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INVESTORS PERCEPTION OF CRYPTO TRADING AND ITS EFFECT ON THE BANKING SYSTEM IN TURKEY

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Investors Perception of Crypto Trading and Its Effect on The Banking System in Turkey

Yatırımcılar Açısından Kripto Ticareti ve Kripto Ticaretinin Türk Bankacılık Sistemine Etkileri

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2) Crypto Trading
3) Turkey Baking System
4) Digital Currency
5) Cashless Payment Systems

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ABSTRACT

The current study has demonstrated rigorous research in the quest to establish the short-term and long-term implications of crypto trading on the banking system in Turkey. As such, it was established that there are both positive and negative effects but the focus being to have a solid regulatory environment that can balance the outcomes that favour all the investors. Nonetheless, the study's outcomes from multifaceted sources i.e. quantitative and qualitative data have shown that the benefits of crypto trading outweigh those that may be regarded as negative in long term. In addition, the study has demonstrated that the banking system in Turkey is still on the learning curve in terms of how it may successfully synchronise its major protocols with the dynamics of crypto trading environment.

Keywords: Cryptocurrency, Crypto Trading, Turkey Banking System, Mixed Methods, Digital Currency, Hedging, Cashless Payment Systems

ÖZET

Mevcut çalışma, kripto ticaretinin Türkiye'deki bankacılık sistemi üzerindeki kısa ve uzun vadeli etkilerini belirleme arayışında titiz bir araştırma göstermiştir. Bu nedenle, hem olumlu hem de olumsuz etkilerin olduğu ancak odak noktasının, tüm yatırımcıların lehine olan sonuçları dengeleyebilecek sağlam bir düzenleyici ortama sahip olmak olduğu tespit edildi. Bununla birlikte, çalışmanın çok yönlü kaynaklardan, yani nicel ve nitel verilerden elde edilen sonuçları, kripto ticaretinin uzun vadede faydalarının, olumsuz olarak kabul edilebilecek olanlardan daha ağır bastığını göstermiştir. Ayrıca, çalışma, Türkiye'deki bankacılık sisteminin, ana protokollerini kripto ticaret ortamının dinamikleriyle nasıl başarılı bir şekilde senkronize edebileceği konusunda hala öğrenme eğrisinde olduğunu göstermiştir.

Anahtar kelimeler: Kripto Para, Kripto Ticareti, Türkiye Bankacılık Sistemi, Karma Yöntemler, Dijital Para, Riskten Korunma, Nakitsiz Ödeme Sistemleri.

CHAPTER ONE: INTRODUCTION

1.1 Background Assessment

Cryptocurrencies serve as technological innovations in finance motivated by the need to lower costs in transactions and enhance management of risk by overcoming agency costs that arise from information asymmetry (Gina, 2017). The process enables to address circumvention of taxes and oversight as well as engagement in regulatory arbitrage. The other notable issue is that apart from the political, economic, and ideological drivers that motivate crypto-trading, these have emerged to address frictions in the market (Robert, 2012). The development of cryptocurrencies "Bitcoin" has brought solutions to double-spending as a problem while created more secure protocols. Bitcoin enables to decentralise the transaction processes in a consensus-driven environment and censorship-resistant way (De-Filippi, 2016). Therefore, a replacement was brought to the traditionally trusted transactions initiated by third parties with proof of cryptographic protocol, which enabled users to engage with options for anonymity and pseudonymity.

In addition to positive things above there are negativity and some areas to be improved; there is a lack of formal regulation over cryptocurrency trading in Turkey (Ceren, 2013). In November 2013, a press release by the Banking Regulation and Supervision Agency noted that Bitcoin does not serve as a mode of electronic money instead of the enacted Law on Payment as well as Securities Reconciliation Systems, Electronic Money Institutions, and Payment Services and therefore has been indicated that, this must be rendered its oversight and surveillance to be outside the framework of the law (Jake, 2013). In the same press release, a warning to the public was issued noting that the absence of identification of the involved parties in Bitcoin transactions or related virtual money transactions establishes a conducive environment for the illegal activities associated with virtual monies (Jake, 2013). The other notable issue was that in Turkey, the Bitcoin or other virtual money presents risks since the market value is subject to extreme volatility; may also be stolen despite being in a digital wallet, and further trespassed actions that are not supported by the users' approval. Other risks include the fact that Bitcoin, for instance, could be subjected to operational errors that draw from irreversible transactions or to malpractices imposed by malicious vendors (Press Release, 2020). Noteworthy, an observation by a Turkish commentator indicated that Bitcoin supersedes any control mechanism hence rendering it impossible to

seize or freeze Bitcoin-related accounts: thus, occasioning financial crime and money laundering operations (Ceren, 2013).

1.2 Problem Statement

Regardless of the unique properties of cryptocurrencies, as evident in the underlying technology and interlinked markets, they pose major risks on both financial and monetary systems (Bartoletti et al., 2020). The potential risks include concerns related to fraud manipulation of the market, financial crime (Choo et al., 2017), protection of the consumers (Robert, 2012), liability concerns traceable in distributed ledgers (Dirk et al., 2017), evolution of closed networks which potentially limit barriers to entry (Dong et al., 2017), issues around protection of data, policy in taxation for cryptocurrencies (Aleksandra, 2015), monetary policy and stability in financial transactions (Committee on Payments and Market Infrastructures, 2015). Other perceived risks include the absence of common standards as well as interoperable operations in financial transactions, exchange, and issues of governance (Van-Wirdum, 2016), privacy violation concerns (De-Filippi, 2016), scalability (Abadi & Brunnermeier, 2018), and probable risks in the unveiling of the central bank digital currency or digital base money (Mersch, 2017).

The varying challenges that link to cryptocurrencies, especially in terms of volatility in price and underlying hybrid nature that enable them to be utilised as modes of payment (Van Steenis et al., 2016) and investment or access (Gina, 2017), have triggered a surge of interest in terms of studying cryptocurrencies for regulators. For instance, the evaluations relate to the enforcement of financial crime, banking agencies, regulators of commodity markets, and securities (Meaning et al., 2018). The limitation with the studies mentioned above was because they were targeted on initial coin offerings (ICOs) facilitated by technologies of distributed ledger (DLTs), cryptocurrencies, and blockchain (Mersch, 2017), including the probable risks as well as rewards linked to blockchain technology. Moreover, several evaluations have been commissioned by institutions such as the European Central Bank, the International Monetary Fund, the European Banking Authority, the US Federal Reserve, and the Bank for International Settlements to understand the risks and rewards that draw from cryptocurrencies. A vast literature covering the monetary, economic, as well as financial aspects of cryptocurrencies and their relation to central banking had been conducted (Dong et al., 2017).

Nonetheless, the social-economic impacts of cryptocurrencies concerning central banking in Turkey remain an under-researched area to date. In this dissertation, the main problem to be re-examined in detail is the evaluations around risks and rewards that derive from cryptocurrencies and the impact on the banking system in Turkey. The other problem that is to be covered in this study includes the feasibility of interoperable operations in financial transactions and [currency] exchange between crypto trading and banking in Turkey; then how the same could be used to hedge risk to safeguard banks' profitability and stability.

1.3 Purpose Statement

In the context of the topic above, the purpose is to apply a mixed-methods approach to fully understand the regime of Crypto Trading in Turkey and how banks have been relying on such an environment to protect/built stability, especially after the financial crisis of 2008. In line with the above, the assessment seeks to undertake a critical evaluation of the development of crypto-trading in Turkey and how it has been impacting the banking sector.

1.4 Research Questions

The main research questions include the following:

1. What is the existing ecosystem of Crypto Trading in Turkey and how does it link to the banking processes?
2. What is the level of synchronisation that can be achieved between Crypto Trading and Banking protocols in Turkey today?
3. What are the main negative episodes that have taken place in the cryptocurrency Trading ecosystem and how have they influenced banks' performance in Turkey?

1.5 Research Objectives

In alignment with the research questions above, the study's objectives are going to include the following:

a) To evaluate the development of the Crypto Trading ecosystem in Turkey and how this has been changing the banking environment
b) To build a prediction model outcome that depicts how Crypto Trading is going to impact the stability and performance of banks in Turkey

c) To recommend systems and policies that can be used to reduce the negative impact of Crypto Trading and protect stability of the banking system in Turkey, while managing the associated risks.

1.6 Significance of the Study

Crypto currencies are major policy issues in Turkey, although there has been no specific law governing the process. The on-going study has significant contributions to policymakers in the line of the banking sector in Turkey that seek to leverage it with the banking regulatory environment to reduce financial crimes that undermine the assets of the depositors. The study is going to have significant contributions to banks' strategists in the region that aim to incorporate cryptocurrency technologies and models to grow the wealth of depositors at the same time, increase the banks' assets. In conceptualising the importance of the study, one affirmation is that cryptocurrency trading is an important economic protocol that, if effectively managed, can increase the wealth of the investors; hence, management of banks can seek to interpret the possible solutions it can offer in the hedging of risk. The banking supervisory body in Turkey is going to benefit from the findings of the study by first understanding the risks paused by cryptocurrency trading and the appropriate systems or practices that may be adopted at the banking level to reduce the negative effects to banks. Further, the study will help to unveil important information associated with the cryptocurrency adoption among different banking institutions in Turkey; hence, contribute towards raising the performance, stability, and profitability for the investors.

1.7 Study Disposition

The dissertation is going to capture six chapters, as follows:

Chapter one is the introduction; features the problem of the study, research questions, research objectives, background analysis, and significance of the study.

Chapter two is the literature review; develops the theoretical framework based on relevant models and theories, a review of empirical analysis, and the identification of gaps in knowledge.

Chapter three is the methodology; consists of the methodology in terms of design, approach, philosophy, data collection, and ethical consideration aspects in collecting and analysing data.

Chapter four presents the findings from both qualitative and quantitative data, thematic analysis, and hypotheses testing.

Chapter five is the discussion; culminates the study with a review of key findings, recommendations both theoretical and practical, and areas of future research occasioned by the limitations of the study.

Chapter six is the conclusion, providing summative information about the whole study.

CHAPTER TWO: LITERATURE REVIEW

2.1 Overview

The chapter reviews the past literature that was performed on crypto-trading and its impacts on the banking sector in Turkey. The main areas reviewed include crypto-trading and its adoption within the banking sector, application, impacts, challenges, and associated models. The review provided an important platform that revealed the existing gap within the literature, hence, forming the key area of research within the study.

The literature review is aligned with the research objectives seeking to assess the development and adoption of crypto-currency within Turkey and its associated challenges. With the critical review of the past works on the topic, a suitable platform is created for making recommendations for the suitable model as defined within the objectives.

2.2 Crypto-trading

According to Yermack (2015), crypto-trading has emerged to be a reliable means of digital currency exchange by the majority of customers in Turkey. The mode of exchange allows users to speculate crypto-currency price movements without taking underlying coins. Corbet et al (2018) previously established that Crypto-currency had become a popular way of digital currency and asset exchange because the method is so flexible that it gives users the freedom to buy whenever they think the value will rise and decide to sell when a fall is anticipated. The exchange process takes into account different classes of economic status since it emphasizes leveraging products, meaning a user is only required to invest the minimum possible deposit known as the Margin (Chuen, 2017). Essentially, after the margin is paid, the user will be guaranteed a chance to have active access to the underlying market. Similarly, Verstein (2019) suggested that both losses and profits under crypto-currency trade should rely on the actual financial position of the user. Therefore, the financial-based crypto process emphasizes leveraged resources, which later play a vital role in magnifying both losses and profits.

Massad (2019) stated that cryptocurrency exchange services are decentralised within the hosting economies, which means no central agency has the power to issue cryptocurrency services; hence, this flexibility enables customers to conduct transactions with easy access. Conversely, Konoth et al. (2018) argued that

cryptocurrency trade mechanism has varied market sentiment, which creates difficulties in deciding when to perform a transaction. Therefore, more robust measures and modifications should be developed on the mechanism to boost the user`s confidence regarding financial market stability.

Currently, there exist 2677 (more than 9000 now) different cryptocurrencies utilised by various companies across the world (Zhong et al., 2020). Saleh &Shayor (2020) asserted that major crypto-currency exchange undertaken by various economies takes different forms in cryptocurrency trade, including bitcoins, Bitcoin Cash, Litecoin, Ethereum, Ripple, Steller, Neo, Cardano, and IOTA. The crypto-currencies are used for wealth management, digital publishing, and handling electoral fraud, among many others. Liu et al. (2019) noted that low-cost and flexibility in managing private transactions are the main advantage that makes users prefer crypto-trading. However, Takagi (2019) argued that security, credibility, transaction delays, and regulation issues have slowed down the adoption rate of crypto-trading across the world.

Larkin et al. (2020) perceived the crypto-currency ecosystem as complex, ever-evolving, and a real-world application of technology. Crypto-currency is a borderless, low-cost, secure tech solution that offers great financial control and increases accessibility to financial transactions as compared to traditional approaches. Saleh & Shayor (2020) noted that the crypto-currencies are categorised with the ecosystem according to their application, hence, forming the payments, value store, stable coins alternative finance, digital ownership, and programmable money systems. Current projects in cryptocurrencies include SPEDN for converting the cryptos to flats to lower the exchange rates and the Slice, focusing on improving the real-estate investments. The near future projects include CyClean that integrates the Electric Vehicles and the Builderium connecting the contractors to different markets (markets.businessinsider, 2019). Therefore, the cryptocurrency ecosystem shows an evolving technology seeking to incorporate and improvement of different business sectors.

2.3 Adoption of Crypto-currency Trade within the Banking Sector

Miraz et al. (2020) held that the use of Bitcoin currency has increased for the last decade and similar claims are corroborated in the study by Erol et al. (2020). Bitcoin is regarded to be a dominant crypto currency within Turkey

(Cointelegraph, 2020). Accordingly, Vardar and Aydogan (2019) explained that Bitcoin is the most preferable alternative currency more than any other state in the region massively due to it is less cost. Vardar and Aydogan (2019) also stated that the residents of Turkey have suffered from high inflation, which has pushed up interest rates, which in turn depreciates the currency. Miraz et al. (2020) showed that the underlying disaster affecting Turkish local currency results from lacking credible inflation strategies adopted by the national central bank.

Makarov and Schoar (2020) stated that Turkish crypto-currency websites had experienced a high increase in registration from 2019, which could encourage local banks to establish robust partnerships with local cryptocurrencies, for example, Turkish lira-backed stable coin Bilira (TRYB) in an attempt to bridge inflation gap. Doyduk (2019) agreed that, entering the cryptocurrency financial market, banking sector and government institutions will be able to ease people from the prevailing financial burden.

According to Hays and Kirilenko (2019), Bitcoin, which is the direct precursor of all existing assets being traded in the crypto space, was born following the global financial crisis and the unusual monetary policies that followed. Since then, crypto use and adoption have enjoyed desirable attributes, including anonymity, scarcity, and immutability, among others that have seen it grow to a total capitation of almost $1 trillion by the start of 2018 (Kshetri and Voas, 2017). Globalisation and use of online payment and the high cost of conventional financial services are amongst the key drivers of crypto trading, which are resulting in an unprecedented rate in demand for digital money in the banking sector across the world.

Since Crypto trading is an internet-based exchange medium for transactional valuation in the banking and financial sector, block-chain technology is used to gain immutability, decentralisation, and transparency (Hin, 2020). Some of the gained features based on blockchain technology render crypto-trading theoretically immune to government interferences in the banking sector (Tu et al., 2020). Nevertheless, Demir et al (2018) argued that governments across the globe that have recognised and otherwise integrated crypto-trading and cryptography in their banking and financial sector must craft regulation frameworks for the same. For instance, in Turkey, the Capital Market Board (CMD) plans to come up with a regulatory framework for crypto trading and other digital money forms; because

without proper regulation in any financial and banking sector, the risk of illegal activities is inherent. Such similar views are shared by Bariviera (2017), who believes that the banking sector in the economy risk vulnerabilities and exposures from virtual currencies from an operational perspective. Thus, in as much as the world is shifting focus towards the possibility of virtual currencies in the foreseeable future, the key aspects of crypto trading need thorough tackling for the transition to be harmonious.

