

## How Do Financial Technology Products Affect Financial Performance? Evidence from Banking Sector

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### Abstract

*The Covid-19 pandemic affects the banking industry in both positive and negative ways. It creates both threats and opportunities for the alliances between banks and financial technology (FinTech). Financial technology means the marriage or combination between finance and technology. The adoption of financial technology in banking industries has led to the expansion of automation and artificial intelligence. As a result, the customers' engagement level has been improved and transaction costs have been decreased. The current paper employs a panel regression model with fixed effects over the period (1990 – 2020). This paper addresses how the adoption of information and communication technology, more precisely, financial technology products, could affect the financial performance of the banking industry in Jordan. The financial technology products include internet, broadband, mobile, automated transfer machines (ATMs), and branches. The results show that financial technology products in the banking sector improve financial performance. In addition, a positive relationship was found between financial technology products and banking system stability.*

**Keywords:** Financial technology products; Banking industry; Amman stock exchange; Jordan.

### 1. Introduction

During the last decade or so, digital innovation has witnessed strong growth, especially in Financial Technology (FinTech). Financial technology is a way to build a system that model, value, and process financial products such as bonds, stocks, contracts, and money (Freedman, 2006; FSB, 2021). However, economic systems incorporate trading systems and trading technology to enable the selling and buying products at different times and in diverse marketplaces. The digitalization of financial services creates an opportunity for new players (i.e., banks) in the industry of finance (Brandl & Hornuf, 2017). The recent innovations in the field of information technology systems digitalize the financial sector. Also, the services provided by banks have been digitalized, such as investment services, payments, and lending. Different studies argued that financial products could increase banks profitability and efficiency as well as reduce costs (Acar & Citak, 2019; Akpan et al., 2020; Alt et al., 2018; Chang et al., 2020; Gomber et al., 2018; Jebril et al., 2023; Mazana et al., 2016; Mugableh, 2023; Mugableh et al., 2023; Okiro & Ndungu, 2013). On the contrary, there is little evidence on the relationship between financial technology products and banking system stability (Beck et al., 2016; Berger et al., 2009; Berger and Mester, 2003; Crawford et al., 2018).

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The present paper investigates the impact of financial technology products on the financial performance of Jordanian banks listed on the Amman Stock Exchange – Jordan. The financial technology products include internet, broadband, mobile, automated transfer technology (ATMs), and branches. The results show a positive association between financial technology products and banking profitability. The current paper contributes to the existing literature on how and whether financial technology products increase banking profitability. In addition, this paper adds to the ongoing debate on how financial technology products safeguard banking stability, providing recommendations to the banking sector's policymakers and academic researchers. The rest of this paper is structured as follows. The next section discusses theoretical background and literature review. Section 3 presents data and methodology. Section 4 deliberates results analysis and conclusions.

## **2. Theoretical background and literature review**

Beck et al. (2016) argued that financial technology either has positive or negative effects on economic sectors through the theory of innovation-growth and innovation-fragility. Under the innovation-growth view, financial innovation improves the functions of the financial system, i.e., decreases transaction costs, fosters risk sharing, and advances allocative efficiency (Allen & Gale, 1994; Freixas et al., 2015; Grinblatt & Longstaff, 2000; Merton, 1992). On the other side, Brunnermeier (2009) argued that the innovation-fragility view implies that financial innovation significantly accelerates risks of economic systems as it accumulates credit expansion.

More recently, the literature has confirmed that information and communication technologies (ICT) rapid innovation, increasing banking profitability and achieving banking system stability. For example, Baker et al. (2023) investigated the impact of financial technology products adopted by commercial banks listed on the Amman stock exchange and Abu Dhabi securities exchange on their financial performance. The results showed that financial inclusion and automation increased the financial performance. Chen et al. (2021) examined the impact of financial technology products on the performance of commercial banks in China. The gathered data was analyzed using the structural equation modeling technique. The results revealed that financial technology products had positive and significant impacts on customers' satisfaction. In addition, financial technology products improved the efficiency of the banking industry in China. Del Gaudio et al. (2021) investigated the impact of ICT innovations on the performance of the banking industry using yearly data over the period (1995 – 2015) of European countries. The findings revealed that ICT innovations with digital payments services enhanced the performance of the banking industry. Goh and Kauffman (2013) discussed that the investment in information technology such as internet banking increased the financial performance of the banking industry. The results of Ky et al. (2019) study revealed that financial technology products enhance banking profitability and efficiency. Lee et al. (2021) examined whether the financial technology products affected cost efficiency and technology adopted for the Chinese banking industry. The results showed that financial technology products improved the cost efficiency and enhanced the technology used by banks. Mary and Isola (2019) examined the effects of electronic banking services (mobile banking, agency banking, ATM banking, and online banking) on the financial performance of listed commercial banks in Kenya. The results revealed that there were strong positive relationships between electronic banking services and financial performance in Kenya.

