









ORIGINAL

The Impact of Digital Financial Technology in Achieving Digital Entrepreneurship: Business Intelligence as a Modifying Variable in Jordanian Banks

El impacto de la tecnología financiera digital en la consecución del espíritu empresarial digital: la inteligencia empresarial como variable modificadora en los bancos jordanos

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ABSTRACT

Introduction: this study aims to examine the relationships between digital financial technologies, business intelligence, and digital entrepreneurship, focusing on how business intelligence influences the relationship between digital financial technologies and the emergence of digital entrepreneurship.

Method: data were collected through a questionnaire distributed to senior management in four Jordanian banks, targeting a total of 270 individuals. A total of 170 questionnaires were distributed, 165 were returned, and 159 were valid for analysis.

Results: the findings revealed significant relationships between digital financial technologies, business intelligence, and the emergence of digital entrepreneurship. Business intelligence was found to play a crucial role as a moderating variable in linking digital financial technologies to digital entrepreneurship.

Conclusions: the study highlights the importance of digital financial technologies and business intelligence in fostering digital entrepreneurship in the banking sector. The results provide valuable insights for banking institutions to enhance their digital strategies and support entrepreneurship initiatives.

Keywords: Digital Financial Technology; Digital Entrepreneurship; Business Intelligence; Jordanian Banks.

RESUMEN

Introducción: este estudio pretende examinar las relaciones entre las tecnologías financieras digitales, la inteligencia empresarial y el espíritu empresarial digital, centrándose en cómo influye la inteligencia empresarial en la relación entre las tecnologías financieras digitales y la aparición del espíritu empresarial digital.

Método: los datos se recogieron mediante un cuestionario distribuido a los altos directivos de cuatro bancos jordanos, dirigido a un total de 270 personas. Se distribuyeron 170 cuestionarios, se devolvieron 165 y 159 fueron válidos para el análisis.

Resultados: los resultados revelaron relaciones significativas entre las tecnologías financieras digitales,

la inteligencia empresarial y la aparición del espíritu empresarial digital. La inteligencia empresarial desempeñó un papel crucial como variable moderadora en la relación entre las tecnologías financieras digitales y el espíritu empresarial digital.

Conclusiones: el estudio destaca la importancia de las tecnologías financieras digitales y la inteligencia empresarial para fomentar el espíritu empresarial digital en el sector bancario. Los resultados proporcionan información valiosa para que las instituciones bancarias mejoren sus estrategias digitales y apoyen las iniciativas empresariales.

Palabras clave: Tecnología Financiera Digital; Emprendimiento Digital; Inteligencia Empresarial; Bancos Jordanos.

INTRODUCTION

Due to the importance of financial and digital technology for digital entrepreneurs, and the rapid development during the past two decades, the focus has been on financial and digital technology technologies, which have developed several technological tools to use business intelligence in electronic banking services that help in contemporary digital entrepreneurship. (Mohsin et al.2023) Technological solutions that are interested in and replace traditional economic models with highly concentrated, efficient and scalable technology have been developed and improved by small businesses (Mohammed et al.2024). Technology platforms unify work environments and jobs that operate with the same principles of technological innovation for service-supporting applications (Upadhyay et al.2023). Several innovative solutions using the latest technologies for high technological performance have also been based on users in creating applications by business intelligence instead of providing information only (Indriasari et al.2022).

With the advent of technology that has provided space for the world to move into digital entrepreneurship (Malkawi et al. 2024), they have been able to apply technology to many companies and individuals (Sanga & Aziakpono2024). Small businesses and individuals working for themselves have become able to access profitable businesses instead of risking their money due to the low profits expected from limited markets (Molla & Biru 2023), so digital financial technology has become the backbone and main driver of digital entrepreneurship due to the low operational costs and risks for large companies such as banks and financial institutions. Through digital entrepreneurship, which has added flexibility to economic business, the economic system has become more competitive internally by business owners (Leong et al.2022).

