Information Technology and Business Value in a Global Economy: Do Information Technology Investments Pay Off in a Developing Economy?

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Information Technology and Business Value in a Global Economy: Do Information Technology Investments Pay Off in a Developing Economy?

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ABSTRACT
Understanding the business value of IT has mostly been studied in developed countries, but because most investment in developing countries is derived from external sources, the influence of that investment on business value is likely to be different. We test this notion using a two-layer model. We examine the impact of IT investments on firm processes, and the relationship of these processes to firm performance in a developing country. Our findings suggest that investment in different areas of IT positively relates to improvements in intermediate business processes and these intermediate business processes positively relate to the overall financial performance of firms in a developing country.

Keywords

INTRODUCTION
The global investment into information technology (IT) is in trillions of U.S. dollars, and globalisation has resulted in developing countries being integrated into the global economy through growing foreign investments (McKinsey Global Institute, 2003). Thus, understanding how IT contributes to business value is a global issue for research and practice. IT business value focuses on the IT contribution to productivity enhancement, profitability improvement, relations, competitive advantage, and efficient use of resources at both the intermediate process level and the organisational level (Melville, Kraemer and Gurbaxani, 2004). While it has been established that IT may indeed contribute to business value, there is uncertainty and debate about what we know and don’t know (Oh and Pinsonneault, 2007).

In addition to the this uncertainty, attributed to methodological issues of data and measurement, level of analysis, and choice of measurement variables (Wade and Hulland, 2004), and despite IT investments being a global phenomenon, the centrality of IT business value studies in the developed economies provides little understanding on how IT investments contribute to business value in other jurisdictions, in particular developing economies (Chau, Kuan and Liang, 2007). Owing to the globalisation of IT investments, and our inconclusive understanding on how IT contributes to business value, it is important to diversify IT business value research. The developing countries are often beneficiaries of investments from developed economies, and these investments have important implications for both the developed economies and the developing economies. In addition, while the current focus of IT investments is on strategic dimensions, with focus on firm level business value contribution of IT investments (Aral and Weill, 2007), investment in developing countries is targeted at the operational level (Pimchangthong, Plaisent and Benard, 2003). Thus, an understanding how IT investments contribute to business value at operational level in developing countries is important. However, because businesses are ultimately interested in understanding the contribution of their investments to the overall business performance, mapping the ITs contribution to business process performance and understanding the association between these business processes and overall business performance is important. We test this notion using a two-layer model.

The aim of this research is to understand how IT investments contribute to business value in developing countries by considering the effect of investments at both operational and firm levels. The paper is organised as follows. The next section provides a literature review on IT business value research followed by discussion of the theoretical framework and
propositions. Then we present our methods and results. In the final section, we discuss the results, limitations, and provide directions for future research.

**IT INVESTMENT AND BUSINESS VALUE – AN OVERVIEW**

The lack of a positive relationship between IT investments and business value is well noted in the early literature (see for example, Barua, Kriebel and Mukhopadhyay, 1995; Brynjolfsson, 1993). The earliest studies considered the contribution of IT investments on performance measures, and IT productivity using the production function approach (for example, Roach, 1987), and were unable to establish any significant relationship between IT investments and productivity. The Brynjolfsson and Hitt (1993), and Lichtenberg (1993) studies were a turning point in the history of IT productivity assessment by providing different outcome from the 1980s research (Barua and Mukhopadhyay, 2000). The positive result was achieved using new data, and subsequently, suggestions were made that a shortfall of evidence does not necessarily mean a fall of IT productivity. The studies that followed supported this assertion (e.g., Brynjolfsson and Yang, 1999; Dos Santos, Peffers and Mauer, 1993). Having established that IT did contribute to business value, thoughts emerged as to whether other factors together with IT may better explain how IT contributes to business value.

This led to the introduction of process oriented studies that attempted to establish relationships between IT and other input factors to performance measures at various levels of aggregation. In a distinct, but related approach, the importance of measuring the intermediate level performance measures was also recognised. As Baura et al. (1995) note, this approach enables one to open the “black box” of IT usage, and detect and measure IT impacts where they occur within the process-oriented framework. In addition, the synergy between IT and other related factors was also recognised.

