

**The Mediating Role of Neuromarketing in the Relationship
Between the Availability of Financial Technology and
Enhancing the Financial Inclusion Strategy in Egyptian
Banks: The National Bank of Egypt as A case Study.**

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Abstract:

The world witnessed a technological revolution that affected all sectors, and the financial sector was not far from that development, as this contributed to the production of a set of financial tools that led to the development of the banking industry. The reason for this is due to the wide spread of financial technology and the use of modern marketing concepts such as neuromarketing, in order Enhancing the financial inclusion strategy and integrating companies and individuals into the official umbrella of the national economy.

Within the framework of this, the aim of this research is to study the mediating role of neuromarketing in the relationship between the availability of f FinTech and the Enhancing of the financial inclusion strategy in the National Bank of Egypt and through application on a random sample of 400 customers at the level of 20 branches of the bank and The correct forms were estimated at 358 forms, with a response rate of approximately 89.5% of the total number .

based on the methodology of case studies in scientific research through application to the National Bank of Egypt as a case study and the researcher used structural equation Modelling to test the study hypotheses through Smart PLS software.

The researcher found a positive relationship between the availability of FinTech and Enhancing the financial inclusion strategy at a significant level of less than 5%, as well as a positive relationship between the availability of FinTech and enhancing the role of neuromarketing in marketing financial services at a significant level of less than 5%, as well as a positive relationship Between neuromarketing and enhancing the financial inclusion strategy at a significant level of less than 5%, neuromarketing also plays a mediating role in the relationship between the availability of FinTech and enhancing the financial inclusion strategy at the National Bank of Egypt.

The researcher recommended the necessity of paying attention to financial technology and providing a financial environment that helps to enhance the financial inclusion strategy of the bank under study, by adopting the concept of neuromarketing to enhance this strategy.

The researcher also recommends conducting future research in other sectors or in the same sector using different intermediate variables between financial technology and the strategy of promoting financial inclusion, such as banking

awareness and business modelling, because this topic still needs more research.

Keywords: Financial Technology, FinTech, Neuromarketing, Financial Inclusion.

1. Introduction : The world witnessed a technological revolution that affected all sectors and the financial sector was not far from that development and this contributed to the production of a group of financial tools that led to the development of the banking industry and the reason for this is the wide spread of technology at the global level that technology has become an essential part of human life, and this The matter prompted banks to take advantage of this feature and employ financial innovations to provide advanced banking services to their customers, hence the emergence of the term financial technology or FinTech and also the term Neuromarketing played a vital role in stimulating and improving sales as well as supporting and strengthening the financial inclusion strategy in Financial and non-financial institutions.

2. Theoretical Background and Literature Review: In the following, the researcher discusses the theoretical background of the research within the framework of Literature Review as follows:

First Axis: The Availability of Financial Technology (FT)

1 -The availability of financial technology Concept (FinTech)

It is any technological innovation that is employed in financial services with the aim of influencing financial markets

and institutions and providing financial services. FinTech is a natural product of the intersection of financial operations with the uses of modern technology (Anyfantaki, S, 2016, P52)

And it is any innovative ideas aimed at improving the operations of the financial services department by proposing technical solutions according to different business situations, and innovative ideas may also lead to new business models.

Also, they are all companies that develop innovative financial services and products by relying on the extensive use of information technology, and among those services are electronic payment and electronic wallets, money transfers, insurance, borrowing and financing, investment services and trading platform (Bansal, S., 2014, P132).

Hence, the researcher believes that FinTech is any financial innovation that can result in new business models, applications, processes, or products.

2 -The most important factors that helped in the transition to FinTech (Barajas, A., Beck, T., Belhaj, M., & Ben Naceur, S. 2020, P 113).

- **The communications and information revolution** that led to fundamental changes in the nature of the financial sector's work.
- **The rapid pace of smart phone and Internet use**, in addition to the huge availability of data and information.

- Electronic commerce, which has become characterized by many characteristics that distinguish it from traditional commerce.
- The increasing entry of many non-banking financial institutions, such as insurance companies and finance companies, and their competition with banks, until many of these institutions provide a group of financial services closely related to the work of banks.
- Increased customer acceptance of Technologically enabled financial services because of the positive impact of modern banking operations.

3 -The importance of FinTech: Here are some of the factors that have contributed to the importance of FinTech: (Blazheska, B., Ristovska, N., & Gramatnikovski, S. 2020, P65).

- **Financial technology applications** have already helped millions of customers achieve financial integration, because of easy access to financial services
- **Promoting the Growth of the Gross Domestic Product (GDP):** FinTech enhances the growth of the gross domestic product through the ease of access of members of society to a wide variety of financial products and services and credit facilities, whether individuals or companies. (Bi, B. Q., Dean, L., Guo, T., & Sun, X. 2020, P13).
- **Enhancing opportunities for compliance with international laws and cooperation between banks:** This

includes supporting operations to combat terrorist financing and money laundering, as well as increasing and facilitating cooperation between banks in the field of compliance with international banking laws.

- **Reducing the costs and time required for banking operations**, which are the preparations required for various banking operations, because of automating several banking operations and dispensing with human intervention as much as possible in those operations, as financial technology enables banks to provide banking services that are low costs, convenient, safe, and easy to access for customers, compared to traditional financial transactions.

