or deficit must be disclosed, and net foreign currency conversion differences must be included in a separate component of net assets/equity.

The integration of financial robots, powered by artificial intelligence (AI) and machine learning (ML), into accounting practices affects the foreign exchange market (Forex) by:

- Improve data accuracy and integrity: Financial robots automate data entry and settlement tasks, reducing human errors, and accurate financial data ensures

that exchange rates and transactions related to Forex are based on reliable information, which enhances market stability and reduces unexpected volatility caused by false data. (Dakalbab et al., 2023a)

- Real-time data processing: Financial robots are able to process huge amounts of financial data in real time. This capability allows financial data to be updated and adjustments made instantly, which is critical for multinational companies dealing in multiple currencies, as real-time data processing helps companies respond quickly to changes in the Forex market, reducing potential losses resulting from currency volatility. (Nguyen Thi Thu & Dang Xuan, 2018)

- Predictive analytics and forecasts: Using artificial intelligence (AI) and machine learning (ML), financial robots can analyze historical data and current market trends to predict future movements in exchange rates. These predictive analytics help companies make informed hedging decisions, reducing the risk associated with forex volatility. This, in turn, can lead to more stable forex markets where companies adopt proactive strategies rather than reactive. (Ayitey Junior et al., 2023)

- Automated transactions in Forex: Financial robots can automatically execute Forex transactions based on specific algorithms and market conditions, and automated trading reduces the time gap between decision making and execution, allowing companies to take advantage of favourable exchange rates and avoid negative movements, and this efficiency can mitigate market volatility and improve liquidity in the Forex market.

- Risk Management: Financial robots help in managing risk comprehensively by constantly monitoring market conditions and financial positions, and then can identify potential risks from Forex exposure and propose or implement hedging strategies in real time, and effective risk management practices help companies maintain financial stability, which contributes to overall market stability. (Meng & Sun, 2013)

- Improve transparency and compliance: Financial robots ensure that all forex transactions are accurately recorded and comply with relevant regulations, this transparency helps build trust between market participants and regulators, reducing the risk of fraudulent activities and promoting fair trading practices, and in the current state of the international foreign exchange market, where exchange rates change rapidly, financial institutions often launch new foreign currency credit and financing products to attract customers. One of the problems in foreign exchange management is that the pattern of foreign exchange control often fails to keep pace with the speed of innovation in financial products, for financial products with unknown financial risks, financial robotics technology based on the use of artificial intelligence can be

relied upon and take advantage of the sandbox[1] environment to create a test environment for foreign exchange control, and this environment can quickly and effectively assess the value and risk of innovative financial products and financial services, Next, it'll determine if these new products can be successfully promoted and listed. (W. Li, 2021)

- Increase operational efficiency: By automating repetitive and time-consuming tasks, finance robots allow HR to focus on strategic activities. This operational efficiency leads to cost savings and improved decision-making processes. Effective companies are better positioned to deal with the complexities of the forex market, contributing to a more resilient financial system. (Dakalbab et al., 2023a)

- Impact on market dynamics: The widespread adoption of financial robots can affect the dynamics of the Forex market by increasing the volume and speed of transactions. While this can boost liquidity, it can also increase competition and reduce spreads. Financial institutions and traders need to adapt to these changes to stay competitive. (Nguyen Thi Thu & Dang Xuan, 2018)

- Strategic decision-making: With access to accurate, real-time financial data and advanced analytics, companies can make more informed strategic decisions on international investments, supply and pricing, and these decisions are often influenced by expected movements in exchange rates, which are better predicted and managed through the use of financial robots. (Seala Syah Alam & A Josias Simon Runturambi, 2021)

   *H2*: The integration of financial robots into accounting practices exacerbate and mitigate volatility in the foreign exchange market.

   In recognition of the importance of financial robotics, the Financial Regulatory Authority issued Resolution No. 57 of 2024, which regulates, for the first time in the Egyptian capital market, the establishment of the Robo-Advisor for Investment program to allow companies for the formation and management of securities portfolios licensed by the Authority, to provide automated financial advisory services to invest in securities listed on the stock exchange. The Authority said that the Robo-Advisor for Investment program is an electronic system that issues financial advice to form, manage and rebalance the client's investment portfolio, through the use of artificial intelligence algorithms. The decision stipulated that the artificial intelligence technology must be of the type in which transparency, disclosure and documentation, data management, conformity assessment, suitability for purpose, tracking, and continuous control, including human control, and the management of the company providing the service must adopt a policy that includes the controls and procedures necessary for the design,

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[1] Regulatory Sandbox, an application of artificial intelligence in financial regulation, is one of the typical innovative regulatory models in developed countries or regions, first proposed by the Financial Conduct Authority United Kingdom (FCA) Financial Conduct Authority (FCA).

selection, operation and development of algorithms, provided that it includes, at a minimum, the procedures that were followed in designing the algorithms, in addition to the controls for retaining documents related to the design of the program, which clearly define the purpose, scope and design of the algorithms, as well as cybersecurity arrangements, as well as cases and controls for not considering the results of algorithms, exceeding them, or temporarily suspending the provision of the service, with the obligation to notify the Authority in advance if the company wishes to do so, provided that the notification includes the company's justifications for doing so, and the decision stipulated the need to review, develop and update the algorithms whenever there are factors that may affect their suitability, including the issuance of any Rules issued by the Authority in this regard. The company shall notify the Authority in advance if it wishes to make an amendment that results in a change in the applied methodology or strategy, explaining the justifications for the amendment, and the program updates customer data on an annual basis, to determine whether there have been any changes in the data and information previously provided by them as well as when any changes occur in this regard (Financial Regulatory Authority, 2024).