Massad (2019) recommends that it is important to reinforce the regulation of cryptocurrency and crypto trading in the banking sector. There is a gap in the regulation of crypto trading and assets that need the regulatory bodies to fix. The gap is an avenue that contributes to weak protection of the investor and fraud in the trading and distribution of crypto assets in the banking sector. Similarly, Demir et al (2018) states that better regulations create an optimum environment for trading, benefit investors, limit the use of crypto assets for illegal payments, encourage the development of new technologies. Effective regulation from the government limits the risk of cyber-attacks and online hacking, which may lead to collateral damage and losses in the banking sector (Kshetri & Voas, 2017). Consequently, the banking sector being such an integral player in the economy of any nation, it is highly likely that crypto trading would attract government regulation and monitoring.

According to Li et al. (2019), crypto-assets and crypto trading concepts are now of interest due to various factors ranging from the key drivers, the desirable features, the adoption and regulation, and consequently, the long-term impact on the banking system of the adopter nation. Some of the issues regarding crypto-trading and the banking system include the role technology plays that affects the nature of money and the role of central banks in this new era of virtual currencies (Singh, 2019). A case in point is many countries are still resistant to make money obsolete even though they have taken big steps in the digital payment systems. The simple explanation is that money acts as a backstop in case the whole digital system comes under attack or fails (Verstein, 2019). Another key issue on crypto trading in the banking system is the question of whether central banks should generate their e-currencies. Such an effort means consumers would hold bank liabilities digitally. The banks may decide to do away with printing money entirely, which is highly unlikely. However, the issue of tax evasion, laundering of money, and other illicit

payment would be dealt with. Such issues that are expected to impact the banking system and adopting nations need to be prepared to provide answers and solutions.

The impact on the monetary system and cross- border capital flows. According to Borri (2019), private cryptocurrencies have little impact on the monetary policy of nations. However, in the event of issuance of central bank digital currencies (CBDC), then there would be implications. Liu & Tsyvinski (2019) noted that the implications would be contingent on the provisions of the CBDC issuance. In particular, whether the CBDC will be generally accessible or not and whether the CBDC will be remunerated (bank reserves) or unremunerated (paper currency). Given the early application of the adoption of crypto trading in the banking sector in the world and Turkey it remains to be seen how efficient and cost-effective the sector would turn out to be, given the consideration concerning energy consumption, scalability issues, and price volatility (Sovbetov, 2018).

2.4 Application of Cryptocurrency in the Banking Sector of Turkey

According to Rosati and Čuk (2019), cryptocurrency trading innovation forms a vital inflation mitigation tool in the financial markets. The viability of cryptocurrency innovation includes its flexibility, ease of use, and ability to generate ideas that foster both local and national financial regulation in the country (Miraz et al., 2019). in addition to that, Vardar and Aydogan (2019) argued that failure to license alternative digital payment platforms like PayPal contributed to the Turkish crypto trading in the region. In summary, cryptocurrency exchange could increase to unprecedented levels in the Turkish banking sector purposely to bridge the online payment gap.

Nguyen et al. (2020) explained that the emerging cryptocurrency innovation had ignited the shock wave across the banking sector to adopt a crypto payment gateway; further, the launching of cryptocurrency has enhanced full integration of local currency to enable users to deposit and withdraw lira with ease. The crypto-adoption in Turkey greatly relieved its citizens from incurring excess service fees, conversion charges, and exchange rates, which would have otherwise accrued as a result of third-party interventions (Howell et al., 2020). On the other hand, Ji et al. (2019) revealed that the state currency regulators are struggling to enforce sufficient supervision over the growth of decentralised crypto business among the Turkish people. Therefore, proper regulations should be adopted by the Turkish

banking sector to control the rapidly growing cryptocurrency markets for the easy curbing of crypto-economic hazards.

On the other hand, Smith (2018a) states that Crypto technology could help banks verify and access data simultaneously by securing them via irreversible changes. And undoubtedly the banks should transform from their current conventional way to new future banking system (Lang 2017b). Kocanski (2018) explained that by collaborating with fintech companies, banks should adopt this new technology and they can improve their profitability and Keller (2018) added that adopting this new technology also improving transparency with productivity. . Therefore, the Turkish banking sector and governing authorities should adopt relevant regulations to accommodate the rapidly growing cryptocurrency adoption into the banking sector.

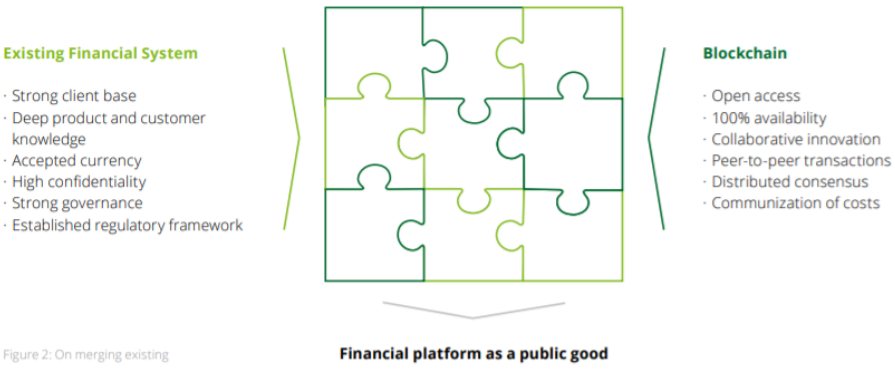


Figure 2: On merging existing

Table 1 Obtained from “Blockchain @ Rethinking banking” report of Deloitte.

2.5 Challenges Associated with Crypto-Currency Trade in Turkey

Lau et al. (2019) established that crypto-currency and Blockchain technology has emerged to be the giant challenger to current financial systems; hence, curbing uneven corporate structure, boosting financial inclusivity, and creating a more robust, transparent, and credible economy. However, Sovbetov (2018) affirmed that, while all crypto benefits are true, the cryptocurrency world has its drawbacks, just like other financial systems. Kandler et al. (2017) affirmed that the key drawback affecting the crypto-market had deteriorated system security, unforeseen breaches, and hackings over system details, which are synonymous in the present crypto-currency exchange. Crypto users are seeking robust measures to protect their accounts and assets from being accessed by unauthorised persons.

King (2013) earlier established that transparency is also a key demerit to the crypto-currency sector, where fraud and uneven competitions are inflating abnormally. Rosati and Cuk (2019) established that big cryptocurrency shareholders self-proclaim that they are fully decentralised when in the real sense, they are not. The study reveals that about 80% of total market tokens are driven by 20 top wallets out of possible 50 coins. Similar to other financial economies, the crypto world is dominated by power dynamics in determining market shares, among other developmental collaborations (Doyduk, 2019).

Liu and Tsyvinski (2018) argued that the credibility of the crypto-sphere is also in question where scamming is an important exchange of crypto-coins has been drawn into current headlines. Proper exchange mechanisms demand that strict and scrutiny of reliable crypto coins is done to guarantee the right assessment performance (Taskinsoy, 2019). Trading charges constitute another common limitation facing crypto-word with majority exchange activities charging flat rates on transactions across all business deals, though Eyal et al. (2019) argued that in some cases, transaction charges favour the trader at the expense of the buyer, thus, creating uneven crypto-business environment, additionally, reduced liquidity in crypto-exchange has led to a substantial imbalance in financial markets. Poor liquidity in the crypto-sector delays important orders from being executed in time; hence, creating a loophole for the dominant shareholder to manipulate market prices (Zhang et al., 2018). Therefore, the study reveals that to attain smooth and sustainable crypto-revolution, robust precautions should be adopted to mitigate the prevailing limitations in crypto-financial markets.

2.6 The Possible Impacts of Cryptocurrency Adoption in the Banking Sector

Katsiampa et al. (2019) supported that crypto-trade serves as a medium instrument that boosts financial inclusion; hence, supporting growth in the banking industry of crypto-adopted nations such as Turkey. The increased service access and financial inclusivity provide better retrieval of funds and thus mitigating poverty levels in the economy (Brauneis and Mestel, 2019). Conrad et al. (2018) asserted that it is important for the present world to focus on the relationship of the impacts with existing solutions to exhibit the practical relevance of cryptocurrency trade in the banking sector.

According to Brauneis and Mestel (2019), crypto-currency adoption in banking sector could promote economic growth by fostering customer trust in terms of credibility, transparency, and accountability. Increased customer trust enhances doubt-free business interactions between the buyer and seller parties, besides, the underlying technology surrounding crypto-adoption utilises consensus technique, and with both private and public are encrypted for independent control over the transactions, implying that customers should only trust the network but not their counterparts (Zamyatin et al., 2019). Therefore, the entire structure behind block-chain technology fosters security of customer accounts against fraudulent activities and cyber-crime related attacks. Nonetheless, Dvorak et al. (2015) established that in the pre-crypto-adoption times, the central bank was to hire intermediaries to oversee every exchange activity involving digital transactions. Intermediary interventions in financial transactions not only escalate service costs but also take an extended time to complete the transaction. Gao et al. (2018) stressed on decentralised nature of the crypto-currency mechanism, which keeps it free from restrictions of central authorities like governments, central banks, and other financial monopolies. In summary, the decentralisation feature of crypto-innovation possibly transforms traditional central trading to remote trading within the banking sector in crypto-adopted states (Scott, 2016).

2.7 Financial Risk Model Analyses in Crypto-Currency Adoption in the Banking System

Chohan (2017) emphasized how risk control is vital in all financial markets, including the crypto-world adoption. Financial risks become significant in various ways of derivative pricing and currency exchange rates. Further, there is a significant need to develop sufficient statistical instruments to determine the extent of potential drift in financial markets (Zhang et al., 2018). On the other hand, Mensi et al. (2019) argued that classical theories on financial risk management; however, give simpler assumptions but result in underestimated real risks. Kamps and Kleinberg (2018) stressed that financial risk theories summarise all gradual theoretical evolution, some of which, being developed through scientific philosophies, a good example is the risk analysis derived from block-chain technology in the crypto-world. Inversely, Catania et al. (2018) established that trade-off risk-returns of cryptocurrencies differ from stock currencies and those of precious metals; for this reason, cryptocurrencies have limited exposure to the

macroeconomic environment such as common stock turnover, neither do they have exposure to product-currency returns. Therefore, this distinction reveals that risk analysis of cryptocurrencies is strictly determined by parameters that are specific to cryptocurrency financial markets (Akyildirim et al., 2020).

Gandal and Halaburda, (2016) argued that financial risk analysis on crypto assets would not be adequately covered without discussing their implications to the functioning, monetary policy risks, and stability of financial markets. Therefore, it is important to adopt a robust monitoring framework that gives an insight into the scope, materiality, and extent to which cryptocurrency risks evolve to properly curb potential adverse crypto scenarios (Brauneis & Mestel, 2019). Similar to common financial markets, Liu et al. (2019) agreed that financial risks such as currency, equity, credit, liquidity, and asset-based risks equally play a significant role in the crypto-world. In controversy, Zamyatin et al. (2019) argued that crypto-currency markets have limited exposure to common financial systems, although its evolution is still in progress to gain more ways of managing unique risks associated with the innovation. The on-going dynamics in cryptocurrency suggest that there is still room to invent ways of bridging the existing financial marketing gap in the business.

Furthermore, Kamps and Kleinberg (2018) discussed that crypto-currency service providers are also learners and still researching performance crypto-index that will best suit financial service systems. Crypto-currencies are a significant part of financial parameters that foster currency exchange technology, and hence, it becomes impossible to separate financial risks from technology-based risks (Metnick et al., 2016). Therefore, it is significantly required to fully manage financial risks in the crypto market to curb asset instability and liquidity concerns (Bentov et al., 2019). Similarly, Larkin et al. (2020) added that technology risks in cryptocurrency trade should be equally monitored to protect and assure sustainable cybersecurity.

However, Kurpjuweit et al. (2021) summed up that cryptocurrency markets should adopt ways of managing emerging financial risks like uncertain protocols and unhealthy legal rules for better custody operation and prepare for financial market dynamics. Gandal and Halaburda (2014) affirmed earlier that cryptocurrency markets are highly vulnerable to liquidity risk, according to this study, making 1million Bitcoin exchange costs between 10,000 to 100,000 dollars

more than the original exchange rates. Consequently, centralised cryptocurrency traders are not adequately set to meet the highly growing needs of crypto-based transactions due to liquidity concerns (Wohrer & Zdun, 2018). There is a high risk of financial loss, especially if a wrong transaction is executed since there is no reversal. Lack of policies and regulations to guide the execution of activities significantly exposes crypto trading to high financial and liquidity risks.

2.8 Theoretical Framework

2.8.1 Information Asymmetry Theory

According to Chod and Lyandres' (2021) knowledge, asymmetric information theory holds that imbalances in market information affect the movement of goods and services from the buyers and sellers. The scholars view that owing to the highlighted point, and it is the essence of the current study considering similar information, imbalance or asymmetry can significantly corrupt crypto-currencies' development as to pricing. Pricing is considered the basis of wealth maximisation since it significantly impacts numerous economic activities, including macro and micro factors. Therefore, pricing can subject naïve investors to low returns in the presence of incongruent information, which aligns with the fundamentals of an efficient market hypothesis that are later addressed. Besides, information symmetry can stabilise the trading process, which will provide conclusive evidence of the effects of economic activities on investors or the individual. According to Zhong et al. (2020), access to the market to varied information affects the market performance due to poor coordination. For example, consider the buyers and sellers of cryptocurrency having the privilege to access information that is not readily available to other buyers. In this case, the Bitcoin prices can be decreased to create lower holding period returns without other investors' suspicions thus the information asymmetry arises So, if the cryptocurrency market turns out as an industrial trend for lemons (realized useless after obtained) because of information asymmetry, then positively contributing to economic growth would be impractical. Based on this merit, the following proposition will suffice:

Proposition 1: Information asymmetry decreases the impact of cryptocurrencies' development on individuals' economic wealth or institutional investors in Turkey's banking sector.

2.8.2 Efficient Market Theory

As previously described, the meaning of information asymmetry and efficient market theory are interlinked since the two illustrate the availability of "information" by potential market players. Trading the security assets at a fair value causes under-pricing of the stocks, making it difficult to sell them (Takagi, 2019). On that account, investors are faced with the challenge of over-performing the benchmarked market through market timing, manipulation, or technical analysis at any point. The EMH assumptions re-introduce the “market for lemons”, as mentioned earlier under Information Asymmetry Theory, which is believed to limit economic growth. In this case, when the problem is analogically tested on the cryptocurrencies industry, it will imply that the undervaluation of the securities certainly suppresses the investors' expected returns, thus causing a critical impact on the banking sector's economic prosperity. For that reason, the second proposition is:

Proposition 2: Cryptocurrencies' development in efficient markets boosts individuals or institutional investors' economic wealth in the banking sector in Turkey.

2.9 Research Gap

The review of the literature revealed an informational gap about the operations of specific ways in which crypto-trading has been adopting and changing Turkey's banking sector. Limited studies have been performed to produce models that can help the banks to improve their stability in adopting crypto trading within the banking business. Previous studies only focused on the crypto-trading concept independently and its possible applications. To bridge the literature gaps, this study will focus upon the use of the crypto-currency and its impacts on the banking sector in Turkey and recommend the systems and policies that can be adopted to minimise risks and increase the benefits of its use.

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

The study focused on examining crypto trading and its effect on the banking system in Turkey. To find answers to the problem, the objectives of the study include evaluating the development of the crypto trading ecosystem in Turkey and the changing banking environment, predict the model outcome that depicts how crypto trading would impact the stability and performance of banks in Turkey. This chapter provides a comprehensive description of the strategies and assumptions that were followed while collecting and analysing the data. In this study, the methodology describes the procedures followed while collecting data from primary and secondary sources. The main sections covered in this chapter include the research philosophy, sampling method, data collection and analysis, ethical consideration, research design, and research approach.