4 -The five main pillars of FinTech: FinTech has a set of main pillars that must be available in any country for the desired goals to be achieved, these pillars are:(Chaffey, D., Ellis-Chadwick, F., Mayer, R., Johnston, K. 2006, P23).

- Availability of the demand for advanced financial services (individuals and companies).
- Ease of access for FinTech companies, especially emerging ones, to financing.
- Availability of technical cadres with the possibility of attracting the best of those cadres.
- Appropriate regulatory environment of regulations and laws.

- Appropriate infrastructure with the availability of business incubators.
- the most important forms of FinTech uses in banks.

5- The most important uses of FinTech in banks (Daj, A., & Chirca, A. 2009, P11)

- Providing banking services via the Internet.
- Payment services through the electronic phone wallet.
- Payment services using bank cards.
- Virtual currencies.

6 -General risks of FinTech for banks: Below are some general risks of FinTech:

-Information security risks: Relying on modern technologies may lead to an increase in the interdependence of commercial banks' business with a number of entities that are not subject to electronic security protection on their data, such as those available in banks, and thus the chances of sensitive data of bank customers being exposed to potential violations increase, and this confirms the need for banks and FinTech companies to strengthen The need for effective management and control of potential cyber risks.(Bouzana, A., & Hamdouche, W. 2020 , P71).

-Risks of outsourcing: Banks' information technology systems may not be sufficiently adaptable to advanced FinTech, so banks resort to using a greater number of external companies, and this increased use may lead to increased risks surrounding data

security and privacy, and the main challenge for banks lies in their ability to monitor operations and risk management activities that are carried out outside its institutions with third parties.(Damodaran, A. 2013 , P146).

From the foregoing, FinTech was an inevitable result of the information revolution, and several factors helped in the rapid spread of this type of advanced financial services, and with the support of these factors, the increasing acceptance of customers for these services. The type of services provided within each stage, and there is a set of pillars that must be available in order for the optimal utilization of financial services to be possible, the most important of which is the availability of the demand side for those services, bearing in mind that the technologically possible uses of financial services are not without a number of risks, the most important of which are information security risks and outsourcing risks **Therefore, banks must take the necessary measures to reduce these risks, in coordination with FinTech companies.**

After reviewing the literature on the availability of FinTech it becomes clear that it consists of the following basic dimensions:

- Demand-side availability for individuals and companies.
- Availability of FinTech companies.
- Availability of technical personnel.

- Availability of infrastructure.
- Availability of electronic payment and collection services for the financial services provided.

The Second Axis: Neuromarketing (NM)

1- The concept of Neuromarketing: The science of neuromarketing is a modern science that is considered the latest marketing method to control the consumer's brain and to know not only what the buyer thinks or feels, but also to know what he intends to do or what he wants.

One of the types of marketing that relies on measuring the response of the human brain to advertisements and advertising and promotional campaigns for a specific product, with the aim of identifying marketing stimuli that affect consumer behavior and preferences and working to modify promotional messages to obtain the best performance.

Also known as "consumer neuroscience", it is the application of neuroscience and the cognitive sciences of marketing to analyze customer responses towards purchasing products and discover their needs, motivations, preferences and what motivates them to make a purchase. (Surya Narayanan, 2020, P 13)

This science specializes in studying the brain's response to advertisements and brands using magnetic resonance imaging techniques. It is also known as a method of modern marketing that seeks to control the mind of the consumer and to know not only what he thinks or feels, but also to know what this consumer intends.

Neuromarketing studies the customer's reactions, brain response, and neural signals in them when he sees a product or service while watching or reading an advertisement or even when shopping. It is a relatively new marketing system that complements traditional research with information that cannot be obtained through other old technologies.

Marketers display advertisements or product design to customers, track their reactions and brain activity, and after receiving responses and measuring changes, companies can use them to improve their brands and choose the best ways to reach customers. (Bhandari, A.2020, P159)

2-Who makes the buying decision? Mind or emotion? In the book Buyology, author Martin Lindstrom who specializes in marketing and advertising sciences describes how your mind subconsciously interacts with the product advertising and product marketing. Our rationality is only 10%. And our preference for a certain brand of drink or electronic device or others depending on its characteristics and technical features is usually false. (Priyanka Singh,2015, P63)

Lindstrom mentions some of the ways brands use to entice you to buy the product and apply neuromarketing in advertising, namely.

1 -Tradition: A person tends to imitate the people around him as this is human nature and that is why companies resort

to using celebrities and influencers in their advertisements, as if they are telling you: Do you want to become like them?

2 -Subliminal messages: by applying neuromarketing, brands focus on the five senses of the customer. Some brands use music and smells in the place to influence the reaction of customers. (Agarwal, S. 2015, P302)

3 -Fear:“ Buy these slimming pills now so that you do not gain weight and become obese”, “You will suffer from symptoms of illness if you do not buy this medicine”, marketers direct these messages to customers prompting them to buy for fear of feeling less happy, less healthy, or less free. (Steven D. Shaw, Richard P. Bagozzi, 2017, P98)

4 -Loyalty and belonging: being human and belonging to groups is an important aspect of life and ensuring our survival as a species, including trademark groups. Marketers address you in the name of your group and direct their messages to you as a representative of the group and not an individual which is like your religious affiliation and belief. (Hebatallah. A & Bassam. S, 2022, P48)

3-The contribution of Neuromarketing to financial inclusion

- **The contribution of neuromarketing to designing the effective advertising message for financial services:** Neurological research relies on several scientific applications that measure specific activities of the body.

