



# **Financial Technology and Economic Growth in the United Kingdom (2007-2023): Econometric Descriptive Analysis**

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## **Authors' contributions**

*This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.*

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## **ABSTRACT**

This study examined the impact of financial technology on economic growth in the United Kingdom from the period 2007-2023. The study utilized the ARDL bound test approach to analyze the results using a time series technique. Point of sales, automated teller machines, and direct debit payment were adopted as measures of financial technology, while GDP per capita was used as the economic growth indicator. The study also controlled using population growth rate and regulatory quality. The findings showed that point of sales positively and significantly impacted GDP per capita in the United Kingdom. Further results revealed that both Automated teller machines and Direct

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debit payments negatively and non-significantly impacted GDP per capita in the United Kingdom. Based on the result, the study recommends that to ensure operational efficiency of the point of sales (POS) system, regulatory agencies (FCA) and digital financial service providers must continue to integrate newer innovations and prioritize the security of customer information which improves and enhances customer satisfaction. There is a need for regulatory policies that encourage investors and financial institutions to provide fee-free ATMs across the United Kingdom through tax breaks. The government must deliver regulations that encourage cardless policies as well as stimulate innovative competition within the fintech payment industry in the United Kingdom.

**Keywords:** Financial technology; economic growth; GDP per capita; direct debit payments; ARDL.

## 1. INTRODUCTION

Over the last decade, the advent of financial technology (fintech) has led to a radical transformation of the financial industry in many countries, including the United Kingdom. Financial technology, or FinTech, integrates technology into financial services to improve delivery, lower costs, and establish new business models (Ezie, Oniore, and Ajaegbu, 2022; Schueffel, 2016). FinTech innovations have transformed how individuals engage with their finances globally, from peer-to-peer lending platforms to digital-only banks. Arner, Barberis, and Buckley, (2016), provide an in-depth description of FinTech and defines it as a new financial firm that employs technology to enhance financial activities. Fintech's fundamental value resides in its ability to improve financial functions, enhance resource allocation, and stimulate economic growth (He, Leckow, & Haksar, 2017; Han, Zhou, & Wang, 2019).

Today, the importance of technological innovation in spurring economic growth has been a central topic in economic and financial discussions. Various theoretical and economic thoughts have emphasized its significance. The innovation-growth idea asserts that financial technology enhances the quality of financial products and services (McGuire & Conroy, 2013; Mroua & Trabelsi, 2020). Schumpeter (1912), and Gurley and Shaw (1967) believe financial development promotes economic growth by increasing savings mobilization, improving resource allocation efficiency, and stimulating technical innovation. The neoclassical growth hypothesis, endorsed by economists such as Ramsey (1928), Solow (1956), and Swan (1956), contends that capital accumulation and labour are the primary drivers of consistent economic growth. In their view, technological advancements are seen as external factors facilitating economic expansion rather than intrinsic elements of the growth process. In

contrast, endogenous growth theory, championed by economists like Romer (1990), posits that technology is an essential internal factor influencing economic progress. This perspective emphasizes the role of internal elements such as capital, human resources, and innovation in stimulating growth. Proponents argue that innovation leads to positive externalities, which enhance productivity and increase returns to scale, thereby emphasizing the significance of technology in economic growth.

However, attention has been drawn to the connection between financial technology and economic growth, particularly in the outcome of the 2007 financial crisis. There is doubt about its impact on GDP (Li & Xu, 2021). Yet, technological innovation in finance is crucial as it offers fresh avenues to access financial services (Berman, Cano-kollmann, & Mudambi, 2022; Handa & Khan, 2008). According to a report by McKinsey & Company (2024), global investment in FinTech amounted to \$51.2 billion across 3,973 deals in 2023, reflecting a substantial decline from the \$99 billion invested in 2022. The United Kingdom's technological advances in Artificial Intelligence, the Internet of Things, and Fintech have made it an attractive option for Fintech companies and investors.

