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THE RELATIONSHIP BETWEEN FINANCIAL TECHNOLOGY PRODUCTS AND FINANCIAL PERFORMANCE IN THE BANKING SECTOR: EVIDENCE FROM JORDAN

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Abstract: The Covid-19 pandemic has impacted the banking industry both positively and negatively. This pandemic creates both threats and opportunities for the alliance between banks and financial technology (FinTech). Financial technology refers to the fusion of finance and technology. The adoption of financial technology in the banking industry has led to the expansion of automation and artificial intelligence. This is reflected in the population used by banking in Jordan. Using a panel regression model with fixed effects, this paper examines how the adoption of information and communication technology, specifically financial technology products, can affect the financial performance of the banking industry in Jordan. Financial technology products include the internet, broadband, mobile phones, automated transfer machines, and branches. The results show that financial technology products in the banking sector improve financial performance. Furthermore, a positive relationship is found between financial technology products and banking system stability.

Keywords: Financial technology products; Banking; Jordan.

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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; Financial Stability Board, 2021). However, economic systems incorporate trading systems and trading technology to enable the selling and buying of 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 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 a bank's profitability and efficiency and reduce costs (Acar & Citak, 2019; Akpan et al., 2020; Alt et al., 2018; Chang et al., 2020; Gomber et al., 2018; Mazana et al., 2016; 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 & Mester, 2003; Berger, 2003; Crawford et al., 2018).

Modern industries leverage technology to serve the payments sector. Fintech companies are generally startups that aim to challenge traditional companies that are less adept at adapting to technology and software (Goldstein et al, 2019). Fintech began to emerge in 2008, following the global financial crisis. Fintech companies provide solutions and deliver financial products controlled by banks, such as remittances, creating attractive alternatives and user-friendly digital destinations (Chen et al, 2019). Banks have invested in fintech to build their foundations and infrastructure, as well as establishing and developing digital strategies (Sefried & Riepe, 2023). This involves using technology to digitize banking services, improve interactions between banks and customers, and maximize revenue.

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 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 following section discusses theoretical background and literature review. Section 3 presents data and methodology. Section 4 deliberates results analysis and conclusions.

2. 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, 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 positively and significantly impacted customers' satisfaction. In addition, financial technology products improved the banking industry's efficiency 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 28 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 the 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 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 revealed 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. Research Method

3.1. Data

The data used in this paper was obtained from the World Bank and the financial statements of the examined listed banks). Table 1 displays the listed banks in Amman Stock Exchange – Jordan. The dataset contains yearly data from 1990 to 2020. The definition of variables related to financial technology products and the proxy of banking profitability is given in Table 2. Figure 1 presents the development of financial technology products in the Jordanian banking sector (1990 – 2020). The results show significant growth in the banking industry's usage of financial technology products. Specifically, the statistics highlight a noticeable increase in branches and ATMs.

Table 1.
The listed banks in Amman Stock Exchange – Jordan.

Bank's name	Bank's short name	Listed shares
Jordan Islamic Bank	JOR Islamic Bank	200,000,000
Jordan Kuwait Bank	JOR Kuwait Bank	150,000,000

Jordan Commercial Bank	JCBANK	120,000,000
The Housing Bank for Trade and Finance	Housing BK TRD FIN	315,000,000
Arab Jordan Investment Bank	Arab JOR/INV/Bank	150,000,000
Safwa Islamic Bank	Safwa Islamic Bank	100,000,000
Bank Al Etihad	Bank Al Etihad	160,000,000
Arab Banking Corporation/ (Jordan)	Arab Banking CO.	110,000,000
Invest Bank	Invest Bank	100,000,000
Capital Bank of Jordan	Capital Bank	200,000,000
Societe General De Banque-Jordanie	Socgen BK - Jordanie	100,000,000
Cairo Amman Bank	Cairo Amman Bank	190,000,000
Bank of Jordan	Bank of Jordan	200,000,000
Jordan Ahli Bank	Jordan Ahli Bank	200,655,000
Arab Bank	Arab Bank	640,800,000