Humans, nerve cells under the skin, sweat, reading eye movement “face coding”. (Gray, M., Kemp, A.H., Silberstein, R.B., Nathan, P.J. 2003, P13).

Biometric measurements, heartbeats, all these processes express, with a high degree of accuracy an understanding of human behavior towards the stimuli to which they are exposed. This understanding is in the field of marketing. (Ariely, D., & Berns, G. 2010, P124)

Advertising and advertising would define marketers and advertisers in the shortest way to direct the consumer to complete a purchase.

Companies working in this field, during their research, use cameras to track eye movement and facial expressions moment by moment, headphones and sensory cells to measure brain activities that express.

In turn, about human feelings with the aim of determining the nature of response to advertisements and various forms of advertising. (Cerci, H., & Koyluoglu, A. 2020, P63)

- **The contribution of neuromarketing activities in reducing the costs of promoting the financial services provided:** in many cases, the issue of the high costs of promoting financial services has been raised, but the possibility of reducing these costs for financial institutions still exists. (Eben Harrell, 2019, P14)

In this regard, we refer to the contribution of neuromarketing through some major international methods. (Institutions do before

marketing their products, as they study advertisements and present them to a group of customers and the impact of that on their decisions to obtain financial services offered by banks and study the feasibility of these advertisements and measure the return and the cost behind it compared to traditional marketing methods. One of the most important factors that contribute to reducing the promotion of financial activities and services is also the design of the smart website that considers the psychological factors of consumers. (Butler, M.J.R. 2008, P12)

- **The contribution of neuromarketing to strengthening the relationship between the customer and the brand or financial service:** Neuromarketing would support the real benefits of a financial service, such as safety and performance requirements. to push banks to work hard on developing their products instead of just flooding the market from time to time with useless services, whether for banks or customers. (Fugate, D.L. 2007, P 15.
- **The contribution of neuromarketing in influencing customer decision:** There are several stages to the neural buying decision process for financial services and these stages fall into four levels :(Manu Melwin Joy,2018, P52)
 - The issuance of several signals from the brain regarding the service that has been identified for the customer.

-Some services, as a result of the signals sent, will move the centers of excitement and enthusiasm But it is not enough to make a purchase decision.

-Some of the other services are moving to the stage of deliberation and will receive attention from brain.

The final decision, after moving from the stage of deliberation to the stage of complete conviction of a need the customer of the financial service provided, by observing the increase in brain activity and urgency to obtain the service.

- **The contribution of neuromarketing to creating value and increasing the market share of the financial institution:** The financial institution can create a two-dimensional value, a special dimension for its customers, by designing and offering financial services that anticipate the aspirations of customers, as the financial institution can adapt neuromarketing to redesign its financial products to suit the needs and desires of the customer. (Harit Kumar, Priyanka Singh, 2015, P52)

And to come up with new innovative and advanced designs, which enhances the growth opportunities of these institutions in the field in the medium and long term, some market sectors prefer financial products with High quality which reflects the greatest perceived value.

On the other hand, financial institutions can benefit from the advantages of neuromarketing Increasing its market share by avoiding designing financial products that are not accepted in the

market and do not help to gain new market segments and focus on financial products that add value to the institution and the customer together. (Andrejevic, M. 2012, P215).

Then the researcher believes that neuromarketing is a scientific field that measures physiological and neurological signals to understand the consumer's motives and preferences and to know the brain's reaction to a specific product, service, or marketing message using modern technology in marketing, and then helps neuromarketing to understand consumer behavior after carrying out marketing and promotional activities.

After reviewing the literature on the axis of neuromarketing, it is represented in the following basic dimensions:

- Behavioural and psychological design of financial service.
- The smart website.
- Designing advertising and marketing stimuli to address all minds.
- Consumer awareness of the financial services provided.

The Third Axis: Financial Inclusion (FI)

1- Definition of Financial Inclusion: There are many definitions of financial inclusion. While the Group of Twenty (G20) and the Global Alliance know it The Alliance for Financial Inclusion defines it as “the access of all segments of society, both the hard and the affluent, to me Financial services and products that suit their needs in a global and transparent manner and at reasonable

costs”. In his report Issued in 2014 under the title “Global Financial Development Report.”

The World Bank defined it as “the proportion of people or firms that use financial services As for the Council of Governors of Central Banks and Arab Monetary Institutions, they defined financial inclusion as “availability”. (Tan, J. D., Purba, J. T., & Widjaya, A. E. 2018, P18)

All financial services and their use by the various segments of society, its institutions, and individuals, especially the marginalized ones, through official channels, including bank savings accounts, payment and transfer services, and insurance and financing and credit, and creating more appropriate financial services at competitive prices.

Others see it as “a financial inclusion process to ensure access to appropriate financial products and services for vulnerable groups in the community, especially low-income ones, at a reasonable cost and in a transparent and fair manner, by influential institutions in the market.