3.2 Research Philosophy

Saunders, Lewis, and Thornhill (2012) argue that a research philosophy entails the assumptions and principles followed while collecting and analysing the data. In this sense, the research philosophy was used to explain the assumptions and beliefs followed during the creation of knowledge. Zukauskas, Vveinhardt, and Andriukaitienė (2018) identified four major philosophies that are used in studies, including interpretivism, pragmatism, positivism, and realism. In this study, pragmatism philosophy was adopted. According to Zukauskas Vveinhardt and Andriukaitienė (2018), pragmatism philosophy recognises that different methods are used when undertaking and interpreting the research. Whilst employing pragmatism philosophy, the research question and objectives are the primary determinants of the assumptions and beliefs followed while collecting and interpreting the data. Regarding this, the qualitative and quantitative method was integrated into single research.

3.3 Research Approach

Saunders, Lewis, and Thornhill (2012) identified the two most common approaches employed while researching inductive and deductive. Inductive reasoning was used during the collection and analysis of the qualitative data. While applying the inductive approach, the researcher starts with observation of data, which ends with the identification of theory at the end of the research process. As

established by Brantnell, Baraldi, and van Achterberg (2019), the inductive approach aims at generating meanings to identify common patterns emerging from the data. In this sense, the inductive approach is based on the learning experience of the researcher (Brantnell et al., 2019). The flexibility associated with the inductive approach enables the researcher to focus on the data that provides accurate answers to the research problem.

A deductive approach was applied while collecting and analysing quantitative data. According to Brantnell et al. (2019), a deductive method usually seeks to conclude from the initial premises. In this regard, the hypotheses established from the review of the previous studies are tested to establish the relationship between the variables. Therefore, Saunders et al. (2012) suggested that a deductive approach is concerned with developing the hypothesis depending on the existing theory and further testing to determine the causal relationship between the theory and collected data. The deductive approach was applied for the quantitative research because it offers the opportunity to explain the causal relationship between variables and concepts and the possibility to generalise the findings.

3.4 Research Design

Both descriptive and exploratory design was used while collecting and analysing the quantitative and qualitative data, respectively. According to Siedlecki (2020), descriptive research design normally aims to systematically describe the particular phenomenon being investigated. While applying descriptive design, the researcher establishes the trends, frequencies, and characteristics of the issue under investigation. The descriptive design allows the researcher to employ different methods of data collection, including surveys, case studies, and observation. In this study, the descriptive model helped in examining the level of synchronisation that can be achieved between crypto trading and banking protocols in Turkey. On the other hand, the exploratory design was employed while collecting and analysing the qualitative data. An exploratory design offers the opportunity for in-depth exploration of the research problem. Although the exploratory design does not offer conclusive results concerning the research problem, the flexibility associated with the design offers the opportunity for the extensive examination of the issue.

3.5 Research Method

The study was based on a mixed method, which comprise of both qualitative and quantitative approaches to collect and analyse data. The primary purpose of mixed methods research is to expand and strengthen the conclusions of the study and, henceforth, contributing to the published literature (Sekaran & Bougie, 2016). The integration allowed the researcher to conduct a more synergistic and complete utilisation of the data to obtain detailed answers regarding the research questions. Major advantages of the method are explained as follows: enhances possibilities of comparing qualitative and quantitative data while considering the existing contradictions. Rich and comprehensive data can be collected along with providing methodological flexibility (Cooper& Schindler, 2014). Furthermore, it fosters scholarly interaction and ensures the findings are grounded in the experiences of the participants. Careful planning is required for effective description of the aspects of mixed research. However, a mixed method is time consuming compared to a single qualitative or quantitative method; thus, there is a need for careful planning for effective description of all aspects of the research (Sekaran & Bougie, 2016). In the context of the topic above, the purpose is to apply a mixed-methods approach to fully understand the regime of Crypto-Trading in Turkey and identify strategies on how banks have relied on such an environment to build stability, especially after the financial crisis of 2008. Qualitative findings helped to validate the qualitative results.

3.6 Data Collection

3.6.1 Primary Data

The qualitative data were collected from primary and secondary sources. For the primary sources, semi-structured interviews were administered to the participants. After the selection of the participants, the interview was conducted through telephone calls. A telephone interview is an easier and faster way to approach primary research compared with focus group discussion and can yield high-quality data. Other advantages include increased chances to conduct interviews over a wider geographic scope and can deliver similar quality or comparable data (Bell, Bryman & Harley, 2018). The limitations include visual aids cannot be used to assist in interviewing, interviews are short, body language and behaviour cannot be observed, and respondents can hang-up the phone before the

interview session is completed (Hair, Page & Brunsveld, 2019). The interviews were then later transcribed to keep the research accurate and allow the researchers to quote interviewees directly when reporting the findings of the project. Furthermore, transcription enhances adherence to standard protocols for qualitative research, which include transferability, context, and credibility.

Quantitative data was collected through a survey questionnaire. Google forms, a free online survey tool was used that helps a researcher to reach the right audience as well as a statistically valid sample size for the study. Google froms are essential in collecting feedback, opinions, and suggestions from the targeted population. In this study, Google forms was used to collect the data because they are cost-effective, simple to administer, and enhances confidentiality and anonymity among the participants. Eventually, the confidentially associated with Google forms influence the participants to provide honest information regarding the research problem.

After selecting the participants, they were requested to provide an email address. In this sense, the survey link was sent to individuals through the email address; whereby, they were given five days to fill the survey. The filling of the survey was completed within 15 days; whereby, 70 individuals responded within the provided timeline. During the data collection process, the participants have been reminded through email addresses the need for providing accurate responses based on their experiences in crypto trading.

3.6.2 Secondary Data

Search Strategy: The secondary data were accessed from existing studies that were accessed from different academic databases. Regarding this, the articles were accessed from different databases, including the University library, Plose Oneand JSTOR. The search strategy was based on keywords, including crypto trading, banking processes, synchronisation, banking protocols, negative effects, and bank performance. Fundamentally, the identification of the keywords was based on the research questions and objectives.

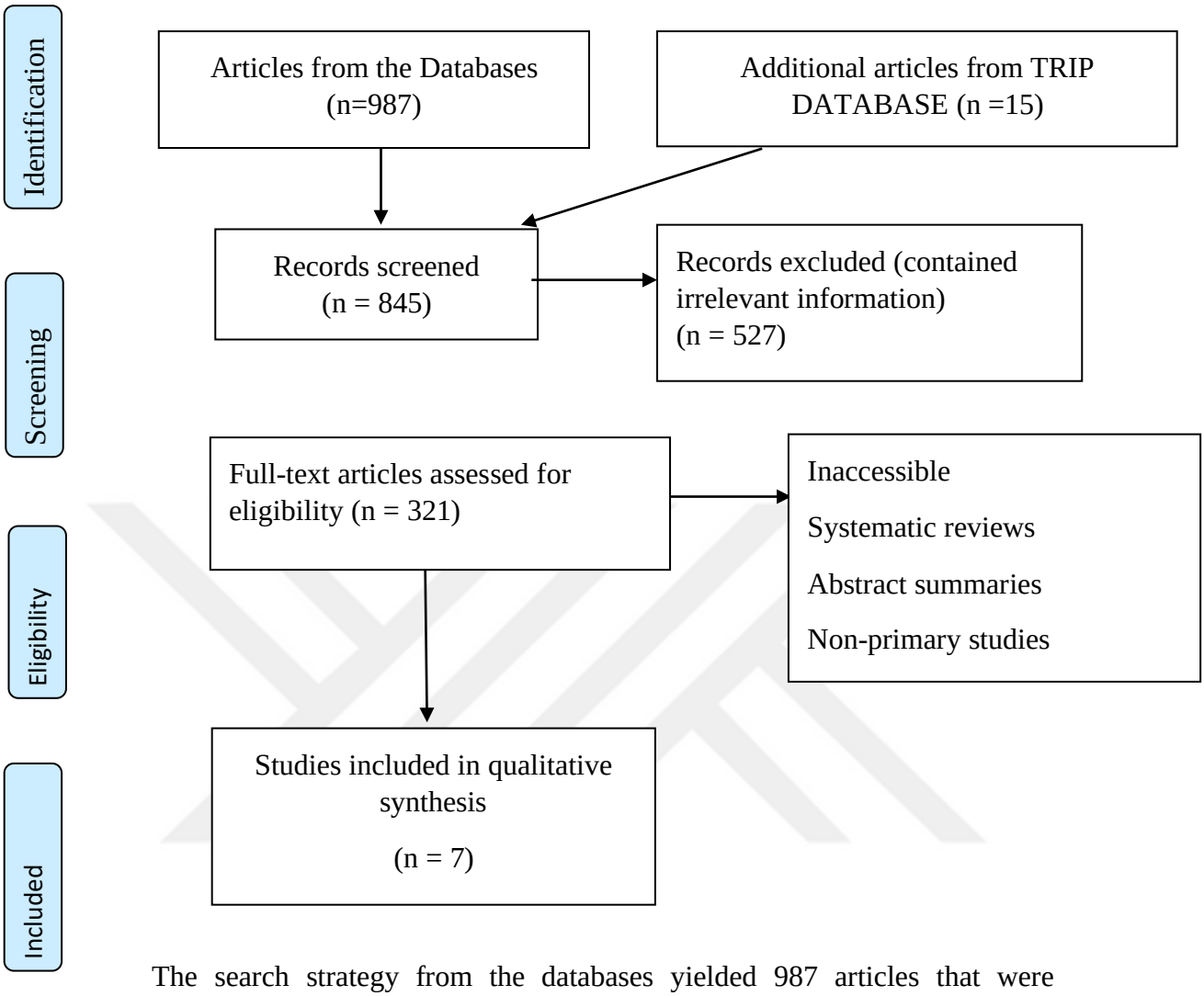
The inclusion and exclusion: The articles were subjected to specific criteria to ensure eligible studies provided accurate and reliable data. The summary of inclusion and exclusion criteria is shown in table 1.

Table 1. Inclusion and Exclusion Criteria

Description	Inclusion	Exclusion
Publication	Articles published by 2010-2020 to capture changes in the banking industry for a decade and further project new developments. Studies published in English language.	Articles published before 2010 because the data does not provide recent state of the banking industry and technological innovations.
Outcome	Articles that provide an insight concerning crypto trading and its banking processes.	Articles that focus on other sectors of the economy including retail, hospitality, and manufacturing.
Design	Primary studies including qualitative, mixed and quantitative studies. Business reports and management reports.	Secondary studies, including systematic reviews, article reviews, conference proceedings, and abstracts.

The summary of the articles accessed from the databases is shown in figure

Figure 1. PRISMA Chart



The search strategy from the databases yielded 987 articles that were screened to remove duplication and studies that were irrelevant to the research questions. After screening, 845 articles remained, which were subjected to the inclusion and exclusion criteria. First, 527 articles were removed because based since they did not meet the criteria established regarding publication and outcomes (Table 1). The remaining 321 articles were subjected to the inclusion and exclusion criteria based on the design or methodology. Consequently, 7 articles remained, which were analysed using the thematic method as presented in chapter four.

3.7 Sampling

To select individuals that participated in the interviews, a purposive sample was used and consisted of 10 investors selected who are working in banking sector in Turkey. The investors were selected based on their knowledge regarding crypto trading and its effect on the banking system. The banks in which they work should have already been using cryptocurrency as a way of building stability in the market.

Through his judgment, the researcher chose members of the population by focusing on the main characteristics, which include knowledge about crypto trading in the banking sector. The technique is an effective type of non-probability sampling technique that enables researchers to investigate specific cultural domains that may have experts within. Purposeful samples are commonly used in qualitative research because of the following benefits: it is one of the time-effective and cost-effective sampling methods available; opportunities for creating generalisation of the data; maximum level of variation can be achieved; and low margin error of the collected information (Sekaran & Bougie, 2016). Despite these benefits, Cooper & Schindler (2014) argue that purposive sampling has limitations, which include invalid inferential statistical procedures, extremely prone to researcher bias, high levels of subjectivity cause challenges to defend the representative nature of the sample, and evaluation of the reliability of the experts is difficult.

To select individuals that answered the survey questionnaire for collecting quantitative data, simple random sampling was used that gave individuals in the targeted population equal opportunities of being selected. In this case, simple random sampling was selected because of the accurate representation of the larger population, ease of use and lack of bias as the technique involves fewer judgment by the researcher (Hair, Page & Brunsveld, 2019). Although the limitations of this method include difficulties in saving money and effort and time, along with challenges in accessing lists of the entire population, the approach was preferred because it allows generalisation of the findings across different groups. The sample consisted of 70 participants randomly selected from the finance sector in Turkey and included employees and other staff who were willing to provide required information that relates to crypto trading.

3.8 Data Analysis

A thematic data analytical approach was used in analysing qualitative data collected from telephone interviews and existing studies. The researcher closely examined the data with the primary purpose of identifying common themes, including patterns of meaning or ideas that are repetitive. The method helped the researcher to reduce data flexibly for easy interpretation to make relevant and informed conclusions regarding crypto trading and the effects on the banking system in Turkey. In describing the content, preliminary codes were assigned to the

qualitative data and the themes searched in the codes across different interviews. The main procedures followed while analysing the data include a reading of the interview transcripts, identification of codes, identification of themes, and reviewing of themes, and writing of the findings. On the other hand, Minitab software was used to analyse the survey data, where both descriptive and inferential statistics were generated.

3.9 Ethical Considerations

While conducting this study, ethical principles were adhered to enhance the credibility and ensure the rights of the participants are protected (McDonald, Simpson & Johnson, 2014). While identifying and selecting the participants, the researcher informed them about the potential benefits and risks of the study, duration of data collection aims of the research, confidentiality issues, and the right to decline to participate in the research, and method of disseminating the findings. Providing the information to participants helped in ensuring individuals were not coerced to take part in the data collection process. According to McDonald et al. (2014), the researcher is required to provide individuals with sufficient information to ensure they make an informed decision regarding their involvement in the study. Additionally, the principle of confidentiality and anonymity was achieved by protecting the identity of the participants unless individuals agreed their details to be published in the results. Personal details were kept separately from the interview and survey responses to enhance anonymity. Essentially, only individuals who participated in the collection of data could access personal information concerning the participants. Any confidential personal information from the participants was securely stored and password protected to enhance privacy and anonymity.

3.10 Methodological Limitations

The methodological process was based on mixed methods, thus requiring the triangulation of data from both quantitative and qualitative sources as well as from primary and secondary material. Thus, the challenges were in the complexity involved in the analysis of the data with the need to establish the cross-linkage across each of them in line with the objectives of the study. Further, it required a lot of time and effort for the researcher to analyse each of the data using both thematic and statistical analysis.

CHAPTER FOUR: RESULTS AND ANALYSIS

4.1 Introduction

The current chapter provides the results for the analysis of the qualitative and quantitative data. While analysing both the primary and secondary data, the focus was given on understanding the development of Crypto trading ecosystem in Turkey and ways it had been changing the banking environment, building and validating the prediction outcome that depicts crypto trading and the potential impacts on performance of banks. The analysis also provides answers to the question regarding the policies and systems that can be used to reduce the negative impact of Crypto Trading on the banking system in Turkey while managing the associated risks. Whilst answering these questions, the first section provides qualitative results whereby the collected data was analysed through the thematic method. The second section provides answers to the research problem from the data analysed through statistical method.

4.2 Qualitative Results

The current section provides analysis of the interviews and secondary data collected from the academic articles. The interviews with 10 investors (including bank managers and other investors) selected who are working in banking sector in Turkey were analysed through the thematic method. In this study, the primary themes that emerged from the qualitative data include the existing ecosystem of Crypto trading in Turkey and how does it link to the banking processes, the level of synchronisation that can be achieved between Crypto Trading and Banking protocols, negative episodes that have taken place in the Cryptocurrency Trading ecosystem, the influence of cryptocurrency trading ecosystem on banks' performance.

