

Role of Fintech in Uncovering Parallel Economy Initiatives among House-Held Business Intrapreneurs

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Abstract. The current study aimed at exploring the role of financial technology (Mobile banking, Credit scoring, E-Payments, Money transfers, and Non-Performing Loans) in uncovering parallel/shadow economy initiatives among house-held business intrapreneurs in Jordan. Quantitative methodology was adopted and a convenience sample of (30) managers and their assistants in the Central Bank of Jordan responded to the questionnaire. SPSS was employed in order to tackle the gathered primary data. Results of study accepted the main hypothesis and it was found out that Fin-Tech has the ability to uncover parallel/shadow economy through monitoring the Non-Performing Loans (NPLs) which are loans that have been extended by financial institutions but are not being repaid according to the agreed terms and are in danger of default. Study recommended developing a legal framework that supports the formal economy and discourages informal economic activities could help to control the shadow economy. This can include measures such as strengthening contract enforcement, protecting property rights, and providing clear and predictable regulations. The implication in exploring the role of fin-tech in uncovering parallel economy initiatives among house-held businesses lies in its ability to provide insights into economic activity and transactions that would otherwise remain unaccounted for. Fin-tech solutions such as mobile banking, digital payments, and block-chain technology provide access to data from various transactions and activities that can be analyzed to understand the scope of the economy.

Keywords: Mobile banking, Credit scoring, E-Payments, Money transfers, Non-Performing Loans (NPL), Parallel Economy, Shadow Economy, Financial Technology (FinTech)

1. Introduction

It is widely known that parallel/ shadow economy is the sum of all illegal and unreported economic activities that are hidden from official authorities (Medina and Schneider, 2021). Parallel/shadow economy has a negative influence on sustainable development, such as reducing tax revenue, distorting competition, and undermining the rule of law (Koufopoulou et al, 2019). C. O (2019) argued that financial technologies has a role in reducing the size of the shadow economy such as the availability of credit, access to financial services, and the stability of financial institutions, which can provide a more formal and regulated environment for economic activities, making it less attractive for individuals and businesses to participate in the shadow economy.

Gharleghi and Jahanshahi (2020), Canh and Thanh (2020) and Syed et al (2021) indicated that shadow or parallel economy can have a number of negative impacts on society including reducing government revenue, increasing inequality, decreasing economic growth, decreasing competitiveness, increasing crime and corruption, and decreasing trust in financial institutions. Overall, the shadow economy can have significant negative impacts on society, reducing economic growth, exacerbating inequality, and undermining trust in institutions and the rule of law. To mitigate these impacts, it is important to implement policies and initiatives that encourage the formalization of economic activities and promote transparency and accountability.

Despite the significance of examining the role of Fintech in uncovering parallel economy initiatives among household business intrapreneurs, there is still a literature gap in this area. Firstly, most of the research on parallel economy has focused on macro-level institutional factors such as regulations, taxation and governance. There is limited research that examines household business intrapreneurial activities and their engagement in parallel economy transactions. Understanding how household businesses participate in the parallel economy requires an exploration of individual-level factors such as attitudes, motivations, values, and behaviors. Thus, there is a need for research that examines the micro-level factors driving parallel economy among household business intrapreneurs.

Secondly, while there are a few studies that have explored the role of Fintech in combating parallel economy activities, most of them focus on the regulatory and technical aspects, overlooking the behavior and the attitudes of intrapreneurs. Furthermore, there is a need to examine the potential of Fintech as a tool to address the factors that drive household business intrapreneurs into the parallel economy. In conclusion, while there have been studies on Fintech, intrapreneurship, and parallel economy; there is a gap in the literature that examines the relationship between Fintech, intrapreneurship, and parallel economy among household businesses; therefore, more research needs to be conducted in this area to provide comprehensive insights for academics, policy-makers, and practitioners.

Based on above argument, current study sought to examine the role of financial technology Fin-Tech (Mobile banking, Credit scoring, E-Payments, Money transfers, and Non-Performing Loans) in controlling and uncovering parallel/shadow economy initiatives among house-held business intrapreneurs in Jordan.

2. Literature Review

2.1. Financial Technology (Fin-Tech)

Financial technology, more commonly known as Fin-Tech, is a broad term used to describe the use of technology to help companies and individuals better manage their financial activities (Goldstein et al, 2019). It includes innovative solutions such as mobile banking, digital payments, online investment management, and other forms of digital financial services (Mention, 2019).

Fin-Tech solutions range from small, innovative startups to big financial institutions who have developed specialized technology to help consumers better manage their money (Berg et al, 2022). The use of Fin-Tech is increasing worldwide, particularly in developing countries and emerging markets,

where digital payments are becoming more widespread. Fin-Tech helps to reduce costs and extends access to financial services to those who may not have otherwise had access. Many Fin-Tech companies are focusing on streamlining the financial services industry, improving customer experience and bringing more transparency to the sector (Takeda and Ito, 2021).