In addition, Musa et al. (2015) examined the impact of E-banking services (number of debit cards issued to customers and number of (ATMs) machines installed by banks) on the performance of the banking industry in Nigeria. The results showed that the E-banking services positively influenced the banking sector in Nigeria. Odawa (2016)

analyzed the impact of financial technology products (i.e., internet banking, ATMs, smart cards, credit cards, and mobile banking) on the financial performance of listed commercial banks in the Nairobi securities exchange. The results showed that financial technology products improved the efficiency of banks' performance and reduced operating costs. Phan et al. (2020) studied the impact of financial technology products on bank financial performance using a sample of 41 Indonesian banks. The results showed that financial technology negatively predicted bank performance. Rega (2017) examined the impact of financial technology products on the banks' financial performance using a panel of 38 European banks (2013 – 2015). The results revealed a positive relationship between financial technology products and the examined banks' profitability.

### 3. Data and Methodology

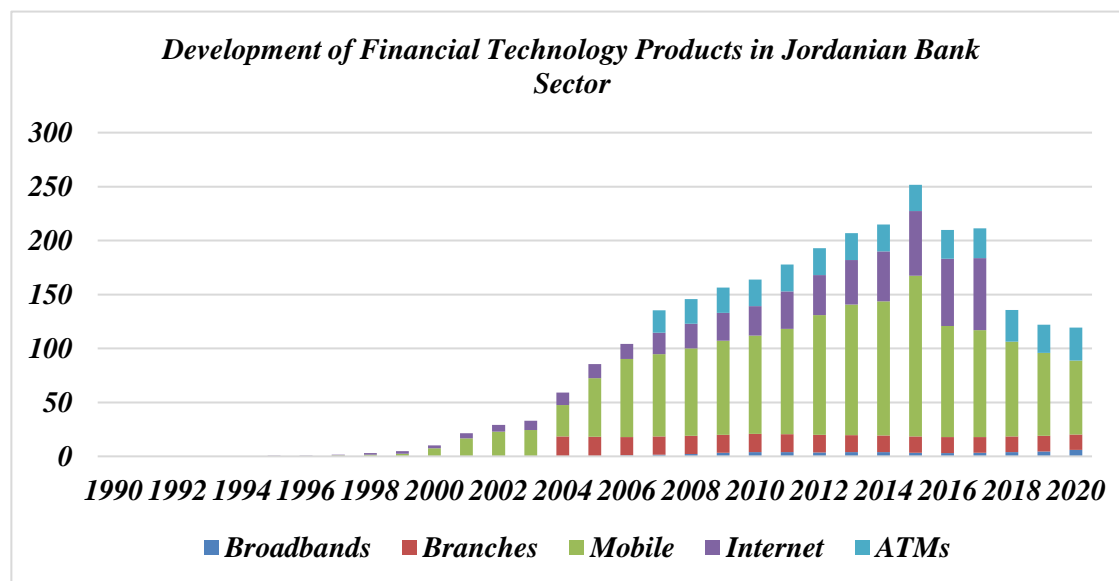
#### 3.1. Data

The data used in this paper was retrieved from two sources (the World Bank and the financial statements of the examined listed banks). The definition of variables related to financial technology products and the proxy of banking profitability is given in Table 1. Figure 1 presents the development of financial technology products in the Jordanian banking sector (1990 – 2020). The results show significant growth for using financial technology products in the banking industry. Specifically, the statistics highlight a noticeable increase in the number of branches and ATMs.

Table 1 Variables definitions and summary statistics over the period (1990 – 2020).