Problem Statement

Commercial banks have a great importance and contribution to sustainable economic and social growth as they are influential in comprehensive development. And to face great challenges to ensure its stability and performance in the global financial markets. The problem of studying lies in digital entrepreneurship in Jordanian banks. The impact of digital financial technology in its dimensions (digital payments, digital borrowing and digital insurance) on digital entrepreneurship with the presence of a modified variable of business intelligence in Jordanian banks. The scientific aspect: The importance of this study comes from the importance of the variables that we have identified, as the concept of digital financial technology is one of the important factors that attract the attention of researchers because of its great importance and competitiveness, the concept of digital entrepreneurship and business intelligence is also one of the renewable factors in the world of banking institutions. Through research, the researchers sought to identify everything that is new and of interest to researchers in this field and present it within this study to be a reference, thus filling some of the gap in the Arabic library about these variables. Hypotheses can be formulated with the following key questions: What is the impact of digital financial technology in its dimensions (digital payments, digital borrowing, digital insurance) on digital entrepreneurship in Jordanian banks? Several sub-questions arise from this question:

What is the impact of digital payments on digital entrepreneurship in Jordanian banks? What is the impact of digital borrowing on digital entrepreneurship in Jordanian banks? What is the impact of digital insurance on digital entrepreneurship in Jordanian banks? • What is the impact of business intelligence in improving the impact of digital financial technology in its dimensions on digital entrepreneurship in Jordanian banks?

Theoretical Framework

Digital Financial Technology (DFT)

The advent of the financial technology revolution has led to a technological development that protects customers from borrowing (Alnsour, 2023). It is shaping digital ways to connect financial banks with customers (Allioui & Mourdi, 2023).

From the point of view of (Broby, 2021), an important feature of digital financial technology is the ability to

carry out several operations from more than one side at the same time using electronic devices for information transfer, will, and social interaction. See (Shehadeh et al., 2024).

Jordanian banks do not use digitization completely, so research has worked on proposing digital financial services to accelerate and use digital entrepreneurship. Digital fintech has also been extensively adopted as a driver of financial inclusion to achieve the UN's Sustainable Development Goals (Khera et al., 2022).

From the point of view (Ahmad et al., 2021). Digital financial technology provides financial services through digital channels in all its forms that support banking and financial services such as the Internet and mobile phones.

Digital Payments

An effective way to transfer, collect and manage funds that can be used in economic positions and financial inclusion, as most financial services such as profit keeping, loans, transfers, and insurance depend on dealing digitally and effectively (Jejenywa et al., 2024; Kristensen & Solvoll, 2019)

Kandpal et al.2023's point of view Digital payments are made via the Internet with the nihilism of fixed cash exchange, which is under the name of electronic payment, which is the transfer of cash from one account to another account using digital devices such as mobile phones or computers and a credit card by both parties.

Digital Borrowing

It is the method of applying by people for loans using electronic platforms without resorting to going to banks and enabling them to complete the process, starting from submitting the application to obtaining money to paying completely electronically (Elizabeth, 2020).

See Nzisa & Kithandi, 2023. It is a smart borrowing process for customers through the use of digital data through digital platforms

Digital Insurance

Digitalization plays an important role in reducing costs and errors in the insurance process and increasing customer satisfaction, leading to higher sales of insurance through digital platforms (Susanto, 2022).

And from the point of view (Infantino, 2024). He sees digitization as the computerization of systems and functions to improve flexibility between the two parties, which has caused a major shift in customer expectations.

According to EY Global Insurance Digital Survey, 2013 (2024), there is no doubt that the best-performing insurers of the future will have better technological infrastructure, new skills, improved measurements, improved systems, and retargeting cultures in order to reach goals, insurers should act as soon as possible.

Digital Entrepreneurship (DE)

Digital entrepreneurship takes care of the business of companies by directing them to the upper levels of management, with the participation of all management levels to obtain a lot of benefits (Awawdeh et al., 2022).

Companies and organizations need digital entrepreneurship for growth and continuity in the changing environment, and it also focuses on two types of activities, one of which analyzes the strengths and weaknesses of the organization and the other identifying the necessary measures strategically to maintain performance and work to improve it (Kadir & Shaikh, 2023).

See (Hong et al., 2024). It is important to use digital entrepreneurship in e-commerce and social media for marketing, product presentation and distribution.

Digital knowledge

Knew it (Neuberger et al., 2023). It is an arrangement of knowledge that identifies basic presuppositions, internal instructions and external conditions for the process of producing knowledge in society, its application, distribution and management, in all degrees of quality and types of knowledge. It can also be defined as the "knowledge economy" and the "knowledge system".

Digital Leadership

It is easy for organizations to use digitization to adapt their skills and culture, especially in the information age, in which leaders in organizations with the ability to amplify AI by robots are not imitated with the capabilities they have. (Proksch et al.2024).

