“Assessing the role of Fintech, technological infrastructure, and macroeconomic stability on per capita spending as a pathway to economic growth in Jordan”

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ASSESSING THE ROLE OF FINTECH, TECHNOLOGICAL INFRASTRUCTURE, AND MACROECONOMIC STABILITY ON PER CAPITA SPENDING AS A PATHWAY TO ECONOMIC GROWTH IN JORDAN

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Abstract

This study examined per capita spending as a key indicator of domestic-level economic activity and households' financial involvement, both of which are essential to promoting inclusive and sustainable economic growth. The analysis focused on the case of Jordan, covering the period 1993–2023, to investigate the effect of three key determinants of per capita expenditure: First, Fintech solutions as a main facilitator of financial inclusion; second, digital tools as the main indicator of digital infrastructure development level; and finally, macroeconomic indicators that mainly affect economic growth. Therefore, the Fully Modified Least Squares (FMOLS) method was applied to the data to emphasize the dynamic relationship between the three determinants in driving per capita expenditure.

The regression results showed a level of spending that naturally exists, even without other determinants, with a coefficient of 4.6 due to the government's grants and subsidies. Furthermore, they affirmed that higher disposable income through wages, as well as effective financial access through remittance transfer payments and account ownership, enhances individual consumption and financial inclusion. Additionally, despite the large volume of cards, the insignificant impact on PCE suggested that Fintech solutions heavily vary with the progress of technological infrastructure, such as the internet and ICT, combined with the need for financial literacy to avoid misuse of them. Additionally, the negative impact of inflation and the insignificant effect of GDP suggest that without stable economic indicators, such as consistent GDP growth, controlled inflation, and income equality, digital financial solutions may struggle to deliver sustainable benefits in sustaining economic growth.

Keywords technological progress, Fintech solutions, household spending, financial inclusion, sustainable development

JEL Classification O53, O33, G21

INTRODUCTION

Household expenditure per capita is an essential indicator of welfare and a primary transmission channel for macroeconomic policy within the global Sustainable Development Goals Framework. In response, most World governments, central banks, and financial organizations invested heavily in retail payment rails and digital connectivity to provide easier access to cash withdrawal tools and card-based credit. Additionally, the internet and ICT infrastructure would translate into higher per capita income, a vital driver of long-term sustainable development, by reducing poverty and promoting sustainable economic growth.

Indeed, the per capita expenditure (PCE) is reflecting the average income level of individuals within a country, and the importance of both private and public expenditure lies in their substantial contribution to the GDP; it directly correlates with financial inclusion (FI) and sustainable economic development (ESD).

Hence, despite the fast expansion of these infrastructures, many economies continue to exhibit volatile consumption dynamics, especially in emerging economies, because real incomes are pressured by inflation, and wage growth is uneven. The resulting policy riddle is whether enhanced access to financial and digital infrastructure truly and macroeconomically stably raises per-capita expenditure, or whether it regularly changes how procurements are made without expanding the household budget constraint.

The logical problem addressed here is to quantify the independent contribution of payment access and digital connectivity to household consumption, distinct from the dominant income–price forces that typically govern spending. The question is whether indicators such as bank accounts, remittance transfers, density of ATMs, the number of credit cards issued, and internet penetration/ICT intensity embody genuine spending power or purely diminish transaction frictions. If these variables capture convenience rather than capability, their association with per-capita expenditure should be weak once wages, inflation, and broader economic activity are taken into account. To address this problem, it is important to empirically investigate how Fintech solutions, digital infrastructure, and macroeconomic indicators influence PCE to provide insights into how integrated economic and financial strategies can support sustainable economic growth, especially in emerging economies.

1. LITERATURE REVIEW

In the early 2000s, the World Bank and IMF emphasized the role of accessible financial services in reducing poverty and promoting inclusive economic growth (World Bank, 2008). In response, several scholars such as Addury (2018), Azmeh and Al-Raeei (2024), and Chen et al. (2019) focused on the role of FI in improving household welfare, enabling consumption smoothing by emphasizing the relationship between PCE, FI, and ESD and how FI increases PCE through improving households'(HH) access to financial services such as payments, credit, and savings (Addury, 2018; Sakanko et al., 2020). Moreover, Hussain et al. (2020) and Petighin (2023) highlighted that inclusive financial systems enhance resource allocation and reduce inequality, which are essential components of sustainable development. Moreover, Marei et al. (2023) and Mbodj and Laye (2025) explained how efficient access to financial services enables households to manage income levels and plan consumption, saving more usefully, thereby raising per capita expenditure levels. Similarly, Demirgüç-Kunt et al. (2018) found that when individuals are financially included through digital payments, credit, and savings, they are more likely to increase their consumption, which directly contributes to economic well-being and poverty reduction. With the integration of Fintech innovations and supportive infrastructure such as digital banking, online payments, ATMS, and credit card transactions, the nature of all financial transactions worldwide has moved into decentralized finance (DEFI) and secure system transactions, especially after the embedding of blockchain technology by Satoshi Nakamoto in 2008 (Mukkamala & Vatrapu, 2021; Themistocleous & Rupino, 2018). Consequently, DEFI has promoted financial inclusion and reshaped consumer spending behavior by facilitating financial accessibility, eradicating mediators, and digital access to credit through lowering transaction costs, extending financial services to the unbanked, and enabling instant cross-border payments, as found by Mustafa et al. (2023), Narula et al. (2023), and Olomukoro (2023). As a result, several scholars such as Coffie et al. (2023), Ediagbonya and Tioluwani (2023), Ogunode and Akintoye (2023), and Putrevu and Mertzanis (2024) explored the role of Fintech solutions in expanding financial accessibility and improving PCE, particularly in emerging economies where conventional banking penetration remains limited. Besides Demirgüc-Kunt et al. (2018), Dzogbenuku et al. (2022), and Ocharive and Iworiso (2024) and Izzat Ali Mustafa (2025).