The complementarity theoretical perspective proposes that objects, processes, people, and technology have a value synergy amongst themselves, and IT must be complemented by investments in appropriate business strategies, processes, incentives, and control systems (Barua and Whinston, 1998). This argument was supported by a number of studies (for example, Barua et al., 1995; Barua and Whinston, 1998).

However, the variability in nature of the positive relationships between IT investments and business value (Aral and Weill, 2007) saw the introduction of resource-based logic in understanding how IT contributes to business value. The Resource-Based View (RBV) argues that since investments into IT can be easily duplicated, investments per se do not provide any sustained advantages (Mata, Fuerst and Barney, 1995). Rather, it is how firms leverage their investments to create unique IT capabilities and skills that determine the firms overall effectiveness(Bharadwaj, Bharadwaj and Konsynski, 2000). The RBV is useful in the IT context as it provides a robust framework for analysing whether, and how IT may be associated with business value (Melville et al., 2004). The RBV has been used by researchers in developed economies to theoretically and conceptually state how distinctive investments contribute to sustained competitive advantage (SCA) (for example, Byrd, 2001; Hidding, 2001), and business value (for example, Aral and Weill, 2007; Oh and Pinsonneault, 2007).

Studies in developing countries, however, have focused on drivers of IT demand (Shih, Kraemer and Dedrick, 2007). IT investment was found to be associated with diffusion of telecommunications structure, education levels, and technical skills. Studies of national productivity gains have shown developing countries have not experienced gains associated with IT investments (see for example, Dewan and Kraemer, 2000; Pohjola, 2001), and suggest that IT investment has not been sufficient in complementary assets to permit developing countries to enjoy productivity benefits (Dewan and Kraemer, 2000). Consequently, we study this notion at the process and firm level with IT specific investments and related complementarities to understand whether these close complementarities contribute to business value.

**THEORY AND PROPOSITIONS**

The Business Value Complementarity (BVC) theoretical perspective emerged because of failure of production economics and business value studies to recognise the synergy between IT and other related factors such as the levels of fit with business strategies, employee empowerment, and team orientation of business processes (Barua and Mukhopadhyay, 2000). As argued by Barua et al., (1996), IT inputs are a component in organisational design, and investments into IT must be complemented...
by investments and consideration into appropriate business strategies, processes, incentives, policies, and control systems. If a firm does not invest in complementary factors, the payoffs are likely to be limited (Barua and Mukhopadhyay, 2000).

The basic tenet of the complementarity perspective suggests that IT investments and complementarities first related to the intermediate performance measures rather than high-level measures such as profitability. The BVC framework helps to understand IT investment’s ability to add value to business in association with closely related factors. While the recent resource-based view argues that firms possess resources, and a subset of these (rare and inimitable) enables them to achieve competitive advantage and superior long term performance (Wade and Hulland, 2004), this logic may not be relevant in developing economies that operate in a near monopolistic environment. Thus, an evaluation of investment in IT and closely related synergies may provide an initial understanding of the nature of IT investment contribution to business value.

**IT Investments and Complementarities**

Information Technology, broadly defined, is a collection of computing systems used by organisations. In this research, the term IT represents an organisation’s collection of information systems, the users, and the management that oversees them.

Businesses invest to acquire the IT resources, and hire people with IT skills to develop their IT applications. The level of raw dollar spending on IT reflects an investment in an important resource for business. Failure to invest in IT resources may put firms at a disadvantage in terms of performance, thus investment into IT has almost become a necessity. Recent studies have shown that successful IT can improve firms business value (for example, Bharadwaj et al., 2000). These arguments lead to the following proposition:

**Proposition 1:** The level of IT spending will be positively associated with overall business performance.

The belief that employee performance has implications for firm-level outcomes has been prevalent for many years (Huselid, 1995). It has been argued that human resources are frequently “underutilised” because employees often perform below their maximum potential and that organisational efforts to elicit discretionary effort from employees are likely to provide returns in excess of any relevant costs. Acquiring qualified IT staff, and training the staff indicates the willingness of an organisation to properly manage and train its IT personnel and end users. While it becomes necessary in developing countries to seek the assistance of experts, continuous training and development of staff would facilitate staff motivation. Educated workers are also more flexible, and adjust more readily, and may smooth the IT implementation process (Bartel and Lichtenberg, 1987). IT is a skill-biased technology whose value is closely linked to the skill levels available to the firm (Bresnahan, Brynjolfsson and Hitt, 2002; Shih et al., 2007). IT spending on staff training is an indicator of a firm’s desire to maintain a well-trained IT workforce. These arguments lead to the following propositions:

**Proposition 2a:** The level of IT spending and on IT staff recruitment will be positively associated with business process performance.

**Proposition 2b:** The level of IT spending and on staff training will be positively associated with business process performance.

IT infrastructure is a capability that can influence the firm’s ability to contribute to performance (Duncan, 1995; Sambamurthy, Bharadwaj and Grover, 2003). IT infrastructure is a shared set of capital resources that provide the foundation on which IT applications are built (Duncan, 1995), and consists of operating systems, communication networks, critical shared data, and core data processing applications (Byrd and Turner, 2000). A flexible IT infrastructure facilitates rapid development and implementation of IT applications that enable organisations to respond swiftly to take advantage of emerging opportunities (Ray, Muhamma and Barney, 2005). Alternatively, inflexible IT infrastructure may impede the undertaking of important initiatives and limit the freedom of the organisation in exploring opportunities (Ray et al., 2005). These arguments lead to the following proposition:

**Proposition 3:** The level of on flexible IT infrastructure will be positively associated with business process performance.

**Business Value Measurement Levels**

The term ‘IT business value’ refers to the organisational performance impacts of IT. This includes productivity enhancement, profitability improvement, cost reduction, competitive advantage, and inventory reduction (Melville et al., 2004). Prior
research has identified two key formulations of performance are: efficiency and effectiveness (Melville et al., 2004). Respectively, for the purpose of this research, we define IT business as organisational performance impacts of IT at both the intermediate business process and organisation level. While the first focal point of the IS research, including assessment and performance measurement, should be IT reliant work processes (Alter, 2003), ultimately, businesses are concerned about the return on their investments. Thus, process performance measurement is not an acceptable alternative to measuring net benefits directly (DeLone and McLean, 2003). However, an organisation’s overall performance depends on, amongst other factors, the effectiveness of these business processes in supporting its business goals (DeLone and McLean, 2003). This argues for mapping the process level outcomes to the firm level outputs in a two stage process. These arguments lead to the following proposition:

**Proposition 4:** Business Process Performance Improvements from IT investments and investment on IT staff recruitment and training will be positively associated with Organisational level performance.

**CONTROL VARIABLES**

This research controls for firm size, number of years of IT investment, whether businesses have separate IT departments to discount for rival hypothesis that may drive process level and organisational level performance. We anticipate that the success of information technology investments in improving processes and performance may depend upon how long a business has engaged itself into its processes. We also anticipate IT firms with a separate IT department may be better organized to support and maintain their IT resources, and the number of years the firms have been investing in IT may have an effect on their process efficiencies and performance. Consistent with our theoretical arguments, we present our research model below.

![Figure 1: A Two-Stage IT Business Value Research Model](image)

**RESEARCH METHOD**

**Data**

Our sample contains publicly listed, statutory, private companies and partnerships in Fiji, a good candidate as a developing country located in the South Pacific. In the South Pacific, Fiji is the most industrialized country with a per capita Gross National Income (GNI) of US$ 2160 in 2002, and the World Bank classifies Fiji as a Lower Middle Income Economy (Asian Development Bank, 2006). Fiji has a diversified open economy with the service sector contributing about 67% of the GDP. A list of 130 enterprises was used as the sample frame for this study. Each firm was contacted and 75 showed interest in participating in the study. The questionnaire, which had the provision to collect data for six years, was mailed to the CEO and a follow up telephone call was made to participants that had not returned their questionnaire after a month. A second follow up call was made one month after the initial call. We received one hundred and ninety two data sets from 51 questionnaires (making a response rate of 68% and 43% for questionnaires and data sets respectively). All financial data were converted to a
base year (2000). We used the "Trimmed Inflation Rate", to convert financial data from respective years into base year terms (Reserve Bank of Fiji, 2006).