4.2.1 Primary Results

Theme 1: Influence of Cryptocurrency Trading Ecosystem on Banks' Performance. The results demonstrate that cryptocurrency trading ecosystem has a negative impact of Turkey’s banking systems and performance. Essentially, development of cryptocurrencies market capitalisation has substantial unidirectional causal variation on deposit variability in the banking sector. In this sense, stakeholders in the banking sector encourage the use of cryptocurrencies as an alternative method of asset investment. Additionally, the adverse impacts

associated with cryptocurrencies on the Turkeys' banking industry are being addressed through the application of blockchain technology to facilitate customers with low transaction costs as well as improving security.

> P 1"*Crytocurrencies market growth is a significant threat to the banking industry. To minimise the negative impacts caused by cryptocurrencies on the banking sector, stakeholders need to improve investment strategies and better policy planning*".

Although the emergence of cryptocurrencies is driven by the opportunity for radical innovation, this analysis indicates that such developments have an adverse impact on Turkeys' banking sector. With the increasing innovation of financial technology, cryptocurrencies act as substitute to established financial systems, which potentially impact the overall performance. From the analysis, it is evident that digital technologies have the potential to substitute the deficit provision of traditional banking services in Turkey. Fundamentally, digital currencies have the potential of reaching many people, especially small businesses and entrepreneurs in remote and marginalised areas across Turkey. Therefore, adoption of cryptocurrencies would adversely impact the growth and performance of the banks.

Participant 2 and 3 stated that cryptocurrencies act as compliments to established financial systems. By acting as complements, it is evident that banks would minimise long waiting among small businesses and individuals and focus on large transactions. In this sense, the results demonstrate that cryptocurrencies would potentially contribute to the growth of the banking sector because of the opportunity for risk diversification. These financial innovations have the potential to act as new payment or exchange system, speculative trading instrument, and investment because of the relatively low foreign exchange transaction costs.

> P3 "*Cryptocurrencies would potentially boost the growth and performance of the banks in Turkey because of the complementary services such as investment, speculative trading instrument, and exchange system*".

In this study, the findings imply that investment in cryptocurrencies increases the opportunity for portfolio risk management, which eventually enables bank to hedge against economic uncertainty. Since cryptocurrencies are not tied to a particular economy, their use offers the opportunity to hedge against country-specific risk and inflation. There is a possibility that cryptocurrencies would enable banks in Turkey to create a less –crisis-prone financial system and further counter-

weight hyperinflation. Consequently, banks can leverage such opportunities to caution against uncertainties in the economy.

According to participants 5 and 9, cryptocurrencies could promote and the competition in banking market, which could adversely affect the performance of the banks in Turkey. Due to the rapid technological innovations, digital currencies could be expected to be preferable payment choice for many people in Turkey in future. The low transaction costs associated with cryptocurrencies potentially act as disincentives for the banking systems.

> P5 "*The greater adoption of cryptocurrencies would culminate in higher competition in the banking sector, and this cause a negative impact on banking industry*".

High level of fees is usually imposed on writing of checks and transfer of funds by financial institutions. However, in this case, the results indicate that cryptocurrencies do not involve transaction fees, which would potentially influence people to prefer such digital finance compared with the traditional banks in Turkey. The fees are lower compared to transaction charges incurred by banking systems. In this context, the one-on-one transactions through peer-to-peer networking increases the convenience of cryptocurrencies.

According to participants 6 and 7, cryptocurrencies would affect the growth and performance of banks because most people are shifting towards cashless systems compared to traditional banking systems. Regarding this, financial technological innovations can potentially result in reduced circulation of cash bills; hence, promoting a shift towards electronic payment ratification.

> P7 "*These adjustments would potentially have an adverse impact on the banking industry since most customers will be shifting from cash to digital systems*".

The study demonstrates that rapid development in financial technology has influenced many people to shift to digital currencies because they are least affected by uncertainty of the economy. Information communication technology is perceived as a pre-requisite for the digital financial technologies experienced across the globe. With these developments, customers prefer transacting their assets and money through the internet without moving to traditional banks. In this sense, the finding implies that adoption of cryptocurrencies enhances diversification and

hedging against equity markets; hence, making them more preferable compared with traditional banking.

Participants 8 and 10 stated that trust issues associated with cryptocurrencies deter their adoption by most people. Despite the increased financial technology innovations, cryptocurrencies would not adversely impact the growth and development of banks in Turkey. Greater cryptocurrencies infrastructure has not been realised in countries with the most unbanked population, such as Turkey, which implies that its development would majorly complement the banking industry rather than acting as a form of competition.

> P10 "*Security issues and slow development of cryptocurrency infrastructure negatively affects the adoption of cryptocurrencies. Thus, cryptocurrencies play a complementary role to banking institutions*."

The findings demonstrate that cryptocurrencies are used as complementary to the existing financial institutions; thus, offering the opportunity for banks in Turkey to focus on a specific portfolio with higher returns. Failures of financial technology platforms are associated with inadequate infrastructural development that affects the use of cryptocurrency transactions. The distrust among customers regarding the application of cryptocurrencies implies that most people across Turkey would prefer the use of banks, which eventually leads to improved current performance in banking sector.

Theme 2: Negative Episodes that Have Taken Place in the Cryptocurrency Trading Ecosystem. The analysis demonstrates that cryptocurrencies are associated with volatility risks. In the past two years, the price of cryptocurrencies has been fluctuating. In this regard, cryptocurrencies are considered to be highly unstable due to speculations and uncertainties. According to participants 1, 3 and 4, cryptocurrencies are disruptive and complex technology that is highly volatile, unlike the banks, which are reliable and predictable.

> P 1 "*Crypto currencies are highly volatile*".

The volatility risk creates the need for investors to trade with caution when handling digital currencies. The crypto assets that lack contractual claims are the most volatile because their value is not attained from the underlying claim. Instead, it is subjected to market speculation. The volatility in prices creates economic concerns for investors who may be affected by the risks. The market volatility makes investors lose millions while others make huge profits from the sudden

changes in prices. Frequent price changes of the crypto assets create fear among investors, which induces negative bias towards the crypto trading market. Investors have a high preference for financial markets that are less volatile to ensure they understand their risk tolerance before investing. The majority of the investors have a fear of sudden losses caused by the unpredictable crypto trading markets. The result implies that the volatility risk of crypto assets affects the returns on investment, which makes them unreliable. Speculation of the prices of crypto assets by the investors creates internal market pressure that leads to buying and selling pressure, which increases the volatility risks. Unlike the regulated financial markets, the crypto trading platforms lack regulations that help in reducing the price changes.

Participant 5 stated that cryptocurrencies are associated with market liquidity risk. However, higher liquidity in the marketplaces brings about various benefits such as fair prices, technical analyses, and market stability.

P 5 "*Cryptocurrencies are associated with market liquidity risks*"

The crypto market is fragile and illiquid because it has few participants that buy and sell the crypto assets. The few market participants limit the depth of the market and minimise the capacity to take in large trading volumes. The small size of the market implies that small forces can create a large impact on prices that de-stabilises the market and causes speculation to increase. Market liquidity may also be caused by operational issues in the trading market, which leads to stratification of the market structure. The crypto trading market lacks the relevant rules and regulations and experience continued market disruptions that result in a massive financial loss for the investors. The strong network in the traditional financial market boosts the market liquidity by creating a connection between buyers and sellers. The crypto trading platforms lack the brokers, dealers, and systemic regulations that improve operational efficiency and strong networks.

Participants 6 and 7 stated that cryptocurrencies are associated with leverage risks. The crypto trading market has greater risk exposure to the investors and creditors. In crypto trading platforms, the investors use leverage to develop strategies that allow them to earn profits on the movement in value of the crypto currency.

P 7 "*The leverage creates high volatility and risk transmission within the market which implies that investors own less equity that can absorb market loss*".

The leverage risk can spread rapidly to other investment entities. The leverage risks in the crypto trading market are dangerous for new investors who may fail to understand the exposure upon making investments in crypto assets. Investors in the crypto market use debt financing to fund the purchase of assets generating the leverage risk that may affect the performance in the market. Leverage magnifies the investment profits in situations where the returns from different crypto assets offset the costs of borrowing. The leverage in the market accelerates volatility of the crypto market, which makes investors speculate the prices of assets. Speculation within a leveraged market transmits the risks to other markets within an economy, hampering growth and development.

Participants 8 and 10 stated that cryptocurrencies are associated with operational risks. Cryptocurrencies are affected by security risks such as immutability; whereby, the transactions cannot be reversed once they are completed.

P 10 "*The operation within the trading platform is characterised by security risks that are a threat to the stability of the virtual markets*".

Crypto trading transactions are not reversed; hence, requires proper security considerations should be considered to keep the virtual market secure. The centralised clearinghouse allows transactions to be completed without giving an option for investors to reverse in cases where there are operational mistakes. Lack of regulations and a structure of governance of the crypto markets contribute to the emergence of operational risks. Errors during the transaction affect the operation of the crypto currency. Additionally, fraud, hacking, and cybersecurity are the security threats that the crypto trading platforms face. Online criminals leverage weak security standards to drain the investors' wallets by creating malware through the internet. The risk exposure threatens the investors' value and may result in losses if the exposure to the risks occurs. Trading platforms with weak security measures are vulnerable to this type of risk, which results in the collapse of the markets and losses for the clients. Investors prioritise operational and security issues within the crypto market before investing in the assets. In this sense, there is a need for enacting appropriate regulation of the trading platforms to create governance

structures that can promote operational efficiency and tackle the technological limitations that may create uncertainty within the market.

4.2.2 Results from the Secondary Sources

4.2.2.1 Crypto Trading in Turkey and How It Links to the Banking Processes. The expansion of the crypto trading market occurred rapidly, leading to the growth into the Turkish market. Presently, crypto-trading is not specified under law, but there are no regulatory restrictions on the use of these virtual currencies. Therefore, the crypto trading ecosystem requires regulation to ensure that the investors are protected from market shocks and insecurity issues. However, Fatoki and Wanjagi (2019) argued that the crypto currencies do not meet the requirements of being considered electronic money within the current scope of Turkish law. Crypto currencies have no legal infrastructure in Turkey, making the ecosystem of their trading to be conducted in countries that have laws that regulate the exchange of virtual assets. In this sense, the results demonstrate that cryptocurrencies would not impact performance of banks.

Most of the countries across the world rely on the US to legalise the crypto trading system before they adopt the regulatory framework to guide the exchange in the market (De Meijer, 2016). Turkey is among the global states that rely on the US to develop regulations regarding the crypto currency money market. There are no legal regulations governing crypto trading in Turkey hence the need to rely on global leaders (Arias-Oliva et al., 2019). The issuance of cryptocurrency as a form of digital money creates an obligation for the finances to be kept in the account, contrary to the operation of the trading systems, which advocates for continued exchange. However, crypto trading system is not considered to be electronic money because of the risks that previously occurred in the economy, making the legal basis for crypto trading to be impossible (Bech & Garratt, 2017). Additionally, there is no legal provision in the Turkish currency value protection law that prevent the widespread use of crypto money and its subsequent trading. The ecosystem in Turkey is characterised by the lack of proper policies and guidelines that define the legality of virtual currency. The analysis demonstrates that cryptocurrencies do not impact the banking processes because of lack of policies to guide the execution of the activities.

The number of business that accepts the Bitcoin has increased, which has greatly boosted diversity in investment and modes of doing business (Bech &

Garratt, 2017). The ecosystem is dominated by various sectors where businesses such as restaurants, real estate entities, and education institutions use the cryptocurrency; hence, expanding the trading platform. The cryptocurrency users in the financial market are protected against foreign exchange risks by the internal market policies developed by banks (Giudici et al., 2020). Turkey is among the top countries where the development of crypto trading has been witnessed and the technology is being used to make international money transfer quicker and easier. The result indicates that Crypto trading ecosystem has expanded, with the number of people using virtual money continuing to increase annually. The trading platforms ensure that the banking process is linked appropriately to improve the activities in the country and promote business diversity.

The crypto trading has been continuing to grow and has a potential to develop the currency into transfer and investment instruments (Arias-Oliva et al., 2019). The shift from credit money to cryptocurrency is considered to be the modern development to protect the economy from financial and currency crises that are considered to be more disruptive. Crypto trading in Turkey has significantly grown despite the presence of economic problems such as unemployment, inflation, and chronic deficits. Crypto trading is a positive development within the financial market by linking the banking process to ensure that there is adequate hedging against inflation and the drop in value of the national currency (Fatoki & Wanjagi, 2019). Although the government and the Banking Regulation and Supervision Agency in Turkey does not recognise the cryptocurrencies as legal tender, they have opted to monitor the development before taking actions to regulate crypto trading and its ecosystem. Turkey's crypto trading ecosystem has developed rapidly because of the geopolitical tensions coupled with an unfavourable macroeconomic environment that put it among the top countries across the world. The results indicate that the development in the crypto trading market has contributed to a significant increase in the number of people owning the crypto currency as compared to other European nations making the ecosystem to be attractive for investments.

Despite being extremely volatile, the crypto trading ensures that the exchange fluctuations of the Turkish Lira against the dollar make the volatility to be calmer. Bitcoin is the most held cryptocurrency, with many people holding virtual money (De Meijer, 2016). The trend is likely to continue rising given the

presence of geopolitical risks as a result of the political differences and international stands. Some investors are reluctant to adopt the trading strategy for fear of being victims due to the lack of a legal framework that regulates the use and exchange of virtual currencies (Bech & Garratt, 2017). Therefore, efficiency in crypto trading will be attained once the government and the Banking Regulation and Supervision Agency develop appropriate regulatory provisions that guarantee confidence among the holders of Bitcoin and other forms of cryptocurrencies. Turkey's political stability and crypto infrastructures that sustain a stable virtual trading ecosystem should be actualised by the state given the high number of users of crypto money.

4.2.2.2 Ways Crypto-Trading Improve Stability and Performance.

Crypto trading in the banking industry is gaining prominence despite issues such as cryptocurrencies being perceived as a financial medium for cyber-criminals' involvement in dark web activities (LeBlanc, 2016). The recent increase in the economic value of Bitcoin has created the perception that crypto trading as one of the viable forms of investment in the financial sector. If stakeholders in the banking industry collaborate towards improving the efficiency of block-chain technology, crypto-trading activities in Turkish banking institutions will be faster and ready for financial market disruptions (Giudici et al., 2020). One of the characteristics of crypto-trading, which double as an advantage, is one-to-one affairs. Crypto-trading activities in the banking sector are based on peer-to-peer networking structures, which eliminate the need for middlemen. The result implies that banks can achieve greater clarity in financial audit trails, which improves transparency in financial sector dealings.

Crypto trading will enable banking institutions to implement and enforce two party-contracts apart from facilitating specialist modes of value transfer when transferring assets (Boshkov, 2019). Regarding to this, the results demonstrate that banks can design crypto-currency contracts to include third-party approvals and make reference to external facts. Being one of the parties to such contracts, banks will achieve more sustainability through exclusive governance of their crypto trading accounts. In the long run, Turkish financial institutions will be better positioned to minimise the costs and time required to make asset transfers.