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suggested that Fintech solutions, by improving access to financial accounts and digital payment, enhance individual financial participation, enabling consumers to participate more dynamically in the economy. Further, empirical studies such as Mallick (2020), Mustafa et al. (2023), Saydaliyev et al. (2022), and Tu et al. (2018) confirm that remittance inflows have been widely recognized for their positive impact on household spending and economic growth by empowering disposable income, refining savings comportment, and enhancing consumption capability, particularly in emerging economies.

Hence, financial accessibility and consumer behavior, particularly through technological infrastructure improvements such as high-speed internet, mobile technology, and cloud computing has enabled the expansion of Fintech services and could address Fintech challenges by real-time monitoring, cyber security, efficient payment systems, and data processing expertise, which enhance consumer experience and achieve more FI as explained by Kim and Quoc (2024) and Oanh (2024). Also, a progressive digital infrastructure increases user involvement in financial ecosystems, leading to higher PCE as customers gain better access to credit and seamless digital financial transactions (Hu et al., 2023). Moreover, Elfaki and Ahmed (2024) demonstrated a positive relationship between technological adoption and increased economic participation.

It is worth noting that the impact of technological progress and Fintech on PCE remains a subject of debate, especially in economies where ICT is growing while financial literacy remains depleted, so the effectiveness of Fintech could be limited (Badruddin, 2017; Airot et al., 2024). Ali Mustafa (2024), Hsieh et al. (2024), and Mustapha et al. (2023) explained that challenges such as financial illiteracy, liquidity risk, regulatory constraints, and technological infrastructure concerns continue to hinder the full adoption of Fintech in developing markets.

Further, Lusardi (2019) suggested that while technology is a key enabler of financial inclusion, complementary measures, such as financial literacy and customer protection policies, are required to maximize economic benefits.

While fintech solutions and advancements in technological infrastructure enhance PCE, their effectiveness is contingent upon stable macroeconomic conditions. Without stable economic indicators such as consistent GDP growth, controlled inflation, and income equality, the digital financial solutions may struggle to deliver sustainable benefits. Therefore, the integration of fintech and technology must be complemented by sound macroeconomic policies to ensure a meaningful and lasting impact on economic development., Macroeconomic indicators such as inflation, per capita GDP, and employment rate notably affect PCE patterns, especially in developing countries such as Jordan (Saeed, 2024). For instance, Khrais (2019) and Olusola et al. (2022) explained how the inflationary environment affects HH purchasing power and how higher inflation rates decrease disposable income and constrain PCE. Besides, Alheet and Hamdan (2020) found that stable macroeconomic conditions through controlled inflation, steady GDP growth, and progressive wage levels increased HH spending. Remarkably, wages as a proxy of a country's employment level are a fundamental factor of consumer expenditure (Ganong, 2019). Nevertheless, studies by Olajumoke (2020), Olusola et al. (2022), and Singal (2012) indicated that higher wages increase HH spending, improve financial security, and promote greater economic participation. In contrast, Aghion et al. (1999), Izvorski et al. (2023), and Williams and Orokpo (2019) illuminated how a drop in HH income reduced consumption and weakened economic growth.

In summary, despite the growing body of literature on Fintech adoption, technological progress, financial inclusion, and macroeconomic stability, gaps remain in empirical research exploring their combined effect on PCE and achieving SED in emerging economies, particularly in Jordan. Hence, the purpose of this study is to fill this gap by building a unique linkage between two theories: first, Romer's work in 1994 about Endogenous Growth Theory (EGT) that emphasized the origins of endogenous growth by technological progress, knowledge accumulation, and a key inner character of sustainable economic growth. The second is the New Keynesian Consumption Theory (NKCT) developed by Mankiw, Romer, and Fischer in 1970–1980, followed by a work of Jordi Galí, who formalized it in 2008 by incorporating HH spending behavior and expectations within modern macroeconomic models (Luo et al., 2021; Yagihashi, 2020).

