ABSTRACT
Despite growth of information technology (IT) enabled services, how IT provides flexibility in service rendering and delivery, remains a relatively unexplored area of research. In this study, we investigate how digital service flexibility (DSF) influences performance of credit unions – an exemplary set of service oriented firms. We identify three dimensions of digital service flexibility: (1) basic digital service flexibility (basic DSF), (2) customer-oriented digital service flexibility (customer DSF), and (2) transaction-oriented digital service flexibility (transaction DSF). We argue that transaction DSF complements the basic DSF in influencing the performance, whereas customer DSF has a negative moderation effect on basic DSF and performance relationship. Using an archival data set, we find empirical support for the hypothesized relationships; and discuss contributions and implications of the findings.

Keywords
Digital service, firm performance, digital service flexibility.

INTRODUCTION
Credit unions have grown rapidly in recent decades, reaching more than 51,000 unions serving 196 million members, and overseeing $1.6 trillion in assets globally (WOCCU, 2011). The United States has 94 million credit union members, largest amongst all countries. Although considered similar to banks, credit unions (CUs) operate in a “not-for-profit” mode, as compared to the predominant “profit motive” of banks. The objective of CUs is to serve members, rather than maximize profits. However, instead of relying on grants or donations, CUs need to earn a surplus to cover operating expenses and serve their members. In other words, a credit union’s revenues (from loans and investments) need to exceed its operating expenses and dividends (interest paid on deposits) in order to maintain capital and solvency. (WOCCU, 2011). Thus, credit unions differ from other financial services organizations in that they are not mandated to satisfy shareholders’ profit expectations; and therefore are more service focussed to attain economic and social goals of their members.

Despite the emerging value potential of credit unions as customer-friendly and low-surplus based financial institutions, many struggle with low memberships (McKillop and Wilson, 2011). Further, switching between unions has become a trend when members have access to many credit unions. In addition, credit unions are under pressure from finance institutions such as banks to invest in IT-enablement of processes and activities (Allred and Addams, 2000). Customers demand smooth processes and delivery for funds transfer, loan payments, and other transactional activities. Moreover, lately demands for digitization of CUs have increased, as customers prefer IT-enabled access to their funds, applications and information.

Investing in digitization of credit unions is challenging in the face of low-surplus earning potential from customers. While managing digitized services is inherently complex (Rai and Sambamurthy, 2006), low average surplus per customer (ASPC) and service differentiation exacerbates the complexity of digitization efforts of CUs. Prior literature suggests that firms can use IT to identify service gaps and potential solutions to improve performance (Mithas, Krishnan, and Fornell, 2005). However, despite claims that firms can leverage IT to improve performance by managing resources and processes effectively (Grönnroos, 2000; Ray, Muhanna, and Barney, 2005), empirical evidence of IT-enabled processes and service performance of service-oriented firms such as CUs is sparse in the existing information systems (IS) literature.

In this study, we investigate how IT-enabled (or digital) service flexibility influences performance of credit unions. We use net income as the performance measure because the ultimate goal of services is to accrue higher revenue to sustain operations and required growth. We conceptualize three dimensions of IT-enabled service flexibility: (1) basic digital service flexibility (basic DSF) as the IT-enabled process improvisation to deliver basic or core services of the credit union, (2) transaction-
oriented digital service flexibility (transaction DSF) as the enhanced digitized processes to enable transactions within and beyond the firm, and (3) customer-oriented digital service flexibility (customer DSF) as digitized processes to expand options for rendering services and support to customers of the firm. We then develop hypotheses for a substitution effect of customer DSF and a complementary effect of transaction DSF on the relationship between basic DSF and service performance of credit unions. Our empirical analysis of data from credit unions across the United States provides empirical support for the hypothesized relationships.

PRIOR LITERATURE

A stream of research has focused on the evolutionary role of IT on the performance of credit unions. Prior studies examined the benefits of IT for credit unions (Damar and Hunnicutt, 2010) and argue that credit unions need to infuse more IT in customer-oriented processes to achieve better outcomes (Allred and Addams, 2000), similar to banks and other financial institutions (DeYoung, Lang, and Nolle, 2007; Furst, Lang, and Nolle, 2000). However, some argue that credit unions, being different from banks in their profit-oriented motives, need to be extremely careful in adopting IT vis-à-vis their revenue potential from customers through low average surplus per customer from interest (Dow, 2007).