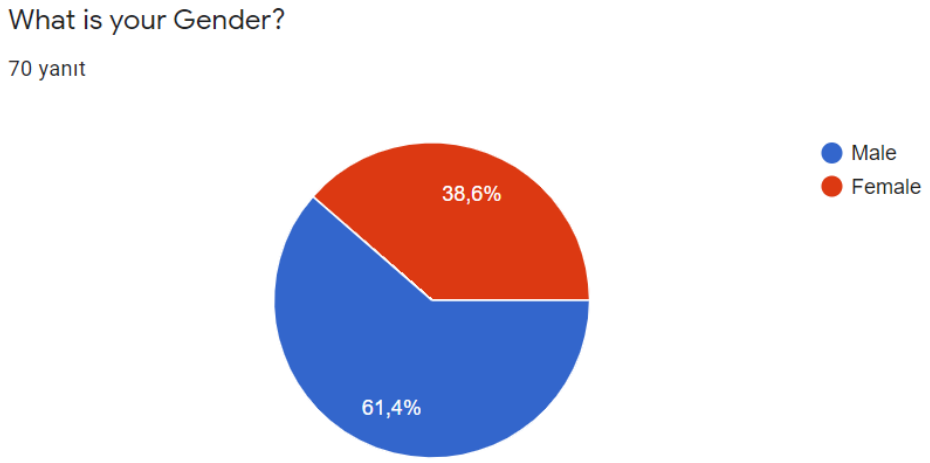
4.3 Quantitative Results

In the current section, the outcomes of the survey have been presented regarding crypto trading and the extended effects on banking sector in Turkey. The responses are based on the perceptions of 70 participants and 100% rating was evident in the sense that majority of the participants confirmed to have understood the ethics consent form over the proposed study and that all clarifications were clear to them.

4.3.1 Demographic Information

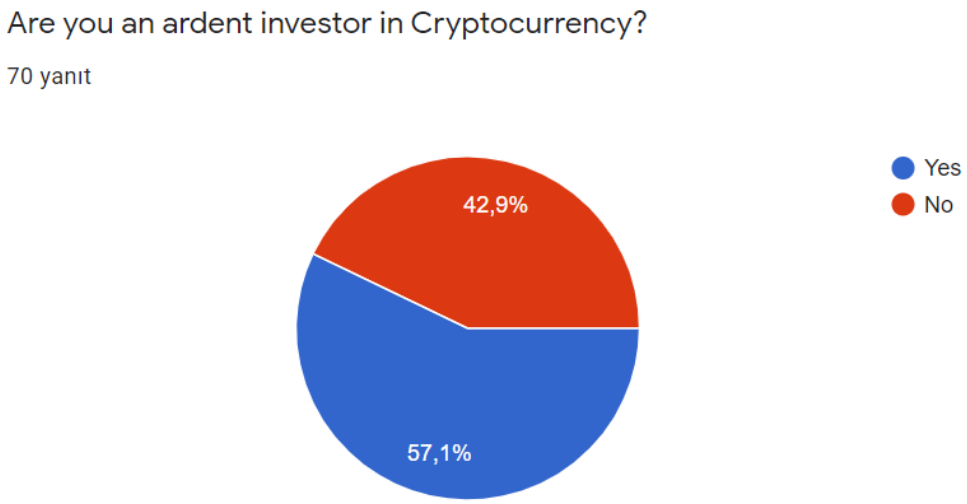
From the results, it is evident that 61.4% of the participants were males while 38.6% being females, which depicted that crypto trading in Turkey is dominated by the male gender. Figure 2 below illustrates the same distribution.

Figure 2: Gender distribution



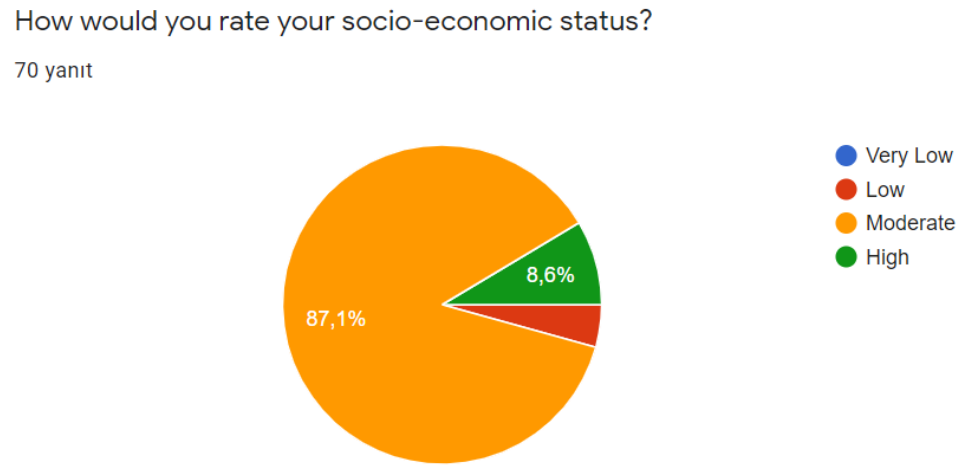
The study sought to establish whether the participants considered them as ardent investors in cryptocurrency, whereby 42.9% said no while 57.1% agreed with the matter. See Figure 3 below, which illustrates the outlook.

Figure 3: Orientation towards investing in Cryptocurrency



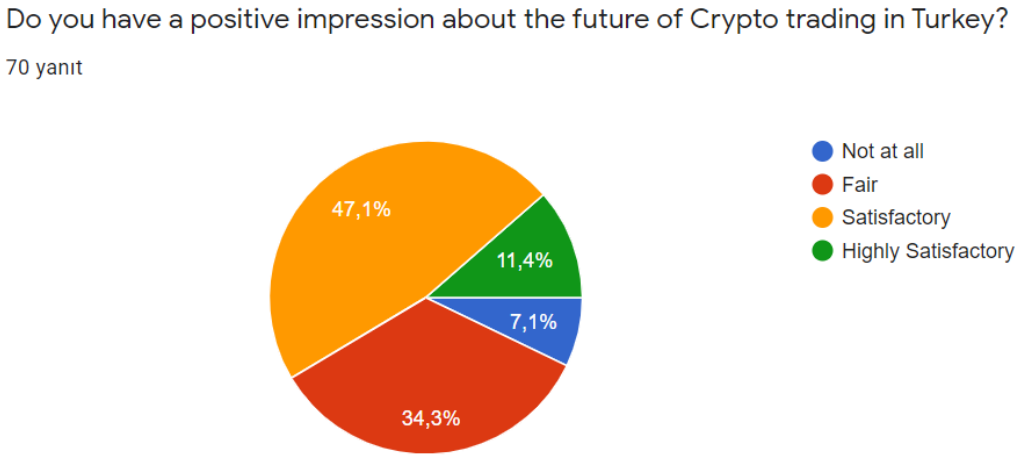
Further the respondents were asked to rate their socio-economic status and 87.1% indicated it to be of a moderate nature while 8.6% categorising it as high; and only 4.3% depicted it to below. The same results are depicted under Figure 4 below, whose importance demonstrates whether there are socio-economic gaps in the choices to invest in crypto trading among the participants.

Figure 4: Socio-economic status



Lastly, the researcher sought to understand whether the participants had a positive impression regarding the future of crypto trading in Turkey. As an outcome, it was evident that 34.3% of the participants rated it as fair while 47.1% maintained that it was satisfactory. On the other hand,11.4% stated that it is highly satisfactory, although 7.1% had a negative impression. The above results are summarised using a pie-chart shown in Figure 5 below.

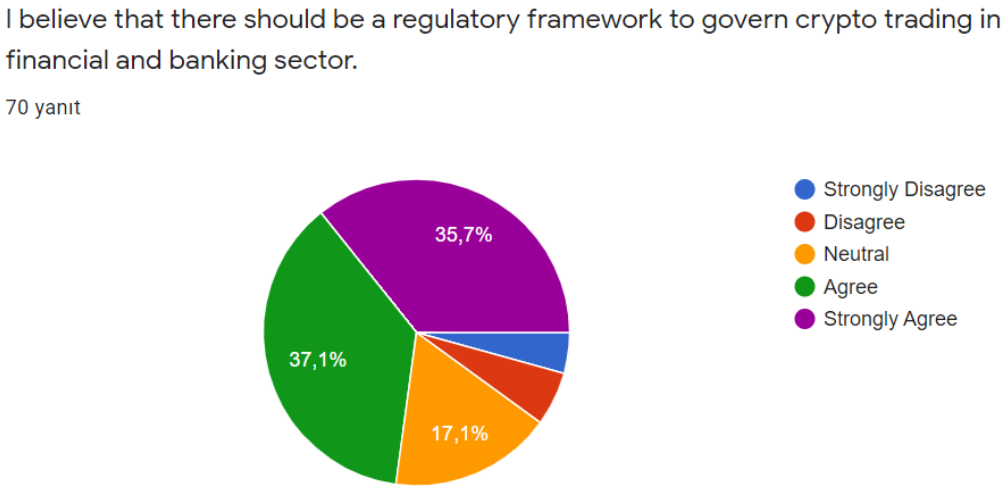
Figure 5: Impression of crypto trading



4.3.2 Perceptions on Crypto Trading and the Banking Sector

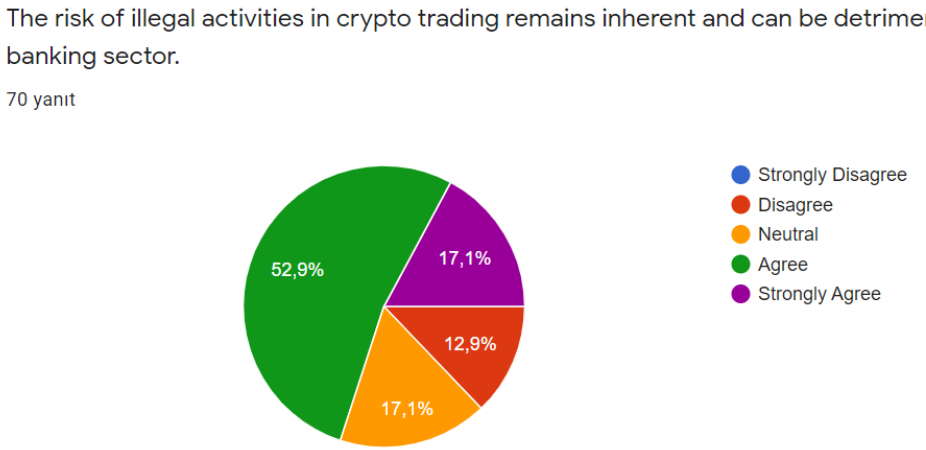
In this section, the key feedback on crypto trading and its impact on the banking sector in Turkey has been addressed. For instance, it was sought whether the participants believed there should be a regulatory framework to govern crypto trading in the banking sector in Turkey. As evidenced in Figure 6 below, 35.7% of the participants strongly agreed with the matter, while 37.1% agreed, and 17.1% were neutral. However, 10% of the respondents gave dissenting views about the matter in question. The researcher interpreted from this feedback that there is a strong perception among potential investors of the need to regulate cryptocurrency in Turkey; the significant point, however, been whether this can enhance the banking sector in the region.

Figure 6: Regulation of crypto trading



In another context, 52.9% of the participants agreed that the risk of illegal activities in crypto trading remains inherent and can be detrimental to the banking sector, while 17.1% strongly agreed with the same position. Then, 17.1% were neutral and 12.9% disagreed with the matter in question. Thus, from this outcome it was clear from the participants' views that illegal transactions emanating from crypto trading would have adverse effects on the banking sector in Turkey. Figure 7 below depicts the same results using a pie-chart.

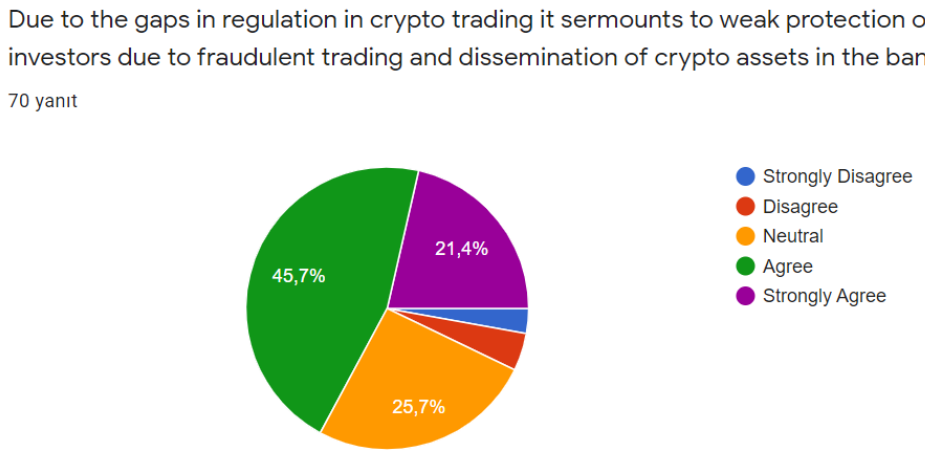
Figure 7: Illegal activities of crypto trading



Further analysis indicated that majority of the participants i.e., 45.7% (agreed) and 21.4% (strongly agreed) were in support of the urgency to reinforce regulation of cryptocurrency in the banking sector. Of significance is the finding that a similar majority of the participants held that as a result of existing gaps in regulation for crypto trading it led to weak protection of the investors; this is

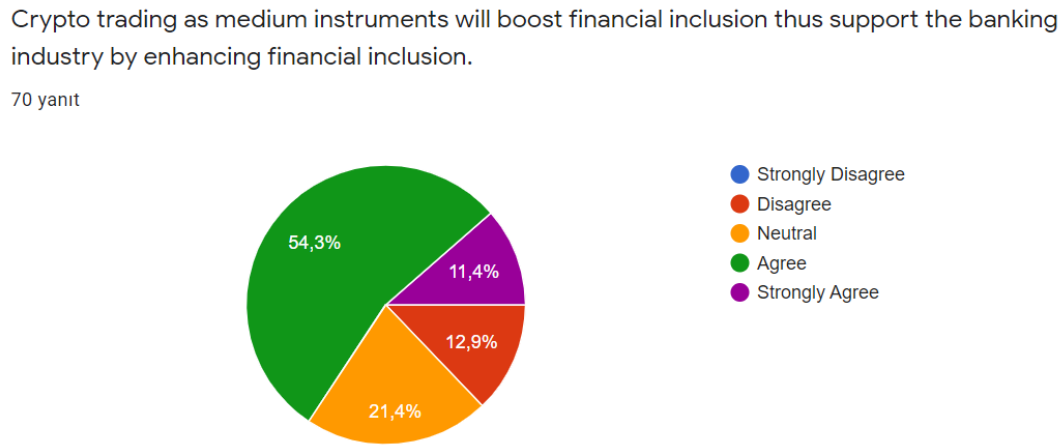
attributable to the fraudulent trading as well as dissemination of crypto assets in the banking sector. The actual results are as shown under Figure 8 below and they put emphasis on the alleged negative effects of cryptocurrencies in Turkey in the event there lacks steady measures such as good laws and regulations.

Figure 8: Effects of gaps in regulation in crypto trading



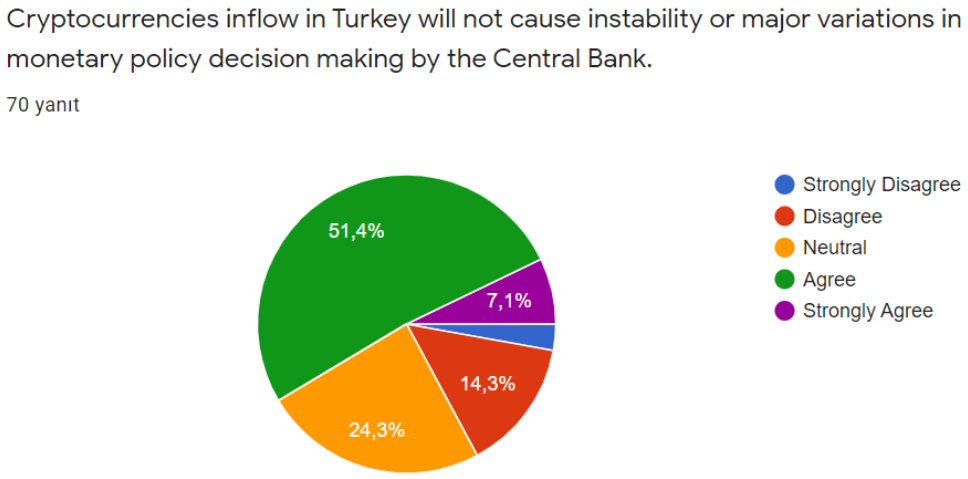
Another important feedback from the survey was that 54.3% of the participants agreed that crypto trading as medium instrument has the capacity to boost financial inclusion, in this case, supporting the banking industry in this domain. From the results, it was evident that 54.3% of the participants agreed with the matter, while 11.4% strongly agreed while 21.4% were neutral about the same. However, 12.9% disagreed with the matter but this was a minority sample, thus confirming the strong impact of crypto trading on the banking sector in Turkey in terms of financial inclusion. Figure 9 illustrates the same results using a pie-chart.