This study proposes a set of hypotheses specified to provide empirical evidence on how digital infrastructure, financial accessibility, and economic stability in developing countries contribute to the financial inclusion and higher consumer spending, ultimately leading to SED in Jordan, as follows:

H1: *The effective use of Fintech solutions improved financial inclusion to achieve higher PCE in Jordan.*

H2: *Improvements in digital infrastructure play a crucial role in financial resources allocation and improving PCE in Jordan.*

H3: *Stable macroeconomic indicators affect PCE and the achievement of sustainable economic development.*

2. METHODOLOGY

Using Jordan's single-country time series data variables from 1993 to 2023, this research analysis explored how Fintech solutions, technological advancements, and macroeconomic indicators can improve PCE to foster inclusive and sustainable economic growth. The secondary dataset was distinctly collected by the author from trusted sources such as the World Bank, the International Monetary Fund, the Central Bank of Jordan, and national statistical agencies and has not been previously published or collectively used in any prior research. Conditional on cointegration, we estimate the associated error-correction model (ECM) and report long-run elasticities, short-run coefficients, and the speed of adjustment. The analysis was executed through the Fully Modified Ordinary Least Squares (FMOLS) method on E-views 12 because it guarantees unbiased and consistent estimates in the presence of unit roots and fitting for cointegrated variables to strongly

Table 1. Research metrics

Metric	Description	The adoption purpose
DV Per Capita Expenditure (PCE)	The ratio of total spending of households, businesses, government, and net exports to the population	To evaluate the level of individual spending as an efficient indicator of economic development (Chen et al., 2019; Rana et al., 2021).
Fintech IVs		
Number of Accounts (AC)	The percentage of respondents with an account at a financial institution, including respondents who reported having a debit card (% age 15+)	Estimator of financial transactions as an economic inclusion (Mustafa et al., 2023)
1. Number of automated transfer machines (ATM)	The number of ATMs available in Jordan, as reported by the Central Bank of Jordan	To measure Fintech advancement to achieve financial inclusion (Airout et al., 2024; Mustafa et al., 2023)
2. Number of Credit Cards (CC)	The number of credit cards issued by banks in Jordan	To assess the level of financial literacy and inclusion (Chen et al., 2023; Ali Mustafa, 2024)
3. Number of Remittances REM	The total number of banks' inward and outward remittances	To control for the effect of price changes on economic activity and spending (Airout et al., 2024; Mustafa et al., 2023)
Digital Infrastructure IVs		
4. Imports of goods from technology and communications (ICT)	The proportion of ICT goods to total goods imports as reported by the Ministry of Finance	To reflect the level of technological infrastructure development in Jordan (Fraihat & Al-Afeef, 2022)
5. Number of Internet Users (INT)	The number of adults with internet access per million population	To evaluate financial literacy and inclusion level (Lewan, 2018; Bhat et al., 2023)
Macroeconomic IVs		
6. Annual Inflation Rate (CPI)	Annual percentage change in the consumer price index (CPI)	To gauge the use of credit facilities and their impact on spending (Raghupathi & Raghupathi, 2020; Montances & Verano, 2023; Safaraliev et al., 2024)
7. Wages of Employees (WAG)	Average wages of employees across sectors from labor market surveys as an indicator of employment level	Indicators of income distribution as a proxy for financial activity (Raghupathi & Raghupathi, 2020; Montances & Verano, 2023; Safaraliev et al., 2024)
8. Per Capita GDP in Constant Prices (GDP)	The ratio of the Gross Domestic Product of Jordan to its total population	Indicator of the standard of living in the Country (Raghupathi & Raghupathi, 2020; Montances & Verano, 2023; Safaraliev et al., 2024)

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assess the long-term relationships between the dependent variable (DV), PCE, and a set of explanatory independent variables (IVs) (see Table 1). The research data were sourced from trusted and open-access databases of the national payment reports of the Central Bank of Jordan and the Findex database of the World Bank.

This study's analysis approach is based on different previous methodologies adopted by scholars such as Gomber et al. (2018), Demir et al. (2022), Yang and Zhang (2022), Mustafa et al. (2023), and Azmeh and Al-Raeei (2024). The PCE in this study was used as a proxy for both FI and SED due to its ability to reflect HH spending and consumption behavior influenced by access to financial services such as banking, credit, and digital payments. Also, greater PCE typically improves living standards and financial stability. Given its robust association with FI and SED, PCE is a relevant and proper measure for estimating the effectiveness of Fintech adoption, technological infrastructure, and macroeconomic stability in promoting FI and SED. Therefore, the IVs were divided into three main categories: First, Fintech tools as a main facilitator of FI; second, digital tools as the main indicator of digital infrastructure development level; and finally, macroeconomics as the main indicators that affect economic growth. Hence, the proposed econometric regression model is specified as follows:

$$\begin{aligned} PCE_t &= \alpha + \beta_1 AC_t + \beta_2 ATM_t + \beta_3 CC_t \\ &+ \beta_4 EMT_t + \beta_5 ICT_t + \beta_6 INT_t + \beta_7 INF_t \\ &+ \beta_8 WAG_t + \beta_9 GDP_t + \varepsilon_{it}, \end{aligned} \tag{1}$$

where *PCE* – Per Capita Expenditure (Dependent Variable), *AC* – Number of Financial Accounts, *ATM* – Number of Automated Teller Machines, *CC* – Number of Credit Cards, *REM* – Number of Remittances, *ICT* – Imports of Goods from Technology and Communications (ICT), *INT* – Number of Internet Users, *CPI* – Annual Inflation Rate, *WAG* – Wages of Employees, *GDP* – Per Capita GDP in Constant Prices, α_i – Firm/Country-specific fixed effect, ε_{it} – Error term.