The Central Bank and Banking System Law No. 194 of 2020 did not deviate from this context, as defined by the paragraph The last of Article 1 defines it as “making various financial services available for use by all segments of society through the official channels are of appropriate quality and cost while protecting the rights of the beneficiaries of those services so that they can manage their money properly.(Tapanainen, T. (2020, P65)

Based on this, we can define “financial inclusion” as: access to formal financial services Formal Financial Services and their use by unbanked individuals and organizations before. (Abdullah S., Hen H., Gabarin A., and Hettawai M., 2016, P63)

Financial inclusion usually begins with obtaining a deposit or transaction account at a bank or financial institution other, or through a mobile money service provider, where the latter is allowed to be used in the domain Financial services have the potential to bypass traditional Brick and Mortar models and make huge profits Under the umbrella of financial inclusion, especially the emergence of platform-based lending models, even in countries developed, as a result of the reduction in lending to SMEs by commercial banks in the aftermath of the crisis Global Finance.(Rainer, A., Beck R., & Smits, M. 2018, P56).

2- Dimensions and indicators of financial inclusion: The dimensions of financial inclusion usually vary according to the perspective adopted by each study, to learn how to provide financial inclusion Banking services of various types for customers in all types of banks. (Kim, M., Zoo, H., Lee, H., & Kang, J. 2018, P64)

According to the methodology of the World Bank, the dimensions of financial inclusion are (the use of bank accounts, savings, lending, payments, and insurance) and in another study by the World Bank presented under the title “Indicator Database Global

Financial Inclusion to measure the level of financial inclusion and the ability of financial technology. (Roy, S. 2015, P56)

Financial inclusion is represented in (account ownership, non-dealers, payment, account use, savings, and credit).

financial flexibility, and opportunities to expand financial inclusion through digital technology While the Financial Inclusion Alliance, after discussing the dimensions of financial inclusion during the CAPS conference held in Malaysia in 2012, the work of the Financial Inclusion Data Action Association, where the coalition concluded that financial inclusion has three dimensions main is;(Villarreal, F.2017, P14)

- Access to the financial service: Availability of financial services may be limited due to access issues. For example, when branches are not available Providers of bank services in rural or remote areas, as there is no access to these services, or whenever there are regulatory regulations. (Ozili, P. K. 2020, P89)

The requirements for obtaining the service, which may not be met by certain groups of the population, and perhaps in many cases in more established markets, services may be more accessible but access to them may be hampered by some complex terminology and vehicle, as well as limited transparency and poor usability.

- **Use of financial services;** This dimension refers to the extent to which customers use financial services provided by

banking sector institutions. (Abosedra, S., Shahbaz, M. and Nawaz, K., 2016, P955)

During a certain period, the frequency of this use, and all the importance of collecting data about its Users who are individuals or companies (small or medium) of bank accounts or who have credit or credit accounts deposits, made payment transactions over the phone, or received local or international money transfers.... etc. (Zins, A., & Weill, L.2016, P45).

- **Competitive advantages in terms of time, quality, cost, and flexibility of the financial services provided;** One of the biggest challenges facing all countries, especially developing ones, is related to the quality of financial services.

This requires these countries to constantly seek to measure, compare and take measures based on clear evidence Concerning the efficiency and quality of the banking service provided. There are a lot of factors that can affect the quality and the quality The service is its cost, consumer culture and awareness, the effectiveness of the compensation mechanism, and the transparency of competition in the market, as well as other factors Others are intangible, such as consumer confidence.

3- Challenges and obstacles to achieving financial inclusion:

Perhaps the most important obstacles or challenges facing the ability of financial inclusion to spread are the following:(Kumar, N., Sharma, S., & Vyas, M. 2019, P65)

- **Twice the banking density index**, and this indicator is usually measured by the number of branches or units per ten thousand souls of the population.
- **Weak awareness and culture of banking**, which is linked in many cases to the existence of high rates of unemployment and, consequently, the low incomes of many members of society. (Camara, N., and Tuesta, D., 2017, P 65)
- **The high size of the informal economy**, given that it is a hidden economy it is usually sought He always wants to work in the shadows and invisibility, and he does not like - of course - dealing with banks or official agencies.
- **The limited achievement of financial inclusion for women**, as the global index of financial inclusion 2017 indicates, it indicates that only 65% of women own bank accounts compared to 72% of men, and that 56% of the total adults who do not women have bank accounts.
- **High rates of poverty and disease**, despite the international efforts made by the World Bank to confront the problem of extreme poverty.
- **High costs of providing services and increased associated risks**, Usually the financial intermediary Fixed costs are incurred with each transaction and for each customer, which means costs decrease with increasing number or volume transactions. (Demirguc-Kunt, A. & Klapper, L. 2012, P65)

4- The role of financial technology in Enhancing the neuromarketing for financial services: The different models of the impact of technology in neuromarketing are related to the following main themes:(Siddiqui, T. A., & Siddiqui, K. I. 2020, P52)

1 -Ad design ; One of the most beneficial aspects of introducing technology to neuromarketing is the design of advertisements for the financial services provided, where the advertisement is designed on a psychological basis so that it addresses the mind and feelings of the potential customer of the financial service, taking into account anticipating the aspirations of customers, through the use of technology, designing neurological advertisements such as Google search ads. , remarketing ads on Facebook and other social media platforms, mobile app ads, etc.