Variable	Definition	Summary statistics				
		Obs	Mean	Sta. dev	Max	Min
ROA	It measures bank profitability, returns on assets (%), net income after income, and tax ÷ total assets).	465	2.50	4.20	48.1	-10.1
Z-score	It is a measurement of the banking system stability, estimated as the sum of ROA (return on assets) and ROE (return on equity) divided by total assets and standard deviation of ROA.	465	9.15	5.89	33.2	-1.50
Internet	People using internet (%).	465	30.5	28.5	40.1	0.00
Broadband	Fixed broadband payments (per 100 people).	300	19.2	10.3	171	0.00
Mobile	Mobile cellular payments (per 100 people).	465	55.5	45.2	185	0.04
ATMs	The number of automated teller machines (per 100000 people).	210	52.3	39.1	169	10
Branches	Bank branches (per 100000 people).	255	32.6	22.1	105	4.15

Figure 1. The development of financial technology products in the Jordanian bank sector over the period (1990 – 2020).



Source: World Bank, development indicators database (2021), available on line at: <https://data.albankaldawli.org/country/JO>

### 3.2. Methodology

The current paper examines the impact of financial technology products on the financial performance of the banking industry in Jordan. It employs a Panel regression model with fixed effects and could be specified as follows (See Al-Ababneh et al., 2022; Bataineh et al., 2022; Bekhet & Mugableh, 2016; Jebriil et al., 2023; Mugableh & Oudat, 2018; Mugableh et al., 2023):

$$Y_t = \beta_0 + \beta_1 \text{FinTech}_t + \varepsilon_t \quad (1)$$

Where Y denotes the bank profitability (ROA) and financial risk (Z-score), FinTech refers to the financial technology products. It is a vector of internet, broadband, mobile, ATMs, and branches. The Z-score as a dependent variable has been employed to evaluate the relationship between banking system stability and financial technology products. Indeed, several studies have utilized the Z-score to measure the banking system stability (Chiaromonte et al., 2016; Del Gaudio et al., 2020; Laeven & Leven, 2009).

## 4. Results analysis and conclusions

### 4.1. Results analysis

This paper investigates the impact of financial technology products on banking financial performance and banking insolvency risk. Table 2 shows that financial technology products, namely internet, broadband, mobile, ATMs, and branches, positively impact banking profitability. The diffusion of financial technology products reduces transaction costs, which in turn positively impacts banking profitability. Additionally, it increases the efficiency of services provided by banks to customers.

Table 2 Results of the impact of financial technology products on banking financial performance and banking-insolvency risk.

Dependent variables →		
Independent variables ↓	ROA	Z-score
Constant	10.31***	3.912***
Internet	0.073*	0.030**
Broadband	0.001***	0.001***
Mobile	0.003**	0.090*
ATMs	0.002**	0.023**
Branches	0.081*	0.061*

Notes: (1) \*\*\*, \*\*, \* denotes the significance at 0.01, 0.05, and 0.10 levels respectively. (2) the analysis of the results is extracted from the E-views software package.

Financial technology products offer numerous advantages for banks, including updating products and services provided and expanding the customer base. The use of information and communication technology lead to expansion into fresh markets, improving banks' efficiency, and creating new sources of income (Almulla, & Aljughaiman, 2021). Therefore, it has become necessary for banks to adopt new technologies. Financial technology products boost banking performance by enhancing monitoring and screening abilities (Berg et al., 2020). Thus, reducing the likelihood of loans defaulting. Financial technology products also improve banking performance via customers' relationships (Mithas et al., 2012). In Table 2, the Z-score is used as a proxy of a country's banking-system stability. The results show a progressive relationship between financial technology products and banking system stability.

#### 4.2. Conclusions

This research paper investigates the impact of financial technology products on the financial performance and stability of listed banks in Amman stock exchange. It employs a panel regression model with fixed effects over the period 1990 – 2020. The financial technology products include internet, broadband, mobile, ATMs, and branches. However, the results document a progressive link between bank profitability and financial technology products. The adoption of information and communication technology innovations enhances the financial performance of the banking industry. Moreover, the findings reveal that the increases in banking profitability lower the probability of bank insolvency (i.e., increased bank stability). These results are in line with the results obtained by many researchers (Chen et al., 2021; Del Gaudio et al., 2021; Mary & Isola, 2019; Phan et al., 2020).

The findings of this paper provide different implications to the policymakers in the banking sector. The experts in the technology field have particular importance in introducing technological advances into financial products; this, in turn, will lead to decreased costs and bring innovation for the banking business. An additional implication is related to the policymakers, based on creating platforms and sharing data and information. This requires rules and policies that emphasize data security and simplify the implementation of new financial technology products in the banking sector, such as cryptocurrency, blockchain, and robotics.

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