3. RESEARCH RESULTS

The descriptive statistics provided a foundational perception of the factors that influenced PCE in Jordan from 1993 to 2023 to cover periods of stability, external shocks, booms, and recessions. The descriptive statistics in Table 2 establish the sample's suitability for further modeling and forecasting Jordan's economic aspects over time. The mean and median values across all indicators are closely aligned with minimal skewness and reasonable limits of standard deviation values without excessive fluctuations, with min-max ranges reflecting realistic economic conditions, which boosts its reliability in constructing a sample robust for trend analysis and policy evaluation. Furthermore, kurtosis values, particularly for WAG and ICT 5.0 and 4.5, respectively, propose occasional extreme values that may be linked to technological infrastructure and income distribution driven by inflation. Additionally, Fintech instruments such as CC, ATM, and REM provide relevant insights into Jordan's FI efforts.

Regarding the dependent variable PCE, the slightly negative skewness (–0.2) suggests some extreme negative values, with a few extreme peaks (kurtosis 3.1), but the distribution is symmetrical overall. Moreover, Figure 1 gives a comprehensive view of Jordan's PCE growth trends from 1993 to 2023. The growth rate exhibited significant fluctuations with sharp increases and declines. The

Table 2. Summary of descriptive statistics

Indicator	Mean	Median	Std Dev	Min	Max	Skew	Kurtosis
PCE	5.27%	4.7%	5.47%	–5%	17.4%	.51	–.21
INT	6.5%	6.8%	1.5%	4.0%	9.5%	0.25	1.9
ICT	11.5%	10.8%	4.5%	5.0%	22.0%	0.5	4.5
CPI	3.2%	3.0%	1.8%	–1.0%	7.0%	0.6	2.7
AC	23.8%	23.7%	0.8%	12.5%	43.1%	0.2	1.8
REM (USD Billions)	3.5B	3.6B	0.6B	2.8B	4.5B	0.3	3.9
CC (Transactions, Thousands)	1,750	1,700	250	800	2,200	0.2	2.2
GDP %	3.1%	3.0%	1.7%	–2.0%	6.0%	–0.3	3.5
WAG (USD Billions)	3.2	3.1	0.7B	2.0	4.2	0.4	5.0
ATM (per 100,000 people)	13.5	13.0	2.5	9.0	18.5	0.4	2.4

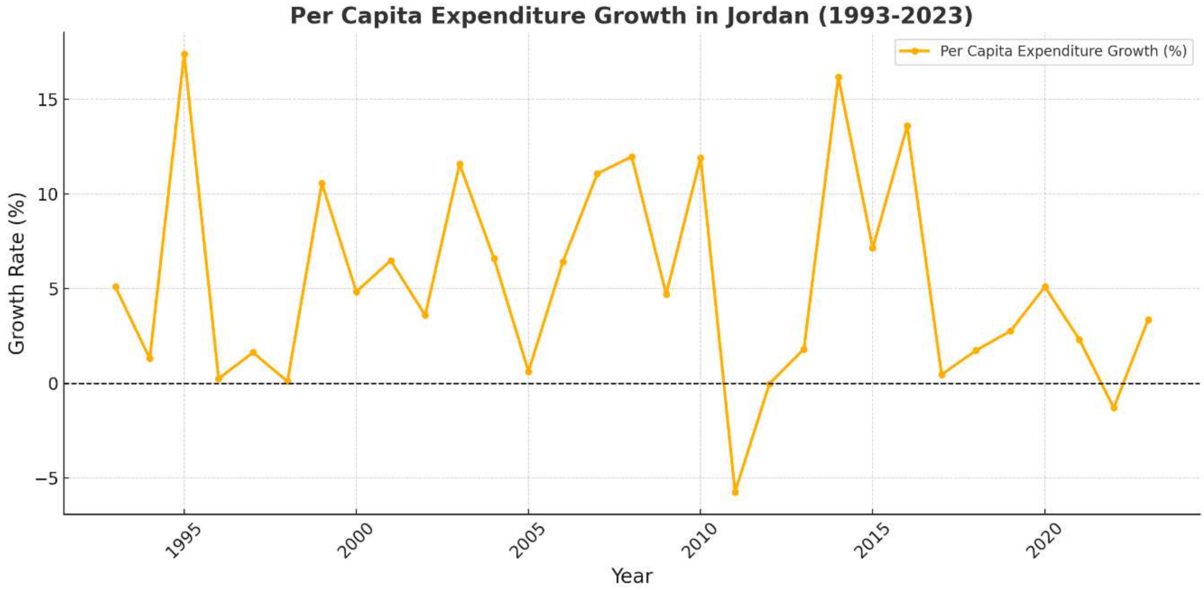

Figure 1. Per capita expenditure growth

highest spikes linked to economic policies, external investments, and major government spending programs occurred in 1995, 2004, and 2016, with 17.4%, 11.9%, and 16.2%, respectively. In contrast, the PCE growth witnessed a sharp decline, reaching its lowest point in 2011 (–5.75%) due to Arab Spring economic policies, the high unemployment rate, and global financial conditions on consumer spending. Despite economic challenges, the long-term expectation is positive, with an average growth rate above 5.27%, indicating overall progress in economic conditions and living standards.

