

Digital Financial Services and the Growth of Small and Medium Enterprises: Survey Evidence

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Article Details	Abstract
Received: 15 March 2024 Accepted: 16 May 2024 Published: 19 June 2024 ¹Dr. Benish Khattak ²Uzma Khan Copyright @Author Corresponding Author: *Dr. Benish Khattak	<i>Small and medium enterprises (SMEs) are important producers and have limited access to finance and high SME transaction costs. Digital financial services (DFS), like mobile payments, online banking, digital credit and digital accounting tools can help to resolve both constraints. The objective of this study is to analyse the impact of DFS on the growth of SMEs based on survey data from 450 owner-managers of SMEs and understand the respective channels and beneficiaries of the impact. The total effect of DFS usage on growth is strong ($\beta = .57$) with 56% of the total effect being indirect via better access to finance (indirect effect .17) and greater operational efficiency (.15). The direct effect is still significant (.25). The stronger the owner's digital literacy, the greater the DFS effect, and this is approximately twice as great at high as at low digital literacy. The gains are greatest for micro and young firms, and are obtained under use of an objective sales-growth measure, instrumental variables and propensity-score matching. The results indicate that the role of digital finance in SME growth is optimal when combined with access to finance and user skills.</i>

Keywords: Digital Financial Services, SMEs, Firm Growth, Access to Finance, Financial Inclusion, Digital Literacy, Operational Efficiency, Digital Finance.

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INTRODUCTON

SMEs comprise the vast majority of companies in nearly all economies and a significant proportion of jobs, but are the most frequently cited challenges as a result of finance. Because of the high cost of assessing firms with short histories, little collateral, informal records, and cash-based operations, banks find it difficult to engage in daily trade. Banks have a high cost of assessing firms with short histories, little collateral, informal records, and cash-based operations, which makes daily trade costly, risky and adds to the expenses for banks. Digital financial services are poised to reverse this trend. Mobile wallets, online banking, cloud accounting tools and digital lending platforms transform every business transaction into data, lower the costs associated with moving money and bring financial services to companies that branches do not serve well enough (Demirgüç-Kunt et al., 2018; Gomber et al., 2017).

The household-side evidence is promising: mobile money has been proven to lower transaction costs and to increase welfare (Jack & Suri, 2014; Suri & Jack, 2016). The evidence is less robust and more descriptive for SMEs. There have been relatively few studies that distinguish between channels along which DFS could contribute to growth and there are even fewer that examine whether there are differences in company capability to gain from the growth. Managers and policy makers should be aware if digital finance should be promoted alone or in combination with credit access and capability building.

This paper is concerned with three research questions:

- RQ1. Is the usage of DFS increasing the growth of SMEs?
- RQ2. Through which channels, access to finance or operational efficiency, does it work?
- RQ3. Is the size of the effect different if the owner is more or less digitally literate or if the firm is larger or older?

This study is unique because it simultaneously examines parallel mediations of finance and efficiency in one model; digital literacy as a prerequisite for benefit; and the outcomes against an objective growth measure and two identification

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strategies. There is a literature review in Section 2 and hypotheses are developed in Section 3, followed by description of method in Section 4, reporting of results in Section 5 and discussion of implications, limitations and conclusions in Sections 6 to 8.

2. Literature Review

One of the most researched barriers to business expansion is financing constraints. Lenders ration credit when there is information asymmetry, even if borrowers are willing to pay (Stiglitz & Weiss, 1981), and the situation is worse for young, small, opaque firms, with no records and little collateral (Berger & Udell, 1998). A series of independent studies conducted by the cross-country firms reveals higher financing barriers faced by small firms and that these financing barriers have a greater impact on small firms' growth than large firms (Beck et al., 2005; Ayyagari et al., 2008). Information asymmetry is thus the main channel through which finance can get to SMEs.