From the above, it can be said that the use of financial robots in accounting significantly affects the Forex market by improving data accuracy, enabling real-time processing, improving risk management, and facilitating automated transactions, and these developments contribute to achieving more stable and efficient Forex markets, which benefits companies and the financial system in general, and as technology continues to develop, the integration of artificial intelligence and machine learning into financial operations is likely to deepen, which will lead to a greater transformation in the finance landscape. International.

### 3/5- Actual cases

Global GDP will rise by 14% in 2030 as a result of AI, equivalent to an additional $15.7 trillion. This makes it the biggest business opportunity in today's fast-changing economy, according to new research by PricewaterhouseCoopers.

Labor productivity improvements are expected to account for more than half of all economic gains from AI during 2016-2030. Increased consumer demand resulting from improvements to AI-enabled products will account for the rest. The largest economic gains from AI will be in China (a 26% increase in GDP in 2030) and North America (a 14.5% increase), equivalent to a total of $10.7 trillion and accounting for nearly 70% of the global economic impact (PWC, 2017)
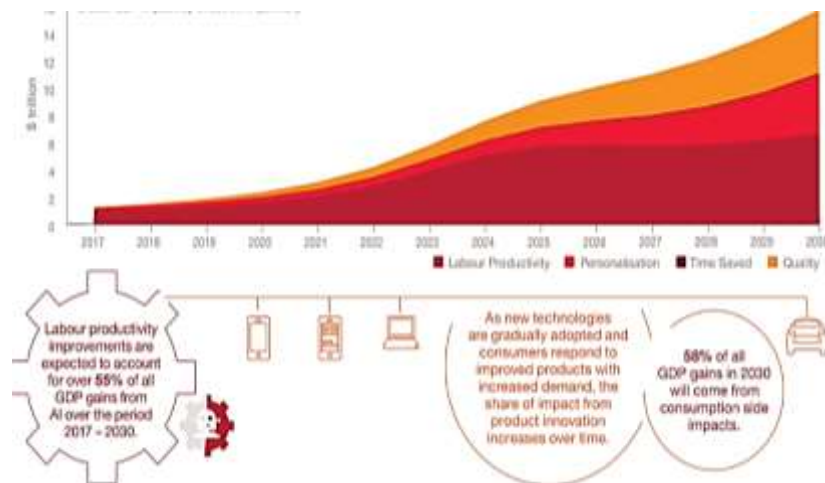
**Figure 1: Global GDP impact by effect of AI**
**Source: PWC analysis**

According to the (Deloitte, 2017) report 'The robots are ready, are you?' the most important findings from the report on robotic automation (RPA) were:

- Widespread adoption: 72% of respondents have already embarked on their robotic automation journey, and 19% plan to adopt it in the next two years.
- ROI: The average cost payback period for robotic automation is less than 12 months, with 20% of the equivalent capacity of employees achieved by robots.
- Performance improvements: 92% of respondents reported improvements in compliance, 90% in quality and accuracy, and 86% in productivity.
- Increased investment: 78% of those who have implemented robotic automation expect a significant increase in investment in the next three years.
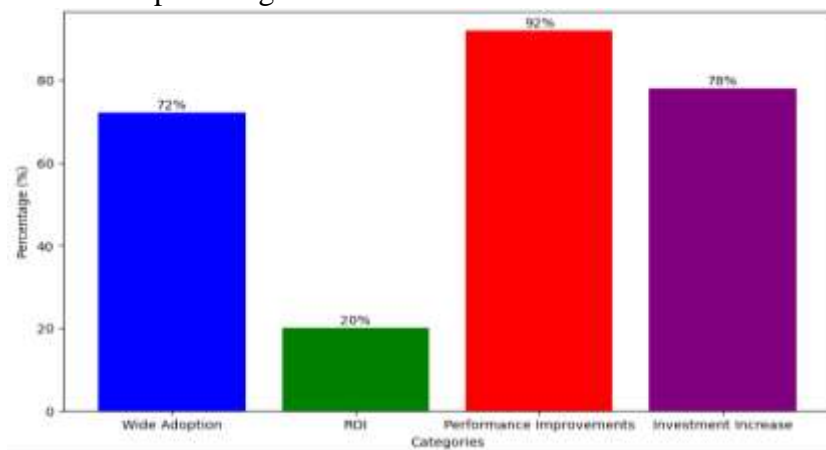


**Figure 2: robotic automation adoption and results**
**Source: The Author**

According to HSBC'S report "Automation the pursuit of efficiency" Automation has evolved since ancient times, with significant developments during the Industrial Revolution and the twentieth century.