For deeper analysis, the multi-line chart (Figure 2) shows how PCE growth in Jordan is influenced by Fintech, digital infrastructure, and economic factors during the study period.

Concluded Fintech adoption, represented by the increasing number of AC, ATMs, CC, and REM, with an upward trend, reflecting the growing financial inclusion and accessibility of Fintech services. Similarly, ICT and INT also track upward paths, indicating enhanced connectivity and digital infrastructure.

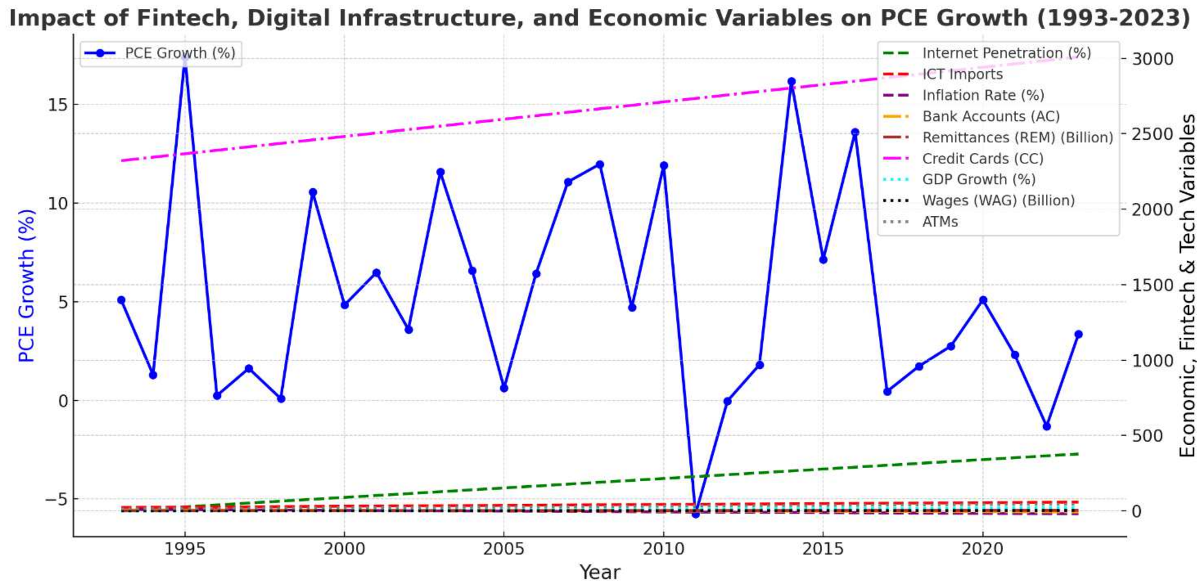

Figure 2. Growth trends of sample factors

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On the macroeconomic front, GDP and wages exhibited a steady trend, suggesting stable income levels, fluctuating consumer purchasing power reflecting economic cycle shifts, and local policy impacts.

To underscore the causal role of Fintech, digital transformation, and economic indicators on financial development by driving per capita expenditure, a regression analysis was added for deeper insights by uncovering quantifying effects and making predictions to enhance consumer spending and overall economic resilience. This study executed a correlation matrix before regression analysis to ensure that the final regression model is built on non-redundant and logically related metrics, starting to provide further precise and significant economic insights.

The findings in Table 3 of the correlation analysis suggested that financial inclusion, economic development, and digital transformation positively depend on income distribution and technological progress, confirmed by positive correlations between their factors, as households receiving external income increasingly engage with banking and digital services.

Specifically, WAG, GDP, and REM exhibited positive relations with PCE, confirming the fundamental role of income distribution and economic expansion in driving per capita spending. Also, financial inclusion indicators, such as AC, CC, and ATM, have clarified the expanding role of Fintech services in reshaping spending patterns. However, their correlation with PCE remains moderate, signifying that meager access to financial services does not immediately translate into higher consumer spending. Further, the rise of digital infrastructure, INT, and ICT climaxed the increasing role of technology in financial transactions and economic activity. Finally, CPI exhibited a negative correlation with PCE, implying that price stability may have mitigated its direct effect on spending.

After correlation analysis, the Augmented Dickey-Fuller (ADF) test was conducted to verify the stationarity of each variable in the databases. The results in Table 4 show that PCE, ICT, REM, INT, and GDP were non-stationary with p-value > 0.05, ADF statistic > critical values, and may host spurious regression results if not transformed.