Leadership is a participatory process of people within an organization that reflects their skills and behaviors together (Shin et al., 2023).

Digital Creativity

It is the ability to solve problems using the human mind, innovation, and the use of new rather than traditional technologies in creativity to break down barriers at work (Lee, 2012).

As for (Antikainen, 2021). He believes that creativity is a person who follows an original approach to solving problems and not following traditional patterns to reach effective solutions, and defines digital creativity as creativity that uses digital technologies in all forms.

The Moderating Role of Business Intelligence

Business Intelligence (BI) It is a strategic management technique that uses sense and discrimination instead of facts that helps managers and decision-makers make important decisions correctly. It is a set of different technologies and applications that are used in business environments to collect, analyze, transmit and store information to present to decision makers (Jaradat et al.2024).

The presence of business intelligence enhances the competitive advantage of banks and helps them expand as it is the main driver of digital banks (AlMomani & Alomari, 2021).

Digitization alone is not enough for banks to succeed, but it is necessary to use business intelligence that helps in the analysis and development process (Olszak, 2020).

Study Methodology

This research is applied in nature and explanatory in goal, focusing on showing the effect of Digital Financial Technology on Digital Entrepreneurship, as Business Intelligence an intervening variable between them under the investigation of Jordanian Banks. It could be inimitable research as it takes place in the natural organizational setting of these banks. The other limitation is that the research is cross-sectional time-wise since the study takes a snapshot in a sample at a given time. Research is quantitative, statistically analyzing the data. Data were analyzed using spss and Smart PLS, which conducted several types of statistical analysis, including descriptive statistics (mean and standard deviation), correlation analysis to examine the Interco struct relationships, and simple and multiple regressions to test the main and sub-hypotheses. One sample t-tests and ANOVA were also used to examine the effect of demographic variables. They both composed the correlation matrix, and structural model assessment along with validity and reliability tests (Heterotrait-Monotrait ratio (HTMT) for 213 sample. A VIF and R² evaluation was also performed.

Population and Sample Research

The researchers adopted a sampling strategy, in which a proportional and stratified random sample representing the study population was drawn. The study population consisted of all managers in the senior management in Jordanian Banks., which numbered (270) administrators in (4) Jordanian Banks. The researchers adopted the relative stratified random sampling method to determine the sample from the study population, where a sample of managers of Jordanian Banks. was withdrawn, due to the difference in the Bank in terms of size (number of employees), which is reflected in the number of managers in each Bank, which leads to the representation of each Bank in the study sample. Therefore, the sample size representing the population is (159) (Sekaran & Bougie, 2016; Al-Najjar et ai., 2020) and to obtain the required number of questionnaires, the sample size was increased to be (170) questionnaires.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	90	42,3	56,6	56,6
	2	69	32,4	43,4	100,0
	Total	159	74,6	100,0	
Missing	System	54	25,4		
Total		213	100,0		

The table presents the gender distribution of a total of 213 respondents. Of these, 159 responded validly, representing 74,6 % of the total. 60, Category 2 (K = 69; 43,4 %). Also, no response for 54 responses (25,4 %) Although this suggests a relatively good gender balance in the valid responses, much of the data is missing.

A summary of the age breakdown of the 213 respondents is shown in the table: 159 (74,6 %) were valid returned responses and 54 (25,4 %) are missing In Category 3: 77 respondents (48,4 %) In Category 4: 41 respondents (25,8 %) in Category 2: 40 respondents (25,2 %) only 1 person (0,6 %) selected Category 1. This means that the majority of the respondents are in categories 2, 3 and 4, with Category 3 being the largest age group.

Table 2. Age					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	1	0,5	0,6	0,6
	2	40	18,8	25,2	25,8
	3	77	36,2	48,4	74,2
	4	41	19,2	25,8	100,0
	Total	159	74,6	100,0	
Missing	System	54	25,4		
Total		213	100,0		

Table 3. Experience					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	2	0,9	1,3	1,3
	2	19	8,9	11,9	13,2
	3	69	32,4	43,4	56,6
	4	69	32,4	43,4	100,0
	Total	159	74,6	100,0	
Missing	System	54	25,4		
Total		213	100,0		

The table shows respondents' experience level among 213 respondents. Out of those, 159 did not have missing data (74,6 %) and 54 had a missing value (25,4 %). In contrast, both categories 3 and 4 have 69 responses (43,4 % of valid responses). 19 respondents (11,9 %) belong to Category 2, against only 2 respondents (1,3 %) belonging to Category 1. Such high representation by Category 3 and 4 (70,2 %) means that the overwhelming majority are experienced respondents.