Fin-Tech tools are being used to revolutionize the banking and finance industry, bringing about big improvements in efficiency, speed, and accuracy. Payment processing services, money transfers, investments, insurance, and analytics are some of the many areas being addressed by Fin-Tech (Suryono et al, 2020). Services like robo-advisors, automated investment and trading, crypto-currency, and cloud computing are widely used in the financial sector. Companies are taking advantage of artificial intelligence, machine learning, and big data to provide better services (Das, 2019).

Financial services companies are increasingly leveraging cloud infrastructure and machine learning to automate many of their processes, such as issuing loans and processing payments. Natural language processing and machine learning technologies are being used to detect fraud and process customer inquiries faster (Boot et al, 2021). Artificial intelligence is used to automate trading decisions and analyze financial markets. Big data and analytics are helping companies gain deeper insights into customer behavior, trends in the financial market, and risk management (Allen et al, 2021).

2.2. Characteristics of Fin-Tech

Financial technology (fin-tech) is a rapidly emerging industry centered on the use of technology to create, manage, and improve financial services. Examples of characteristics of fin-tech include efficiency, scalability, automation, cost savings, customer experience, risk management, and data-driven decision-making (Ng et al, 2022).

According to Li and Xu (2021), Fin-tech is a rapidly growing and innovative industry that uses the latest technologies to provide customers with the best value for their money and the highest quality financial services. This can include everything from online banking and digital payments, to online personal financial advisors, to automated trading and wealth management platforms (Bu et al, 2022). Fin-tech can also improve risk assessment and management, automate processes and operations of financial services, and unite customers with investments and services that are tailored to their requirements and preferences (Pi et al, 2022).

Giaretta and Chesini (2021) argued that Fin-tech also offers customers an increased level of personal security, with its secure digital platforms allowing customers to store and track personal information and financial transactions with ease. As it becomes more and more prevalent across industries, Fin-tech has become a key player in the global financial market and has the ability to transform entire industry verticals from banking and finance to healthcare, insurance, and even retail (Boratyńska, 2019).

Fin-tech is also revolutionizing the way people save and spend money. Through the use of advanced technologies such as block-chain, digital wallets, and secure payments, Fin-tech has enabled people of all backgrounds to more securely access and stores their funds (Wonglimpiyarat, 2019). Fin-tech also aims to make money transfer and payment services more secure, efficient, and accessible. This has empowered users to take greater control over their finances and make better-informed financial decisions (Dranev et al, 2019).

2.3. Parallel Economy/ Shadow Economy

A parallel economy is an economic system that operates alongside the traditional economy. It includes non-monetary exchanges and exchanges of goods, services, or labor for goods or services of equal or greater value (Lemarchand, 2019). Examples of a parallel economy include barter systems, informal sector businesses, and some types of digital currency. Parallel economies can help to bridge the gap between the wealthy and the poor, providing individuals and small organizations with access to resources and opportunities that would otherwise be difficult to acquire (Roth, 2022).

Grossman (2019) also argued that parallel economy is also known as shadow economy which is economic activities and transactions that are not reported or recorded to avoid regulation and taxation. This type of economic activity is often associated with illicit activities such as money laundering, tax evasion, and bribery (Mishchuk et al, 2020).

The shadow/parallel economy refers to all economic activities that are hidden from official authorities for various reasons, such as to avoid paying taxes, regulations, or to evade legal restrictions. This type of economy is not included in the official statistics of a country, but it still exists and operates in parallel to the formal economy (Ginevicius et al, 2020). Examples of activities in the shadow economy can include illegal and black market transactions, underground businesses, and off-the-books work arrangements. The size and scope of the shadow economy vary greatly from country to country and can have significant impacts on a nation's economy, such as reducing tax revenue and undermining fair competition in the formal market (Terziev, 2020).

2.4. Monitoring Income of Parallel Economy

According to Bashlakova and Bashlakov (2021), it is challenging to monitor the income of the shadow economy since these activities are deliberately hidden from official authorities. However, there are a few methods that have been used by economists and governments to estimate the size and scope of the shadow economy (Kelmanson et al, 2019); (Wu and Schneider, 2019); (Svazas et al, 2022); (Ajide, 2021); (Goel and Saunoris, 2019); (Canh and Thanh, 2020) and (Plotnikov et al, 2020):

Surveys: Surveys can be used to gather information from individuals and businesses about their participation in the shadow economy. This method can provide insight into the types of activities and the motivations behind them.

Electricity consumption: Since most economic activities require energy, the amount of electricity consumed can be used as a proxy for the level of economic activity in a particular area.