Table 4. ADF test results

Indicator	ADF Statistic	p–value
PCE	0.81	0.09
INT	1.61	.087
ICT	–1.68	0.094
Inf	–4.77	0.00
ACC	–6.75	0.00
REM	–0.61	0.087
CC	3.49	.042
GDP	1.05	0.099
WAG	–2.46	0.012
ATM	–2.10	0.025

Based on ADF findings, the first difference and log transformation were applied to non-stationary variables, and then the ADF test was conducted to check stationarity as offered in Table 5.

Table 3. Correlation matrix

Indicator	INT	PCE	ICT	Inf	AC	REM	CC	GDP	WAG	ATM	REM	WAG
PCE	0.25	1.00	0.35	–0.04	0.21	0.16	0.15	0.80	0.14	0.07	0.12	0.10
INT	1.00	0.25	0.72	–0.72	0.96	0.98	0.92	0.75	0.98	0.88	0.96	0.97
ICT	0.72	0.35	1.00	–0.34	0.72	0.57	0.50	0.60	0.61	0.32	0.51	0.55
Inf	–0.72	–0.04	–0.34	1.00	–0.53	–0.77	–0.84	–0.37	–0.78	–0.86	–0.80	–0.82
AC	0.96	0.21	0.72	–0.53	1.00	0.94	0.83	0.74	0.94	0.79	0.90	0.91
REM	0.98	0.16	0.57	–0.77	0.94	1.00	0.96	0.69	1.00	0.95	1.00	0.99
CC	0.92	0.15	0.50	–0.84	0.83	0.96	1.00	0.65	0.95	0.94	0.97	0.96
GDP	0.75	0.80	0.60	–0.37	0.74	0.69	0.65	1.00	0.67	0.56	0.66	0.63
WAG	0.98	0.14	0.61	–0.78	0.94	1.00	0.95	0.67	1.00	0.94	0.99	1.00
ATM	0.88	0.07	0.32	–0.86	0.79	0.95	0.94	0.56	0.94	1.00	0.97	0.96
REM	0.96	0.12	0.51	–0.80	–0.90	1.00	0.97	0.66	0.99	0.97	1.00	1.00
WAG	0.97	0.10	0.55	–0.82	–0.91	0.99	0.96	0.63	1.00	0.96	1.00	1.00

Table 5. ADF results

Indicator	ADF Statistic	p-value
ΔPCE	−6.07	0.00
ΔINT	−2.90	0.05
ΔICT	−2.38	0.015
Inf	−3.53	0.01
ACC	−6.95	0.00
CC	−0.52	0.008
ΔGDP	−5.91	0.00
ATM	0.66	0.009
ΔREM_log	4.62	.007
WAG_log	−0.56	0.008

The following charts in Figure 3 illustrate the transformation of key economic indicators PCE, INT, ICT, GDP, and REM from non-stationary to stationary after applying first differencing and log transformations.

The charts demonstrate upward and downward trends; the patchiness is centered around a constant means, confirming stationarity after applying transformations. This ensures the data is statistically valid for FMOLS regression analysis, preventing spurious relationships and improving model accuracy.

Once the data were properly adjusted, the FMOLS regression was applied to estimate the long-run relationship between PCE and its key determinants as presented in Table 6. The results of the robust-