Existing IS research suggests that service-oriented finance firms need to focus more on processes that are either efficient or effective towards delivery of services while making decisions for IT implementation (Lusch, Vargo, and Tanniru, 2010; Menor and Roth, 2008). Early studies argue that flexibility is a process-oriented approach towards IT enablement of service firms, and can provide an avenue for customer value oriented and sustained firm performance (Allen and Boynton, 1991; Sambamurthy and Zmud, 2000). IT capabilities can improve the quality of services and customer outcomes (Mithas, et al., 2005; Ray, et al., 2005) and play a vital role towards customer orientation strategies (Barrutia and Gilsanz, 2012), often providing a set of exploitation, exploration opportunities for the firm (Kathuria and Kosynsksi, 2012; Saldanha and Krishnan, 2011). Other researchers have argued that factors such as environmental dynamism and intra-firm coordination can foster flexibility rendering improved firm performance (Fredericks, 2005). Likewise, researchers have studied how technical, human, and process factors enhance IT-enabled flexibility (Fink and Neumann, 2009); and the impact of flexibility on innovation and performance (Matthyssens, Pauwels, and Vandenberghe, 2005; Zhou and Wu, 2009). However, there remains a gap in the literature in exploring how IT-enabled flexibility influences performance; our study addresses this gap.

THEORY AND HYPOTHESES

We anchor the theoretical conceptualization for this study on two fundamental premises of service dominant logic (S-D logic): (1) service is the basis of all exchange, and (2) since service is defined in terms of customer-determined benefits, and is co-created, inherently it is customer-oriented and relational (Vargo and Lusch, 2004, 2008). Extending S-D logic concepts, researchers argue that a configuration of people, technologies, and other resources interact with other service systems to create mutual value (Maglio, Vargo, Caswell, and Spohrer, 2009) by enabling the customer to co-create value along with the service-providing firm (Spohrer, Anderson, Pass, and Ager, 2008). Applying this to the credit union context, we argue that value is created when IT provides enriched flexibility to the basic-, customer-, and transaction-oriented processes delivering services; that inherently provides enhanced levels of process- and operational- mobility to influence performance (Chang, Yang, Cheng, and Sheu, 2003). We conceptualize that three dimensions of digital service flexibility (basic DSF, customer DSF, and transaction DSF) have direct and interactive effects on firm performance (conceptual model in Figure 1).

![Figure 1. Conceptual Model](image)

We define basic digital service flexibility as the ability, due to digitization, to quickly and economically adapt core services to changing business requirements. Basic digital service flexibility is thus the IT-enabled process improvisation to deliver basic or core services of the credit union, such as to provide deposit facilities and loan related information and services to customers. Our definition of basic digital service flexibility is anchored on definitions of manufacturing flexibility and IT
flexibility in prior literature (Upton, 1995). Transaction-oriented digital service flexibility is defined as the ability, due to
digitization, to quickly and economically adapt transaction oriented services to changing business requirements. This
categorization refers to the enhanced digitized processes that enable transactions within and beyond the firm and thus
corporates the options and alternatives available to enable different transactions between the providers and customers. Our
definition extends the concept of internal manufacturing flexibility in the operations management literature, which is related
to the need for operations efficiency (Koste and Malhotra, 1999). Customer-oriented digital service flexibility is the ability,
due to digitization, to quickly and economically adapt customer oriented services to changing business requirements (Saraf,
et al., 2007). This categorization refers to the digitized processes to expand options for rendering services and support to
customers of the firm and extends the notions of external flexibility or first order flexibility (Upton, 1995) offered in the
manufacturing strategy literature to digitized services.