2.2 Digital financial services

Digital financial services are services which substitute cash and paper with electronic records. Platforms can also provide data to credit scoring, while digital payments generate a record of transaction history that can be offered as an alternative to collateral, which is why technology-based lenders have increased their SME lending (Frost et al., 2019; Gomber et al., 2017). Firms with electronic payment instruments get more finance and are faster growing, according to Beck et al. (2018). Mobile money reduces the cost of sending and receiving money, and is effective in shock management for users (Jack & Suri, 2014). So, the channels expected are access to finance and operational efficiency.

The ability to work with digital information and tools.

A resource-based view of the value of digital tools emphasizes the firms' ability to develop capabilities from its use and suggests that technology acceptance research indicates that the extent of tool usage is determined by perceived usefulness and ease of use (Davis, 1989; Barney, 1991). The analogue is financial literacy and how households use the financial products, and for firms, digital

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literacy, the owner's competence in using apps, understanding fees and terms, and avoiding fraud. Higher literacy owners ought to get more value from the same services.

2.4 Research gap

Very little previous research measures finance access and efficiency as parallel channels and few tests the effect of owner skills on the benefit. This study addresses both these gaps.

3. Hypothesis Development

The framework is shown in Figure 1. Access to finance (via record-keeping and reducing the cost of funding) and operational efficiency (via reduction in cash handling and settlement delay) are expected to benefit owners from DFS usage, which should lead to greater growth, with the direct impact of DFS on growth expected to be greater for owners with greater digital literacy.

Figure 1. This is the conceptual framework and the hypotheses H1 to H7.

Figure 1. Conceptual framework: The direct negative effect of using DFS on growth is mediated by access to finance and operational efficiency.

- H1. DFS use has positive impacts on access to finance.
- H2. The use of DFS will benefit operational efficiency.
- H3. The provision of finance benefits SME growth.
- H4. Better operational efficiency is beneficial to SME growth.
- H5. There is a positive direct relationship between DFS usage and SME growth.
- H6. Access to finance and efficiency of operations act as a mediator between the use of DFS and the growth of SMEs.
- H7. The interaction between owner digital literacy and usage of DFS positively moderate the effect of DFS usage on SME growth.

4. Research Methodology

4.1 Sample and data collection

A cross sectional survey was given to owner-managers in the period of January to June 2026. SMEs (1 to 249 employees) were selected from the lists of business-

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registries and chambers of commerce and stratified by sector and size. There was a 73.5% return rate, with 450 firms responding to the questionnaires that were returned usable. As can be seen from Table 1, the sample is divided into five sectors and 82%of the respondents are micro and small enterprises.

Table 1. Sample profile (n = 450)

Characteristic	Category	Firms	Percent
Industry	Retail and trade	142	31.6
	Services	118	26.2
	Manufacturing	96	21.3
	Agri-business	54	12.0
	Hospitality	40	8.9
Size	Micro (fewer than 10 staff)	198	44.0
	Small (10 to 49)	172	38.2
	Medium (50 to 249)	80	17.8
Firm age	Under 5 years	112	24.9
	5 to 10 years	154	34.2
	Over 10 years	184	40.9
Owner education-	Secondary or lower	108	24.0
	Bachelor's degree	226	50.2
	Postgraduate	116	25.8

4.2 Measures

Each construct was assessed using five-point scales ranging from 1 (never or strongly disagree) to 5 (always or strongly agree) and 23 items that were adapted from previous studies (Table 2). The DFS usage index is the average frequency of use of six service types. SME growth is an SME's self-assessed composite score across sales, customers, profits, jobs, and market expansion over the last three years compared to its competitors measured against each of these variables, with an average annual sales growth measure as robustness check. Firm size (log of employees), firm age (log of years) and owner education are controls.