CONSTRUCT OPERATIONALISATION

We measured investment as raw dollar spend on IT as defined above. IT budget on staff training per employee measures the level of IT staff training, and IT human resource expenditure (including IT staff salary and other recruitment expenses) per employee measures the level of IT spending on staff recruitment. We measured Flexible IT infrastructure by adopting a set of questions from Duncan (1995), and focuses on the level of IT platform standardisation.

We define a business process as a set of linked activities that create value by transforming an input into a more valuable output. Sales revenue per employee and sales per total assets measures a firm’s sales and marketing productivity at the process level. Operating expenses per sales, selling and general expenses per sales and labor costs per sales ratios measure cost efficiencies (Mitra and Chaya, 1996). Productivity is measured through revenue per employee and revenue to assets. Investment in IT should also bring about improvements in the way in which firms deal with their customers. This means fewer resources should be used in advertising to attract customers; rather, sales should grow by improving customer value, and emphasizing service quality.

The firm performance looks at the how the resources have been utilized in monetary terms, and we consider the monetary returns (profit) on those resources. Return on asset, return on equity, return on sales, market share, market capitalisation, return on shareholders’ funds, market value, and total asset turnover have been used extensively in prior studies to measure firm performance. For wider applicability, we use return on assets, return on equity, and return on sales, and they act as dependent variables in the second stage of the model. We use total assets as the proxy for firm size. Table 1 presents description of variables.

<table>
<thead>
<tr>
<th>Name of Variable</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ITINV</td>
<td>Total IT Investment in Hardware, Software and Infrastructure</td>
</tr>
<tr>
<td>ITSTFTRNC</td>
<td>Spending on IT Staff Training</td>
</tr>
<tr>
<td>ITREXP</td>
<td>Expenditure on IT Human Resources excluding Staff Training</td>
</tr>
<tr>
<td>FLXITINFST</td>
<td>Flexible IT Infrastructure</td>
</tr>
<tr>
<td>YRSITINV</td>
<td>Number of Years of IT Investment</td>
</tr>
<tr>
<td>SEPIITDEPT</td>
<td>Separate IT Department</td>
</tr>
<tr>
<td>TOTASSETS</td>
<td>Total Assets - Size of the Firm</td>
</tr>
<tr>
<td>SAREVEMP</td>
<td>Sales Revenue per Employee</td>
</tr>
<tr>
<td>OPEXPTOSAL</td>
<td>Operating Expenses as a proportion to Sales</td>
</tr>
<tr>
<td>LECSTTOSAL</td>
<td>Labour Cost as proportion to Sales</td>
</tr>
<tr>
<td>SGEXPTOSAL</td>
<td>Selling and General Expenses as a proportion to Sales</td>
</tr>
<tr>
<td>SALTOTA</td>
<td>Sales to Total Assets Ratio</td>
</tr>
<tr>
<td>ROA</td>
<td>Return on Assets</td>
</tr>
<tr>
<td>ROE</td>
<td>Return on Equity</td>
</tr>
<tr>
<td>ROS</td>
<td>Return on Sales</td>
</tr>
</tbody>
</table>

Table 1. Description of Variables
RESULTS

Descriptive Statistics

Table 2 presents descriptive statistics for the independent variables, dependent variables and control variables, including mean and standard deviations. The average investment in IT is half a million dollars, with a similar average spending on IT human resource expenditure. An average of $70,506 is spent on training of IT staff. On average, businesses perceive to have a satisfactory flexible IT infrastructure (4.58). More than half of the businesses have a separate IT department. Some businesses have negative return on their investments, with average returns of 0.07, 0.17, and 0.16 on assets, equity and sales respectively.

Diagnostic Checks

We performed several diagnostic checks to ensure that assumptions of the analysis were not violated. We captured the residuals to test for normality using Kolmogorov-Smirnov test, and p-values did not indicate violation of the normality assumption. White’s heteroscedasticity test did not highlight any issues. The Durbin-Watson statistic did not indicate any problems with serial correlation. Finally, the variance inflation factors (VIF) were below the threshold value of 10, suggesting multicollinearity was also not an issue.