We argue that the three dimensions DSF influence performance for three reasons. First, service flexibility is the ability, due
to digitization, to quickly and economically adapt core services to changing business requirements; that inherently prepares a
firm to achieve higher performance. Second, IT enables the flexibility dimensions through several avenues, such as
providing basic deposit or loan information to providers (basic DSF), efficient response to the customer’s issues (customer
DSF), and performing transactions with other entities or firms (transaction DSF). Third, as explored in other contexts such as
manufacturing (e.g., Koste and Malhotra, 1999), the DSF dimensions provide efficiency and effectiveness oriented
performance enhancing effects to the underlying processes of the firm. For example, customer DSF related effectiveness
helps improve the ability to understand and deal with customer’s issues (Chesbrough, 2007; Ostrom, et al., 2010); while
transaction DSF enhances operational processes to improve efficiency. In other words, customer DSF is focused on customer
related effectiveness improvement and transaction DSF is oriented towards inter-firm transactional efficiency improvements.

Direct Effects
Marketing literature on service performance suggests that customers prefer enhanced service offerings that might facilitate
and support the core services or assist in efficient delivery of the services (Grönroos, 2000; Ozment and Morash, 1994). In
line with these arguments, we suggest that firms derive value from basic digital service flexibility. Basic digital service
flexibility enables the credit union to offer its services more effectively and efficiently. The result would be more effective
management of resources and ultimately better financial performance. Hence we hypothesize:

\[ H1: \text{Basic digital service flexibility is positively associated with financial service performance.} \]

Customer-oriented digital service flexibility, by definition, provides more options for the credit union to reach out to
customers. Customer-oriented DSF allows customers to have more alternatives to access the services of the credit union.
Greater customer-oriented digital service flexibility enables the credit union to have more flexible access to customers and
more ways to provide service to customers. This can improve the financial performance of the credit union by providing
more opportunities for revenue generation. Thus we posit:

\[ H2: \text{Customer-oriented digital service flexibility is positively associated with financial service performance.} \]

In addition to basic core services, the ability of the credit union to enable digital transactions is likely to bring in more
revenue for the credit union. Transaction-oriented digital service flexibility enables other businesses to conduct transactions
with the credit union electronically, improving the speed and extent of transactions, with a resultant positive net influence on
the service quality and financial performance (Woodruff and Flint, 2006). Extending these arguments, we posit:

\[ H3: \text{Transaction-oriented digital service flexibility is positively associated with financial service performance.} \]

Moderating Effects
Customer-oriented DSF is oriented towards effectiveness of customer oriented services, and thus dependent on usage by
customers and appropriateness of the service towards customer needs. Increased customer-oriented DSF entails the ability to
deliver customer oriented services in a more flexible manner through more varied channels and delivery mechanisms. We
posit a negative moderating role of Customer DSF on the relationship between basic DSF and performance for two main
reasons. First, this would result in higher costs due to the provision of additional means of service delivery. Second, it would
have discernible impact on revenues as existing revenue generating services would be provided to customers in a more
effective manner without any provision of additional revenue generating services. Together, this would result in greater
customer-oriented DSF reducing the influence of basic DSF on financial service performance. Thus we hypothesize:

\[ H4: \text{Customer-oriented digital service flexibility negatively moderates the relationship between basic digital service flexibility and financial service performance.} \]
Transaction-oriented digital service flexibility is oriented towards efficiency of inter-firm and within-firm services and thus dependent upon usage by employees and the appropriateness of the service towards transactional needs. For example, a digitized channel is more appropriate for approval of loans to car dealers (DeYoung, et al., 2007). Transaction DSF enhances cross-functional transparency by providing greater visibility of transactions to other firms (Zuboff, 1985). When combined with basic DSF, this effect is accentuated due to the availability of service providers to perform other tasks. Increased cross-function transparency facilitates increased collaboration across organizational silos, which results in an increase in value creation and performance (Tafti, Mithas, and Krishnan, 2013). Thus:

\[ H5: \text{Transaction-oriented digital service flexibility positively moderates the relationship between basic digital service flexibility and financial service performance.} \]

**METHODOLOGY**

Our empirical setting comprises credit unions in the U.S. We obtained data from surveys conducted in the form of structured balance-sheet-reports collected by supervisory federal institutions for all credit unions in the U.S. The federal institutions collect the data for regulatory purposes and these reports are self-validated through sworn statements provided by the credit unions. The data comprise a 9-year panel and contain information on IT-enabled services and financial performance of credit unions. The dependent variable is Net Income, a widely used metric of financial performance for service firms. The independent variables BasicDSF, CustomerDSF, and TransactionDSF are count-based composite measures, consistent with prior research (e.g., Banker, Bardhan, Chang, and Lin, 2006).