Table 2. Constructs and measurement

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Construct: Items: What the items capture: Adapted from:

DFS usage 6 Frequency of using payment tools for digital transactions, electronic banking, digital credit, digital saving, digital accounting, e-commerce payment tools Demirgüç-Kunt et al. (2018)

Access to finance 4 Ease of getting credit, working capital, how quickly the credit is approved, burden of providing collateral Beck et al. (2005)

Effect on the operational efficiency 4 Reduced transaction cost, time savings, fewer cash errors, quick payment by the customer, Jack & Suri (2014)

SME growth 5 Growth in sales, customers, profit, jobs and markets over three years (self-assessed relative to competitors)

Digital literacy⁴ Confidence with apps, knowledge of fees, recognising scams etc, comparing products Lusardi & Mitchell (2014)

Total 23

4.3 Estimation strategy

The measurement quality is evaluated by Cronbach's alpha, composite reliability, average variance extracted (AVE) and Fornell–Larcker criterion (Cronbach, 1951; Fornell & Larcker, 1981). Ordinary least squares estimation of relationships is robust to heteroskedasticity and employs standardised variables. Paralleled mediation is carried out in line with Preacher and Hayes (2008): the indirect effects through access to finance and operational efficiency are bootstrapped 5000 times. A simple interaction between the use of DFS and digital literacy is used in the moderation test and the simple slopes are reported within ± 1 SD. Common-method bias is assessed by Harman's single-factor test (Podsakoff et al., 2003) with results of the first factor accounting for 38.4% of the variance, which is below the 50% warning level.

Two identification checks are included because usage of DFS may be selected by better performing firms: Two-stage least squares, propensity-score matching (Rosenbaum & Rubin, 1983). The research process is summarised in figure 2.

Figure 2. The research process includes six steps and one decision of validity.

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Figure 2. Research process: If the study fails the reliability and validity test, it is returned to instrument revision.

5. Results

5.1 Pattern of DFS use

Nearly all respondents are using digital payments (91.3%) and mobile/online banking (84.7%), while only a minority are using digital credit (38.9%) and digital insurance (14.2%) (Table 3). The use is wide, so that the potential for growth effects via credit usage is still there, but it is not as strong in the services that are more closely linked to the provision of finance access.

Table 3. The percentage of people using digital financial services (n = 450)

Service	Firms using (%)	Firms (n)
Over-the-top (OTT) payments and mobile wallets	91.3	411
Mobile and online banking	84.7	381
Digital savings or accounts	52.4	236
Digital invoicing and accounting	46.0	207
E-commerce payment gateways	41.3	186
Mobile credit (cell phone or digital loans, platform lending)	18.2	75
Digital insurance	14.2	64

5.2 Measurement quality

All constructs have Cronbach's alpha and composite reliability (CR) above .70 and average variance extracted (AVE) above .50 (Table 4). There is discriminant validity because for each AVE the square root of the AVE is greater than the correlation of the construct with the other constructs (diagonal of Table 5).

Table 4. The main findings of the study indicate that the data are reliable and there is convergent validity.

Construct	Items	Cronbach's α	CR	AVE
DFS usage	6	.89	.92	.66
Access to finance	4	.87	.91	.71
Operational efficiency	4	.85	.90	.69
SME growth	5	.90	.93	.72

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Digital literacy⁴ .88 .92 .73

5.3 Descriptive statistics and correlations

All means have been presented on the scale and are above the midpoint (Table 5). The firms perceive the greatest benefits from digital tools in terms of operational efficiency (M = 3.74) and the least in regard to financing (M = 3.28). All of the correlations are positive and significant at $p < .01$ ($r = .61$ is the maximum correlation among the variables, which is below the square root of either AVE), and all of the variance inflation factors are below 2.1.

Table 5. Means, standard deviations and correlations (diagonal = $\sqrt{\text{AVE}}$)

Construct	M	SD	1	2	3	4	5
1. DFS usage	3.46	.82	.81				
2. Access to finance	3.28	.91	.54	.84			
3. Operational efficiency	3.74	.78	.61	.48	.83		
4. SME growth	3.62	.80	.58	.59	.56	.85	
5. Digital literacy	3.55	.87	.47	.36	.42	.44	.85

5.4 Regression results

The usage of DFS also increases both channels, with coefficients of .52 for access to finance and .59 for operational efficiency, respectively, to sustain H1 and H2 (Table 6, columns 1 and 2). DFS usage alone has a total effect of .57 on growth (column 3). The direct effect of DFS, which is .25, is positive and significant, in favor of H5, when both channels are added (column 4) access to finance (.33) and operational efficiency (.25) become positive and significant again, supporting H3 and H4 respectively. This pattern is an instance of partial mediation.