- Benefits include increased productivity and improved quality, while risks include job loss and high costs.
- Sectors affected: including manufacturing, transportation, healthcare, finance, and logistics.
- Digital Data: Adoption of automation technology in warehouses: 60-80% of organizations.
- Top 10 industries with automation potential: food service, manufacturing, agriculture, transportation, retail, mining, construction, utilities, wholesale, and financial services.
- Proportion of hours that can be freed in healthcare by 2030: 30-50%.
- Change in weekly working hours in the United States due to automation and artificial intelligence between 2016 and 2030: a 60% increase in technological skills, and a 14% decrease in basic cognitive skills. (Mcloughlin et al., 2021)
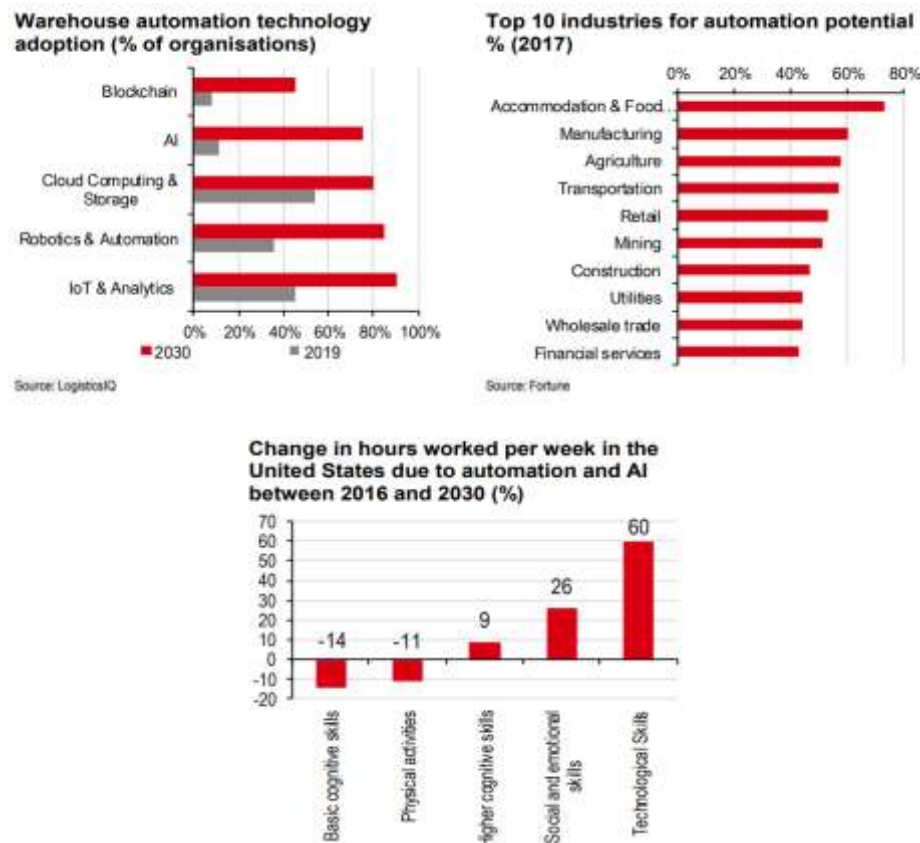
**Figure 3: outcomes of the HSBC's analyses**
**Source: HSBC**

## 3/5/1- Goldman Sachs

Goldman Sachs has developed and used advanced financial algorithms based on artificial intelligence and robotics to analyse historical data and

currency markets in real time to predict the movement of foreign exchange rates. These algorithms help them make more accurate trading decisions.
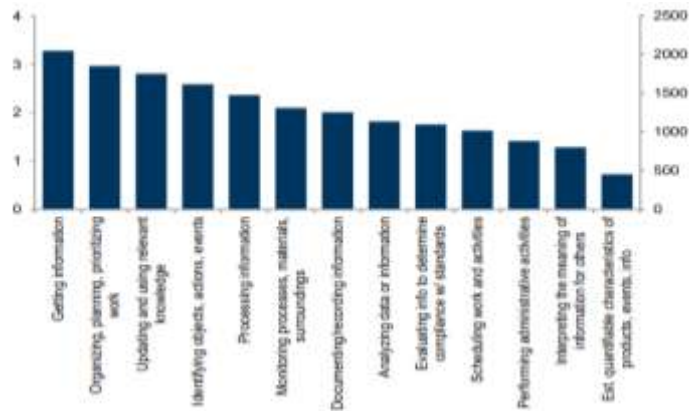


**Figure 4: value of automating work**
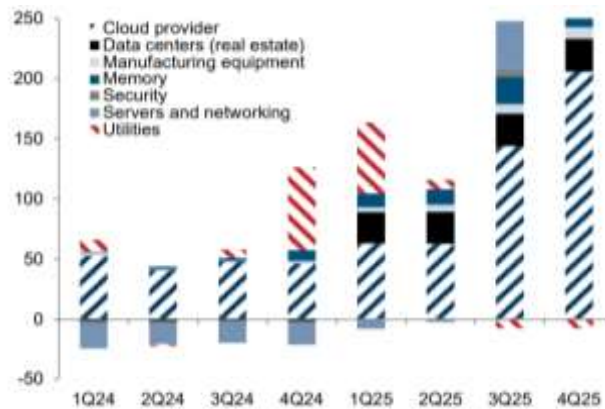**Source: Goldman Sachs**



**Figure 5: change in consensus revenue forecast since March 2023**
**Source: FactSet, Goldman Sachs**

### 3/5/2- J.P. Morgan Chase:

JPMorgan Chase uses an artificial intelligence platform called LOXM, which is designed to execute forex trades at the best possible prices. LOXM relies on machine learning to analyse huge amounts of data and make trading decisions based on patterns detected in the market.

### 3/5/3- Bank of America:

Bank of America uses artificial intelligence tools to analyse market data and predict the movement of foreign exchange rates. These tools rely on machine learning to analyse historical trends and interact with current data to provide accurate forecasts.

### 3/5/4- Deutsche Bank:

Deutsche Bank has implemented an AI-based system called Autobahn FX, which uses machine learning to analyse market data and make recommendations on foreign exchange rates. The system helps the bank optimize trading strategies and reduce risk.