The UK is the second largest FinTech investment hub after the US. The United Kingdom continues to stand out as the most compelling destination for FinTech in Europe, offering unparalleled opportunities for growth and innovation. Investments in the sector fell 34% to \$12.3 billion in 2023, down from \$18.7 billion in 2022, due to high interest rates and inflation rate. The number of fintech deals also dropped, with 456 Merger & Acquisition, Venture Capital transactions completed in 2023, compared to 706 in 2022 (KPMG, 2024). The UK's thriving FinTech sector comprises around 1,600 enterprises and is projected to grow significantly by 2030. With an

estimated value of \$13.4 billion (£11 billion) to the UK economy and engaging around 76,000 individuals, it is a vital and dynamic contributor to the country's financial landscape. The central concern is whether this contribution adequately serves the needs of the UK's growing population.

This study aims to tackle critical issues and engage in discussion and analysis surrounding the role of financial technology in shaping economic growth in the United Kingdom. This research addresses a significant void in the current literature by identifying the remarkable rise of FinTech in the UK. Its goal is to provide compelling evidence that underscores the critical role of technology in enhancing economic growth from 2007 to 2023. The base year 2007 was chosen because in 2007 the world experienced a global financial shock that ushered in a renewed financial technology revolution. This analysis will particularly examine the recent implications of the aftershock of the 2007 financial meltdown, BREXIT, and the COVID-19 pandemic, emphasizing the transformative power of FinTech in these challenging times. This study is highly relevant in showcasing the United Kingdom's position as a financial technological powerhouse.

The study is organized as follows: section 1 introduction, section 2 theoretical & empirical literature, section 3 focuses on methodology. Section 4 evaluates and addresses the findings, while Section 5 summarizes the study and makes some important policy recommendations.

## **2. THEORETICAL AND EMPIRICAL LITERATURE**

Several empirical investigations highlight the significant effect of financial technology on fostering economic growth in both technologically advanced and emerging nations. However, it is essential to mention that much of this research yields conflicting and sometimes contradictory findings (Ozturk and Ullah, 2022; Utami, 2022). The current literature on the link between financial development and technological innovation dates to Schumpeter's groundbreaking work in 1912. Schumpeter posited that financial development has the potential to enhance the savings rate and optimize resource allocation, thereby promoting technological innovation within enterprises and fostering economic growth. Bai and Ding (1998) state that significant financial innovation is vital for promoting economic success and sustainable

financial development. Similarly, Fisman and Love (2007) observed that economies with more sophisticated financial systems typically experience faster growth in industries that have substantial potential. Furthermore, Laeven, Levine, and Michalopoulos (2015) argue that financial innovation and technology enhance economic growth by optimizing growth opportunities. In summary, these studies highlight the critical significance of financial technology in advancing the economy.

A significant shift occurred as many scholars began to embrace the endogenous growth hypothesis, introduced by Romer (1986) and Lucas (1988), to explore the dynamic correlation between financial development and economic growth. This evolving conversation was significantly shaped by the foundational theories of neoclassical economic growth offered by Solow and Swan (1956). They believe that technological innovation is the primary force behind economic progress in addition to capital and labor. According to Solow (1956), efficiency improvements or technological breakthroughs were the only ways to achieve long-term, sustainable growth.

Ezie, Oniore, and Ajaegbu (2023) conducted a pivotal study on the interplay concerning financial technology and economic growth in Nigeria, examining data from 2012Q1 to 2022Q4. Utilizing a fully modified ordinary least squares (FMOL) methodology, their findings provide compelling evidence that both web-based and mobile payment transactions significantly bolster economic growth. In stark contrast, instant pay transactions were found to hinder growth, underscoring the urgent need for stricter regulatory oversight to protect the economy.

Utami (2022) analyzed the impact of Financial Technology (Fintech) on Indonesia's economy during the new normal era. Through a rigorous quantitative approach, tapping into monthly Fintech statistical statements from 2020 - 2022, the study revealed that Fintech plays an essential role in driving Indonesia's economic growth. These insights collectively highlight the critical importance of embracing financial technology while ensuring appropriate regulations are in place.