Currency demand: Changes in currency demand can indicate changes in the level of shadow economy activity. For example, if there is an increase in the demand for cash, it could indicate an increase in informal economic activity.

Indirect tax evasions: Indirect taxes, such as value-added tax (VAT) or sales tax, can be used as an indicator of shadow economy activity. If a large portion of economic activity is taking place in the shadow economy, there will be a corresponding decrease in the amount of indirect tax revenue collected by the government.

Macroeconomic modelling: Macroeconomic models can be used to estimate the size of the shadow economy by taking into account various factors such as income, employment, and government spending. It is important to note that these methods have limitations and can only provide rough estimates of the size of the shadow economy. Nevertheless, they can provide valuable information that can be used to develop policies and strategies to address the challenges posed by the shadow economy (Wyznikiewicz, 2019).

2.5. Employing Fin-Tech to Uncover Parallel Economy

One example of how financial technology (FinTech) can uncover parallel economy is through the use of blockchain technology. Blockchain is a secure and decentralized digital ledger that records transactions and stores them in a way that is transparent and tamper-proof. It records every transaction in a block, and each subsequent block contains a cryptographic hash of the previous one, forming an unalterable chain (Bahar, 2022). By implementing blockchain-based systems, FinTech companies can monitor transactions and identify any abnormalities or questionable activities that indicate a parallel economy. This parallel economy may include illegal or unreported transactions, tax evasion, money laundering, or other illicit activities that are conducted outside of the traditional financial system. With blockchain, it becomes possible to track the path of funds, thus, making it easier to detect fraud and other illegal activities.

Moreover, advanced data analytics can be used to investigate patterns and correlations in transaction data, allowing for the identification and tracking of illegal activities or fraudulent transactions. The end goal is to create a transparent, secure and efficient financial ecosystem, reducing the illicit activities being conducted in the financial system (Karim et al, 2022).

2.6. Potential Challenges and Drawbacks of Using Fintech

According to Nas et al (2022) and Ramzbari et al (2023), while the use of Fin-Tech to uncover parallel economy has many potential benefits, there are also several challenges and drawbacks that need consideration. Some of these are:

1. **Limited Adoption:** Not all individuals, businesses or governments have the technical skills or financial resources to adopt and implement Fin-Tech solutions, particularly in developing countries. Thus, there might be difficulties in getting more participants who are willing to use the technology.

2. **Privacy Concerns:** While Fin-Tech solutions can help to track and monitor financial transactions, there are privacy concerns regarding data security and personal information. People may be hesitant to use Fin-Tech for financial transactions due to the risk of data breaches, hacker attacks, or misuse of personal information.

3. **Regulatory Challenges:** There are currently few regulations governing the use of block-chain and other Fin-Tech solutions. Regulators need to keep up with the changing landscape of Fin-Tech to ensure proper compliance and protection of users.

4. **Technical Challenges:** The integration of Fin-Tech solutions with existing financial systems can present technical challenges, such as compatibility issues, interoperability, and security issues.

5. **Resistance to Change:** Resistance to change can be a significant challenge to the adoption of Fin-Tech solutions. Some individuals, businesses or governments may be reluctant to change their existing practices, making it difficult to implement Fin-Tech solutions to uncover parallel economy.

2.7. Related Studies

In a study by Gharleghi and Jahanshahi (2020) explored the relationship between the shadow economy and sustainable development. The authors argue that financial development can play a crucial role in reducing the size of the shadow economy and promoting sustainable development. The authors conclude by saying that promoting financial development can help to reduce the size of the shadow economy and support sustainable development by increasing the formalization of economic activities, improving the allocation of resources, and reducing corruption. The article provides a detailed analysis of the relationship between the shadow economy and sustainable development and highlights the important role of financial development in reducing the size of the shadow economy and promoting sustainable development.

Canh and Thanh (2020) examined the relationship between financial development and the shadow economy using a multi-dimensional analysis. The authors find that financial development has a positive impact on reducing the size of the shadow economy. For example, greater access to finance can provide individuals and businesses with alternative opportunities to engage in formal economic activities, reducing their reliance on the shadow economy. Similarly, the stability of financial institutions and the quality of financial regulation can provide a more formal and regulated environment for economic activities, making it less attractive for individuals and businesses to participate in the shadow economy. Authors also find that the relationship between financial development and the shadow economy is not straightforward and depends on the specific context of each country. For example, in some countries, the shadow economy may be larger in areas with greater financial development due to the presence of financial opportunities that are used to support illegal activities. In conclusion, the article provided a comprehensive examination of the relationship between financial development and the shadow economy, using a multi-dimensional approach. The authors find that financial development has a positive impact on reducing the size of the shadow economy, although the relationship between the two

is complex and depends on the specific context of each country.