IT Investments and Related Complementarities and Intermediate Business Processes

Table 3 provides the regression results for the five models, with each model considering the relationship between IT investments and related complementarities, and a measure of intermediate business processes. The results indicate a significant positive relationship between IT investment and SALREVEMP, LBCSTTOSAL, and SGEXPTOSAL, thus supporting proposition one. IT investment in staff training is favorably and significantly associated SALREVEMP, OPEXPTOSAL, and SALTOTA, while IT human resource spending is favourably and significantly associated with OPEXPTOSAL, LBCSTTOSAL, SGEXPTOSAL, and SALTOTA. This supports propositions 2a and 2b.
Flexible IT infrastructure is favourably and significantly associated with all except SALREVEMP. Flexible IT infrastructure and IT investment together are favourably and significantly associated with two measures of business process performance. With IT staff training and IT human resource expenditure, IT investment is favourably and significantly associated with four measures of business process performance. IT investment, IT spending on staff training, IT human resource spending and Flexible IT infrastructure together are favourably and significantly associated with LBCSTTOSAL and SGEXPTOSAL. These relationships support proposition 3.

The control variables have varying, but largely insignificant effect on the business process measures. Number of years of IT investment significantly related to SGEXPTOSAL, whereas the size of the firm has favourable impact on SALREVEMP and OPEXPTOSAL.

<table>
<thead>
<tr>
<th>VARIABLE</th>
<th>MODEL 1 SALREVEMP</th>
<th>MODEL 2 OPEXPTOSAL</th>
<th>MODEL 3 LBCSTTOSAL</th>
<th>MODEL 4 SGEXPTOSAL</th>
<th>MODEL 5 SALTCTA</th>
</tr>
</thead>
<tbody>
<tr>
<td>ITINV</td>
<td>0.851***</td>
<td>0.064</td>
<td>-0.018**</td>
<td>-0.019***</td>
<td>-0.059</td>
</tr>
<tr>
<td>ITSTIFTRNG</td>
<td>0.078*</td>
<td>-0.039**</td>
<td>1.096</td>
<td>1.136</td>
<td>0.045*</td>
</tr>
<tr>
<td>ITREXP</td>
<td>-0.254</td>
<td>-0.199*</td>
<td>-0.203**</td>
<td>-0.256***</td>
<td>0.127***</td>
</tr>
<tr>
<td>FLXITINFST</td>
<td>-0.022</td>
<td>-0.298***</td>
<td>-0.119***</td>
<td>-0.086*</td>
<td>0.217*</td>
</tr>
</tbody>
</table>

Controls Variables

| YRSITINV       | -0.008             | -0.155             | -0.190             | -0.171***          | 0.149           |
| SEPITDEPT      | -0.003             | -0.079             | -0.024***          | -0.030             | -0.026          |
| TOTASSETS      | 0.249***           | -0.524***          | -0.008             | 0.007              | -0.235          |
| R²             | 0.798***           | 0.301***           | 0.857***           | 0.854***           | 0.118***        |
| Adjusted R²    | 0.790              | 0.275              | 0.582              | 0.848              | 0.085           |
| Max VIF        | 2.966              | 1.697              | 1.569              | 1.658              | 2.783           |

Table 3. IT and Complementarities and Intermediate Business Processes

**IT Investments and Related Complementarities, Intermediate Business Processes and Business Performance**

Table 4 provides the regression result of the relationship between the intermediate business processes and the business performance. The three models, with dependent variables of return on asset, return on equity, and return on sales indicate that the relationship between the businesses process performance and business performance is favourable and statistically significant. The three models show a statistically significant change in R² from stage 1 to stage 2 of 0.340, 0.397, and 0.113 respectively. Labour cost to sales ratio, selling and general expenses to sales ratio, operating expenses to sales ratio, and sales as a proportion to total assets are favourably associated with business performance measures. These results support proposition 4. Only sales revenue per employee is not favourably associated with business performance. The control variables have varying effects on the three measures of business performance. Separate IT department and total assets have mixed significant association at both the business process and business performance level.