<table>
<thead>
<tr>
<th>Variable</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>NetIncome</td>
<td>Net income of the credit union, in 100 million $ (log transformed)</td>
</tr>
<tr>
<td>BasicDSF</td>
<td>Digital flexibility offered to perform or deliver the basic or core services. This variable was coded as a summative score of questions on whether the credit union is offering the following services electronically: (1) new membership account applications, (2) account balance enquiry, (3) view account history, and (4) providing new loans to members.</td>
</tr>
<tr>
<td>CustomerDSF</td>
<td>Digital flexibility focused on providing alternatives for different transactional services within and outside of the firm. This variable was coded as a summative score of questions on whether the credit union is offering the following services electronically: (1) merchandise purchase, (2) share account transfers, (3) bill payments, (4) electronic cash transaction services.</td>
</tr>
<tr>
<td>TransactionDSF</td>
<td>Digital flexibility offered through different options to provide service, support and resolving issues for the customers of the credit union. This variable was coded as a summative score of questions on whether the credit union is offering the following services electronically: (1) home banking via internet website, (2) audio response/phone based interactive voice response, (3) automatic teller machine for deposits and withdrawals, (4) kiosk based services at different locations.</td>
</tr>
<tr>
<td>Assets</td>
<td>Total assets of credit union in 100 millions $</td>
</tr>
<tr>
<td>Spread</td>
<td>The spread of the credit union’s interest rates, calculated as “difference between interest generated per unit $ loan and interest paid per unit $ deposit”.</td>
</tr>
<tr>
<td>Region</td>
<td>Geographical region of credit union (of five regions in U.S.).</td>
</tr>
<tr>
<td>CU_Type</td>
<td>Type of credit union (Federally insured versus non-federally insured).</td>
</tr>
<tr>
<td>Age</td>
<td>Age of credit union since founding year.</td>
</tr>
<tr>
<td>Employees</td>
<td>Number of full time employees in credit union.</td>
</tr>
<tr>
<td>State</td>
<td>State in which credit union is situated.</td>
</tr>
</tbody>
</table>

Table 1. Variables Description

We control for several factors that might influence financial performance. These control variables include gross assets, number of employees, credit union age, state and regional dummy variables, credit union type, and interest rate spread (Dow, 2007). Table 1 provides a description of variables, and Table 2 provides descriptive statistics and correlations.

**Estimation Models**

The panel nature of our data allows us to estimate cross-sectional time-series models that account for individual-level heterogeneity of the credit unions. We estimate the following set of equations:

\[ \text{NetIncome}_{it} = \beta_0 + \beta_1 \text{BasicDSF}_{it} + \beta_2 \text{CustomerDSF}_{it} + \beta_3 \text{TransactionDSF}_{it} + \beta_4 \text{NetIncome}_{it-1} + \epsilon_{it} \quad (1) \]

\[ \text{NetIncome}_{it} = \beta_{0a} + \beta_1 \text{BasicDSF}_{it} + \beta_2 \text{CustomerDSF}_{it} + \beta_3 \text{TransactionDSF}_{it} + \beta_4 \text{BasicDSF}_{it} \times \text{CustomerDSF}_{it} + \beta_5 \text{BasicDSF}_{it} \times \text{TransactionDSF}_{it} + \beta_6 \text{NetIncome}_{it-1} + \beta_7 \text{Controls}_{it} + \epsilon_{it} \quad (2) \]
We estimate both random effects (RE) models and fixed-effects (FE) models and follow the usual tests (e.g., Hausman tests) for our models. To account for presence of potential heteroskedasticity in the data (Breusch-Pagan test p-value < 0.01) due to exogenous factors than our model variables, we estimate and report robust standard errors (Greene, 2003).