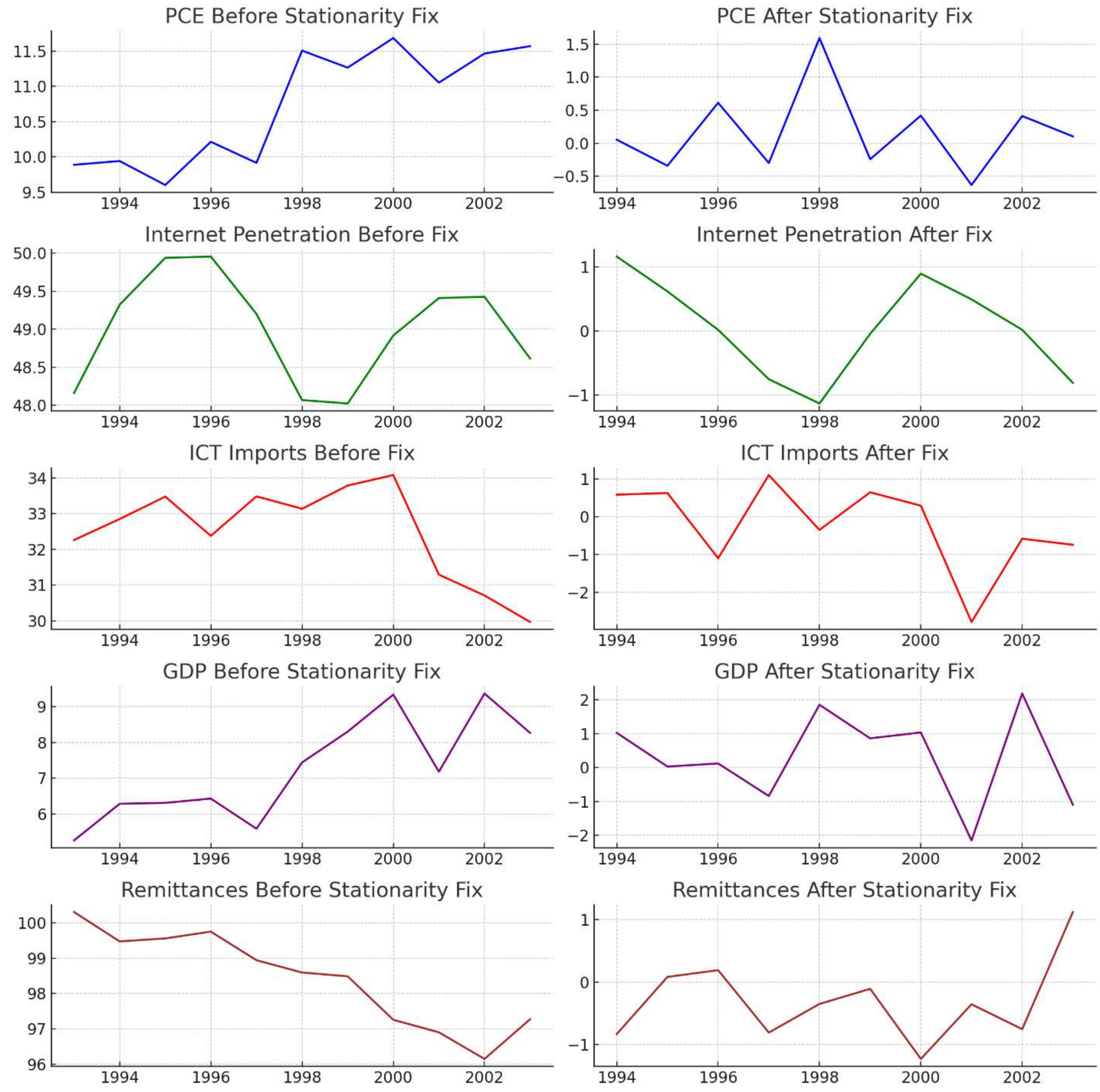

Figure 3. Data series stationarity

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Table 6. FMOLS regression model results

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	4.6	9.03	0.51	0.0371
AC	0.181	0.0729	2.47	0.06
ATM	0.1152	0.0732	1.5731	0.1307
CC	–0.112	0.1291	–0.8698	0.394
Δ log REM	0.244	0.0964	2.5309	0.0194
logWAG	3.2317	1.4313	2.2579	0.0347
ΔGDP	0.1485	0.1386	1.0715	0.2961
INF	–0.2258	0.1132	–1.9938	0.0593
ΔINT	–0.0126	0.0239	–0.5287	0.6026
ΔICT	0.4291	0.2748	1.5615	0.1334

Statistic	Value
R-squared	0.45
Adjusted R-squared	0.33
S.E. of Regression	1.65
Sum Squared Residual	69.8721
Long-run Variance	2.1849

ness of the model provided meaningful insights into the determinants of PCE in Jordan. The R^2 of 45% and the adjusted R^2 of 33% suggested modest power of variation. Additionally, the S.E. of Regression of 1.65 was relatively low, signifying stability in the predictions, avoiding heteroskedasticity and multicollinearity.

The coefficient values (C = 4.6) indicated a level of spending that naturally exists, even without other determinants, with a coefficient of 4.6. This could be due to government safety nets or savings. According to digital infrastructure metrics, ICT (B = 0.43, p = 0.13) has a positive but a statistically weak effect, indicating that while technology adoption is beneficial, its full impact may take time to materialize. This result comes from Saidi et al. (2017). Conversely, INT (B = –0.0126, p = 0.6026) demonstrated a negative and insignificant relationship with PCE as without immediately boosting consumption.

Correspondingly, the Fintech instruments had varied influences; for instance, AC and REM showed a significant effect with relatively low variability, indicating a substantial role in achieving financial inclusion. However, despite the large volume of CC and ATMs, the insignificant impact on PCEATM (B = .115, P=0.13) and CC (B = –0.11, p = 0.394) indicated that the mere obtainability of ATM or credit cards does not guarantee higher customer consumption. This might be due to cashless payment and the misuse of CC, which often leads to debt burdens.

Further, the macroeconomic indicators regression results affirmed the study's third hypothesis, that macroeconomic indicators affect PCE and the achievement of sustainable economic development, by exhibiting unstable growth with the positive impact of per capita GDP (insignificant effect) and WAG (significant effect). In contrast, INF (B = –0.23, p = 0.059) negatively impacts PCE at a 10% significance level, as is predictable since higher inflation reduces purchasing power.

4. DISCUSSION

This study investigated the influence of the interplay between Fintech solutions adoption, technological progress, and macroeconomic stability on PCE in Jordan, grounded on EGT and NKCT theories. The results revealed several notable outlines, some of which are consistent with previous scholars, while others diverge from predictable outcomes to provide new insights to policymakers, especially in emerging economies.