Other empirical research revealed that financial technology positively promotes economic growth across countries (Ozturk and Ullah, 2022; Gomes, Lopes, and Ferreira 2022; Jorgenson

and Vu, 2016; Jiang, Wang, Ren, and Xie, 2021). On the other hand, Agba, Tunio, Shah, and Zia (2022) empirically investigated how trade, financial development, and information and communication technology affected economic growth in N11 nations from 2000-2018. It is evident from the PMG estimator for a dynamic

panel (ARDL) model that the proliferation of ICT significantly hinders economic growth. Rossignoli and Arnaboldi (2009) used empirical and theoretical data from the UK and Italy to investigate financial innovation. applying a rating system. According to the facts, innovation, and cost-cutting in Italy don't seem to be related

## 2.1 Review Summary of Related Study

**Table 1. Summary of related study**

Authors Name	Topic/Period	Country	Methodology	Findings
<b>Gomes, Lopes, and Ferreira (2022)</b>	Impact of digital economy on economic growth in OECD countries (2000-2019)	OECD Countries	Correlation Analysis and GMM using a fixed cross-section.	ICT positively influences the GDP of OECD Countries
<b>Ngong, Thaddeus, and Onwumere (2024)</b>	Financial Technology and Economic Growth Nexus in the East African Community States (1997-2019)	EACS Countries	ARDL Method	The results showed a significant relationship between financial technology and economic growth.
<b>Jorgenson and Vu (2016)</b>	Impact of digital technology usage on economic growth in Africa	African Countries	GMM	Positive relationships exist between digital technology and economic growth.
<b>Mugableh and Hammouri (2022)</b>	Exploring the impact of financial technology on economic growth in Jordan (1990-2021)	Jordan	ARDL/VECM	A positive impact exists between financial technology and Economic Growth.
<b>Ahassan, Blokhina and Kouadio (2021)</b>	Financial innovation: The impact of mobile money on innovative economic growth (1980-2018)	SSA Countries	Partial least square (PLS) regression	Positive relationship between financial innovation and economic growth.
<b>Bu, Yu and Li (2022)</b>	The nonlinear impact of FinTech on real economic growth.	China	Threshold regression model	The result revealed that fintech significantly promotes real economic growth.
<b>Ravikumar, Suresha, and Rajesh (2019)</b>	Impact of Digital payment on economic growth.	India	OLS/ARDL	Digital payment impacts economic growth in the short run but not in the long run.
<b>Maknickiene and Lapkovskaja (2024)</b>	An Exploratory Review of the Fintech Influence Field (2006-2020)	Non-generic study	Bibliometric Analysis	There were significant influences between fintech and economic development and socio-demographic inequalities.
<b>Salahuddin and Gow (2016)</b>	effects of internet usage on economic growth (1991-2013)	South Africa	ARDL Approach	A positive and significant long-term relationship between internet usage and economic growth.
<b>Jiang, Wang, Ren, and Xie (2021)</b>	The nexus between digital finance and economic development (2011-2018)	China	A panel model, a Mediating effect model, and an instrumental variable technique	A positive link between digital finance and economic development in China.
<b>Akwam, Okaro, Okonkwo, Adigwe, and Ogbonna (2023)</b>	Financial technology and economic growth in selected SSA Countries (2004-2021)	Nigeria	Pooled effect panel EGLS	A strong positive correlation exists between financial technology and economic growth in SSA countries.
<b>Jiarong, Yinnang, and Song (2023)</b>	The impact of fintech on Economic Growth (2010-2022)	Singapore	VAR Model	The result confirmed a positive impact on Singapore's economic growth.

Authors Name	Topic/Period	Country	Methodology	Findings
Zhiwei, (2023)	Impact of Financial Technology on GDP and Home Prices (2000-2023).	China	Regression	Fintech has a positive and significant effect on both GDP and Home Prices.
Serhan (2024)	Is Schumpeter Right? Fintech and Economic Growth (2012-2020)	198 Countries Study	GMM model	A positive relationship exists connecting fintech and economic growth.
Alhassan, Blokhina, and Kouadio (2021)	Financial Innovation: The impact of mobile money on innovative economic growth	SSA countries	Partial least squares regression (PLS)	A positive correlation exists between mobile money and GDP.

Source: Authors Compilation

### 3. METHODOLOGY

#### 3.1 Estimation Technique

This study utilized an *ex-post facto* and analytical research approach to collect and evaluate data. Secondary sources were employed to gather the necessary data to measure the variables. GDP per capita, ATM, population growth rate, and regulatory quality data were sourced from the World Bank Development Indicator. Point of sales and direct debit transactions were obtained from Statista.com from 2007 to 2023. This study centers on the United Kingdom, which was selected for its robust financial technology infrastructure and solid regulatory framework for fintech.