Figure 9: Crypto trading and financial inclusion in the banking sector



The study established from a majority of the participants that cryptocurrencies inflow in Turkey would cause less instability or major variations in the monetary policy decisions undertaken by the Central Bank. For instance, 51.4% of the participants agreed, 7.1% strongly agreed, 24.3% were neutral about the matter while 14.3% disagreed as shown in Figure 10 below.

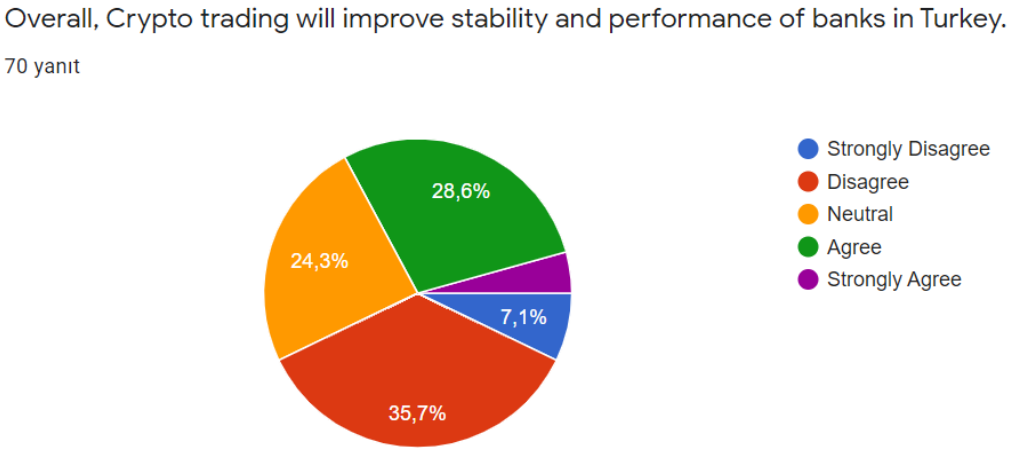
Figure 10: Cryptocurrencies inflow and monetary regime



The illustration in Figure 10 above could be a positive indicator of growth in the banking sector in Turkey since policy stability from the central bank allows banks to operate in an enabling and profitable environment.

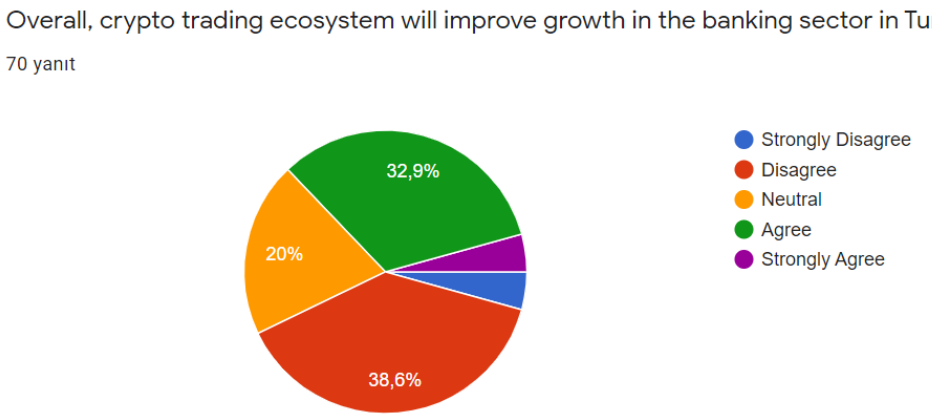
As depicted in Figure 11, 35.7% of the participants disagreed that crypto trading will improve stability and performance of banks in Turkey while 24.3% being neutral and 28.6% agreeing with the matter in question; another 7.1% strongly disagreed with the issue as illustrated below.

Figure 11: Crypto trading, improved stability, and performance of banks



In line with the above, 38.6% of the respondents does not agree that crypto trading ecoystem will improve growth in the banking sector in Turkey but 32.9% also agreed with the matter. 20%, on the other hand, were neutral, while 4.3% strongly disagreeing with the issue. See Figure 12 below for the actual outlook of the above information.

Figue 12: Crypto trading ecosystem and improved growth



In summary, the researcher holds the position that there is still much to be weighed and tested to affirm the actual significant effects of crypto trading on the growth and stability of the banking sector in Turkey. However, looking at the trends throughout the survey, there is a strong indication that there should be regulations over the crypto-trading and even if the most of the participants think crypto trading will cause a negative impact on banking industry there are still many of them have an optimistic view that there are going to be long-run growth of the banking sector in Turkey as a result of crypto trading.

4.3.3 Hypothesis Testing on Dataset

To test the correlation between the dependent and independent parameters in the survey dataset have been used Indepented t-testing and Chi-squre testing; t-test is a statistical testing method to analyze means between 2 groups (Scribbr, 2020) and chi-square test is again statistical testing to evalute dependancy between variables (Ugoni 1995).

At first, chi-squre testing has been performed to analyze if the investment decision differs by gender, so are there any correlation in being an investor between men and women.

X: Women

Y: Men

H(0): There is a meaningful correlation between gender and being investor

H(1): There are no any meaningful correlation between gender and being investor

Participant gender * investor or not crosstabulation (table-1);

			Investor or not		
			Investor	Not Inverstor	**Total**
Participant Gender	Women	Count	18	9	**27**
		Expected Count	15.4	11.6	**27.0**
	Men	Count	22	21	**43**
		Expected Count	24.6	18.4	**43.0**
Total		Count	40	30	**70**
		Expected Count	40.0	30.0	**70.0**

Chi- Square Testing (table-2);

	Value	df	Asymptotic Significance (2- sided)	Exact Sig. (2- sided)	Exact Sig. (1- sided)
Person Chi-Square	1.628[a]	1	0.202		
Continuity Correction	1.056	1	0.304		
Likelihood Ratio	1.648	1	0.199		
Fisher`s Exact Test				0.255	0.152
Linear by Linear Association	1.605	1	0.205		
N of Valid Cases	70				

a. 0 cells (0.0%) have expected count less them 5. The minimum expected count is 11.57.
b. Computed only for a 2x2 table.

As can be seen on above in table-1, there are 27 women and 43 men surveyed in dataset and 40 of them are investors, 30 of them not. To understand if chi-square testing is applicable, no more than 20% of values in table-1 must not be less than 5; and as can be followed, there are no any value less than 5 in the table.

In table-2, Chi-square testing results have been presented and when analysed the results in table, significance value (p) for testing is 0.202, so more than 0.05 ($p>0.05$) which means the variance is not significant and there is no significant correlation between gender and being investor.

Conclusion:

- *$P>0.05$; H(1): There are no any meaningful correlation between gender and being investor*

Secondly, independent t-test has been performed to understand if the decision on crypto trading regulation differs between investors and non-investors.

X: Investor

Y: Non-investor

H(0): $X=Y$ (There are no any difference between investor and non-investor)

H(1): $X\neq Y$ (There is a difference between investor and non-investor)

Group Statistics;

		N	Mean	Std. Deviation	Std. Error Mean
Regulation decision	**Investor**	40	3.95	1.061	0.168
	Not investor	30	3.93	1.112	0.203

Independent Samples Test;

		Levenee`s test for equality of Variances		t-test for equality of means							
						Significance				interval of difference	
		F	Sig.	t	df	One-sided	two-sided	Mean difference	Std. error difference	Lower	Upper
Regulation decision	Equal variances asssumed	0.114	0.737	0.064	68	0.475	0.949	0.017	0.262	-0.505	0.539
	Equal variances not asssumed			0.063	60.977	0.475	0.95	0.017	0.263	-0.51	0.543

As shown on table above, there 40 investors and 30 non-investors surveyed and the mean for 3.95 and 3.93 respectively and values are very close to each other.

In the second table, the significance value (p) can be seen as 0.737 in Levene`s test, p>0.05, that means the variance is not significant and the variations of the groups are homogeneously distributed in the population.

Conclusion and summary:

- *t(68)= 0.064, p>0.05;*
- *As a result of the independent samples t-test, it was found that there are no any significant difference between investors (mean=3.95, sd=1.061) and non-investors (m=3.93, sd=1.11) decision on the need for regulation on cryptocurrencies. t(68)= 0.064, p>0.05.*

In summary, according to result in above, both investors and non-investors believe that there should be regulatory framework to govern crypto trading and it is fair to say that due to this un-regulatory environment participants are feeling uncomfortable and insecure.

And the 3rd testing has been performed to understand if the decision differs between investors and non-investors on whether crypto trading is improving the banking industry.

X: Investor

Y: Non-investor

H(0): X=Y (There are no any difference between investor and non-investor)

H(1): X≠Y (There is a difference between investor and non-investor)

Group Statistics;

		N	Mean	Std. Deviation	Std. Error Mean
Crypto trading will improve the banking sector	**Investor**	40	2.88	1.017	0.161
	Not investor	30	3.03	1.066	0.196

Independent Samples Test;

		Levenee`s test for equality of Variances		**t-test for equality of means**							
						Significance				**interval of difference**	
		F	Sig.	t	df	One-sided	two-sided	Mean difference	Std. error difference	Lower	Upper
Crypto trading will improve the banking	Equal variances asssumed	0.448	0.506	-0.631	68	0.265	0.53	-0.158	0.251	-0.659	0.34
	Equal variances not asssumed			-0.627	60.988	0.267	0.533	-0.158	0.253	-0.663	0.34

Again, if we analyse the Levene`s test result in 2nd table, the significance variance level is 0.506, that means >0.05 and not significant.

Conclusion and summary:

- *t(68)= -0.631, p>0.05;*
- *As a result of the independent samples t-test, it was found that there are no any significant difference between investors (mean=2.88, sd=1.017) and non-investors (m=3.03, sd=1.066) decision on whether crypto trading is improving the banking* industry. *t(68)=- 0.631, p>0.05.*

In summary, both investors and non-investors are not quite confident that cryptocurrency will have a positive impact on enhancing banking sector. There is still not sufficient knowledge if it is possible to say how it may impact the bank at least by protecting their stability.

Another t-testing has been performed for the question "I find cryptocurrency as a convenient medium of exchange." And to understand if there are any significant differences between gender (T- testing 1) or investment decision (T-testing 2) who accepts the cryptocurrency as a medium of exchange.

T-testing 1 (gender comparison);

X: Women

Y: Men

H(0): X=Y (There are no any difference between women and men)

H(1): X≠Y (There is a difference between women and men)

Group Statistics;

		N	Mean	Std. Deviation	Std. Error Mean
Crypto currency is convenient medium of exchange	**Women**	27	4.11	0.698	0.134
	Men	43	3.37	1.047	0.16

Independent Samples Test;

		Levenee`s test for equality of Variances		t-test for equality of means							
						Significance				interval of difference	
		F	Sig.	t	df	One-sided	two-sided	Mean difference	Std. error difference	Lower	Upper
Crypto currency is convenient medium of exchange	Equal variances asssumed	9.648	0.003	3.239	68	<0.01	0.002	0.739	0.228	0.284	1.194
	Equal variances not asssumed			3.542	67.705	<0.01	<0.01	0.739	0.209	0.323	1.155

This time significance level under Levenee`s testing is 0.003, so <0.05. It is obvious that there is a significant difference between women and men accepting the cryptocurrency as a convenient exchange.

Conclusion:

- *t(67.705)= 3.542, p<0.05;*
- *As a result of the independent samples t-test, it was found that there is significant difference between women (mean=4.11, sd=0.698) and men (m=3.37, sd=1.047) decision on whether cryptocurrency is convenient medium of exchange. t(67.705)= 3.542, p<0.05.*

T-testing 2 (Investment decision comparison);

X: Investor

Y: Non-investor

H(0): X=Y (There are no any difference between investor and non-investor)

H(1): X≠Y (There is a difference between investor and non-investor)

Group Statistics;

		N	Mean	Std. Deviation	Std. Error Mean
Crypto currency is convenient medium of exchange	**Investor**	40	4.1	0.709	0.112
	Not investor	30	3.07	1.015	0.185

Independent Samples Test;

		Levenee`s test for equality of Variances		t-test for equality of means							
						Significance				interval of difference	
		F	Sig.	t	df	One-sided	two-sided	Mean difference	Std. error difference	Lower	Upper
Crypto currency is convenient medium of exchange	Equal variances asssumed	5.96	0.017	5.016	68	<0.01	<0.01	1.033	0.206	0.622	1.444
	Equal variances not asssumed			4.772	49,210	<0.01	<0.01	1.033	0.217	0.598	1.468

As a parallel to the gender testing above, the significance level in Levenee`s testing for Investors and non-investors also <0.05 which is expected and that means most of the investors are very positive about cryptocurrency is convenient medium of change.

Conclusion:

- *t(49.210)= 4.772, p<0.05;*
- *As a result of the independent samples t-test, it was found that there is significant difference between investors (mean=4.1, sd=0.709) and non-investors (m=3.07, sd=1.015) decision on whether cryptocurrency is convenient medium of exchange. t t(49.210)= 4.772, p<0.05.*

Combined result analysis above is given that investors are more positive about cryptocurrency future, they find it less risky and believing that this is very convenient exchange and will continue to be so and also investor women seem more confident that cryptocurrency is a convenient exchange than men, some of men is more hesitant and even if they are investing, they are not quite sure if this will be a convenient medium of exchange in long term. In conclusion, it is possible to say that if the women are investing the cryptocurrency, they are mostly believing that this a convenient medium of exchange and has a positive impression on its future position but even if they are investors men could be negative or uncommitted.