Table 4. Qualification					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	84	39,4	52,8	52,8
	2	7	3,3	4,4	57,2
	3	60	28,2	37,7	95,0
	4	8	3,8	5,0	100,0
	Total	159	74,6	100,0	
Missing	System	54	25,4		
Total		213	100,0		

Table 4 shows the frequency of respondents according to qualifications (213 original respondents; valid responses = 159 (74,6 %); missing = 54 (25,4 %)).

Category 1 further broken down is the most common, with a total of 84 of the respondents (52,8 % of valid responses). In order of frequency, 60 participants (37,7 %) are assigned to Category 3, 7 participants (4,4 %) are assigned to Category 2 and 8 participants (5,0 %) are assigned to Category 4. This means that most respondents are qualified in Category 1 and 3.

Table 5. Functional					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	42	19,7	26,4	26,4
	2	74	34,7	46,5	73,0
	3	31	14,6	19,5	92,5
	4	12	5,6	7,5	100,0
	Total	159	74,6	100,0	
Missing	System	54	25,4		
Total		213	100,0		

Table 5 shows the functional distribution of 213 respondents, with 159 valid ones (74,6 %), and 54 missing ones (25,4 %) Category 2 is the largest group, with 74 respondents (46,5 % of valid) and category 1 is the second largest, with 42 respondents (26,4 %). The least represented is Category 4 with 12 respondents (7,5 %) and Category 3 follows with 31 respondents (19,5 %). This means that almost 50 % of these respondents fit in Category 2, meaning it is the most populous functional group.

Correlation Analysis

The correlations are reported in following figure. The results are indicated that there is no multicollinearity problem. Moreover, there are significant positive correlations between all constructs, the correlation coefficient values ranged from ($r = 0,19$, $p < 0,05$) “between Intelligent and Payments”; to ($r = 0,72$, $p < 0,001$) “between Knowledge and Leadership”. These results are very important to say that there is no collinearity problem between the constructs

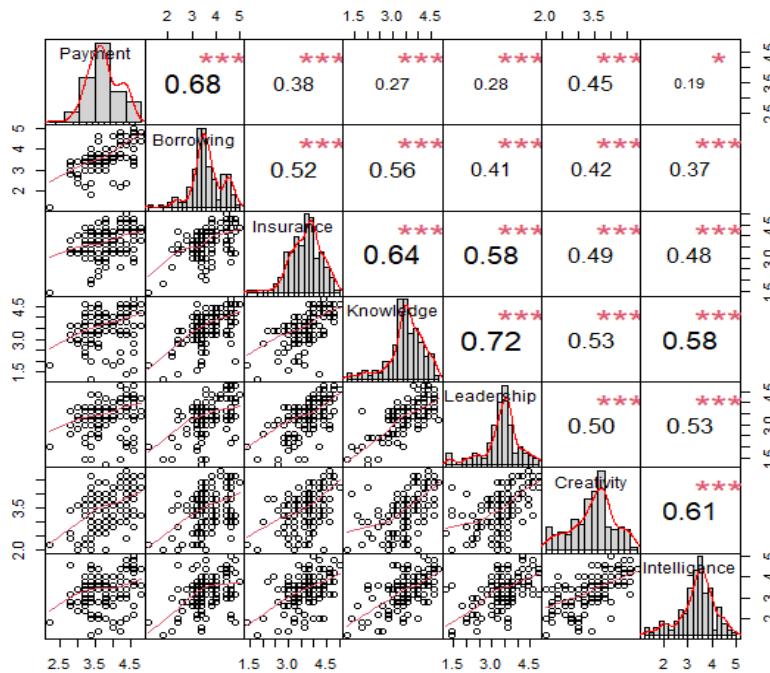


Figure 1. Correlation Analysis

Structural Equation Model

As suggested by the researchers, the path model is given I the following figure using Smart PLS 4.