This study conducted a preliminary investigation of the basic statistics and time series attributes of the series before merging them into an estimation model. This includes descriptive statistics, correlation matrix, graphical analysis, and unit root test findings that serve as the foundation for the studies. The Autoregressive Distributed Lag (ARDL) bound testing established by (Pesaran and Shin, 1997;

Pesaran et al., 2001) was used to determine Fintech's long and short-run impact on the United Kingdom's economic performance. The ARDL is appropriate since it is applied regardless of whether the underlying variables being integrated are of order  $I(0)$ ,  $I(1)$ , or  $I(2)$ . The ARDL strategy is more robust and performs better for finite samples than previous co-integration strategies. Pesaran et al. (2001) employed this strategy.

The generalized ARDL ( $p, q$ ) model is specified as:

$$Y_t = \alpha_0 + \sum_{i=1}^p \beta_i Y_{t-i} + \sum_{i=1}^q \delta_i X_{t-i} + \epsilon_t \quad \dots (i)$$

Where  $Y_t$  is the dependent variable and the variables in  $X_t$  are independent variables that can be purely  $I(0)$ ,  $I(1)$ , or co-integrated; and are coefficients;  $i = 1, \dots, k$ ;  $p$  is the optimal lag order for the dependent variable and  $q$  is the optimal lag order for the exogenous variables. The lag durations of  $p$  and  $q$  may not be the same; this is the white noise error term. This test uses the FPSS critical values from Pesaran (1997) and Pesaran et al. (2001), as well as the decision rules listed in Table 2.

**Table 2. Summary of FPSS decision rules**

STATE	INFERENCE	REMARKS
FPSS > $I(1)$	$H_0$ is rejected.	Co-integration is inferred.
FPSS < $I(0)$ and $I(1)$	$H_0$ cannot be rejected.	No Co-integration
FPSS within $I(1)$ and $I(0)$	Inconclusive Results	Results is inconclusive

We specified our model based on theoretical and empirical specifications from past research. This is consistent with Andrea, Udeh, and Allison (2022) findings, who used the following model. The models are thus stated and illustrated below.

$$GDP = f(ATM, POS, MAP) \quad \dots (ii)$$

The model was thus expressed in a linear equation form.

$$GDP = \beta_0 + \beta_1 ATM + \beta_2 POS + \beta_3 MAP + \mu \quad \dots (iii)$$

Where,  $\beta_0$  = Constant Term,  $\beta_1$  = Coefficient of Automated Teller Machine,  $\beta_2$  = Coefficient of Point-of-Sale,  $\beta_3$  = Coefficient of Mobile Applications,  $\mu$  = Error Term.

The ARDL model is used in this study and specified as follows.

$$\Delta \text{GDPPC}_t = \beta_0 + \sum_{i=0}^p \alpha_i \Delta \text{GDPPC}_{t-1} + \sum_{i=0}^p \vartheta_i \Delta \text{DDP}_{t-1} + \sum_{i=0}^p \sigma_i \Delta \text{ATM}_{t-1} + \sum_{i=0}^p \sigma_i \Delta \text{POS}_{t-1} + \sum_{i=0}^p \sigma_i \Delta \text{PGR}_{t-1} + \sum_{i=0}^p \sigma_i \Delta \text{RQ}_{t-1} + \delta_0 \Delta \text{GDPPC}_{t-1} + \delta_1 \Delta \text{DDP}_{t-1} + \delta_2 \Delta \text{ATM}_{t-1} + \delta_2 \Delta \text{POS}_{t-1} + \delta_2 \Delta \text{PGR}_{t-1} + \delta_2 \Delta \text{RQ}_{t-1} \varepsilon \quad \dots \dots \dots (iv)$$

Where:

GDPPC=Gross domestic product per capita, DDP= Direct debit payment, ATM= Automated teller machine, POS= Point of Sales, PGR=population growth rate, RQ= Regulation Quality,  $\beta_0$  = Regression constant,  $\delta_1$ = Coefficient of variables,  $\varepsilon$ = Error ter.