**Studying The Impact of Using Financial Robots in Accounting Practices on Foreign Exchange Markets Volatility.                Walaa Nasreldein Gad**

### 3/5/5- Citi Bank:

Citibank uses financial robots and AI-based analytics tools to predict the movement of foreign exchange rates. These tools rely on big data analysis from multiple sources to provide accurate forecasts and support trading decisions (CITI Bank, 2024)
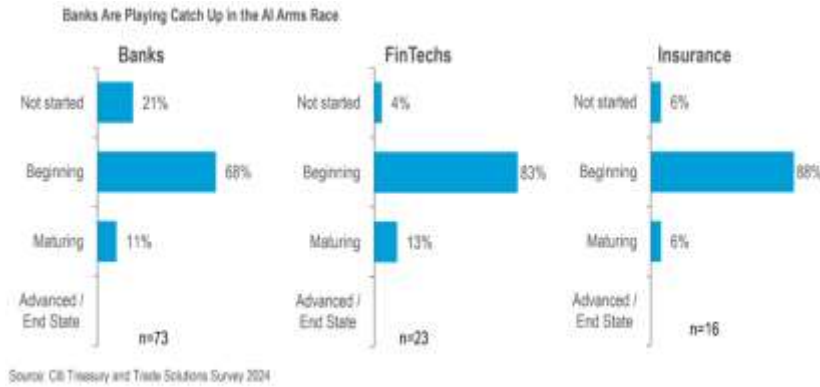


**Figure 7: banks adoption of AI**
**Source: Citi Treasury and solution survey 2024**



**Figure 8: breakdown of banks' profit**
**Source: SNL financial, IMF World economics, Citi global insights**

## IV.    Research Methodology

The objectives of this research are achieved through a combination of inductive and deductive approaches as follows:

### A- Deductive Approach:

This is done by extrapolating international instructions and publications, as well as studying the conclusion of scientific research on digital transformation and its impact on revision.

## B. Inductive Approach

By conducting interviews or surveys with market participants, including accountants, traders, investors, financial analysts and academics, to gather qualitative insights into the role of financial robots in exacerbating or mitigating volatility and analysing qualitative data to identify common topics, trends and perceptions regarding the impact of financial robotics on market dynamics.

## D. Field study

The researcher conducted a field study to investigate the impact of the use of financial robots in accounting practices on the strategies and stability of foreign exchange markets. This field study aims to investigate the impact of the use of financial robots in accounting practices on the strategies, and stability of foreign exchange markets, and the study will be carried out using the Delphi method, which relies on collecting expert opinions over several rounds to achieve consensus on the topic.

## 4/1- Variables of the study

Independent variable
- The use of financial robots in accounting practices.

Intermediate variable
- The accuracy and reliability of financial Practices.

Dependent variable
- Volatility of foreign exchange markets.



**Figure 9: Variables of the study**
**Source: The Author**

## 4/2- population of the Study

The sample population in this study includes a variety of experts in the following areas:

1) Financial experts and accountants: People with experience in financial accounting and management of accounting operations.

2) Directors of International Institutions: Directors who manage companies that deal with foreign exchange markets on a regular basis such as Commercial International Bank (CIB), Hermes Financial Holding EFG

Hermes, Qalaa Holdings, Pelton Financial Holdings, Telecom Egypt (TE Data) and HSBC Egypt.



**Figure 10: Fintech experts in Egypt**
**Source: rasmal.com**

3) Academic professors: researchers in universities who have information about the use of technology in accounting and financial markets.
4) Business Advisors: Advisors who provide financial and investment advice to companies such as Mars Consultation, Udjat Agency, Deloitte Egypt, Compass Capital, ACT Financial.

**4/3- Sample of the Study**

The optimal size of the study population in the Delphi method depends on several factors, including the nature of the study, the complexity of the topic, and the resources available.

1. Small sample size (10-15 experts):
   o Suitable for exploratory studies or specialized topics.
   o Helps achieve greater interaction between participants.
   o It can be enough to achieve consensus on less complex issues.
2. Average sample size (15-30 experts):
   o Suitable for studies that require a balance between depth and diversity of opinions.
   o Helps cover multiple aspects of the topic and provide comprehensive insights.
   o It can provide more stable and versatile results.
3. Large sample size (30-50 experts and more):
   o Suitable for large and complex studies that need a wide variety of opinions and experiences.
   o Helps enhance the accuracy of results and their wider generalization.
   o Can face challenges in managing, coordinating and analysing answers.

**4/4- Tool of the Study**

To achieve the objectives of the study, the researcher used the survey form to collect the necessary data to measure and analyse the statistical tests for the opinions of the sample items, due to the lack of information in the practical field of the subject.

## 4/5- Statistical treatment of the questionnaire

The statistical processing of questionnaires is an important step in research methodology, ensuring that the collected data is systematically analysed to derive meaningful insights. This section explains the different statistical techniques used to process and interpret responses. By applying both descriptive and deductive statistical methods, we aim to provide a comprehensive understanding of data, highlighting the main trends, relationships and differences between the variables studied. Careful analysis not only verifies the reliability and accuracy of the results, but also supports the overall goals of research.

### First round:

The initial phase of our study focuses on collecting and analyzing primary data through a structured questionnaire. This first round is designed to capture a wide range of responses, providing a fundamental understanding of key variables and their interrelationships. Through the use of rigorous statistical methods, we aim to ensure the reliability and correctness of the data collected. This stage paves the way for deeper analysis in subsequent rounds, enabling us to refine our hypotheses and draw more accurate conclusions.

1. Identification of experts: 60 experts were identified and selected in the above fields.
2. Questionnaire Design: The questionnaire consists of 50 questions divided into two main axes: the impact of financial robots on the accuracy and efficiency of accounting operations, and the impact of the use of financial robots in accounting practices on the stability of foreign exchange markets, The respondents were asked to answer the questions of the survey list out of five answers according to the five-point scale

The researcher reviewed the survey forms to ensure their validity for data entry and statistical analysis, where the forms that meet the necessary conditions were used, and the variables and data were coded and unloaded within the Statistical Packages for Social Sciences (SPSS) program.