Syed et al (2021) examined the relationship between digital finance and the shadow economy, as well as its impact on financial instability in selected South Asian countries. The authors use econometric techniques to analyze data from selected South Asian countries to understand the impact of digital finance on the shadow economy and financial instability. They find that digital finance has a positive impact on reducing the size of the shadow economy, as it provides a more formal and regulated environment for economic activities. Additionally, digital finance also has a positive impact on financial stability, as it can help to reduce the risk of financial instability by improving the allocation of resources and reducing the level of corruption. The authors also find that the relationship between digital finance and the shadow economy, as well as financial stability, is complex and depends on the specific context of each country. For example, in some countries, digital finance may have a positive impact on reducing the size of the shadow economy, but may also increase financial instability by creating new risks. In conclusion, the article provided an empirical analysis of the relationship between digital finance and the shadow economy, as well as its impact on financial stability in selected South Asian countries. The authors find that digital finance has a positive impact on reducing the size of the shadow economy and promoting financial stability, although the relationship between the two is complex and depends on the specific context of each country.

Kanga et al (2022) investigated the relationship between the diffusion of fin-tech, financial inclusion, and income per capita. The authors use econometric techniques to analyze data from a sample of countries to understand the impact of fin-tech on financial inclusion and income per capita. They find that the diffusion of fin-tech has a positive impact on financial inclusion, as it provides individuals and businesses with access to financial services that they might not have had access to otherwise. Additionally, they find that the diffusion of fin-tech is positively correlated with income per capita, as higher income per capita can lead to greater demand for fin-tech services. The authors also find that the relationship between fin-tech, financial inclusion, and income per capita is complex and depends on the specific context of each country. For example, in some countries, the diffusion of fin-tech may have a positive impact on financial inclusion, but may not be positively correlated with income per capita. In conclusion, the article provides a comprehensive examination of the relationship between the diffusion of fin-tech, financial inclusion, and income per capita. The authors find that the diffusion of fin-tech has a positive impact on financial inclusion, is positively correlated with income per capita, although the relationship between the three is complex, and depends on the specific context of each country.

Launching from previous argument and related studies, researcher was able to build the following model that highlighted the relationship between variables, and from which study hypotheses will be extracted:

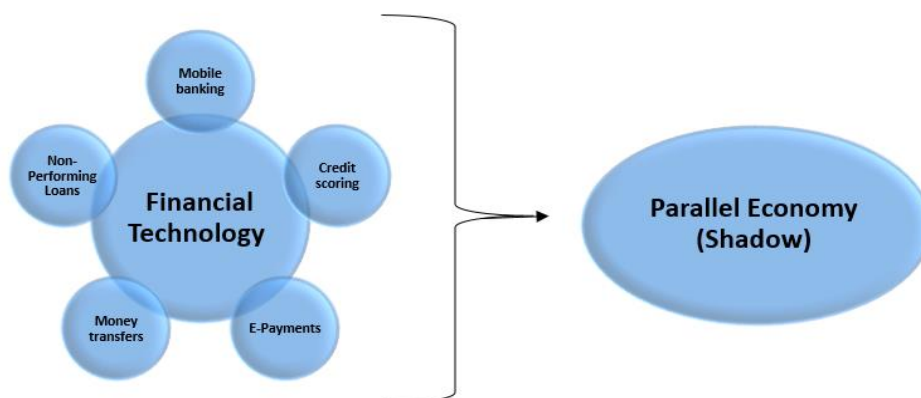


Fig.1: Study Model (Tsanis and Stouraitis, 2022; Agarwal et al, 2020)

From above model, following set of hypotheses was extracted:

Main Hypothesis:

H: Financial Technology (Fin-Tech) has a role in uncovering parallel economy initiatives among house-held business Intrapreneurs

Sub-Hypotheses:

H1: Mobile banking has a role in uncovering parallel economy initiatives among house-held business Intrapreneurs

H2: Credit scoring has a role in uncovering parallel economy initiatives among house-held business Intrapreneurs

H3: E-payment has a role in uncovering parallel economy initiatives among house-held business Intrapreneurs

H4: Money transfer has a role in uncovering parallel economy initiatives among house-held business Intrapreneurs

H5: Non-performing loans has a role in uncovering parallel economy initiatives among house-held business Intrapreneurs

3. Methodology

3.1. Methodological Approach

The current study started in achieving the main goal and standing on the hypotheses adopted by adopting the quantitative approach based on the numerical results, which were later translated into actual results that explain the phenomenon under study.