T-testing has also been performed the questions below to understand the correlation between **investor** and **non-investor**;

a) "*Cryptocurrencies inflow in Turkey will not cause instability or major variations in the monetary policy decision making by the Central Bank."*

X: Investor

Y: Non-investor

H(0): X=Y (There are no any difference between investor and non-investor)

H(1): X≠Y (There is a difference between investor and non-investor)

Group Statistics;

		N	Mean	Std. Deviation	Std. Error Mean
Cryptocurrency will not cause instability in the monetary policy decision making by Central Bank	**Investor**	40	3.75	0.742	0.117
	Not investor	30	3.07	1.015	0.185

Independent Samples Test;

		Levenee`s test for equality of Variances		t-test for equality of means							
						Significance				interval of difference	
		F	Sig.	t	df	One-sided	two-sided	Mean difference	Std. error difference	Lower	Upper
Cryptocurrency will not cause instability in the monetary policy decision making by Central Bank	Equal variances asssumed	3.888	0.53	3.255	68.000	<0.01	0.02	0.683	0.21	0.264	1.102
	Equal variances not asssumed			3.115	50.863	0.02	0.03	0.683	0.219	0.243	1.124

Conclusion and summary:

- *t(68)= 3.255, p>0.05;*
- *As a result of the independent samples t-test, it was found that there is no significant difference between investors (mean=3.75, sd=0.742) and non-investors (m=3.07, sd=1.015) decision on whether cryptocurrency is convenient medium of exchange. t(68)= 3.255, p>0.05.*

As can be seen above both investors and non-investors believe that cryptocurrency will not impact the Central Bank decision on monetary policy. Especially in a short-term period they don`t believe cryptocurrency will have that much effect on Central Bank.

b) *"Crypto-currency will promote credibility, transparency and accountability in the banking sector in Turkey."*

X: Investor

Y: Non-investor

H(0): X=Y (There are no any difference between investor and non-investor)

H(1): X≠Y (There is a difference between investor and non-investor)

Group Statistics;

		N	Mean	Std. Deviation	Std. Error Mean
Cryptocurrency will promote credibility, transparency and accountability in the banking sector in Turkey	**Investor**	40	3.7	0.992	0.157
	Not investor	30	2.9	0.995	0.182

Independent Samples Test;

		Levenee`s test for equality of Variances		t-test for equality of means							
						Significance				interval of difference	
		F	Sig.	t	df	One-sided	two-sided	Mean difference	Std. error difference	Lower	Upper
Cryptocurrency will promote credibility, transparency and accountability in the banking sector in Turkey	Equal variances asssumed	0.001	0.981	3.334	68	<0.01	0.01	0.8	0.24	0.321	1.279
	Equal variances not asssumed			3.3333	62.535	<0.01	0.01	0.8	0.24	0.32	1.28

Conclusion and summary:

- *t(68)= 3.334, p>0.05;*
- *As a result of the independent samples t-test, it was found that there is no significant difference between investors (mean=3.7, sd=0.992) and non-investors (m=2.90, sd=0.995) decision on whether cryptocurrency is convenient medium of exchange. t(68)= 3.334, p>0.05.*

As a result of testing above it seems there are not any significant variance between investors and non-investors decision however, when we analysis the detail responses it will be fair to say investors are more positive that cryptocurrency will promote credibility, transparency and accountability in Turkey in a long term while non-investors are more neutral about their opinion.

c) *"Adoption of crypto trading in Turkey has been a relieve for us as investors in incurring excess service fee in conversion charges and exchange rates."*

X: Investor

Y: Non-investor

H(0): X=Y (There are no any difference between investor and non-investor)

H(1): X≠Y (There is a difference between investor and non-investor)

Group Statistics;

		N	Mean	Std. Deviation	Std. Error Mean
Adoption of crypto trading in Turkey has been a relieve for us as investors in incurring excess service fee in conversion charges and exchange rates.	**Investor**	40	3.98	0.698	0.11
	Not investor	30	3.23	0.858	0.157

Independent Samples Test;

		Levenee`s test for equality of Variances		t-test for equality of means							
						Significance				interval of difference	
		F	Sig.	t	df	One-sided	two-sided	Mean difference	Std. error difference	Lower	Upper
Adoption of crypto trading in Turkey has been a relieve for us as investors in incurring excess service fee in conversion charges and exchange rates.	Equal variances asssumed	4.21	0.044	3.987	68	<0.01	<0.01	0.742	0.186	0.37	1.113
	Equal variances not asssumed			3.87	54.837	<0.01	<0.01	0.742	0.192	0.358	1.126

Conclusion and summary:

- *t(54.837)= 3.87, p<0.05;*
- *As a result of the independent samples t-test, it was found that there is significant difference between investors (mean=3.98, sd=0.698) and*

non-investors (m=3.23, sd=0.858) decision on whether cryptocurrency is convenient medium of exchange t(54.837)= 3.87, p<0.05.

The significance level on the Levenee`s testing is <0.05, thus it is obvious that there is a significant difference between investors and non-investors in decision whether adoption of crypto trading is reducing the service fee in conversion as expected. Most of the investors experienced and agreed that the transaction costs are more less in crypto trading and it is feasible to say that non-investors are a bit prejudicial about it.

CHAPTER FIVE: DISCUSSIONS

The focus of the study has been to establish the trends in crypto trading and the extended effects on the Banking System in Turkey. At the onset of the study, it had been stated that cryptocurrencies dynamism had paused major risks to both financial and monetary systems due to fraudulent activities, financial crimes, exploitation of consumers, and violation of data protection, just to mention a few. Therefore, in this discussion, the researcher sets out to examine the findings of the study that have been drawn from multifaceted sources i.e., the use of triangulation in data and effectively cement the arguments around the problem study. Other than that, the key investigations in the study include the following: (a) An evaluation of the development of Crypto Trading ecosystem in Turkey and how this could change the banking environment (b) a quest to build a prediction model that depicts how Crypto Trading is going to impact the stability and performance of banks in Turkey (c) a quest to recommend applicable systems and policies that can be used to integrate c Crypto Trading to the banking system in Turkey, while managing the associated risks.

The study's objectives were addressed from various angles in the context of both qualitative and quantitative data-driven reviews. The key discussions are presented next.

5.1 Discussion of Primary Qualitative Findings

For instance, the results of the qualitative research guided by the interview findings established perceptions and opinions around the matter of the influence of cryptocurrency trading ecosystem on banks' performance in Turkey. The assessment was in line with objective 1 of the study. In this review, it was asserted that cryptocurrency trading ecosystem will negatively impact the banking systems and performance in Turkey. In the same review, it was stated that the development of cryptocurrency, especially the market capitalisation factor, was reported to impact on deposit variability; the actual statement from this opinion was that a unidirectional causality exists between digital currency market capitalisation and deposit variability in the banking sector. The results contradict the literature by Liu et al. (2019), given that this author attributed the low-cost transactions supported by cryptocurrencies as increasing the traded volumes from which banks profit from the depositors. The other matter emerging from the qualitative findings pointed to the

hedging solutions of the cryptocurrency in the banking sector in the sense in which they were regarded as alternatives or optional asset investments. In the past literature, contrary to the negative relationship evident in the study's findings, authors such as Larkin et al. (2020) and Saleh & Shayor (2020) affirmed the positive role of cryptocurrencies as an optional ecosystem for banks to diversify in multiple forms of payments, improved value store, and overall stability of the coin as an alternative finance mechanism. The findings from the qualitative findings re-affirmed the hedging solutions that arise from the cryptocurrency trading within Turkey's banking sector, especially the mention of the fact that it serves as a substitute to existing financial systems at the same time eliminates the deficit provision that affects the traditional banking service model in Turkey. The same issue on cryptocurrencies overcoming deficit provision faced by banks and in a special way, that of Turkey is evident in the research by Vardar and Aydogan (2019) and Erol et al. (2020). Worth discussion is the fact that cryptocurrencies, due to their digital fluidity, were regarded to spread out faster as to reach remote areas in Turkey that banks cannot; here, it would be termed as the expansion of the geographical reach which enables banks to tap the same potential markets by providing solutions for large and swift transactions. The same position is present in the literature by Corbet et al (2018) and Verstein (2019) in the sense in which they stated that banks are benefiting from the expended use of digital currency by providing secure platforms for such transactions. In line with the above, it was decoded from the qualitative findings that cryptocurrencies have offered the banking sector in Turkey complementing models that render the already established financial systems to have meaning to the cohort that engages in such trading. Fundamentally, the sentiments expressed in the qualitative findings were that due to cryptocurrency becoming an investment solution in Turkey, it has also led to the growth of the infrastructure of the banking industry due to the increasing number of transactions. Similar assertions are also supported in the research by Makarov and Schoar (2020); Cointelegraph (2020) and Miraz et al. (2020), whereby the authors affirmed that there had been an increasing registration in crypto-currency trading in Turkey and banks have been utilising the popularity of digital currency by opening platforms for related transactions. In other words, banks play the intermediate role by offering depository solutions to the growing number of crypto traders across the geographic wide. Therefore, as noted in the study's findings cryptocurrencies were

considered to have created more opportunities in the banking sector in the sense of risk diversification at the same time increasing economic activity of the bank; in addition, the participants noted that financial innovations will increase the potential of Turkey's banking sector to capitalise on multifaceted payment systems or exchange systems. The above sentiments, especially on increased banking activities in Turkey due to crypto trading, been evidenced in the works by Doyduk (2019), where spread of the cryptocurrency financial market rendered banks to provide payment solutions to the investors; in a different context, Hays and Kirilenko (2019) noted on the impact of reduced foreign exchange transaction costs to the bank in the sense in which crypto trading has attracted lowest interest rates due to its unregulated nature of transactions. The authors, in this case, upheld the views of the participants who noted that crypto trading had created a speculative trading investment that has been adumbrated by the reduced cost of exchange rates. However, the researcher finds a limitation in this observation since the participants and neither the previous scholars demonstrated in detail how crypto trading has managed to lower the cost of foreign exchange rate, yet the latter money markets are highly regulated. In that case, it was not clear how the foreign exchange market that is more regulated and centralised can be manipulated by the trajectory of the performance of the digital currency market. As such, this will need further review and justification in future studies. In tandem with the assertions above, the interview findings supported the fact that cryptocurrencies will be offering the banking sector in Turkey solutions and options for payment methods. The fact of the cryptocurrencies being optional mediums of exchange and optional payment systems for banks is supported in the literature by Kshetri and Voas, (2017), Tu et al. (2020), and Hin (2020). In fact, from the study's primary findings, it was a strong re-affirmation that cryptocurrencies offer banks portfolios for risk management, which in the sense in which banks also use the same to hedge against uncertainty in the economic performance. Inasmuch as these assertions aligned to the works by Bariviera et al. (2017); Massad (2019); and Demir et al (2018) on the capacity of banks to diversify portfolios in the digital currency market, the researcher still holds the position that: there is a need to understand and explore more how hedging is being achieved in the banking sector in Turkey through the digital currencies. Consequently, there needs a clear and detailed demonstration from financial experts' point of view how hedging has been derived from the dynamics of crypto

trading for the benefit of banks, including an event record of the proceeds of risk reduction either in the foreign exchange risk or stock market process of banks due to cryptocurrency inflow in Turkey. The researcher appraises the fact that in Turkey, especially the banks, there should be a statutory disclosure provision that should compel the management or the board of directors to account on how the hedging solutions capitalising on digital currency trading in the region will impact the profitability of banks both in the short-run and the in the long-run. The investors such as the ordinary shareholders of banks or capital providers have a right to know how the banks' board of directors will be benefiting from the digital currency environment and the role or impact such has on the entire cash flow system of the bank i.e., the return on investment among other issues that are of interest to the capital providers. In other words, the position that cryptocurrencies impact on the banking sector negatively or positively verified and be an ipso facto position as opposed to being speculation or unfounded opinion; it should be clear to the investors in Turkey how such adds value to their pecuniary sacrifices in supporting the stability of the institutions.

Further review of the qualitative findings indicated that cryptocurrencies have resulted in negative growth and slowed performance of the banking sector for this reason majority of customers are shifting to cashless systems when compared to traditional modalities of banks. However, these assertions are contradicted in the study by Singh (2019); Verstein (2019); and Li et al. (2019) in the sense in which these authors noted that cashless payments increased by crypto trading required banking systems for safer and transparent process for the investors. However, the researcher, as an opinion believes that the shift to a cashless system should be an advantage to the banks in Turkey because they can synchronise their systems to this model. Therefore, it remains a threat to the banks if the board of directors fails to deploy incremental innovation in the banking systems that not only support cashless systems but also offer electronically supported payment or transaction systems. In this case, the researcher does not hold the view that cryptocurrencies, by triggering cashless systems, become a threat to the banks in Turkey but a wakeup call to embrace more technological innovation that can serve these emerging market segments. In a different context, it was affirmed in the findings that the rise of digital currency in Turkey pauses more potential for fraudulent activities that may lead banks to experience untrustworthy transactions and illegal

money transfers like in the case of money laundering. Similar affirmations are echoed in the works by Liu and Tsyvinski (2019), who noted the minimal impact of the monetary policy regime in Turkey that can offer banking surveillance over fraudulent activities or transactions attributable to crypto trading. On this point, the researcher believes that the issues identified above do not serve as a long-term problem to the banking models in Turkey; one of the remedies would be to lay down an intelligent, systemic, and firm cybersecurity model that can safeguard the banks and the depositors from untrustworthy transactions. Probably, in the future, it would be vital to follow up with banking IT experts on how a security system infrastructure can be designed to enable banks in Turkey to support digital currency transactions without causing any depositor to lose money in the process. Nonetheless, the matter of unscrupulous transaction process occurring in the cryptocurrency dynamics hence compromising reliability of the banking system have also been addressed by Sovbetov (2018) and Nguyen et al. (2020).

5.2 Discussion of Qualitative Findings II

The review by Fatoki and Wanjagi (2019) opposed the concern for having a regulated crypto trading ecosystem by noting that it failed to meet the requirements or standards of being categorised as electronic money within the scope of the Turkish jurisdiction. Therefore, the argument being there lacks sustainable legal infrastructure for cryptocurrencies in Turkey. In this context of the findings, the two authors were opposed to what past scholars have held in that cryptocurrencies will offer banks solutions and hedging opportunities in using these assets as another form of exchange. The authors that hold the latter position i.e. positive effects of crypto trading on banks in terms of improved virtual transactions include Verstein (2019), Chuen (2017), Yermack (2015), and Corbet et al (2018). However, this position is not supported based on the analysis by Fatoki and Wanjagi (2019), who express conviction that Turkey is not prepared with a regulatory system that can render banks to benefit from crypto trading, especially in the short-term. Overall, contrary to other studies by Massad (2019); Kshetri and Voas (2017); Singh (2019); Demir et al (2018) who argued that a regulatory environment would stimulate bank performance through crypto trading; it is evident from the evaluation by Fatoki and Wanjagi (2019) that cryptocurrencies in Turkey would create more instability and havoc in the banking sector in Turkey for the reason that there lacks a credible

regulatory environment that would foster transparency and accountability among the investors. Similar thoughts on the weak regulatory environment for crypto trading in Turkey were expressed by Arias-Oliva et al. (2019), wherein this review it was emergent that cryptocurrencies could not be considered as a form of electronic money; it was seen that these authors associated crypto trading with risks that have no basis on any of the existing laws. The findings, therefore, affirmed that crypto trading is a major risk whenever integrated with the banking system in Turkey, yielding negative results to the investors. The results contradict the works by Erol et al. (2020); Vardar and Aydogan (2019); Miraz et al. (2020); where the authors noted that crypto trading in Turkey would be used as a form of virtual currency by the banks, in turn, triggering more profitable transactions among the investors. In the same analysis the works by Bech and Garratt (2017) harmonised with Arias-Oliva et al. (2019) and Fatoki and Wanjagi (2019) in denying the fact that crypto trading has legal protection in Turkey, which increase its risk if it is to be used as a form of exchange in baseline banking transactions. The same author asserted that in Turkey, there lacks sound policies and guidelines that adumbrate the legality related to virtual currency hence rendering its adoption into the banking transaction futile. Contrary to the issues above, the works by Giudici et al. (2020) noted that cryptocurrencies penetration in Turkey is going to expand the trading platform, thus raising the level of transactions through the banks. The same authors noted the fact that it would prevent the investors from the foreign exchange risk triggered by the internal market policies by banks. As a result, rendering the banking processes to improve and directly enhance business diversity. The assertions are supported in the literature by Miraz et al. (2020) and Makarov and Schoar (2020) in that crypto trading has provided banks with inflation strategies that reduce the interest rates and depreciation of the currency. Further, the review by Arias-Oliva et al. (2019) indicated that crypto-currencies would enable banks to overcome financial and currency crises; here, the researcher considers that the dynamics of crypto trading would assist banks to reduce the risk aligned to bank run due to sudden high withdrawals by investors which can cause significant disruption to the banking sector in Turkey. The affirmations above corroborate with the works by Erol et al. (2020), Hays and Kirilenko (2019), Doyduk (2019), who noted that crypto trading eradicates inflation gaps that weaken banking performance at the same time overcome prevailing financial burden. For De Meijer (2016),

crypto trading may not have positive impact on the banking system since majority of investors would be reluctant to rely on it, considering the feeble legal framework that governs its transactions. Thus, banks would not successfully capitalise on it as a form of exchange of virtual currencies. Nonetheless, LeBlanc (2016) noted the prominence of crypto trading in the banking industry regardless of its associated activities with cybercrime and fraudulent transactions. The author held that an asset such as Bitcoin is a viable class of investment in the banking sector. In tandem with the findings above Liu and Tsyvinski (2019); Howell et al. (2020); and Nguyen et al. (2020) upheld that cryptocurrencies would be used by banks as forms of investments that investors can maximise or optimise more for more gains. Finally, the findings by Boshkov (2016) indicated that crypto trading would facilitate banks in Turkey to formulate two-party contracts during value transfer of assets. In fact, the researcher considered this matter as one of the added contributions to knowledge as it was not sufficiently covered in past literature. The same serves as a major area of future research in the pursuit to determine the effects of crypto trading on the banking performance in the region.