3. Distribution of the questionnaire: The questionnaire was sent to the experts via e-mail and through electronic means of communication.

### Second round:

1. Data collection and analysis: The answers to the first round were analysed and general trends and repeated opinions were identified.

**Table (1)**
**Sample component data**

|   | Statement | Number | percent% |
|---|-----------|--------|----------|
| 1 | Sample size | 60 | ١٠٠% |
| 2 | Number of Forms Answered | ٤٢ | 70% |

**Source: The Author**

According to the previous table, the percentage of the questionnaires answered was equal to 70% of the sample size, which is suitable for use in statistical analysis.

**4/6- Secondary data collection sources:**

In this regard, the researcher has access to the available sources of information and documents, considering that this main step began before the start of the research and continued until the end, as these documents varied to include:

1) Reports issued by international professional bodies and organizations related to the subject of study.
2) Scientific research and articles related to the subject of study.
3) In addition to the previous, the researcher also relied on other channels in order to obtain information, foremost of which is the World Wide Web, through continuous research and browsing many specialized sites at the international level, which helped in directing her study, and visualizing the methodology of fieldwork.

**4/7- Questionnaire design**

During this stage, the researcher designed the questionnaire phrases in a simple way according to the phrases reached from the interviews of the study sample so that these statements allow testing the research hypotheses, and this is to take note of all aspects of the questionnaire design to raise the percentage of agreement in the sample.

1. Structure of the questionnaire form

The final questionnaire form included fifty (46) main phrases, distributed on three main axes, and to reach a clear and accurate answer to the respondents, the phrases were formulated according to the Likert pentameter (closed type) following the five-point card.

**4/8- Data analysis, Results and Discussion**

The data was analysed using descriptive statistical methods to analyse trends, as these analyses help identify the main benefits and challenges associated with the use of financial robots in accounting practices and foreign exchange markets, and the following statistical methods were used:

▪ **Factor Analysis Test**

The researcher used factor analysis to ensure that the phrases express a kind of credibility and to reach the most related and influential phrases in each of the five axes.

**Table (2)**
**Matrix of factor analysis elements**

| Sentences | AXES | | |
|---|---|---|---|
| | 1 | 2 | 3 |
| Q1: Financial robots contribute to improving the integration of financial data from multiple international subsidiaries. | .790 | | |
| Q2: Financial robots aid in automating compliance checks for | .717 | | |

| Sentences | AXES | | |
|---|---|---|---|
| | **1** | **2** | **3** |
| international financial regulations. | | | |
| Q3: Financial robots facilitate the automation of cross-border payment processing, reducing manual errors. | .819 | | |
| Q4: Financial robots help improve the cash forecasting strategies for companies operating in international markets. | .680 | | |
| Q5: Financial robots contribute to enhancing the accuracy of financial projections in volatile international markets. | | .605 | |
| Q6: Financial robots improve the accuracy of risk assessments for international mergers and acquisitions. | .543 | | |
| Q7: Financial robots contribute to improving the strategic financial planning of companies operating in global markets. | .690 | | |
| Q8: Financial robots contribute to improving debt management strategies in foreign currencies. | .850 | | |
| Q9: Financial robots contribute to improving the management of time differences between international financial transactions. | .735 | | |
| Q10: Financial robots help improve the effectiveness of hedging strategies against currency risks. | .755 | | |
| Q11: Financial robots help improve the accuracy of forecasting cash flows in foreign currencies. | .666 | | |
| Q12: Financial robots enhance the accuracy and timeliness of tax reporting for multinational companies. | .568 | | |
| Q13: The use of financial robots reduces administrative costs associated with managing financial risks. | | .595 | |
| Q14: Financial robots assist in optimizing currency conversion rates for transactions in multiple foreign currencies. | .593 | | |
| Q15: The use of financial robots improves long-term financial planning and budgeting for multinational companies. | .722 | | |
| Q16: Financial robots enhance the accuracy of consolidated financial reporting for multinational companies. | .595 | | |
| Q17: Financial robots contribute to improving the accuracy of financial data used in strategic decision-making. | .754 | | |
| Q18: Financial robots help improve coordination between different financial departments within the company. | .580 | | |
| Q19: Financial robots help improve the accuracy of preparing budgets and annual financial reports for international companies. | | .623 | |
| Q20: Financial robots contribute to improving the accuracy of financial performance analysis for companies in international markets. | | .598 | |
| Q21: Financial robots contribute to reducing the time required to prepare financial reports related to exchange markets. | | .549 | |
| Q22: Financial robots help improve the efficiency of accounting operations related to foreign currencies. | | .685 | |
| Q23: Financial robots help improve the management of cash exchange operations between international branches. | | .697 | |
| Q24: Financial robots contribute to reducing discrepancies in financial performance reports between international branches. | | .518 | |
| Q25: Financial robots contribute to improving the management of contracts and financial liabilities in foreign currencies. | | .817 | |