2 -The smart website to manage the content of the advertising message about financial services

Marketers produce content to sell their products which is why an effective digital asset management system is key to extracting value from branded content.

Technology and search engines have provided the rules and conditions for search engine optimization so that the content is at the forefront and effective and works on the nerves of customers.

3 -Using financial technology in designing advertising and marketing incentives that appeal to all minds.

4 -Educating the consumer about the financial services provided, and managing customer relations

Implementing an effective CRM system is an important aspect of marketing efficiency by enabling customer retention.

5-The role of Fintech in Enhancing the Financial Inclusion Strategy:

Advanced technology helps the financial system to function well, spreading opportunity, fighting poverty, and allowing people to build their professional activities more easily by:(Kovalchuk, Y. 2020, P65)

1 -Technology is helping to realize the vision of creating tailored financial products and services for vulnerable consumers. And while digital technology is not an end in and of itself, it is a means to achieve broad-based financial inclusion and to ultimately achieve the United Nations' Sustainable Development Goals (SDGs).

Internationally Financial Inclusion is high on the agenda, as it is a strong enabler for the Sustainable Development Goals.

2 -Less time and risk in transacting money, i.e., instead of having to physically exchange cash (sometimes require hours of travel), a bank payment can be executed in a matter of seconds (in developing countries often via mobile payments). One study showed that in developing countries receiving social benefits through cell phones saved recipients an average of 20 hours in commuting and wait time.

3 -Allows to finance activities, i.e., use debt for investing in a business to leverage future profits.

4- Allows to save money for the future (i.e., plan for long-term goals), which protects from the risks of daily life (unexpected emergencies such as medical emergencies, death in the family, theft, or natural disasters) and allows to build a working capital.

5- Technology helps achieve and spread financial inclusion by facilitating the following services:

- **Payments:** The use of digital payments, meaning access through a cell phone or the internet, is on the rise, newly connecting 11 percent of the world's population between 2014 and 2017 to reach 52 percent of adults. The electronic mobile wallet, an application that enables person-to-person, person-to-merchant, and bill payment transactions, is a good example of an innovative product utilizing digital payments. Electronic wallets allow remittances and bill payments to be conducted in a matter of minutes vs. hours or even days, saving low-income segments valuable time and money. (Ghosh, J. (2013, P96)

- **Savings:** Financial institutions have been increasing financial service accessibility in rural areas. In emerging markets, for example, they are using agent networks to reach underserved rural populations. These systems—wherein financial institutions designate authority and responsibility to

third parties to offer services to typically low income or remote customers-have increased customer trust, financial capability, and use of products. They have also lowered the costs associated with providing services to these underserved segments of the market and reduced the costs to savers who make smaller deposits. The use of technology by agents and tailoring savings products to the needs of savings groups and low-income segments will further ensure the underserved are being incorporated into the formal economy. (Rajan, R. and Zingales, L. 2003, P89).

- **Credit:** Financial institutions are using social media data, mobile call data records, bill payment patterns, and psychometric testing to establish credit profiles and target previously invisible consumers. Advanced analytical techniques enable financial institutions to provide access to credit to clients with historically low financial transaction data, who are otherwise excluded from the formal financial sector .(Manyika, J., Lund, S., Singer, M., White, O., & Berry, C. 2016, P96).

- **Insurance:** Machine learning is transforming insurance, analytical tools are re-defining traditional risk models, and identity and onboarding solutions are creating a more convenient on-demand service while decreasing costs for insurance firms. Safeguarding the underserved against financial risk can help people at the base of the economic

pyramid manage the stresses of illness, crop failures, natural disasters, or income loss due to the death of a wage earner. (Rusu V. 2019, P65).

After reviewing the literature on the axis of Enhancing the financial inclusion strategy, it becomes clear that it consists of the following basic dimensions:

- Ease of access to the financial services provided.
- Use of financial services.
- Sustainability of financial services provided (quality, cost, flexibility, and time).
- Intelligent management of financial risks.

3. Research Gap

The research gap is represented by the severe lack of Arab and foreign studies and research that dealt with the mediating role of neuromarketing in the relationship between the availability of FinTech and enhancing the financial inclusion strategy (within the researcher's knowledge). Then the researcher seeks to contribute to covering this gap theoretically and practically through A case study on the National Bank of Egypt.

4. Research Questions: The research questions can be formulated in the following questions:

- 1-What is the role of FinTech availability in enhancing the financial inclusion strategy for financial services in the National Bank of Egypt?

2- What is the role of FinTech availability in enhancing the role of neuromarketing for financial services in the National Bank of Egypt?

3-What is the role of neuromarketing in enhancing the financial inclusion strategy for financial services at the National Bank of Egypt?

4-What is the mediating role of neuromarketing in the relationship between the availability of FinTech and enhancing the financial inclusion strategy in the National Bank of Egypt?

5. Research Objectives: Considering the research title and method, the research objectives can be formulated in the following objectives:

1- Recognizing the role of FinTech availability in enhancing the financial inclusion strategy for financial services at the National Bank of Egypt.

2- Recognizing the role of FinTech availability in enhancing the role of neuromarketing for financial services in the National Bank of Egypt.