### 3.2 Description of Model Variables

**Table 3. The model variables for this study.**

Variables	Definition	Adopted	Apriori Expectations
<b>Dependent Variable</b>			
GDP Per capita	It is computed by dividing a nation's total GDP by its population.	World Bank, (2024), Mugableh and Hammouri (2022), Suleiman, Nwala and Jacob (2023)	
<b>Independent Variables</b>			
Automated teller machine	Total number of ATMs per 100,000	World Bank (2024). Mugableh and Hammouri (2022)	Positive (+)
Point of sales	Number of transactions at POS terminal on cards issued in the United Kingdom	Statista.com, Friedman & Johnson, (2019), Suleiman, Nwala and Jacob (2023).	Positive (+)
Direct Debit Card Payment	Volume of direct debit payments through the Bacs system in the United Kingdom	Staista.com	Positive (+)
<b>Control Variable</b>			
Population growth rate	The exponential rise of a midyear population from one year to the next is represented as a percentage.	WDI, (2024)	Negative (-)
Regulatory Quality	Measures the government's capacity to develop and implement appropriate policies and regulations.	IFS, (2024)	Positive (+)

Source: Authors Compilation

## 4. RESULTS

Table 4 the measure of central tendency, dispersion, and element of test for normality.

**Table 4. Summary of Descriptive Statistics**

VAR	MEAN	MEDIAN	MAX	MINI	STD DEV.	CV	SKEWNESS	KURTOSIS
<b>UNITED KINGDOM</b>								
<b>GDPPC</b>	0.503425	1.112856	8.763986	-10.68717	3.945209	7.8429	-1.057525	5.915591
<b>ATM</b>	117.8112	123.4200	131.2900	95.15000	13.19136	0.1119	-0.818411	2.047245
<b>POS</b>	14.37412	12.66000	24.49000	5.310000	6.363847	0.4427	0.251928	1.630663
<b>DDP</b>	3.890000	3.910000	4.830000	2.960000	0.639365	0.1642	0.035632	1.544656
<b>PGR</b>	0.684012	0.756391	1.134448	-0.081937	0.249342	0.3640	-1.594862	6.817077
<b>RQ</b>	1.678492	1.705334	1.868066	1.452375	0.126731	0.0755	-0.290596	1.955306

Source: Author's compilation for Eviews

**Table 5. Summary of correlation Matrix**

<b>Correlation Matrix</b>						
<b>Variables</b>	<b>GDPPC</b>	<b>ATM</b>	<b>POS</b>	<b>DDP</b>	<b>PGR</b>	<b>RQ</b>
<b>GDPPC</b>	-----					
<b>ATM</b>	-0.106 (0.69)	-----				
<b>POS</b>	0.648 (0.00)	-0.454 (0.07)	-----			
<b>DDP</b>	0.109 (0.68)	-0.583 (0.01)	0.714 (0.00)	-----		
<b>PGR</b>	-0.125 (0.63)	-0.215 (0.41)	-0.104 (0.69)	-0.255 (0.32)	-----	
<b>RQ</b>	0.191 (0.46)	0.517 (0.03)	-0.310 (0.23)	-0.573 (0.02)	0.438 (0.08)	-----

Source: Author's compilation for Eviews

**Table 6 Augmented dickey-fuller unit root test**

<b>Series</b>	<b>ADF T-Stat</b>	<b>Critical Values</b>			<b>P Value</b>	<b>Order</b>
		<b>1%</b>	<b>5%</b>	<b>10%</b>		
<b>GDPPC</b>	-5.50344	-4.00443	-3.09889	-2.68044	0.000	1(1)
<b>ATM</b>	-6.095442	-4.88643	-3.82898	-3.36298	0.037	1(1)
<b>POS</b>	-4.365088	-3.95915	-3.08100	-2.68133	0.004	1(1)
<b>DDP</b>	-4.914096	-4.68643	-3.82898	-3.36298	0.020	1(1)
<b>PGR</b>	-4.106946	-4.00443	-3.09889	-2.69044	0.008	1(1)
<b>RQ</b>	-4.107626	-3.95915	-3.08100	-2.68133	0.009	1(1)