Regarding the first hypothesis, both descriptive statistics and regression results provided evidence that effective use of Fintech solutions, such as holding a bank account and remittances, had an impressive impact on PCE and Increased financial inclusion, by encouraging saving, investing, borrowing, and providing easier access to funds, which directly supports PCE. These findings complete previous results on the effect of Fintech instruments in improving financial inclusion

(Ogunode & Akintoye, 2023; Sakanko et al., 2020; Saydaliyev et al., 2022), suggesting that holding bank accounts and remittances improve access to money and upsurge household income, and both naturally raise spending. On the other hand, despite the large volume of CC and ATMs, the insignificant impact on PCE, as found by Putrevu and Mertzanis (2024), indicated that the mere obtainability of ATM or credit cards does not guarantee higher customer consumption. In numerous economies, particularly developing ones, cards are used for necessary purchases, not to increase spending. This highlights the need for financial literacy to avoid the misuse of CC, which often leads to debt burdens and the accumulation of installments for customer accounts, which in turn reduces their disposable income and dominates consumer spending. These results are close to Azmeh and Al-Raeei (2024), Demir et al. (2022), Marei et al. (2022), and Mustafa et al. (2023), suggesting that FinTech alone does not assure improved expenditure unless effective adoption of them with a continuously developed digital infrastructure to encourage economic participation, as indicated in the study's first and second hypotheses.

It is worth noting that Fintech solutions heavily depend on the progress of technological infrastructure, such as ICT and INT, which stands beside a steady increase in digital adoption in financial sector especially in developed countries, the regression results demonstrated a negative and insignificant relationship of INT with PCE, as found by Zhang et al. (2020), when it shifts spending patterns, substitutes traditional expenditures, or adds communication costs without immediately boosting consumption. On the other hand, ICT imports have a lowly significant effect and vary significantly, suggesting fluctuating investment in technological infrastructure in Jordan. This suggests that while digital infrastructure is expanding, its impact on consumer expenditure may require more time or complementary policy interventions to be fully realized as a source of digital connectivity and secure data transmission to achieve FI effectively, as initiated by Lewan (2018) and Herman (2022) and support the research second hypothesis that improvements in digital infrastructure play a crucial role in financial resources allocation, creating new innovative opportunities and improving PCE that help in achieving sustainable economic development in Jordan.

Finally, the analysis results reinforced the importance of the stability of Macroeconomic indicators, such as employment level estimated by WAG, per capita GDP, and inflation, which combined between steady in specific periods and experienced growth fluctuations in other periods due to geographical and political pressures in Jordan. For instance, INF has an average ranging from -1% to 7%, with negative impact on PCE reflecting periods of both stability and high inflation, while GDP and WAG average values with positive effect on PCE suggesting that economic downturns may have been more frequent than periods of high growth, and highlight the importance of stable and increasing incomes in driving spending as found by identical with Herman (2022), Manasseh et al. (2018), Ngepah and Mouteyica (2024), Montances and Verano (2023), Raghupathi and Raghupathi (2020), and Safaraliev et al. (2024) who highlighted the role of economics in enhancing disposable income and driving greater expenditure and financial inclusion.to confirm the third hypothesis that stable macroeconomic indicators affect PCE and the achievement of sustainable economic development.

CONCLUSION

This study primarily focused on how Fintech solutions, progressive digital infrastructure, and stable macroeconomic conditions can improve per capita expenditure through the lens of EGT and NKC theories to provide empirical evidence on their role in fostering inclusive and sustainable economic growth in Jordan.

The results of multiple regression analysis indicated that remittances, ICT, and wages were significant in driving consumer spending, reinforcing their role in achieving financial stability. Moreover, the study found that certain Fintech products, such as ATMs and credit cards, do not directly affect PCE, signify-

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ing that technological progress gauges, such as ICT imports and internet penetration, exhibited positive trends with PCE. They designated that digital transformation may require complementary factors, such as digital literacy and improved regulatory frameworks, to expand financial inclusion effectively.

Furthermore, maintaining stable macroeconomic conditions is essential for sustaining long-term economic growth in Jordan. While the positive impact of wages and per capita GDP growth rate encourages disposable income, economic indicators' volatility, such as the negative influence of inflation, could reduce purchasing power and spending patterns.

Therefore, the study recommends more policy involvement in factors influencing spending patterns, increased digital financial literature, improved digital infrastructure utilization, and stabilized inflation to achieve long-term economic development. It also recommends reinforcing fintech adoption to facilitate digital financial transactions, particularly in remittance and e-commerce activities.

Overall, the implications of this study are significant for financial institutions and policymakers seeking to extend financial inclusion and economic stability through recognition of the PCE growth by increasing the role of digital infrastructure and fintech innovations proposes the need for more strategic policy interventions in Jordan's financial landscape, which is stirring toward a more technology-driven and sustainable, inclusive long-term economic prosperity.

AUTHOR CONTRIBUTIONS

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