3-Recognizing the role of neuromarketing in enhancing the financial inclusion strategy for financial services at the National Bank of Egypt.

4- Recognizing the mediating role of neuromarketing in the relationship between the availability of FinTech and

enhancing the financial inclusion strategy in the National Bank of Egypt.

6. The importance of the research: The research derives its scientific and applied importance as follows:

-**Scientific importance:** Due to the scarcity of Arabic studies - within the limits of the researcher's knowledge - it focused on studying and researching the mediating role of neuromarketing in the relationship between financial technology and promoting financial inclusion strategy, despite the importance of the concepts in light of the increasing competitiveness in the business environment.

- **Applied importance:** The research seeks at the applied level to identify the mediating role of neuromarketing in the relationship between the availability of financial technology and the promotion of financial inclusion strategy in Egyptian banks through a case study on the National Bank of Egypt and then providing those in charge of managing this bank with data and information that show The role played by neuromarketing in the relationship between the availability of financial technology and the promotion of financial inclusion strategy. In a way that achieves a direct benefit for the bank in question, and for the banking system in general. Hence, this study helps to increase the awareness of those in charge of managing banks of the importance of neuromarketing and its role in financial inclusion by adopting modern concepts and

applications of financial technology and providing recommendations that enable commercial banks in general and the bank under study to enhance their competitiveness.

7. Research variables: After reviewing the literature, the research variables are:

1- independent variable: "Availability of Fintech (FT) "

- Availability of the demand side for individuals and companies. (FT1, FT2)
- Availability of FinTech companies. (FT3, FT4)
- Availability of technical personnel. (FT5, FT6)
- Availability of infrastructure. (FT7, FT8)
- Availability of electronic payment and collection for financial services provided. (FT9, FT10)

2- Intermediate variable: "Neuromarketing (NM)"

- Behavioral and psychological design of financial service. (NM1, NM2)
- The smart website. (NM3, NM4)
- Designing advertising and marketing stimuli to address all minds. (NM5, NM6)
- Consumer awareness of the financial services provided. (NM7, NM8)

3- dependent variable: "Enhancing the financial inclusion strategy (FI)"

- Ease of access to the financial services provided. (FI1, FI2)
- Use of financial services (FI3, FI4)

- Sustainability of financial services provided (quality, cost, flexibility, and time). (FI5, FI6)
- Intelligent management of financial risks. (FI7, FI8)

8. Research Model: The model explains the research variables and includes neuromarketing as a mediating variable in the relationship between the availability of financial technology and the promotion of the financial inclusion strategy in Egyptian banks through a case study on the National Bank of Egypt, as shown in Figure.(¹)

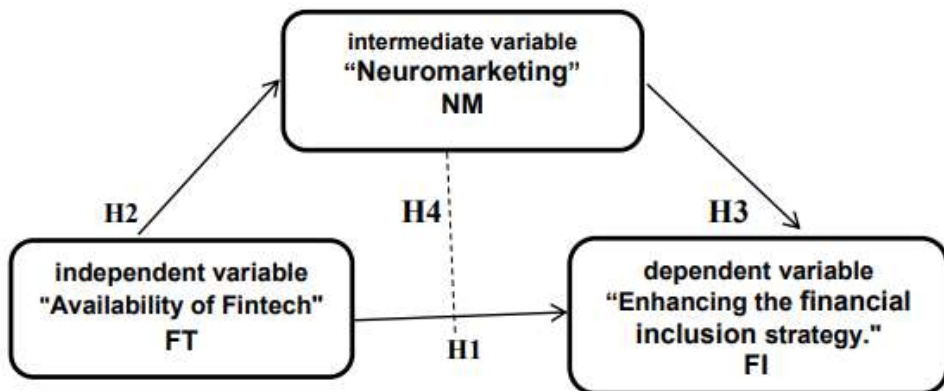


Figure 1: Research Model.

9. Research Hypotheses: Depending on the study model, and based on its objectives, the Research seeks to test the validity of the following hypotheses:

H1: Availability of Fintech has a positive effect on Enhancing the **financial inclusion** strategy in the National Bank of Egypt.

H2: Availability of Fintech has a positive effect on **Neuromarketing** in the National Bank of Egypt.

H3: Neuromarketing has a positive effect on Enhancing the **financial inclusion** strategy in the National Bank of Egypt.

H4: Neuromarketing has a mediating effect on the relationship between Availability of Fintech and Enhancing the **financial inclusion** strategy in the National Bank of Egypt.

10. Method and design: In this research the researcher relied on the method of case studies in scientific research using quantitative and qualitative analysis. More specifically the researcher used structural equation Modelling to test the study hypotheses through Smart PLS software through application to the National Bank of Egypt as a case study, and the data required for research and its sources were as follows:

A - **Secondary data:** It was obtained by looking at previous studies related to the study variables (neural marketing, FinTech, financial inclusion strategy), which enables the researcher to prepare the theoretical framework for the study and consolidate the concepts related to the research variables.

B- **Primary data:** Based on the survey lists addressed to the clients of the National Bank of Egypt, which enables testing

the validity or falsity of the research hypotheses and then reaching the results and recommendations.

11. Research population and sample: The Egyptian banking system includes 38 banks, among government and private banks, and branches of foreign banks, with a total number of employees amounting to 130,385 employees.