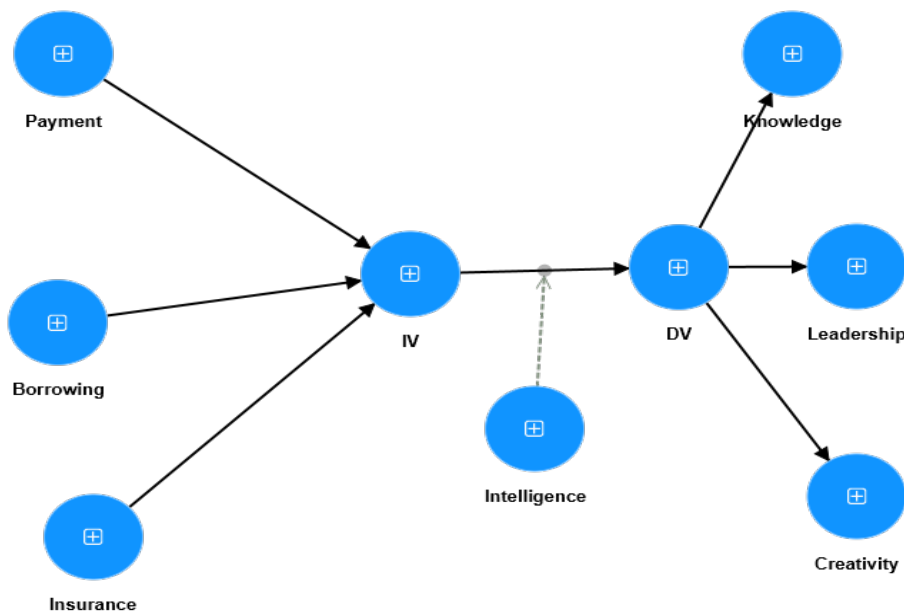


Figure 2. Structural Equation Model

Validity and reliability results

All the scores for Cronbach's α , composite reliability and AVE show internal consistency and convergent validity, respectively, of the reflective constructs and are shown in the following table.

	Cronbach's alpha	Composite reliability (rho_a)	Composite reliability (rho_c)	Average variance extracted (AVE)
Payment	0,725	0,729	0,83	0,551
Borrowing	0,836	0,849	0,884	0,606
Creativity	0,834	0,84	0,883	0,604
Insurance	0,813	0,854	0,862	0,559
Knowledge	0,837	0,846	0,885	0,609
Leadership	0,791	0,801	0,865	0,616
Intelligence	0,805	0,809	0,872	0,631

See the table for the reliability analysis results of seven constructs, measured from 213 respondents. Cronbach's alpha ranged from 0,725 (Payment) to 0,837 (Knowledge), indicating acceptable to good internal consistency. In addition, composite reliability (rho_a and rho_c) for all constructs exceeds 0,7 that confirms acceptable level of reliability. Convergent validity is confirmed as the average variance extracted (AVE) values are higher than the 0,5 cut-off. Of the constructs, IntelligenceAch (AVE = 0,631) and LeadershipAch (AVE = 0,616) have the highest reliability and validity, indicating strong measurement properties.

Heterotrait-monotrait (HTMT) ratio is a measure of discriminant validity to determine if the constructs of a reflective model. Generally, HTMT ratios should not exceed 0,85, or 0,9 if the reflective constructs are closely related (Hair et al., 2017). None of the HTMT ratios reported in table 4 exceed the recommended cutoff of 0,90.

	Borrowing	Creativity	Insurance	Intelligence	Knowledge	Leadership	Payment
Creativity	0,505						
Insurance	0,642	0,601					
Intelligence	0,51	0,712	0,641				
Knowledge	0,676	0,636	0,782	0,719			
Leadership	0,481	0,619	0,731	0,646	0,878		
Payment	0,845	0,55	0,403	0,267	0,355	0,361	
Intelligence x IV	0,363	0,122	0,222	0,309	0,262	0,223	0,085

Table presents Heterotrait-Monotrait Ratio (HTMT) values for seven constructs measured across 213 respondents. HTMT is used to evaluate discriminant validity, and thresholds for it would be values below 0,85. Key takeaways are below:

1. Borrowing-Payment (0,845): Close to the threshold, indicates some overlap.
2. Knowledge-Leadership (0,878): This value is above the threshold [49]; therefore, disaffirmed the discriminant validity issue.
3. All the other pairs, including Borrowing-Creativity (0,505), Insurance-Intelligence (0,641), and Payment-Intelligence (0,267) remains at the acceptable limit.

The findings suggest relatively good discriminant validity, with further investigation needed for a few of the pairs with elevated HTMT values.