Investment into IT and associated IT complementarities, and the effect of these on the business processes explain 50% to 72% of the variance in the business performance. The business processes explain a greater proportion of this variance in business performance in model 1 and 2. IT investments and associated IT complementarities also directly explain some variance in business performance (ROE R² = 0.114; ROA R² = 0.221; and ROS R² = 0.609).
DISCUSSION

Organisations spend millions of dollars, both locally and globally on IT. However, empirical studies examining the contribution of IT investments to performance are concentrated in developed economies, and show mixed results. Therefore understanding how IT contributes to business value in broader jurisdiction is important. Our approach, using process-oriented and complementarity approach represents a step in that direction. The approach in this paper adopts a two-stage process. First we suggest that IT investments, in the presence of related complementarities are favourably associated with business processes performance. Secondly, the business process performance is favourably associated with overall business performance in a developing economy. This implicitly indicates that investment into IT and related complementarities contributes to improvement in business processes, and these processes contribute to improvement in overall business performance.

This study makes several theoretical and empirical contributions. First, in understanding the payoffs from IT investments, measurement of the outputs and inputs are imperative. This consideration was the foremost in developing a two-stage model for this study. The results support the notion that payoffs from IT investments could be better evaluated if we first consider its effect at the intermediate level, and then at business performance level, in relation to these processes. We feel that this is an important theoretical issue in considering the assessment of IT in all jurisdictions.

Table 4. Business Process Performance and Business Performance

<table>
<thead>
<tr>
<th>STAGE</th>
<th>VARIABLES</th>
<th>MODEL 1 ROA</th>
<th>MODEL 2 ROE</th>
<th>MODEL 1 ROS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>ITINV</td>
<td>0.08*</td>
<td>0.11*</td>
<td>0.07*</td>
</tr>
<tr>
<td></td>
<td>ITSTFTRNG</td>
<td>0.07</td>
<td>-0.23***</td>
<td>0.1</td>
</tr>
<tr>
<td></td>
<td>ITHREXP</td>
<td>-0.34***</td>
<td>-0.03</td>
<td>-0.38***</td>
</tr>
<tr>
<td></td>
<td>FLXITINFST</td>
<td>-0.43***</td>
<td>-0.19**</td>
<td>-0.2***</td>
</tr>
<tr>
<td></td>
<td>YRSITINV</td>
<td>0.1</td>
<td>0.16</td>
<td>0.03</td>
</tr>
<tr>
<td></td>
<td>SEPITDEPT</td>
<td>0.27***</td>
<td>0.23***</td>
<td>0.24***</td>
</tr>
<tr>
<td></td>
<td>TOTASSETS</td>
<td>0.01</td>
<td>0.04</td>
<td>0.72***</td>
</tr>
<tr>
<td>2</td>
<td>ITINV</td>
<td>0.03</td>
<td>0.1</td>
<td>0.02</td>
</tr>
<tr>
<td></td>
<td>ITSTFTRNG</td>
<td>0.13</td>
<td>-0.09</td>
<td>0.16</td>
</tr>
<tr>
<td></td>
<td>ITHREXP</td>
<td>-0.15</td>
<td>0.1</td>
<td>-0.32***</td>
</tr>
<tr>
<td></td>
<td>FLXITINFST</td>
<td>-0.13***</td>
<td>0.09</td>
<td>-0.1</td>
</tr>
<tr>
<td></td>
<td>YRSITINV</td>
<td>-0.08</td>
<td>-0.03</td>
<td>-0.03</td>
</tr>
<tr>
<td></td>
<td>SEPITDEPT</td>
<td>0.24***</td>
<td>0.18***</td>
<td>0.22***</td>
</tr>
<tr>
<td></td>
<td>TOTASSETS</td>
<td>-0.24***</td>
<td>-0.27***</td>
<td>0.5***</td>
</tr>
<tr>
<td></td>
<td>OPEXPTOSAL</td>
<td>-0.56***</td>
<td>-0.67***</td>
<td>-0.34***</td>
</tr>
<tr>
<td></td>
<td>SALREVEMP</td>
<td>-0.07</td>
<td>-0.19</td>
<td>-0.09</td>
</tr>
<tr>
<td></td>
<td>LBCSTTOSAL</td>
<td>-1.84***</td>
<td>-1.64***</td>
<td>-1.2***</td>
</tr>
<tr>
<td></td>
<td>SGEXPTOSAL</td>
<td>-1.7***</td>
<td>-1.44***</td>
<td>-1.11***</td>
</tr>
<tr>
<td></td>
<td>SALTOTA</td>
<td>0.22***</td>
<td>0.08</td>
<td>0.19***</td>
</tr>
</tbody>
</table>