The National Bank of Egypt acquires 12% of the volume of employment in the banking system, and it also acquires a market share estimated at 33% of the size of the banking market in Egypt.

Then the Research population consists of 17.8 million customers of the National Bank of Egypt. The researcher selected a random sample of 20 of the bank's branches and distributed 400 survey forms to the bank's customers. The correct forms were estimated at 358 forms, with a response rate of approximately 89.5% of the total number. For the distributed forms, which is a representative and acceptable percentage.

12. Measurements: The questionnaire was developed and divided into four sections .The first section includes the respondents' demographic data . The second section included questions related to FT and was measured through 10 questions . Then, the third section consists of 8 questions to measure NM . The fourth section includes questions related to measuring FI, which was measured through 8 questions .

Moreover, the five-point Likert scale was used to classify the answers of the Research sample members (strongly agree, agree, neutral, disagree, and strongly disagree).

13. Research limits: The research limits are as follows:

1 -Objective limits, as the study is limited to examining the mediating role of neuromarketing between Availability of FinTech and the promotion of financial inclusion strategy.

2 -Applied limits, the study is limited to the National Bank of Egypt by the case study method in scientific research.

3- Time limits: The field study data was collected during the period from March to May 2023.

14. Statistical Analysis of the Data

A) Demographic characteristics of the Research sample:

Table (1) Demographic characteristics of the Research sample

Variables	Category	Freq uency	Percentage (%)
Gender	Male	189	53%
	Female	169	47%
	Total	358	100%
Age	30 year or less	79	22%
	31–40	163	46%
	41–50	88	25%
	Over 50 years old	28	7%
	Total	358	100%

Education Level	Diploma or less	68	19%
	Bachelor	227	63%
	Master	56	16%
	PHD	7	2%
	Total	358	100%
Experience	5 years or less	68	19%
	6–10	156	44%
	11–15	108	30%
	15 years and above	26	7%
	Total	358	100%
Position	Manager	44	12%
	Head of the Department	182	51%
	Teller	109	31%
	Customers Service	23	6%
	Total	358	100%

Source: Statistical analysis results.

B) Validity and Reliability: to verify the tool's validity, the questionnaire was presented to a group of arbitrators specialized in the field of the current study to obtain observations and suggestions and to come up with the questionnaire in its final form.

the researcher used Structural Equations Modelling–Least Squares Technology through Smart PLS software to analyze the data and verify its validity.

Table (2) shows the results of the validity and reliability analysis of the questionnaire list statements:

Table (2) Factor loadings, validity, and reliability of the questionnaire

Variables	Indicators	Convergent Validity		Internal Consistency reliability		Discriminant validity HTMT Confidence Interval doesn't include 1
		Loadings > 0.70	Average Variance Extracted > 0.50	Cronbach's Alpha	Composite Reliability	
Availability of Financial Technology (Fintech) (FT)	FT1	0.709	0.588	0.922	0.934	Yes
	FT2	0.725				
	FT3	0.806				
	FT4	0.794				
	FT5	0.800				
	FT6	0.771				
	FT7	0.737				
	FT8	0.732				
	FT9	0.816				
	FT10	0.773				
Neuromarketing (NM)	NM1	0.716	0.585	0.914	0.927	Yes
	NM2	0.753				
	NM3	0.819				
	NM4	0.754				
	NM5	0.755				
	NM6	0.821				
	NM7	0.728				
	NM8	0.769				
Financial Inclusion (FI)	FI1	0.779	0.687	0.936	0.946	Yes
	FI2	0.874				
	FI3	0.815				
	FI4	0.805				
	FI5	0.874				
	FI6	0.785				
	FI7	0.817				
	FI8	0.874				

Source: Smart PLS Output.

It is evident from the outputs of Smart PLS the validity and reliability of the search variables. Thus, the questionnaire is considered valid to achieve the Research's objective.

C) Descriptive Analysis:**Table (3) Descriptive Statistics**

Variable	Mean	Standard Deviations	Level
FinTech (FT)	2.473	0.957	Moderate
Neuromarketing (NM)	2.490	0.936	Moderate
Financial Inclusion (FI)	2.450	0.907	Moderate

Source: Statistical analysis results.

Table (3) shows the values of the arithmetic means and standard deviation of the study variables, where the results indicate a moderation in all Research variables. Thus, participants indicate that the National Bank of Egypt has a moderate level of fintech, NM, and FI.

D) Hypothesis Testing:

The following tables show the results of the analysis of the Research's hypotheses.

H1: Availability of Fintech has a positive effect on Enhancing the financial inclusion strategy in the National Bank of Egypt.

Table (4) Results of the first hypothesis test (FT → FI)

H	Variables	R2	R2 Adjusted	B	SD	t -test	Sig	Decision
H1	FT → FI	0.715	0.714	0.848	0.018	45.891	0.000	Accepted

Source: Statistical analysis results.

FinTech has a significant and positive impact on FI with an interpretation level of 71.4%. The t-test value was 45,891 with a

significance level of 0.000 less than 0.05, therefore **the first Research's hypothesis is accepted.**

Thus, there is a positive role for the availability of financial technology in enhancing the financial inclusion strategy in the National Bank of Egypt.

H2: Availability of Fintech has a positive effect on Neuromarketing in the National Bank of Egypt.