3.2. Tool of Study

The questionnaire was used as a main tool for the study. The researcher built the questionnaire based on the previous study and it consisted of two parts; the first dealt with the demographic information of the sample members (gender, education and experience), while the second part dealt with questions that measure the variables of the sub-variables of study including (Financial Technology (Fin-Tech)/ Mobile banking, Credit scoring, E-Payments, Money transfers, and Non-Performing Loans), and the questionnaire was presented to a group of academic specialists in the field of For arbitration of the questionnaire, and the questionnaire is in its latest version of (31) paragraphs according to the table below:

Table 1. Statements Distribution of Variables

Variable	# of Statements
Financial Technology (Fin-Tech)	
Mobile banking	5
Credit scoring	5
E-Payments	5
Money transfers	5
Non-Performing Loans	5
Parallel Economy (Shadow)	6

3.3. Population and Sampling

The researcher contacted HR department in the Central Bank of Jordan, the questionnaire was handed out and researcher was able to retrieve (30) properly filled questionnaire that were valid for statistical processing.

3.4. Primary Data Analysis

In order to deal with the collected data and convert it into understandable information, the researcher relied on SPSS version 26th, where the following statistical tests were adopted:

- Frequency and percentages
- Mean and standard deviation
- Multiple regression
- Linear regression

Cronbach's Alpha was also measured in order to stand on the reliability and consistency of the study tool and proved that Alpha (0.969) higher than 0.70 and therefore the tool was consistent and reliable.

4. Results and Discussion

4.1. Demographic Results

Results of demographic analysis indicated that majority of respondents were males forming 80% of total sample with an educational level of BA forming 66.7% and an experience that was more than 9 years forming 456.7% of total sample.

Table 2. Demographic Statistics

	F	%
Gender		
Male	24	80.0
Female	6	20.0
Education		
BA	20	66.7
High studies	10	33.3
Experience		
2-5	4	13.3
6-8	9	30.0
+9	17	56.7
Total	30	100.0

4.2. Questionnaire Analysis

Analyzing questionnaire statement indicated that respondents had positive attitudes towards statements of questionnaire given that all of the statements scored higher than mean of scale 3.00. The highest mean was scored by the statement articulated " It offers users a convenient way to view their transaction history, check account activity, and transfer money." with a mean of 4.40/ 5.00 compared to the least statement articulated " E-payments are monitored through the bank from which payments take place " with a mean of 3.27/5.00. Going deeper into analysis, it was found when analyzing variables of study that all of them scored higher than mean of scale which was statistically positive, the highest variable was "Non-Performing Loans" with a mean of 3.96/5.00 compared to the least variable "Parallel Economy (Shadow)" with a mean of 3.71/5.00.

Table 3. Questionnaire Analysis

Statements	Mean	Std. Deviation
1. Mobile banking provides an easy and accessible way for users to manage their finances	3.57	1.04
2. It offers users a convenient way to view their transaction history, check account activity, and transfer money.	4.40	.89
3. Mobile banking apps help users to monitor their spending and budget their expenses.	3.80	1.03
4. Mobile banking allows users to securely access their accounts and make payments quickly	3.60	1.07
5. Mobile banking is often free and can be used on a variety of mobile devices	4.07	.98
Mobile Banking	3.89	.73
6. Credit scoring is used to measure a person's creditworthiness and assess how likely they are to repay debts	3.73	1.08
7. A credit score is calculated using payment history, debt-to-income ratio, and total amount of outstanding debt.	3.80	.96
8. Poor credit scores can result in higher interest rates and limited access to certain products	3.87	1.01
9. Good credit management habits help maintain or improve credit score over time	3.97	1.00
10. Credit scoring reports regularly to ensure accuracy and to make sure steps are taken to build credit	3.87	1.01
Credit Scoring	3.85	.86
11. E-payments are secured and available all the time	3.83	1.12
12. E-payments can be done by any person regardless of their computer literacy	4.23	.97
13. E-payments are monitored through the bank from which payments take place	3.27	1.48
14. E-payment are accessible all the time without trouble	3.67	1.27
15. people tend to prefer e-payment than other payment methods	4.40	.86
E-Payment	3.88	.70
16. Anybody with legal documentation has the ability to transfer money	3.50	1.14
17. people use house-held services and products due to their affordable prices	3.93	1.01
18. making a money transfer is easy as long as the amount of money isn't above what is legally accepted	3.90	1.03
19. Money transfer can be made easily over smart phones applications	3.97	.81
20. Money transfers are monitored and can be controlled by the government when needed	4.17	.83
Money Transfer	3.89	.73
21. NPL are always monitored by the central banks	3.90	.99
22. NPLs are easy to spot as they can erode banks' profitability and weaken credit provision to the real economy.	4.13	.90
23. The accumulation of NPLs is a major challenge for countries in different economic contexts that is why it is always monitored	4.23	.82
24. Central banks monitor NPL as they can cause macroeconomic shock	3.70	1.18
25. NPL are spotted as they can cause structural weaknesses in the economy, unsustainable credit policies of banks, and misalignment of incentives	3.83	1.26
Non-Performing Loans	3.96	.60