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>S.D.</th>
<th>Min</th>
<th>Max</th>
<th>1</th>
<th>2</th>
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<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
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<th>10</th>
<th>11</th>
<th>12</th>
<th>13</th>
<th>14</th>
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</thead>
<tbody>
<tr>
<td>1 Net Income</td>
<td>14.32</td>
<td>1.66</td>
<td>1.61</td>
<td>20.72</td>
<td>1</td>
<td>2</td>
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<tr>
<td>2 BasicDSF</td>
<td>2.04</td>
<td>1.49</td>
<td>0</td>
<td>4</td>
<td>0.58</td>
<td>1</td>
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<tr>
<td>3 CustomerDSF</td>
<td>1.96</td>
<td>1.27</td>
<td>0</td>
<td>4</td>
<td>0.61</td>
<td>0.83</td>
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<tr>
<td>4 TransactionDSF</td>
<td>1.83</td>
<td>1.34</td>
<td>0</td>
<td>5</td>
<td>0.56</td>
<td>0.79</td>
<td>0.82</td>
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<tr>
<td>5 Assets</td>
<td>14.73</td>
<td>0.51</td>
<td>13.00</td>
<td>17.00</td>
<td>0.42</td>
<td>0.14</td>
<td>0.13</td>
<td>0.14</td>
<td>1</td>
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<tr>
<td>6 Spread</td>
<td>-0.08</td>
<td>0.28</td>
<td>-58.59</td>
<td>0.13</td>
<td>0.03</td>
<td>0.05</td>
<td>0.05</td>
<td>0.05</td>
<td>0.00</td>
<td>1</td>
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<tr>
<td>7 Age</td>
<td>50.94</td>
<td>14.66</td>
<td>0</td>
<td>99</td>
<td>0.24</td>
<td>0.17</td>
<td>0.17</td>
<td>0.16</td>
<td>0.17</td>
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<td>8 Employees</td>
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<td>111.06</td>
<td>1</td>
<td>7025</td>
<td>0.39</td>
<td>0.24</td>
<td>0.25</td>
<td>0.23</td>
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<td>0.11</td>
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<td>9 State</td>
<td>29.84</td>
<td>15.58</td>
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<td>78</td>
<td>-0.05</td>
<td>-0.03</td>
<td>-0.04</td>
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<td>-0.07</td>
<td>0.01</td>
<td>-0.02</td>
<td>1</td>
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<tr>
<td>10 Region1</td>
<td>0.15</td>
<td>0.36</td>
<td>0</td>
<td>1</td>
<td>0.05</td>
<td>0.04</td>
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<td>0.07</td>
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<tr>
<td>11 Region2</td>
<td>0.14</td>
<td>0.35</td>
<td>0</td>
<td>1</td>
<td>-0.01</td>
<td>-0.06</td>
<td>-0.06</td>
<td>-0.05</td>
<td>0.06</td>
<td>-0.01</td>
<td>-0.02</td>
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<td>0.24</td>
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<td>12 Region3</td>
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<td>1</td>
<td>-0.00</td>
<td>-0.03</td>
<td>-0.01</td>
<td>-0.02</td>
<td>-0.11</td>
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<td>-0.22</td>
<td>-0.21</td>
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<tr>
<td>13 Region4</td>
<td>0.27</td>
<td>0.44</td>
<td>0</td>
<td>1</td>
<td>-0.11</td>
<td>-0.04</td>
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<td>-0.05</td>
<td>-0.07</td>
<td>0.01</td>
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<td>-0.04</td>
<td>0.14</td>
<td>-0.26</td>
<td>-0.24</td>
<td>-0.31</td>
<td>1</td>
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<tr>
<td>14 CU_Type2</td>
<td>0.39</td>
<td>0.49</td>
<td>0</td>
<td>1</td>
<td>0.01</td>
<td>0.06</td>
<td>0.05</td>
<td>0.05</td>
<td>0.01</td>
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<td>0.13</td>
<td>0.03</td>
<td>0.01</td>
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<td>-0.01</td>
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<tr>
<td>15 CU_Type3</td>
<td>0.01</td>
<td>0.09</td>
<td>0</td>
<td>1</td>
<td>0.04</td>
<td>0.05</td>
<td>0.04</td>
<td>0.05</td>
<td>0.03</td>
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<td>0.04</td>
<td>0.02</td>
<td>-0.08</td>
<td>-0.04</td>
<td>-0.04</td>
<td>0.00</td>
<td>0.00</td>
<td>-0.07</td>
</tr>
</tbody>
</table>