5.3 Discussion of Quantitative Findings

In the quantitative findings, it was evident that majority of the experts concur that crypto trading has a negative impact on the banking industry in Turkey. Qualitative reviews had demonstrated that a negative effect was present in the two relationships and that was debated, and the findings linked the same other economic conditions as well as ethical business environment that govern the digital currency regime in the region. However, there are indications that a positive relationship was affirmed through the survey feedback with banking and finance industry experts in Turkey and also it can be supported by Katsiampa et al. (2019), Hayes (2017), and Farell (2017) since all these authors asserted that the rise of digital currency economy in Turkey has opened the economy and, as a result increased the bank-supported financial transactions. Although, the researcher in considering the earlier assertions over the negative effects of crypto trading on banks to be something that requires to subject the quantitative analysis to a thorough review and validation to ensure proper models are implemented to determine the actual relationship between crypto trading versus the banking performance trends in Turkey. Other results from the quantitative evaluations depicted that majority of the experts were in

concurrence that crypto trading would improve the stability and performance of banks in Turkey. The affirmations above align with the literature by Brauneis and Mestel (2019); Stosic et al. (2018); Brauneis and Mestel (2019); and Conrad et al. (2018), as the authors unanimously stated that the flow of crypto trading will stabilise the banking sector due to increased deposits and transfers across the investors. From the same quantitative findings, it was established that crypto trading won`t have a positive impact on growth in the banking sector since majority of the experts agreed with this fact, but also there are many other investors who believes crypto-trading could enhance the growth in the banking sector The works by Dvorak et al. (2015) and Sun et al. (2020) support the above matter and the researcher had also argued in the qualitative section that it would take the banking sector to develop a capable and credible cybersecurity infrastructure that would reduce the risks associated with crypto trading. Therefore, this was a matter that was supported by the someof the participants and it should be the trajectory that the banking sector is required to deliberate to ensure crypto trading positively impacts the banking sector. Therefore, as depicted in the findings, government regulations and indeed, sound banking surveillance would act as the bridge between cryptocurrencies and risk mitigation that can arise hence impacting negatively on the banking sector. In this dissertation, the issue of risk mitigation through governance models is an added knowledge to the existing literature on crypto trading and banks; it makes it imperative for future scholars to address the matter with more detail and shed light on the banking sector in Turkey how and why blockchain technology must be subjected to constant surveillance. The result should be to enable the banking sector, especially the customers, to be free from unscrupulous dealings that may be disguised in the blockchain infrastructure where naïve or unsuspecting investors may lose their money. In the quantitative findings, it was established that there is positive perception over the possibility for banks to capitalise on optional model of payments, especially the use of cashless transactions in the future. Similar findings are present in the literature by Gandal and Halaburda (2016) and Ronca et al. (2019) in that banks in Turkey have expanded their portfolios to accommodate diverse forms of payment to support crypto trading in the region. While in the same respect, it can be recalled that under the qualitative discussions, the notion of cashless payments emerged as a key contribution of cryptocurrency towards the banking sector in Turkey. Later, the researcher, in the

process of coining a prediction model, one of the variables to be considered shall be the optional transaction solutions that blockchain technology maybe not in short term but in long term will create benefit in Turkey's banking sector.

5.4 Implications

Overall, the findings of the study have indicated that in a long-term, cryptocurrency trading in Turkey could generate a benefit to the banking sector due to various aspects, namely: (a) increased market expansion as a result of cashless transactions that require bank-specific protocols (b) financial diversification of risk as a result of hedging (c) expanded payment systems (d) low-cost transactions despite the high foreign exchange variability (d) shift to cashless payments systems. However, there are also negative effects were cited, such as (a) negative relationship between bank performance and cryptocurrencies market capitalisation (b) fraudulent transactions (c) money laundering (d) unregulated crypto trading transactions. Therefore, the model prediction would be based on these factors whereby the exogenous variables are the positive effects of crypto trading while the control variables being the negative consequences that draw from the cryptocurrency's transactions. Thus, it may be modelled as follows:

α= *Exogenous factors*

ε= *Internal factors and control variables*

$$\textit{Impact on Bank Stability} = (\alpha \times \beta 1 \textit{Positive Crypto-Trading}) + (\varepsilon \times \beta 2 \textit{Negative Crypto-Trading})$$

However, the limitations of the study were that the model above could not be validated since there lacks historical statistical data that demonstrate the trends of crypto trading in Turkey as a region and in an exclusive manner; in fact, the qualitative analysis has played a major role in this dissertation in elaborating about the outlook of the crypto market in Turkey and major issues have been sufficiently followed-up with expert opinion. Thus, in this chapter four, the data that was formulated from the participants through a survey could be used effectively to test and validate the proposed prediction model. Later, under areas of future research it has been stated that future scholars can attempt to assess the proposed prediction model aimed to establish the impact of crypto trading on bank stability-improvement in Turkey. Nonetheless, this should be on condition that the central bank in the region or the treasury will have started to record all transactions and

market prices of cryptocurrencies and the information made available for public scrutiny and related scholarly endeavours.

CHAPTER SIX: CONCLUSION, RECOMMENDATION, AND LIMITATIONS

6.1 Key Summary

Overall, the study has evaluated the standing benefits and threats caused by crypto trading and the short versus long term effects on the banking system in Turkey. In this case, the insights in the project are pointing to both policy and practical pathways that can be sought by respective stakeholders to ensure crypto trading significantly impacts banks in Turkey. Foremost, based on the findings of the study, the research questions have been addressed. For instance, the existing ecosystem of Crypto trading in Turkey has been explored both based on literature and expert opinion generated based on the interview discussions as well as the expert survey results. Among the issues that were found included: negative effects of crypto trading on the banking system in Turkey where market capitalisation from such trading was said to cause deposit variability for banks in the region; use of cryptocurrencies as an optional payment system where banks can rely on the same to diversify their protocols hence more profits; the rise of low-cost cashless transactions, and that crypto trading offers banks an opportunity to hedge against risk by capitalising on diversified portfolios offered by the digital currency environment. Moreover, from an assumptive point of view, the study has demonstrated the level of synchronisation that can be achieved via Crypto trading as well as banking protocols in Turkey at present. Based on this, a prediction model was proposed that require further validation in the future as a blueprint for the synchronisation that can be achieved between Crypto Trading and Banking protocols in Turkey; the same model is expected to demonstrate real impact on bank stability. In the model, the positive aspect of Crypto trading was said to be characterised by factors such as increased market boundaries, financial diversification as a hedging solution, and expanded payments systems, not to mention low-cost transactions embedded on cashless payments. In the findings, the research question around issues pertaining to the main negative episodes that have taken place in the Cryptocurrency Trading ecosystem and how they have influenced banks' performance in Turkey was captured. The study found that crypto trading has been regarded as highly volatile, increased market liquidity risk, high-risk transmission, and unscrupulous trading, just to mention a few. The theoretical framework of the study addressed issues of information asymmetry and efficient

markets where the central emphasis was the need to have regulatory modalities that eliminate barriers between investors that allow for the realisation of abnormal returns through unscrupulous trading.

6.2 Recommendations

Further, key recommendations of the study are based on what may be pursued as future research to close the gaps in knowledge currently in this dissertation and practical issues on policy dynamics of crypto trading in Turkey that can be integrated in the banking system by reducing its negative impact on baking system.

6.2.1 Theoretical Recommendations

A thorough quantitative analysis is required to generate data on transactions and changes in prices from crypto trading environment in Turkey and the same for financial data of banks in the same region. The data may be cross-sectional or longitudinal so long as it can be used to execute the prediction model that was formulated in the discussion chapter of this dissertation. Currently, this data is lacking hence being a gap that remains in this dissertation, yet it is significant to be addressed in future scholarly works that relate to crypto trading and its integration on banking system in Turkey.

The other theoretical recommendation is to undertake a further expert review, especially with bank fund managers or portfolio managers in Turkey to have tangible evidence on how they plan to align their banking process with the environment of crypto trading. Thus, build a first-hand experience of the same and understand the threats or misgivings they have towards crypto trading in influencing or rather contributing to the stability of banks in the region. For instance, through a modified Delphi method it would be possible to come up with the best answers and indeed insights that can be used to model a prediction of the effects of cryptocurrency trading on bank stability in Turkey.

6.2.2 Practical Recommendations

The first practical recommendation is that the government of Turkey should create a legislation to govern crypto trading to safeguard the investors from the risks of an inefficient market as held in both information asymmetry theory and efficient market hypothesis. Therefore, there is the risk of naïve investors losing

more on crypto trading through unscrupulous trading that can be hidden in banking transactions. Secondly, banks in Turkey should be legally tasked to produce a legally binding information memorandum that will safeguard all investors from losing unfairly whenever they engage in digital currency trading. Thirdly, banks in Turkey should appoint fund managers fully qualified with crypto trading to provide oversight on related transactions to guide both the investors and management on risks and return. The personnel should become the mouthpiece on whether crypto trading economy poses adverse effects to all the parties and measured taken to reduce the risk.

6.3 Limitations

The limitations of the study had been re-echoed earlier in that there exists little evidence on the trading patterns and price variations of cryptocurrency trading in Turkey. Thus, it remains an area that must be explored in the future and such time-series data to be available for public scrutiny.

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Appendices

APPENDIX A: LITERATURE MATRIX

Author	Aim	methodology	Findings	Recommendations
LeBlanc 2016.	To explore the impacts of cryptocurrencies in the banking industry	Interviews	Cryptocurrencies would have a negative impact on the banking industry	There is need for appropriate regulations to guide people while executing transactions using digital currencies
Giudici et al. (2020).	To examine the emerging phenomenon of cryptocurrencies	Semi-structured interviews	Unstable of cryptocurrencies makes them speculative assets which imply that digital currencies would not have a negative impact on the banking sector.	To examine measures that should be implemented to enhance efficient execution of cryptocurrency transactions.
Boshkov (2019).	To examine the impacts of cryptocurrency on the finance industry	Focus group observation	Cryptocurrencies would act as a complementary to the banking industry	There is a need for further research on security issues associated with cryptocurrencies
Fatoki & Wanjagi (2019).	To examine ways cryptocurrencies and blockchain technologies can be used to mitigate financial risks	Interviews	Digital currencies have the potential of removing intermediaries in the banking sector; hence, acting as a complementary	There are high risks of inaccurate authentication and valuation of risks affects needs further research on the potential ways of addressing them.
Bech &	To examine the emergence of	Business report	Digital currencies would supplement	There is lack of an appropriate

Garratt (2017).	cryptocurrencies an its influence on the banking sector		the traditional banks	mechanism to evaluate cryptocurrencies risks; hence, a need for future research.
De Meijer (2016).	To examine the influence of blockchain and cryptocurrencies in the banking industry	Interviews	Digital currencies potentially eliminate some of the inconveniences experienced in the banking sector	Future research needs to be conducted on methods of addressing the risks associated with blockchain and cryptocurrencies.
Arias-Oliva et al. (2019).	To examine variables that influence the use of cryptocurrencies	Structured and semi-administered online survey	Performance expectancy is the major aspect influencing the use of cryptocurrencies	Future scholars should examine evolutionary adoption of cryptocurrencies

APPENDIX B: QUESTIONNAIRE TEMPLATE

Topic: How Block chain and cryptocurrency will impact the banking sector and are there any significant impacts on the Banking sector in Turkey.

Consent Form

If you volitionally accept to participate in this study, please complete the form provided below and append your signature thereunder.

	Activities	Tick Box
1	I hereby confirm that I have understood the attached ethics consent form regarding the proposed study; I have been given the opportunity to consider all information and seek clarification where all have been addressed satisfactorily	
2	I have understood that my involvement in this study shall remain volitional and that I may withdrawal at any time without offense or detriment to myself. I also understand that data acquired from me shall be included in the main study of which am not able to remove upon it been anonymised. I, nonetheless, agree to participate on this basis	
3	I agree to the use of a survey been sent to my email and later re-coded for further analysis	
4.	I agree to login to any platform to fill up the survey	
5.	I agree that all details from my feedback in the survey to be published in the main dissertation or other academic journals, reports, and books	
6.	I affirm that the researcher may contact me at any time in case of any clarifications needed	
7.	In line with the above clause, I agree that the research may contact me including the university if am needed or required to provide information meant to authenticate this study and all its findings	
8.	I fully agree to participate in this research	

Data Protection

The personal information we collect and use to conduct this research will be processed in accordance with data protection law as explained in the Participant Information Sheet and the Privacy Notice for Research Participants.

_____	_____	_____
Name of Participant	Signature	Date

_____	_____	_____
Name of the person taking consent	Signature	Date

QUESTIONNAIRE TEMPLATE

PART A: BIO-DATA OF THE RESPONDENTS

Q1. What is your Gender? □ **Male** □ **Female**

Q2. Please state your age _____

Q3. Are you an ardent investor in Cryptocurrency?

□ **Yes** □ **No**

Q4. How would you rate your socio-economic status?

□ **Very Low**

□ **Low**

□ **Moderate**

□ **High**

Q5. Do you have a positive impression about the future of Crypto trading in Turkey?

□ **Not at All**

□ **Fair**

□ **Satisfactory**

□ **Highly Satisfactory**

PART B: PERCEPTIONS ON CRYPTOCURRENCY

Please indicate how much you agree with the following statements:

Variable	Survey	Strong Disagree	Disagree	Neutral	Agree	Strongly Disagree
	I find cryptocurrency as a convenient medium of exchange					
	I consider crypto trading to be highly transparent and decentralised					
	I believe that there should be a regulatory framework to govern crypto trading in any financial and banking sector					
	The risk of illegal activities in crypto trading remains inherent and can be detrimental to the banking sector					
	As an urgent measure it is vital to reinforce the regulation of cryptocurrency and crypto trading in the banking sector					
	Due to the gaps in regulation in crypto trading it surmounts to weak protection of the investors due to fraudulent trading and dissemination of crypto assets in the banking sector					
	Effective regulation from the government will safeguard the investors from cyber-attacks during crypto trading or online hacking thus damaging the banking sector					
	Cryptocurrencies inflow in Turkey will not cause instability or major variations in the monetary policy decision making by the Central Bank					
	Adoption of crypto trading in Turkey has been a relieve for us as					

	investors in incurring excess service fee in conversion charges and exchange rates					
	Crypto trading as medium instruments will boost financial inclusion thus support the banking industry by enhancing financial inclusion					
	Crypto-currency will promote credibility, transparency and accountability in the banking sector in Turkey					
	There are more investment going to the banking sector in Turkey due to the ease created by crypto-trading including its limited regulation and flexibility in handling exchange activities					
	Overall, Crypto trading will improve stability and performance of banks in Turkey					
	Overall, crypto trading ecosystem will improve growth in the banking sector in Turkey					

PART C: PERCEPTIONS ON BANKING STABILITY OR BANKING PERFORMANCE

Please rate how much you agree or disagree with the issues cited.

Variable	Survey	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
	I believe cryptocurrency trading innovation shall be a vital inflation mitigation tool for the banking sector in Turkey					
	Cryptocurrency innovation has enabled the banking sector to adopt better payment gateways					
	Crypto currency has strengthened the integration of the local currency hence it has been possible to withdraw lira with ease from the banks					
	Adoption of crypto trading in Turkey has been a relieve for us as investors in incurring excess service fee in conversion charges and exchange rates					