26. the government isn't involved in parallel economy at all	3.73	1.23
27. there are no legal control to manage parallel economy	3.93	1.17
28. Social media helped in increasing initiatives of parallel economy	4.03	1.16
29. Social media supported the increase in house-held intrapreneurship	3.47	1.33
30. inflation encouraged people to use services and products of house-held intrapreneurship	3.90	1.27
31. easy delivery and smooth supply chain increased he demand on house-held intrapreneurship	3.20	1.40
Parallel Economy (Shadow)	3.71	.78

4.3. Hypotheses Testing

H: Financial Technology (Fin-Tech) has a role in uncovering parallel economy initiatives among house-held business Intrapreneurs

Multiple regression was used to test the main hypothesis; findings in table below indicated that the independent variables explained **45.9%** of the observed variance in the dependent variable. In addition, there is a relationship between each and every one of the variables. These results, along with the significance of the F value of 4.077 at the 0.05 level, lead us to believe that Financial Technology (Fin-Tech) has a role in uncovering parallel economy initiatives among house-held business Intrapreneurs.

Table 4. Main Hypothesis Testing

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	R	R Square
		B	Std. Error	Beta				
1	(Constant)	.288	.873		.330	.745	.678	.459
	a	-.163	.300	-.153	-.543	.592		
	b	.053	.322	.058	.165	.870		
	c	.325	.310	.292	1.046	.306		
	d	-.032	.213	-.029	-.148	.884		
	e	.685	.275	.532	2.492	.020		

Linear regression was used in order to the sub-hypotheses which were extracted from model of study as in figure 1. Results of linear regression accepted all presented sub-hypotheses as according to the following:

The 1st sub-hypothesis was accepted and the findings indicated that the independent variable explains **17.5%** of the observed variance in the dependent variable. In addition, there is a relationship between each and every one of the variables. These results, along with the significance of the F value of 5.919 at the 0.05 level, lead us to believe that "Mobile banking has a role in uncovering parallel economy initiatives among house-held business Intrapreneurs".

The 2nd sub-hypothesis testing indicated that the independent variable explained **24.3%** of the observed variance in the dependent variable. In addition, there was a relationship between each and every one of the variables. F value = 8.992 at the 0.05 level, lead us to believe that "Credit scoring has a role in uncovering parallel economy initiatives among house-held business Intrapreneurs".

The 3rd sub-hypothesis indicated that the independent variable explains **30.9%** of the observed variance in the dependent variable. In addition, there was a relationship between each and every one of the variables. F value =12.526 at the 0.05 level, lead us to believe that "E-payment has a role in uncovering parallel economy initiatives among house-held business Intrapreneurs"

The 4th sub-hypothesis resulted that the independent variable explained **14.3%** of the observed variance in the dependent variable. In addition, there was a relationship between each and every one of the variables. These results, along with the significance of the F value =4.691 at the 0.05 level, lead us to believe that "Money transfer has a role in uncovering parallel economy initiatives among house-held business Intrapreneurs".

The 5th sub-hypothesis resulted that the independent variable explained **41.7%** of the observed variance in the dependent variable. In addition, there was a relationship between each and every one of the variables. These results, along with the significance of the F value of 20.038 at the 0.05 level, lead us to believe that "Non-performing loans has a role in uncovering parallel economy initiatives among house-held business Intrapreneurs".

Table 5. Sub-Hypotheses Testing

Coefficients								
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	R	R Square
		B	Std. Error	Beta				
1	(Constant)	1.985	.722		2.750	.010	.418	.175
	a	.444	.183	.418	2.433	.022		
H1: Mobile banking has a role in uncovering parallel economy initiatives among house-held business Intrapreneurs								
Coefficients								
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	R	R Square
		B	Std. Error	Beta				
1	(Constant)	1.985	.589		3.369	.002	.493	.243
	b	.449	.150	.493	2.999	.006		
H2: Credit scoring has a role in uncovering parallel economy initiatives among house-held business Intrapreneurs								
Coefficients								
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	R	R Square
		B	Std. Error	Beta				
1	(Constant)	1.310	.689		1.901	.068	.556	.309
	c	.619	.175	.556	3.539	.001		
H3: E-payment has a role in uncovering parallel economy initiatives among house-held business Intrapreneurs								
Coefficients								
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	R	R Square
		B	Std. Error	Beta				
1	(Constant)	2.127	.744		2.860	.008	.379	.143
	d	.407	.188	.379	2.166	.039		
H4: Money transfer has a role in uncovering parallel economy initiatives among house-held business Intrapreneurs								
Coefficients								
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.		