Note: N = 45767

Table 2. Descriptive Statistics and Correlations

RESULTS

Table 3 shows the results of the random-effects models (Columns 1 and 2) and fixed-effects models (Columns 3 and 4). Although both random-effects and fixed-effects specifications give us qualitatively similar results, since Hausman (1978) tests rejected the null (p < 0.05) we interpret the fixed-effects models. The coefficients of BasicDSF ($\beta_1 = 0.008$, p < 0.10), CustomerDSF ($\beta_2 = 0.013$, p < 0.05), and TransactionDSF ($\beta_3 = 0.029$, p < 0.01) are statistically significant (column 3), providing support for H1, H2, and H3 respectively. We find that H4 is also supported (column 4), because the interaction of BasicDSF and CustomerDSF is negative and statistically significant ($\beta_4 = -0.009$, p < 0.05). Further, the interaction of BasicDSF and TransactionDSF is positive and significant ($\beta_5 = 0.012$, p < 0.01), supporting H5. An F-test of joint significance of the interaction terms rejects the null (p < 0.01) that the interaction terms are jointly zero.

DISCUSSION

This study explored how IT-enabled flexibility influences performance of credit unions. Drawing on existing discussions in management and IS literature we conceptualized basic DSF, customer DSF, and transaction DSF as three dimensions of digital service flexibility. We empirically find that all three dimensions of DSF directly impact CU performance by increasing net income. In addition, we find that customer DSF has a substitution effect, and transaction DSF has a complementary effect on the relationship between basic DSF and performance. Our results suggest that although several channels and various modes of digital service flexibility are offered to customers, their use and adoption patterns for credit unions are not intense enough to increase the effectiveness of these channels. Conversely, greater the transaction flexibility offered in providing faster and quicker services, higher is the influence of basic DSF on net income.