Table (5) Results of the second hypothesis test (FT → NM)

H	Variables	R2	R2 Adjusted	B	SD	t -test	Sig	Decision
H2	FT → NM	0.896	0.896	0.948	0.007	128.49	0.000	Accepted

Source: Statistical analysis results.

FinTech also has a significant and positive impact on NM, with an interpretation level of 89.6%. This result is reinforced by the t-test value of 128.49 with a significance level of 0.000 less than 0.05 **Therefore, the second Research hypothesis is accepted.**

Thus, there is a positive role for the availability of Fintech in enhancing the role of neuromarketing for financial services in the National Bank of Egypt.

H3: Neuromarketing has a positive effect on Enhancing the financial inclusion strategy in the National Bank of Egypt.

Table (6) Results of the third hypothesis test (NM → FI)

H	Variables	R2	R2 Adjusted	B	SD	t -test	Sig	Decision
H3	NM → FI	0.913	0.913	0.957	0.003	273.49	0.000	Accepted

Source: Statistical analysis results.

The results also show a significant and positive impact of NM on FI, with an explanation rate of 91.3% and a t-test value of 273.49 with a significance level of 0.000 less than 0.05. Therefore, the third Research **hypothesis is accepted.**

Thus, there is a positive role for neuromarketing in enhancing the financial inclusion strategy in the National Bank of Egypt.

H4: Neuromarketing has a mediating effect on the relationship between Availability of Fintech and Enhancing the financial inclusion strategy in the National Bank of Egypt.

Table (7) Results of the third hypothesis test (FT → NM → FI)

H	Variables	R2	R2 Adjusted	B	SD	t -test	Sig	Decision
H4	FT → NM → FI	0.879	0.878	1.250	0.060	20.90	0.000	Accepted

Source: Statistical analysis results.

To test the hypothesis of the fourth Research, the results of analyzing the mediating effect of NM on the relationship between FinTech and FI results are evident in Table (7) and Table (8) shows that the strength of the interpretation of fintech on FI was 87.8% with the presence of the mediating variable NM an increase of 16.4% over the direct effect of the first hypothesis with a significance level of 0.000 less than 0.05.

Table (8) Mediation analysis (FT → NM → FI)

	Path a	Path b	Indirect effect	S. E	Bootstrapped Confidence Interval			Decision
					t-value	95% LL	95%UL	
H4	0.937	1.329	1.246	0.060	20.76	1.128	1.364	Mediation

Source: Statistical analysis results.

Hence, the fourth hypothesis is accepted, Neuromarketing has a mediating effect on the relationship

between Availability of Fintech and Enhancing the financial inclusion strategy in the National Bank of Egypt.

15. Conclusions and Recommendation

The researcher sought to contribute to covering the research gap on the mediating role of neuromarketing in the relationship between the availability of Fintech and Enhancing the financial inclusion strategy (within the knowledge of the researcher).

The researcher also reached practical results related to the National Bank of Egypt under study as follows:

- 1- Availability of Fintech has a positive effect on Enhancing the financial inclusion strategy in the National Bank of Egypt.
- 2- Availability of Fintech has a positive effect on Neuromarketing in the National Bank of Egypt.
- 3- Neuromarketing has a positive effect on Enhancing the financial inclusion strategy in the National Bank of Egypt.
- 4- Neuromarketing has a mediating effect on the relationship between Availability of Fintech and Enhancing the financial inclusion strategy in the National Bank of Egypt.

Based on the results of the present research. The research recommends that:

Table (9) Action Plan with the Most Important Recommendations

Recommendation	Activities	Responsible	Time	Control
Must Pay More Attention to FinTech	<ul style="list-style-type: none"> - Holding training courses for employees in areas of application of FinTech. (Technical personnel) - The existence of an evolved environment for financial technology that enhances financial inclusion More particularly. 	<ul style="list-style-type: none"> - Information technology management. - Human resources management and banking operations. 	1-2 years	<ul style="list-style-type: none"> - Branch senior management. - Branch quality management. - External inspection of the main bank.
Use Advanced Strategies that Enhance Technological Innovation and Neuromarketing	<ul style="list-style-type: none"> - Behavioral and psychological design of financial service . - The smart website. - Designing advertising and marketing stimuli to address all minds . - Consumer awareness of the financial services provided. 	<ul style="list-style-type: none"> - Information technology management. - Marketing management and banking operations. 	1 year	<ul style="list-style-type: none"> - Branch senior management. - Branch Customer Relationship Management. - External inspection of the main bank.
Adopting A Specific Strategy to Enhance Financial Inclusion.	<ul style="list-style-type: none"> - Availability of infrastructure. - Availability of Electronic payment and collection for financial services provided. - Ease of access to the financial services provided. - Sustainability of financial services provided (quality, cost, flexibility, and time). -Intelligent management of financial risks. 	<ul style="list-style-type: none"> - Branch senior management - Information technology management. - Banking operations management. 	1-٢ years	<ul style="list-style-type: none"> - Branch quality management - External inspection of the main bank.
<p>The researcher also recommends conducting future research in other sectors or in the same sector using different intermediate variables between FinTech and the strategy of Enhancing financial inclusion, such as banking awareness and business modelling, because this topic still needs more research.</p>				

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