	B	Std. Error	Beta		R	R Square
1	(Constant)	.414	.745		.555	.583
	e	.833	.186	.646	4.476	.000

H5: Non-performing loans has a role in uncovering parallel economy initiatives among house-held business Intrapreneurs

4.4. Discussion

Current study aimed at examining the role of financial technology Fin-Tech (Mobile banking, Credit scoring, E-Payments, Money transfers, and Non-Performing Loans) in uncovering parallel economy initiatives among house-held business intrapreneurs. Quantitative methodology was adopted, and a convenient sample of (30) managers from the Central Bank of Jordan responded to an online questionnaire in order to collect the needed primary data. SPSS was used to screen and analyzed gathered data, and results of study accepted the main hypothesis which argued that "**Financial Technology (Fin-Tech) has a role in uncovering parallel economy initiatives among house-held business Intrapreneurs**"

The above main hypothesis suggested that the use of Fin-Tech can help to uncover and address informal economic activities that take place within households. These informal economic activities often referred to as the parallel or shadow economy, can include unregistered businesses, tax evasion, and other economic activities that are not recorded in official statistics. Fin-Tech companies can use various tools and technologies, such as digital payments, mobile banking, and financial data analysis, to monitor and track economic activities that take place within households. This can help to uncover parallel economy initiatives and bring them into the formal economy, where they can be taxed and regulated. Such results matched what came along with Gharleghi and Jahanshahi (2020) arguing that by using digital payments, Fin-Tech companies can track the flow of money between individuals and businesses, which can help to identify informal economic activities that are taking place within households. By analyzing financial data, Fin-Tech companies can also identify patterns and anomalies in economic activity, which can help to uncover parallel economy initiatives and bring them into the formal economy.

4.4.1. Mobile banking has a role in uncovering parallel economy

Results of study accepted the above hypothesis, it referred that the use of mobile banking technology can help to uncover and address informal economic activities that take place within households. Mobile banking allows individuals and businesses to access financial services and make transactions through their mobile devices, which can help to bring informal economic activities into the formal economy. Furthermore, mobile banking also provides financial institutions with access to a wealth of financial data, which can be used to identify patterns and anomalies in economic activity. This data can help to uncover parallel economy initiatives and bring them into the formal economy.

These results matched what came along with Canh and Thanh (2020) who argued that it's important to note that the hypothesis that mobile banking has a role in uncovering parallel economy initiatives among household business intrapreneur is based on assumptions about the nature of parallel economy initiatives and the capabilities of mobile banking technology. It's possible that parallel economy initiatives can adapt and evolve to evade detection by mobile banking technology, or that mobile banking technology may not have the resources or expertise to effectively uncover and address parallel economy initiatives.

4.4.2. Credit scoring has a role in uncovering parallel economy

The hypothesis suggested that the use of credit scoring technology can help to uncover and address informal economic activities that take place within the economy. Credit scoring is a process of

evaluating the creditworthiness of an individual or business by analyzing their financial history and credit-related data. By using credit scoring, financial institutions can gain insight into an individual or business's financial behavior, which can help to identify patterns and anomalies in economic activity. This information can help to uncover parallel economy initiatives and bring them into the formal economy, where they can be taxed and regulated. For example, by using credit scoring, financial institutions can detect instances of tax evasion or unregistered businesses, which are common characteristics of the shadow economy. Additionally, credit scoring can also help to identify individuals or businesses that have a high risk of default, which can be a sign of informal economic activities that are taking place within the shadow economy.

4.4.3. E-payment has a role in uncovering parallel economy

Results of study accepted the above hypothesis; it argued that by using e-payment, individuals and businesses can make transactions and access financial services through their electronic devices, which can help to bring informal economic activities into the formal economy. By using e-payment, individuals and businesses can make digital payments and transfer funds, which can be tracked and monitored by financial institutions. This can help to uncover shadow economy initiatives and bring them into the formal economy, where they can be taxed and regulated. Additionally, e-payment also provides financial institutions with access to a wealth of financial data, which can be used to identify patterns and anomalies in economic activity. This data can help to uncover shadow economy initiatives and bring them into the formal economy which matched results of Syed et al (2021).

4.4.4. Money transfer has a role in uncovering parallel economy

Testing the above hypothesis was accepted and it appeared that by using money transfer technology, individuals and businesses can easily and securely transfer funds, which can help to bring informal economic activities into the formal economy. In addition to that, results indicated that by using money transfer technology, individuals and businesses can transfer funds digitally, which can be tracked and monitored by financial institutions. This can help to uncover parallel economy initiatives and bring them into the formal economy, where they can be taxed and regulated. Additionally, the use of money transfer technology also provides financial institutions with access to financial data, which can be used to identify patterns and anomalies in economic activity. This data can help to uncover parallel economy initiatives and bring them into the formal economy as according to Kanga et al (2022).