Moreover, Discriminant validity is proven if the square root of AVE for a particular construct is greater than its correlation with all other constructs; in SMART-PLS Discriminant Validity is proved using the Fornell and Larcker Criterion, the results of Fornell and Larcker are given in the following table indicate the discriminant validity is achieved.

Correlation Matrix Analysis The correlation matrix indicates strong positive correlations between some variables including Borrowing and Knowledge (0,563) and Insurance and Knowledge (0,631) which suggest considerable influences warranting additional investigation. Additionally, constructs such as **Payment** have weak correlations with other constructs, which indicates that it has a limited role in the proposed model. The diagonal values (square roots of AVE) are greater than the correlation of the off-diagonal values, confirming discriminant validity of the measures used.

	Borrowing	Creativity	Insurance	Intelligence	Knowledge	Leadership	Payment
Borrowing	0,778						
Creativity	0,421	0,777					
Insurance	0,546	0,478	0,748				
Intelligence	0,42	0,584	0,504	0,794			
Knowledge	0,563	0,53	0,631	0,585	0,781		
Leadership	0,396	0,515	0,578	0,515	0,711	0,785	
Payment	0,661	0,423	0,317	0,205	0,269	0,281	0,743

Structural model evaluation

The quantitative results of the study were developed using SmartPLS4 version 4.1.0.0 (Ringle et al., 2022) for PLS-SEM analysis. The research model based on the CFA results are shown in the following figure:

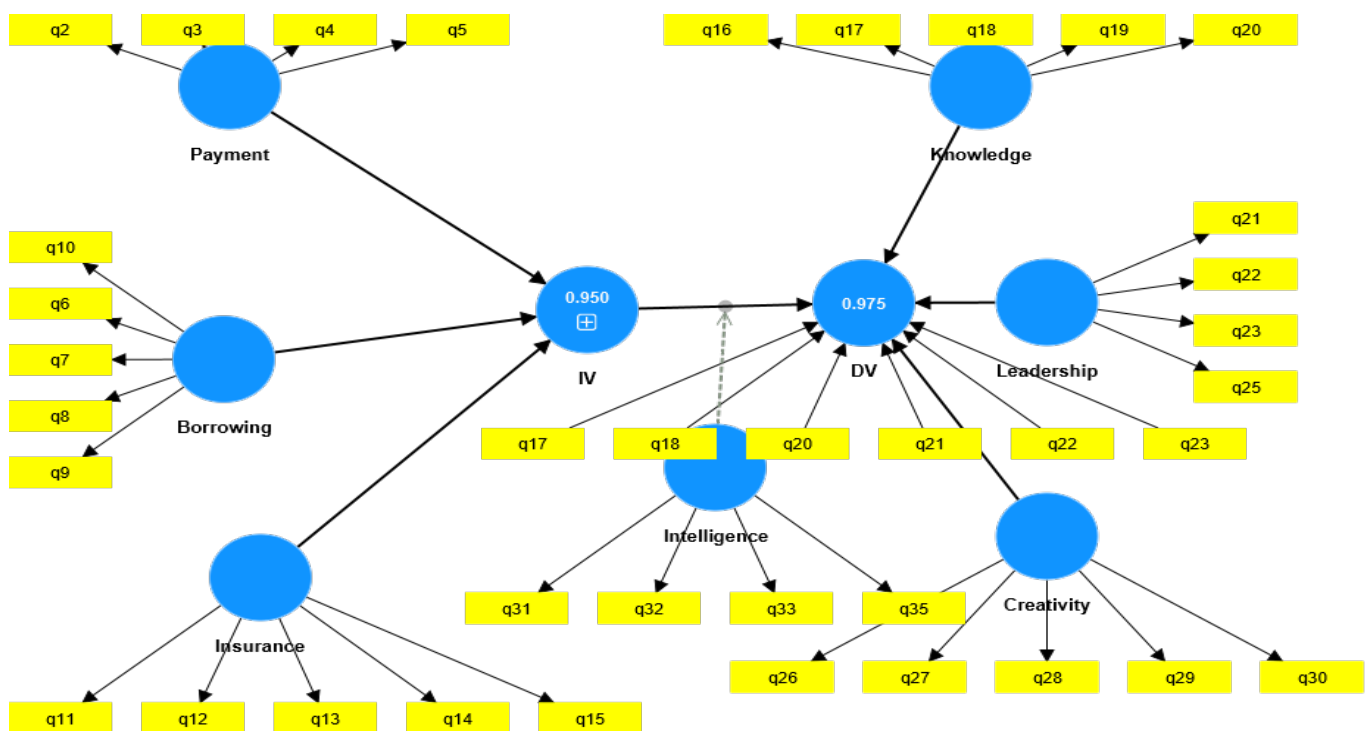


Figure 3. Research model based on the CFA results

Coefficient of Determination R2 show that the independent variables explain 95 % of the variations in the dependent variables.