| Sentences | AXES | | |
|---|---|---|---|
| | **1** | **2** | **3** |
| Q26: Financial robots contribute to improving transparency and compliance with international financial accounting standards. | | .753 | |
| Q27: Financial robots help reduce costs associated with financial audits of international institutions. | | .686 | |
| Q28: Financial robots help improve the speed and efficiency of international financial settlements. | | .718 | |
| Q29: Financial robots help improve the accuracy of cost analysis for international transactions. | .500 | | |
| Q30: Financial robots help improve the accuracy of expense analysis related to international transactions. | | .566 | |
| Q31: The use of financial robots in accounting practices contributes to improving liquidity and cash management in companies dealing in foreign currencies | | .733 | |
| Q32: The use of financial robots contributes to improving the quality of financial information provided to investors. | | .619 | |
| Q33: Financial robots improve the accuracy of the analysis of historical financial data related to exchange markets. | | .663 | |
| Q34: The use of financial robots in accounting practices improves the accuracy of forecasting exchange rate volatility. | | | .828 |
| Q35: The use of financial robots in accounting practices helps reduce the risks associated with exchange rate volatility. | | | .580 |
| Q36: The use of financial robots in accounting practices helps reduce the costs associated with hedging against exchange rate volatility. | | | .759 |
| Q37: The use of financial robots in accounting practices enhances the transparency and compliance of companies with international standards considering exchange rate volatility. | | | .798 |
| Q38: The use of financial robots in accounting practices helps in improving hedging strategies against exchange rate volatility. | | | .557 |
| Q39: The use of financial robots in accounting practices contributes to reducing time delays in recording financial transactions affected by exchange rate volatility. | | | .785 |
| Q40: The use of financial robots in accounting practices contributes to reducing the risk of financial corruption and fraud in companies facing volatility in exchange rates. | | | .651 |
| Q41: The use of financial robots in accounting practices contributes to improving the accuracy of financial reports related to exchange rates. | | | .524 |
| Q42: The use of financial robots in accounting practices helps improve the accuracy of cash forecasts for companies operating in international markets. | | | .712 |
| Q43: The use of financial robots in accounting practices helps in monitoring and managing currency differentials in financial markets. | | | .654 |
| Q44: The use of financial robots in accounting practices improves the accuracy of the analysis of returns and risks associated with international investments. | | | .604 |
| Q45: The use of financial robots in accounting practices reduces | | | .703 |

| Sentences | AXES | | |
|---|---|---|---|
| | 1 | 2 | 3 |
| the risks of unexpected volatility in exchange rates. | | | |
| Q٤6: The use of financial robots in accounting practices improves the accuracy of profitability reports related to international transactions. | | | .684 |

**Source: The Author according to the outputs of the SPSS V27**

According to the previous table the results were as follows:

o The first element of the first axis contains ١٧ statements that explain ٨٤% of the axis variation, and the results confirmed the significance of the KMO and Bartlett's test at a confidence level of 99%, where the KMO value was equal to 0.71, which is an acceptable value, as the minimum value for that value is 0.600.

o The first element of the second axis statements contains ١٦ statements that explain 79% of the axis variation, and the results confirmed the significance of the KMO and Bartlett's test at a confidence level of 99%, where the KMO value was equal to 0.63, which is an acceptable value.

o The first element of the second axis statements contains ١4 statements that explain 77% of the axis variation, and the results confirmed the significance of the KMO and Bartlett's test at a confidence level of 99%, where the KMO value was equal to 0.606, which is an acceptable value, and this indicates the need to take the results of factor analysis.

▪ **Cronbach's Alpha test**

The researcher used the stability coefficient Cronbach's Alpha and the self-validity coefficient to measure the stability of the content of the axes as well as the stability of the content of the study and the results were as shown in the following table:

**Table (3)**
**Cronbach's Alpha**

| | Variables and axes of the study | Phrases | Stability | Validity |
|---|---|---|---|---|
| ١ | Financial robots | 17 | 0.925 | ٠,٩٦١ |
| ٢ | Accounting practices | ١٦ | ٠,٩١٠ | ٠,٩٤٥ |
| ٣ | Foreign Exchange Markets Volatility | ١3 | ٠,٩٠٣ | ٠,٩٤٧ |
| | Stability and Validity of the model | 46 | ٠,٩٣٣ | ٠,٩٦٤ |

**Source: The Author according to the outputs of the SPSS V27.**

According to the previous table, the stability coefficient is 93% which is greater than 60%, and that indicates the stability of the statements of the study variables, as well as it is found that the self- validity coefficient is greater than (0.5), which indicates the sincerity of the statements that make up each of the study variables, in addition to the stability and credibility of the model as a whole.

- **Descriptive statistics**

The researcher used descriptive statistics to measure the consistency of the statements of the four axes of the study by extracting the values of each of the arithmetic mean, standard deviation and coefficient of variation for the statements of each axis of the study separately, and the results were as follows:

**Table (4)**
**The results of the descriptive analysis of the variables**

| Axis | Mean | Std. Deviation | Variance | Direction |
|---|---|---|---|---|
| Financial Robots | 4.2017 | 0.48874 | 0.2389 | Strongly agree |
| Accounting Practices | 4.3051 | 0.46304 | 0.2144 | Strongly agree |
| Foreign Exchange Market Volatility | 4.1769 | 0.50018 | 0.2502 | Agree |