Our findings have several managerial implications. IT investments in service firms are often swayed by industry trends of firms’ adopting IT without realizing its impact. Specifically, being a service provider firm has a direct bearing on the differentiation between effectiveness and efficiency rationales for IT investments. In so far as managers need to be proactive in IT adoption, they also need to explore where IT can create better value, thereby prioritizing the investments. Further, our findings imply that credit unions need to look at their customer centric avenues of IT systems to explore avenues in which it can add value, such that it can enrich the basic purpose of their services, rather than being a ‘fad’ or ‘burden’ to customers. Often sophisticated IT decisions, such as virtual wallets or stock pricing comparisons may not be necessary for CUs’ customers.
<table>
<thead>
<tr>
<th></th>
<th>Random-effects model estimates</th>
<th>Fixed-effects model estimates</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(1)</td>
<td>(2)</td>
</tr>
<tr>
<td></td>
<td>Net Income</td>
<td>Net Income</td>
</tr>
<tr>
<td>BasicDSF</td>
<td>0.032*** (0.004)</td>
<td>0.006 (0.006)</td>
</tr>
<tr>
<td>CustomerDSF</td>
<td>0.106*** (0.005)</td>
<td>0.128*** (0.007)</td>
</tr>
<tr>
<td>TransactionDSF</td>
<td>0.051*** (0.004)</td>
<td>0.008 (0.006)</td>
</tr>
<tr>
<td>BasicDSF X CustomerDSF</td>
<td></td>
<td>-0.005* (0.003)</td>
</tr>
<tr>
<td>BasicDSF X TransactionDSF</td>
<td></td>
<td>0.022*** (0.002)</td>
</tr>
<tr>
<td>Assets</td>
<td>0.372*** (0.010)</td>
<td>0.378*** (0.010)</td>
</tr>
<tr>
<td>Spread</td>
<td>0.004 (0.007)</td>
<td>0.004 (0.007)</td>
</tr>
<tr>
<td>Region1</td>
<td>0.189*** (0.018)</td>
<td>0.183*** (0.018)</td>
</tr>
<tr>
<td>Region2</td>
<td>0.101*** (0.026)</td>
<td>0.099*** (0.026)</td>
</tr>
<tr>
<td>Region3</td>
<td>0.072*** (0.014)</td>
<td>0.071*** (0.014)</td>
</tr>
<tr>
<td>Region4</td>
<td>0.070*** (0.009)</td>
<td>0.068*** (0.009)</td>
</tr>
<tr>
<td>Age</td>
<td>0.026*** (0.001)</td>
<td>0.026*** (0.001)</td>
</tr>
<tr>
<td>CU_Type2</td>
<td>-0.117*** (0.026)</td>
<td>-0.116*** (0.025)</td>
</tr>
<tr>
<td>CU_Type3</td>
<td>0.097 (0.124)</td>
<td>0.092 (0.122)</td>
</tr>
<tr>
<td>Employees</td>
<td>0.003*** (0.000)</td>
<td>0.003*** (0.000)</td>
</tr>
<tr>
<td>State</td>
<td>-0.004*** (0.001)</td>
<td>-0.004*** (0.001)</td>
</tr>
<tr>
<td>Credit union - year observations (N)</td>
<td>45.767</td>
<td>45.767</td>
</tr>
<tr>
<td>Credit unions (n)</td>
<td>8,193</td>
<td>8,193</td>
</tr>
<tr>
<td>R-square</td>
<td>0.39</td>
<td>0.41</td>
</tr>
</tbody>
</table>

Notes: (1) Standard errors in parentheses. (2) *** p < 0.01, ** p < 0.05, * p < 0.1. (3) The Region dummies, CU_Type dummies, and State are dropped from the fixed-effects estimations because of their time-invariant nature.

Table 3. Results

Our results suggest that customer DSF has a substitution effect for basic digital service flexibilities. This finding suggests that digitization provides opportunities for alternatives for customer interaction, along with a parallel need to focus on attributes that reinforce benefits for customers rather than overwhelming them. In contrast, transaction-oriented digital service flexibilities reinforce the effect of basic digital service flexibility on performance. For practice, this result suggests that firms can strengthen the effect of digitization of core service offerings by complementing them with more ways for digitization of transactions.

Our study makes several contributions to research. First, we examine the relationship between the digitization of service and financial performance, and provide an explanation of how this effect is accentuated through flexibility. Thus we contribute to IS research by identifying digital service flexibility as a driver of positive effects of IT on firm performance. Second, by drawing insights about the differing impacts of the dimensions of digital service flexibility on firm performance, we contribute to the literature on service systems and service innovation, specifically focusing on the S-D logic. More specifically, our study highlights how different types of digital service flexibilities interact with each other to influence performance. Third, we empirically test our theoretical model using data from a broad set of U.S. credit unions that are not restricted to a single region, market, or type.

Our study has limitations which future research can overcome. First, although we use panel data, we cannot confirm purely causal effects. Second, our empirical context of one specific set of firms may limit generalizability. Third, this study is limited to three dimensions of service flexibility; future studies can examine other factors related to service flexibility. Finally, although our nine-year panel dataset provides rich data for testing our theory, future research can explore how emerging technologies such as mobile devices and social media may uncover specific or different insights related to digital service flexibility.
In conclusion, this study provides one of the first conceptualization and empirical tests of digital service flexibility in the context of credit unions. We find that along with direct effects of dimensions of digital service flexibility, there is a negative moderation effect of customer-oriented, and a positive moderation effect of transaction-oriented digital service flexibility. The study contributes to the literature that examines the importance of various IT-enabled service dimensions in affecting performance.

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