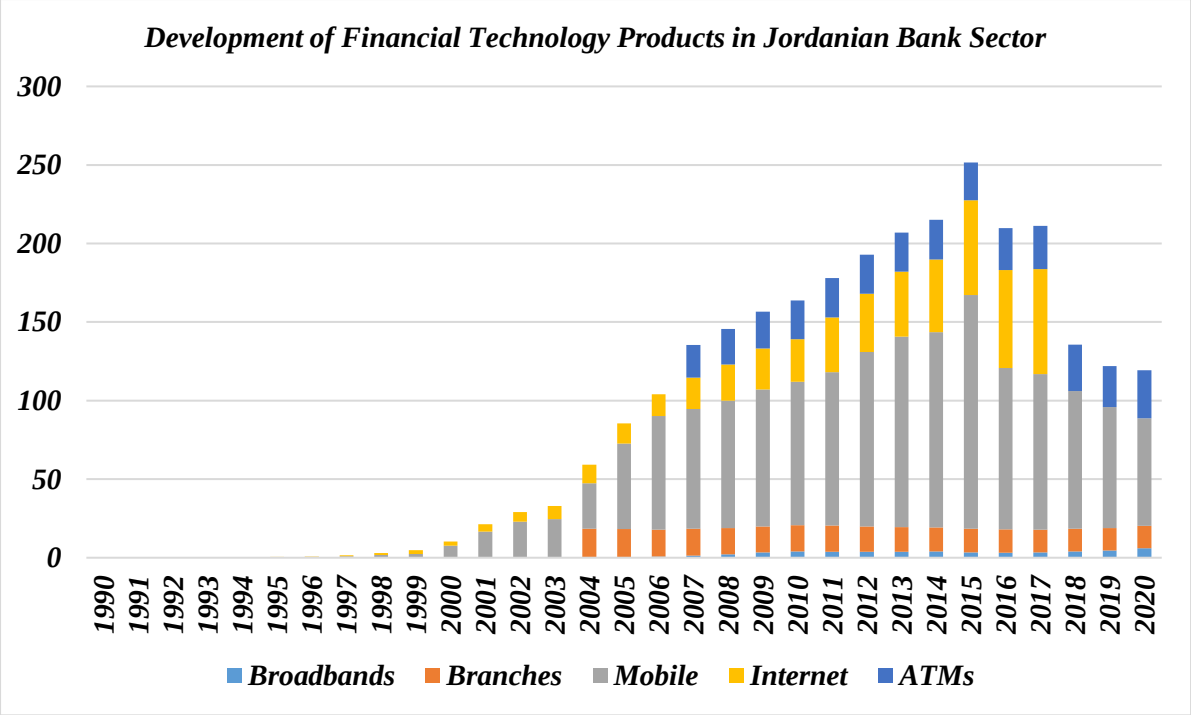
Source: Amman Stock Exchange – Jordan.

Table 2.
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	Individuals using the internet (% of the population).	465	30.5	28.5	40.1	0.00
Broadband	Fixed broadband subscriptions (per 100 people).	300	19.2	10.3	171	0.00
Mobile	Mobile cellular subscriptions (per 100 people).	465	55.5	45.2	185	0.04

ATMs	Is the number of automated teller machines (per 100000 people).	210	52.3	39.1	169	10
Branches	Are 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 (1990 – 2020).



Source: *World Bank* (2021)

3.2. Methodology

This 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:

$$Yt = \beta 0 + \beta 1 FinTecht + \varepsilon t \quad (1)$$

Where Y denotes the bank profitability (i.e., ROA) and financial risk (i.e., 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's stability (Chiaramonte et al., 2016; Del Gaudio et al., 2021; Laeven & Levine, 2009).

4. Results and Discussion

This paper investigates the impact of financial technology products on banking financial performance and banking insolvency risk. Table 3 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, positively impacting banking profitability. Additionally, it increases the efficiency of services provided by banks to customers.

Table 3
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 3, the Z-score is used to proxy a country's banking-system stability. The results show a positive relationship between financial technology products and banking system stability.

5. Conclusions

This research paper investigates the impact of financial technology products on listed banks' financial performance and stability in the Amman stock exchange. It employs a panel regression model with fixed effects from 1990 – 2020. The financial technology products include internet, broadband, mobile, ATMs, and branches. However, the results document a positive 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 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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