4.4.5. Non-performing loans has a role in uncovering parallel

Results of study accepted the hypothesis and agree on the fact that NPL has the ability to uncover parallel economy given that NPLs are loans that have been extended by financial institutions but are not being repaid according to the agreed terms. The presence of NPLs in the banking sector can be an indicator of a number of issues, including economic hardship, fraud, and informal economic activities. NPLs may be a result of informal economic activities, such as unregistered businesses that are unable to repay loans. Financial institutions can use data on NPLs to identify patterns and anomalies in economic activity and uncover parallel economy initiatives. By uncovering these initiatives, financial institutions can help to bring them into the formal economy, where they can be taxed and regulated.

Results of study indicated that financial technology can uncover the parallel economy by analyzing data and trends associated with financial transactions and activities. Through the use of analytics and predictive modeling, financial technology can help identify patterns that may be indicative of illicit activities or otherwise hidden from regulatory scrutiny. This may include tracking suspicious movements of funds or activities that do not fit the profile of reputable institutions. As well, financial technology can help to identify individuals or entities engaging in activities that raise the risk of money laundering or the financing of terrorism.

In addition to that, results indicated that Financial technology can also be used to track and detect fraudulent activities, including identity theft, spoofing, and other malicious activities. By leveraging

machine learning and data analysis techniques, financial technology can identify patterns indicative of criminal activity, such as unusual spending patterns or the use of multiple accounts. Additionally, financial technology can be used to detect and prevent money laundering schemes, by identifying suspicious transactions and detecting trends among multiple transactions.

Results also indicated that financial technology can provide tools to securely store financial data and enable secure online payments. Several companies have developed online payment systems that are designed to protect the integrity of financial data. Additionally, financial technology can be used to facilitate the transfer of funds securely, with fraud protection built in. Finally, financial technology can be used to automate the accounting process, providing greater accuracy, visibility, and control over financial resources.

5. Conclusive Remarks

The theoretical implications of exploring the role of fin-tech in uncovering parallel economy among household businesses are that it could provide insights into how modern technology can be used to uncover previously hidden sources of income and other economic activity. By examining the patterns and methods of how fin-tech is used, researchers may gain insight into how to best harness these technologies to uncover and address other sources of economic activity that may not be reflected in traditional economic data.

The exploration of the role of Fin-Tech in uncovering a parallel economy among household businesses offers many practical implications, such as increased economic activity, increased economic efficiency, improved financial services, and increased financial inclusion. Additionally, research has shown that tapping into this previously untapped sector often presents numerous opportunities for growth.

The main limitation of exploring the role of Fin-tech in uncovering a parallel economy among household businesses is the lack of reliable data and difficulty in obtaining accurate and up-to-date information. Additionally, digital financial transactions and services can be subject to data security issues, which can lead to privacy concerns for consumers. Moreover, as household businesses are often informal and unregulated, there is a risk of encouraging economic activity that is not compliant with existing regulations.

It's important to note that controlling the shadow economy is a complex and challenging task and different measures may be more or less effective in different contexts. A comprehensive and coordinated approach that involves multiple stakeholders, including government agencies, private sector organizations, and civil society, is likely to be the most effective in reducing the size of the shadow economy and promoting sustainable development.

Based on above results, discussion and conclusion, the current study recommended the following:

- Improve tax administration that can help to reduce tax evasion, which is a major contributor to the shadow economy. This can include measures such as increasing the resources and capabilities of tax authorities, improving tax collection and enforcement processes, and simplifying tax systems.
- Encourage formalization to formalize and register with the government can help to bring informal economic activities into the formal economy, where they can be taxed and regulated. This can include measures such as reducing the costs and regulatory burden of formalization and providing incentives for businesses to formalize.
- Promote financial inclusion by providing access to financial services, such as banking and digital finance, can help to bring informal economic activities into the formal economy. This can include measures such as improving access to financial services for underserved communities and reducing barriers to entry for financial institutions.

- Enhance transparency in economic transactions can help to reduce the incentives for informal economic activities. This can include measures such as improving data collection and reporting systems and strengthening anti-money laundering regulations.
- Develop a legal framework that supports the formal economy and discourages informal economic activities can help to control the shadow economy. This can include measures such as strengthening contract enforcement, protecting property rights, and providing clear and predictable regulations.

From a theoretical perspective, this research can contribute to the existing knowledge on intrapreneurship and parallel economy. It sheds light on the potential of Fintech in uncovering parallel economy activities conducted by household businesses. Additionally, it offers insights into the interplay between intrapreneurship and Fintech, which is an area that has received limited research attention. Understanding the relationship between these two concepts is essential to promote the adoption of Fintech and encourage intrapreneurial activities that can help uncover parallel economy transactions. On a practical level, this research can inform the design of Fintech solutions that can help detect and uncover parallel economy activities. For instance, Fintech solutions that can detect illicit financial activities, identifying suspicious transactions, evaluating cash flows and patterns, and analyzing spending behaviors can help household businesses adopt alternative payment modes and reduce the parallel economy's resources.

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