R² Model1 0.22*** 0.114*** 0.609***
R² Model2 0.561*** 0.493*** 0.722***
Adjusted R² Model1 0.192 0.080 0.594
Adjusted R² Model2 0.532 0.459 0.703
R² Change From Model 1 to Model 2 0.340*** 0.397*** 0.113***
Max VIF 1.913 1.738 1.563

***p<0.01  **p<0.05  *p<0.10
Second, this study highlights that investment in IT resources (hardware software and infrastructure) is valuable, but further suggests that business can derive better value from these investments by considering related complementarities. Both foreign and local investors in IT may gain more if they also consider improving areas closely related to the use of IT. This study has shown the contribution of training staff, and recruiting appropriate IT personnel derive value from those IT investments. Further, the importance of a flexible IT infrastructure in deriving better value from IT investments, both at process and firm level is also supported. For IT investors, the integration of developing economies in the global economy may prove to be valuable if there is support for their IT investments through related complementarities. For local investors in developing countries, the outcome of this study supports the notion that IT does contribute to business value, and provides opportunities for investors to capitalize on local IT investment.

Of course, the results do not mean that the RBV logic is not relevant for evaluating IT investments. Rather, while the resource-based logic argues for resource rarity and inimitability as key contributors to business value (Mata et al., 1995), absence of strong competition and focus on operational efficiencies means understanding how businesses could derive value from their investments in such environment is important. Further, this lack of competitive environment means the local and international investors have the flexibility to invest in “tested” modern technology. With the potential of technology known, an understanding of ways to explore and utilize this potential is important for developing countries. The value complementarity perspective adopted in this study provides an appropriate framework for exploring the potential of IT resources and supports the importance of a strong human resource element and adoptive infrastructure.

Based on the results, we conclude that superior business process performance from IT rests on how well the organisation is prepared to deploy the IT resources in their organisations. This contingency perspective of the relationship between IT investments and performance suggests that IT on its own may not act as the best enabler of business processes. Rather, it is how well the IT dependent functions are resourced to use this IT is an important determinant of the enabling capability of IT investments. The results also indicate that how successfully IT is used will affect the business processes first. The results also indicate that these business process improvements positively contribute to business performance.

LIMITATIONS AND DIRECTIONS FOR FURTHER RESEARCH

Developing countries differ in terms of proportion of local and international investment, the societal culture, organisational culture, and investment culture. This study was conducted in a single developing country and therefore, to expand to other developing countries, further studies are required. Scope exists in expanding this study to other cultural domains and different types of developing countries to obtain a broader understanding of how IT investment relates to performance in these countries.

This study considered IT investment returns in all industries in Fiji. It may not be feasible to partition firms within industry segments for studies conducted in developing countries because there are likely to be insufficient numbers of firms to form industry segments. The variables considered therefore, were ones applicable to all industries. This restricts the number of factors that may be accommodated at each layer of the model. Broadening the scope to include a number of countries, therefore, would allow for studying the effect of IT investments at industry level, and allow for a greater number of factors to be considered at each layer of the model.

The technological advancement of developed countries indicates that today, ceteris paribus, IT is an important contributor to achieving efficiencies, productivity, and economic growth. The outcome of this study supports this notion in developing countries. For multinational investors this means greater return for their investments. More importantly, for developing countries, this means a chance to learn to work better with technology, growth of the local economy, overall improvement in the standard of living, and taking steps to narrow the gap between developed and developing countries.

REFERENCES