Source: Author's compilation for Eviews

**Table 7. Summary of ARDL Estimates**

<b>UNITED KINGDOM</b>						
<b>DEPENDENT VARIABLE – GDPPC</b>						
<b>Var</b>	<b>POS</b>	<b>ATMs</b>	<b>DDP</b>	<b>PGR</b>	<b>RQ</b>	
<b>Coeff</b>	5.74	-0.24	-10.78	3.34	7.40	
<b>T.stat</b>	2.92	-0.23	-2.33	7.95	5.96	
<b>P.val</b>	(0.04)	(0.83)	(0.10)	(0.00)	(0.01)	
<b>Stability &amp; Reliability Test</b>						
<b>R<sup>2</sup></b>	<b>F-STAT</b>	<b>FPSS</b>	<b>ECMt-1</b>	<b>LM</b>	<b>HET</b>	<b>RESET</b>
94%	8.16 (0.04)	4.14	-2.54 (0.00)	9.63 (0.21)	9.76 (0.13)	0.36 (0.75)

Source: Author's compilation for Eviews

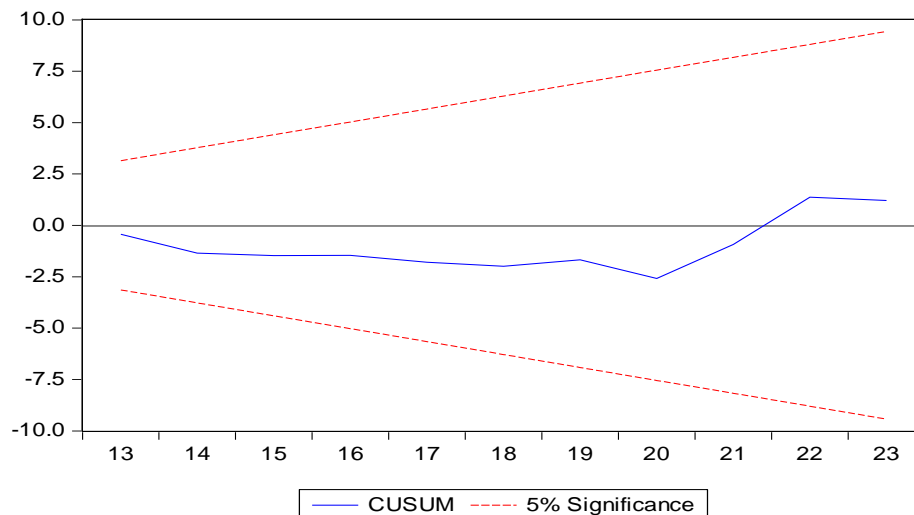
**Fig. 1. Cumulative sum of square (CUSUM) test**

Table 4 above displays the descriptive statistics of the time series results in the United Kingdom from 2007-2023. The standard measures of central tendency like the mean, and median are reported, and the results showed that ATM had both the highest mean value of 117.81 and a median of 123.42. with a maximum of 131.29 and a minimum of 95.15. The population growth rate has the lowest mean value of 0.68 and a median of 0.75 with a maximum of 1.13 and a minimum of -0.08. The standard deviation which measures the dispersion of distribution showed that ATM had a standard deviation of (13.19, POS, 6.36; DDP, 0.63; PGR, 0.25; RQ, 0.12) respectively as it tends to hover around the mean. However, the result showed that GDPPC, ATM, PGR, and RQ were all negatively skewed (-1.06, -2.93, -1.59, and -0.29) respectively. While POS and DDP were positively skewed at 0.12 and 0.03 respectively, indicating the degree of the departure from symmetry. For the Kurtosis, GDP per capita, and PGR were leptokurtic, while POS, ATM, DDP, and RQ were all platykurtic around the mean. The coefficient of variance, which measures the dispersion of a probability distribution, is normally distributed because it tends to stay close to the mean.

Table 5 highlights key relationships between financial technology and GDP per capita. ATMs and population growth rates both have a significant negative correlation with GDP per capita, indicating that higher ATMs or population growth can lead to lower GDP per capita in the UK. In contrast, point-of-sale systems, direct debit payments, and regulatory quality are positively associated with GDP per capita, emphasizing their role in driving economic growth. This indicates that increasing POS, DDP, and RQ will result in higher GDP per capita, and vice versa. However, under multicollinearity conditions, two variables are considered perfectly collinear if their correlation coefficients are  $\pm 1.0$ . Thus, the preceding results demonstrated that the correlational matrices do not show any signs of multicollinearity.

Table 6 shows the results of a unit root test performed on time series data. Because the ARDL estimate technique requires variables to be integrated of order  $I(0)$  or  $I(1)$  and does not support order two  $I(2)$  variables, it was critical to analyze the series' unit root features. The results show that all variables are of order  $I(1)$ , indicating their eligibility for study using the ARDL method. By this, the null hypothesis of  $I(2)$  is rejected for all the variables at the 0.05 percent significance

level. However, the results justify using the ARDL estimator without worries about data misspecification and spuriousness.