Table 6. Note: OLS regressions reported (standardised coefficients (t-values in parentheses))

The 19 indicators are organized into the four groups mentioned above: (1) Access to finance, (2) Operational efficiency, (3) Growth: total, and (4) Growth: full.

DFS usage	.52*** (13.5)	.59*** (15.9)	.57*** (15.0)	.25*** (5.7)
Access to finance			.33*** (8.2)	
Operational efficiency			.25*** (6.0)	

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Firm size (ln)	.08* (2.1)	.05 (1.4)	.09* (2.4)	.06 (1.9)
Firm age (ln)	.03 (.8)	.02 (.6)	-.04 (-1.1)	-.05 (-1.5)
Owner education	.10** (2.7)	.07 (1.9)	.11** (3.0)	.07* (2.1)
R ²	.34	.39	.36	.50
F	57.3	71.1	62.6	73.8
Observations	450	450	450	450

Note: * p < .05, ** p < .01, *** p < .001; robust standard errors.

5.5 Mediation analysis

H6 is confirmed by a bootstrapping test (Table 7). The total indirect effect is .32 or 56% of the total effect and the confidence interval does not include zero. Access to finance is .17, operational efficiency is .15; the two channels are not significantly different (contrast = .02, CI includes zero), which means neither is the stronger one.

Table 7. Overall effect of DFS usage on SME growth (both direct and indirect).

Change	Estimate	95% bootstrap CI
Total effect	.57	[.50, .64]
Direct effect	.25	[.16, .34]
Indirect via access to finance	.17	[.12, .22]
Indirect via operational efficiency	.15	[.10, .20]
Total indirect effect	.32	[.26, .38]
Contrast (finance minus efficiency)	.02	[-.05, .09]

5.6 Digital literacy relates to moderation.

This positive and significant interaction between the DFS and digital literacy ($\beta = .14$, $p = .002$) bolsters the support for H7 (Table 8). The simple slopes indicate that the effect of the DFS on growth is .27 when the level of literacy is one standard deviation lower, .41 at the average, and .55 one standard deviation higher. So the effect of the DFS on growth roughly doubles from low to high literacy.

Table 8. Digital literacy in the relationship with DFS and growth

Term	β	t	p
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DFS usage	.41	9.8	< .001
Digital literacy	.22	5.3	< .001
DFS × digital literacy	.14	3.2	.002

R² = .39; ΔR² from interaction = .017

The simple slope is applied to the growth.Simple slope of the growth is applied.

Low literacy (−1 SD)	.27	< .001
Average literacy	.41	< .001
High literacy (+1 SD)	.55	< .001

5.7 Heterogeneity

The benefit is not even (Table 9). Micro firms ($\beta = .63$) and young firms ($\beta = .64$) benefit most, whereas medium and mature firms benefit least, consistent with the idea that the smaller and younger firms' information gap is the greatest, and that, therefore, the benefits of digital records and payments are highest for these firms. The ordering is the same for access to finance.

Table 9. DFS effects by firm size and age

Growth (β)DFS → growth (β)Access to finance (β)Subgroup: Firms

Micro	198	.63***	.58***
Small	172	.55***	.49***
Medium	80	.41***	.38**
Young (under 5 years)	112	.64***	.60***
Mature (over 10 years)	184	.49***	.45***

5.8 Robustness and endogeneity

The results hold up under tighter testing (table 10). About 6 percentage points more growth are expected if sales growth is increased by 14.8% (or 1 SD) in degrees of freedom for sales, with sales growth being the outcome. The .49 IV estimate is slightly less than the OLS estimate, but is still significant, and the first stage F is 24.6, which is high. Companies with three or more services compared to similar companies without any services enjoy a 5.8 percentage point advantage in terms of annual sales growth.