R-square	R-square adjusted
0,95	0,949

The value of the (variance inflation factor) VIF is used to check the structural model for collinearity. The criterion of using the VIF will be that there is multicollinearity if the VIF is more than 5. Following this rule of thumb, the results indicate that there is a multicollinearity problem occurs within the charisma factor.

Table 10 shows the VIF, which you will see that multicollinearity is not a big problem in the model. All values are less than the common threshold of 5, and the largest VIF (2,784 for Knowledge) is still in an acceptable range. The lowest VIF value is 1,218 for the Intelligence x IV variable, indicating little multicollinearity of this variable. Rammer have low or moderate multicollinearity, which will ensure that the independent variables are not excessively colinear, and they can be interpreted without distortions.

Table 10. VIF of the model

	DV	IV
Payment		1,785
Borrowing		2,29
Insurance		1,433
Creativity	1,804	
IV	1,947	
Intelligence	1,899	
Knowledge	2,784	
Leadership	2,156	
Intelligence x IV	1,218	

Table 11. Results for second main hypothesis

	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (O/STDEV)	P values	Hypothesis
Intelligence -> DV	0,408	0,4	0,063	6,46	0	Direct effect
Intelligence x IV -> DV	0,016	0,019	0,032	0,491	0,623	Indirect effect (Moderator)

The direct effect of Intelligence on the DV is significant, while the interaction between Intelligence and IV does not appear to moderate the relationship with the DV.

Table 12. Other results

	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (O/STDEV)	P values	Result
Borrowing -> Creativity	0,194	0,196	0,037	5,193	0	S
Borrowing -> Knowledge	0,311	0,312	0,051	6,063	0	S
Borrowing -> Leadership	0,31	0,311	0,051	6,121	0	S
IV -> Creativity	0,246	0,255	0,045	5,438	0	S
IV -> Knowledge	0,394	0,404	0,056	7,038	0	S
IV -> Leadership	0,393	0,403	0,056	7,042	0	S
Insurance -> Creativity	0,073	0,079	0,027	2,657	0,008	S
Insurance -> Knowledge	0,117	0,126	0,04	2,921	0,004	S
Insurance -> Leadership	0,117	0,125	0,04	2,895	0,004	S
Intelligence -> Creativity	0,235	0,234	0,049	4,764	0	S
Intelligence -> Knowledge	0,377	0,369	0,058	6,495	0	S
Intelligence -> Leadership	0,376	0,368	0,058	6,48	0	S
Payment -> Creativity	0	0	0,007	0,035	0,972	NS
Payment -> Knowledge	0	0,001	0,01	0,036	0,971	NS
Payment -> Leadership	0	0,001	0,01	0,036	0,971	NS
Intelligence x IV -> Creativity	0,009	0,011	0,018	0,491	0,623	NS
Intelligence x IV -> Knowledge	0,014	0,018	0,029	0,494	0,621	NS
Intelligence x IV -> Leadership	0,014	0,018	0,029	0,493	0,622	NS

Summary of hypothesis testing results

The analytical results showed that most of the relationships of the structural model were statistically significant (S) at $p < 0,05$, which provides strong support for the proposed hypotheses. Especially Borrowing, Insurance, IV, Intelligence can positively impact Creativity, Knowledge, Leadership, at high t-values $> 1,96$. However, the construct Payment exhibits no major impact on the model’s dependent variables, evident by their t values (very low) and p-values ($p > 0,05$) Moreover, the interaction term Intelligence x IV shows no significant moderating effect and indicates that the interaction also may be relatively unimportant in this context.

Most, but not all, of the proposed relationships are confirmed, and the results identify areas for further investigation.