The ARDL results indicate that point of sales (POS) transactions positively and significantly affects GDP per capita (POS/GDPPC: Coeff= 5.74, P-val= 0.04). This means that an increase in POS transactions leads to a notable rise in GDP per capita in the United Kingdom. In contrast, Automated Teller Machines (ATMs) and Direct Debit payments negatively impact GDP per capita, though these effects are not significant (ATMs/GDPPC: Coeff = -0.24, P-val= 0.83; DDP/GDPPC: Coeff= -10.78, P-val= 0.10). This indicated that an increase in ATMs and DDP transactions would result in a decrease in GDP per capita in the United Kingdom. For the moderating variables, the findings showed a positive and significant (PGR/GDPPC= Coeff: 3.34, P-val= 0.00; RQ/GDPPC= Coeff: 7.40, P-val= 0.01) influence on GDP per capita. Using the ARDL bound test approach confirmed the existence of no long-run cointegration between observed independent variables and GDP per capita, as the FPSS (GDPPC < 4.14) is less than the  $I(0)$  and  $I(1)$  respectively. The short-run parameter of interest error correction terms (ECT). This shows how the system adjusts toward long-run equilibrium at the speed of 254% for GDPPC. In terms of velocity of return to equilibrium from short-run deviations, it will take less than a year for GDPPC to return to equilibrium. The diagnostic tests prove that the ARDL model have a good fit (GDPPC  $R^2 = 94\%$ ), is stable (RESET p-value: GDPPC = 0.75), have no autocorrelated residual (LM p-value: GDPPC= 0.21) and the variance of the residual is constant (HET p-value: GDPPC= 0.13).

## 5. CONCLUSION

Financial technology has the remarkable potential to stimulate economic growth by facilitating financial inclusion, enhancing efficiencies, and fostering innovation. However, it's crucial to recognize that its effects can vary. Policymakers and financial institutions must diligently evaluate the specific impacts of various fintech innovations. By doing so, they can harness the positive contributions of fintech to stimulate economic advancement while effectively addressing and mitigating any potential drawbacks. The post-crisis fintech boom of 2007-2008 was a transformative milestone that distinguished earlier phases of fintech evolution from today's dynamic landscape. This crisis acted as a catalyst for



unprecedented growth in fintech in the years that followed, usually labeled fintech 3.0. However, this study explored the impact of financial technology on economic growth in the United Kingdom from 2007-2023. These periods captured both the post-economic crisis era of 2007 and post COVID-19 era. Financial technology was measured using the number of ATMs per 100,000, the number of POS transactions, and the number of debit card transactions, while economic growth was measured by GDP per capita. The empirical findings of this research give a more robust value addition to the empirical body of literature in this area of research. The study findings revealed that point of sales positively and significantly impact GDP per capita in the United Kingdom. This is in line with our *a priori* expectations. For both Automated teller machines and debit card transactions, our results showed negative and non-significant impact exits with GDP per capita in the UK which is not in line with our *a priori* expectations. The conclusions drawn in this study are considered significant as they open new research frontiers in understanding the degree to which financial technology policies are considered relevant policy initiatives. Based on the result, it is recommended that to maximize the operational efficiency of the point of sales (POS) system regulatory agencies (FCA) and digital financial service providers must continue to integrate newer innovations and prioritize the security of customer information which improves and enhances customer satisfaction, thereby boosting economic returns. Also to ensure optimization, government agencies must encourage investors and financial institutions through tax breaks to provide fee-free ATMs across the United Kingdom. This will increase the number of fee-free ATMs available thereby enhancing economic growth. Lastly, regulatory agencies must provide regulations that encourage cardless policies as well as stimulate innovative competition within the fintech payment industry in the United Kingdom.

## DISCLAIMER (ARTIFICIAL INTELLIGENCE)

Author(s) hereby declare that NO generative AI technologies such as Large Language Models (ChatGPT, COPILOT, etc) and text-to-image generators have been used during writing or editing of this manuscript.

## COMPETING INTERESTS

Authors have declared that no competing interests exist.

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