Source: The Author according to the outputs of the SPSS V27.
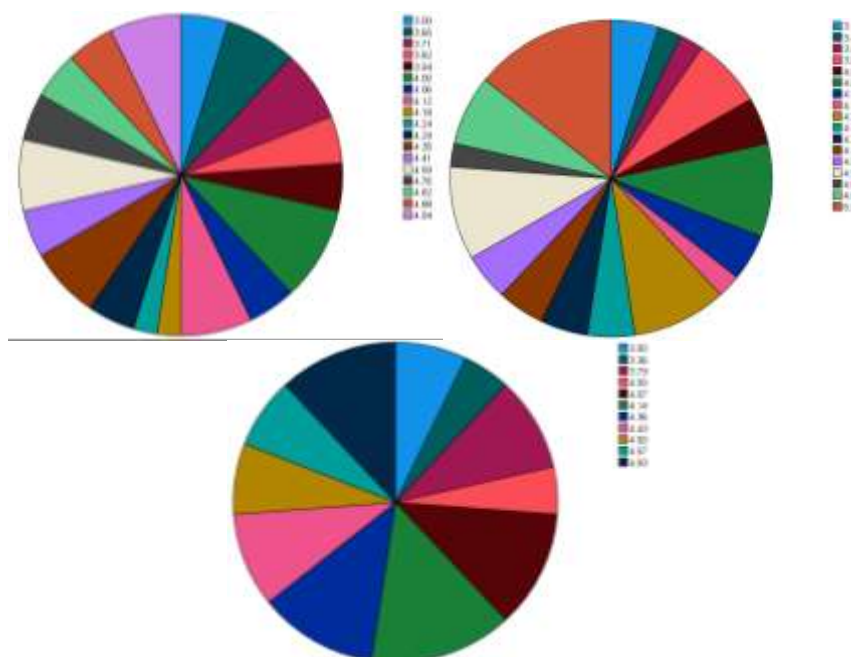


**Figure 11: Axes' statements frequencies**
**Source: The Author according to the outputs of the SPSS V27.**

According to the previous table:
- Axis1 respondents showed a general trend towards strong agreement, with an arithmetic mean of (4.2017), a standard deviation of (0.48874) and a variance of (0.2389), which is equivalent to an agreement rate of (77%).
- Axis2 respondents showed a general trend towards strong agreement, with an arithmetic mean of (4.3051), a standard deviation of (0.46304) and a variance of (0.2144), which is equivalent to an agreement rate of (79%).

➤ Axis3 respondents showed a general trend towards agreement, with an arithmetic mean of (4.1769), a standard deviation of (0.50018) and a variance of (0.2502), which is equivalent to an agreement rate of (75%).

From the previous results, the researcher concluded that there is general agreement among the sample members that:

1- Accounting practices by financial robots affect the foreign exchange markets.
2- Financial robots enhance the accuracy of consolidated financial reporting for multinational companies.
3- Financial robots contribute to reducing discrepancies in financial performance reports between international branches.
4- The use of financial robots in accounting practices enhances the transparency and compliance of companies with international standards considering exchange rate volatility.
5- Financial robots help improve the accuracy of forecasting cash flows in foreign currencies.

# V.    Findings and Discussion

## 5/1 Hypothesis Test

*H1:* The integration of financial robots into accounting practices improves overall accuracy in financial reporting and reconciliation processes.

The regression coefficient was used to determine if the integration of financial robots into accounting practices improves overall accuracy in financial reporting and reconciliation processes and the results were as follows:

**Table (5)**
**Results of regression analysis for H1**

| H | R | R Square | F | df | Sig. F Change |
|---|---|---|---|---|---|
| H1 | .841 | .707 | 96.55 | 41 | .000 |

Source: The Author according to the outputs of the SPSS V27

According to the previous table:

➤    There is a direct correlation between the intermediate variable (Accounting Practices) and the independent variable (Financial Robots), where the correlation coefficient reached (0.841) with significant levels less than (0.01), where it is clear that 70.1% of the change in the Accounting Practices is due to the use of financial Robots and the rest is due to other factors, which indicates the strength of the correlation between the variables of the first hypothesis, emphasizing their effectiveness and direct impact between each other and confirms the validity of the hypothesis.

**Table (6)**

**Coefficients**

| Model | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. |
|---|---|---|---|---|---|
| | B | Std. Error | Beta | | |
| (Constant) | .958 | .343 | | 2.793 | .008 |
| FR | .797 | .081 | .841 | 9.826 | .000 |

**Source: The Author according to the outputs of the SPSS V27**

The equation of the regression model in the previous table is shown as follows:
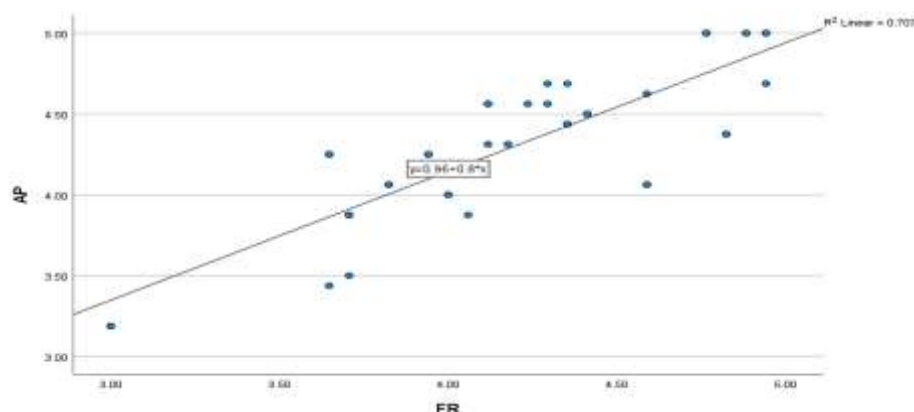
$$Y = 0.96 + 0.797X$$



**Figure 12: scatter of H1**
**Source: The Author according to the outputs of the SPSS V27**

According to the previous model, each change of (0.^) in the use of financial robots increases the accuracy of accounting practices by one unit.

- **Path analysis using AMOS program**

  *H2*: The integration of financial robots into accounting practices exacerbate and mitigate volatility in the foreign exchange market.