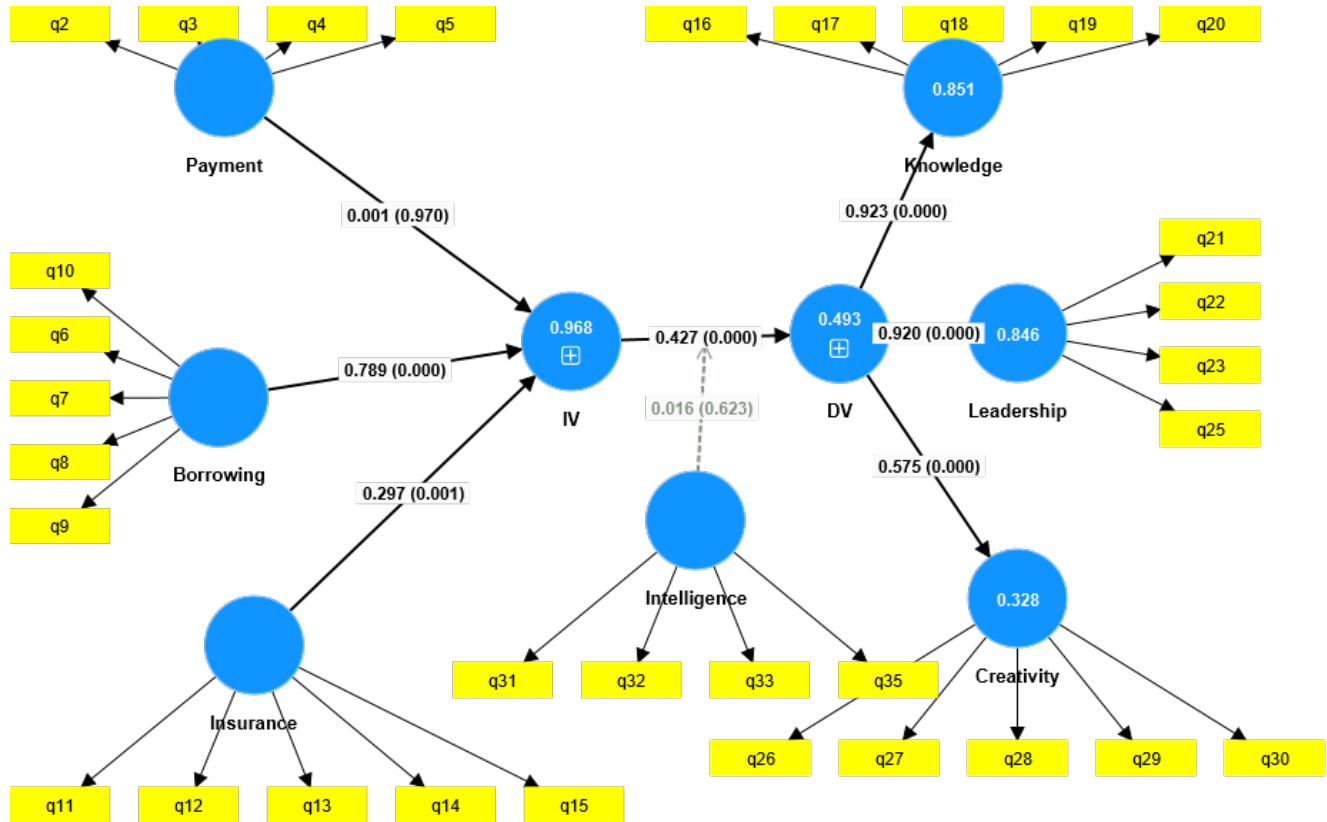


Figure 4. the relationships of the structural model were statistically

CONCLUSIONS

The study examined the impact of digital financial technology in building the function of Jordanian banks towards digital entrepreneurship. Digital entrepreneurship is a modern concept of paramount importance in the field of digital finance, which integrates the latest developments in financial technology. The findings in this study suggest that the role of digital fintech in Jordanian banks has demonstrated the importance of technologies through a holistic digital approach. This is an essential aspect of the development of banks in particular, as it will improve the rare digital banking culture. Essentially asserts that business intelligence has made positive contributions to the emergence of digital entrepreneurship. A compelling digital entrepreneurship culture should be inclusive in its pursuit by the various stakeholders responsible for banking regulations, as well as consumer/customer futures contracts under which banks should operate. A good start for bank regulators and bank managers working to express values and ethics around the world.

All banks around the world must use business intelligence because of its ability to reach the desired goals The process of digital leadership increases the ability to reap profits and gain the largest number of customers

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FINANCIACIÓN

Ninguna.

CONFLICTO DE INTERÉS

Los autores declaran que no existe ningún conflicto de intereses.

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