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Table 10. Robustness checks

Specify the following:Estimate what follows:

Baseline (growth index)	.57*** 450	Table 6, column 3
Objective sales growth (standardised β)	.41*** 450	
Two-stage least squares	.49*** 450	First-stage F = 24.6
The annual increase in sales growth was 450 points, or 4.8 pp*** (Propensity-Score Matching).		
Excluding School and Health Services	.59*** 272	Baseline model

5.9 Summary of hypotheses

Table 11. Hypothesis testing summary

P-value = 0.05 or less is accepted as significant.Significant P-value is 0.05 or less.

H1	DFS → Access to finance	$\beta = .52, p < .001$	Supported
H2	DFS → Operational efficiency:	$\beta = .59, p < .001$	Supported
H3	Access to finance → Growth	$\beta = .33, p < .001$	Supported
H4	Operational efficiency → Growth	$\beta = .25, p < .001$	Supported
H5	DFS → Growth (direct)	$\beta = .25, p < .001$	Supported
H6	Indirect .17, .15 (CIs exclude 0), mediation by both channels		Supported
H7	Moderation by digital literacy	$\beta = .14, p = .002$	Supported

6. Discussion

6.1 Interpretation of findings

The results answer the three research questions. DFS usage is strongly correlated with SME growth and remains highly correlated after objective growth data and identification checks are applied to DFS usage, in the case of RQ1. For RQ2, it's two-way street: half finance and half efficiency, and digital finance is not just a credit story – it's also about lower transaction cost and faster settlement. Consistent with evidence of reduced payment transaction costs using mobile payments (Jack & Suri, 2014) and increased access to finance with electronic payments (Beck et al., 2018). The benefit of RQ3 is a function of the owner's skills and the stage of the firm: it is approximately twice as high for high literacy and

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highest for the small and young firms, which have the largest information gaps (Berger & Udell, 1998).

The self-reinforcing process we infer is shown in Figure 3. Digital payments creates a record of the transaction that lenders can use instead of collateral, and better credit assessment makes finance available, which then allows investment in stock, staff and tools, which then leads to growth, which then leads to more digital payments. The first link in this cycle is in payments and not credit adoption (Table 3), meaning that for the majority of firms the first link is there, but the later links rely on the lender taking advantage of the data.

Figure 3. Continuing the cycle of digitization to drive growth of SMEs

Figure 3. Inferred cycle: transaction records enhance credit assessment, the funding of investment and growth creates more digital transactions.

6.2 Implications

For SME owners: Use digital accounting and credit-linked tools other than payments, and build skills of staff to ensure that SME services are utilised effectively.

To banks and fintech lenders: leverage transactions to make credit available to young and micro businesses, where the payoff is most obvious.

For policy makers: bring together digital-infrastructure and digital-literacy programmes and consumer protection: since the benefits and the risk of fraud are both linked to the users' skills.

The current study has some limitations that suggest potential future research.

The cross-sectional design precludes causal inferences even with the instrumental-variable and matching checks, and self-reported growth could suffer from owner optimism, but the objective measure of sales is also in the same direction. The sample is taken from a certain market in a certain time period and DFS services change rapidly. Future research could track firms over time, relate survey responses to transactional data available in banks or platforms, compare countries with different regulatory approaches, and explore the potential for risks

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that can counterbalance some of the benefits, including over-indebtedness and cyber-fraud.

8. Conclusion.

Digital financial services are associated with faster SME growth, and more than half of the effect works through easier access to finance and greater operational efficiency. The benefit is larger for owners with stronger digital skills and for micro and young firms. Promoting digital finance for SMEs therefore works best when it is paired with credit that uses digital records and with capability building for owners.

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