The researcher used the path analysis model in the AMOS program, where this analysis shows the effect of the intermediate variable, after being exposed to the effects of independent variables, on the dependent variable, which cannot be done by the tests used previously, where the variables were divided into:

- Observed, endogenous variables which include the intermediate and dependent variables (Accounting Practices (M), and Foreign Exchange Market Volatility (Y)).
- Observed, exogenous variables which include the independent variable of the model (Financial Robots (X)).

- Unobserved, exogenous variables: Scaling errors include dependent and intermediate variables.

**Table (7)**
**Regression Weights**

| | | | Estimate | S.E. | C.R. | P | Label |
|---|---|---|---|---|---|---|---|
| M | <--- | x1 | .797 | .080 | 9.948 | *** | |
| Y1 | <--- | x1 | .616 | .040 | 15.495 | *** | |
| Y1 | <--- | M | .367 | .042 | 8.749 | *** | |

Source: The Author according to the outputs of the SPSS V27

According to the previous table:

➤    There is a statistically significant substantial relationship between independent variable (Financial Robots) and the intermediate variable (Accounting Practices), estimated at a regression coefficient of (0.797) at a significant level less than (0.001), which is consistent with the result of the first test in the statistical analysis table for the first hypothesis, table ( ), which confirms the validity of the first hypothesis.

➤    There is a statistically significant substantial relationship between the intermediate variable (Accounting Practices) and the dependent variable (Foreign Exchange Market Volatility), with the presence of the independent variable (Financial Robots), estimated at a regression coefficient of (0.367) at a significant level less than (0.001), which confirms the validity of the Second hypothesis.
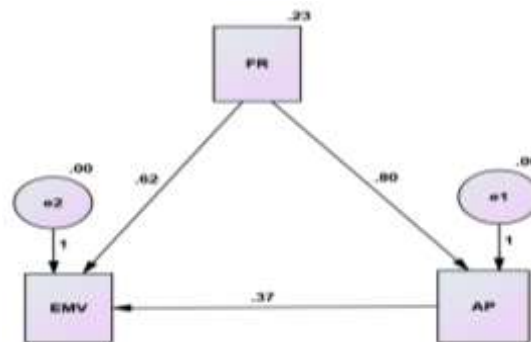


**Figure 13: Path analysis model for study variables**
**Source: The Author according to the outputs of the Amos V23.**

According to the previous figure, the relationship of the intermediate variable with the dependent variable is an interactive relationship, that is, the intermediate variable is a catalytic variable (Moderator).

**5/2 Discussion**

The researcher's study aimed to validate hypotheses related to the automation of accounting practices and financial strategies in the Forex markets. Here's an analysis of the key elements and findings of the study:

➢ **Research Design and Hypotheses**
- **Hypotheses Design**: The researcher carefully crafted the hypotheses to align with the study's goals. This meticulous design ensured that the arrangement of the axes and phrases supported the vision needed to reach meaningful results.

- **Hypotheses Testing**: The study's hypotheses were accepted, indicating that the research findings supported the initial assumptions. The theoretical framework provided a foundation for these hypotheses, suggesting that automation in accounting and finance offers significant benefits.

➢ **Theoretical Study Findings**
- **Efficiency and Risk Management**: The theoretical study highlighted that automating accounting practices and financial strategies in Forex markets can:

    o Enhance operational efficiency

    o Reduce human errors

    o Provide rapid responses to market changes

    o Improve risk management

    These points underscore the potential advantages of integrating financial robots and automation tools in financial operations.

➢ **Field Study Findings**
The field study aimed to verify the theoretical findings with real-world data. The results were consistent with the theoretical study, and the key outcomes were:
- **Improvement in Accounting Practices**: There is a statistically significant positive relationship between the use of financial robots and the enhancement of accounting practices. This implies that automation can streamline accounting processes, making them more efficient and accurate.

- **Impact on Foreign exchange Market Volatility**: There is a statistically significant positive relationship between the use of financial robots in accounting practices and Forex market volatility. This suggests that while automation improves efficiency, it also interacts with market dynamics, potentially influencing volatility.

➢ **Implications**

The study's findings have several implications:

- **For Practitioners**: Financial professionals and institutions may consider adopting automation tools to improve efficiency and accuracy in accounting practices.

- **For Researchers**: The study provides a basis for further research into the relationship between financial automation and market dynamics, particularly in the context of Forex markets.

- **For Policymakers**: Regulators might need to consider the impact of automation on market volatility and develop frameworks to manage these changes effectively.

## VI.    Conclusion and Future Reashers

The study successfully demonstrated that the automation of accounting practices and financial strategies in the Forex markets is beneficial, aligning theoretical expectations with empirical evidence. The positive relationships identified between financial robots and accounting improvements, as well as their impact on market volatility, highlight the transformative potential of automation in finance. By reducing human errors, increasing efficiency, and improving risk management, financial robots can significantly enhance the overall functioning of financial operations. Thanks to the speed and accuracy of financial robots' data analysis, companies can adapt more quickly to changes in exchange rates and make more effective financial decisions, this can reduce volatility caused by delayed or ill-considered reactions. Automated systems improve the transparency of financial and accounting processes by providing accurate and timely reports and this can reduce unfounded rumors and speculation, thus limiting volatility in the exchange markets. Finally, the use of financial robots in accounting practices can reduce volatility in foreign exchange markets by improving efficiency, transparency and accuracy in financial operations, as well as better management of financial risks.

The researcher recommends analyzing the cost-effectiveness of using financial robots in auditing and measuring the impact of using financial robotics on financial risk management in multinational companies

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