Effect of Management Change on R&D/IA and Stock Return in IT Companies

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ABSTRACT

Compared with others, IT companies could be seen as relatively more rapid innovatively and are defined by intense competition. This study explores whether management change in information technology (IT) companies promotes research and development (R&D) as well as improvements in intangible asset (IA) performance. Our study provides evidence of R&D/IA performance on stock returns for new IT management and reinforces that efficiency improvements occur through the turnover of existing managers.

Keywords: Information Technology (IT), Research and Development (R&D), Intangible Asset (IA), and Management Change.

INTRODUCTION

This study explores whether management change in information technology (IT) companies promotes research and development (R&D) as well as improvements in intangible asset (IA) performance.

R&D, IA and IT

Compared with others, IT companies could be seen as relatively more rapid innovatively and are defined by intense competition. It is considered that the only sustainable development strategy of IT companies is that of developing high quality products on time and at low cost (Hart et al., 2000). Therefore, the level of R&D outlay would seem to decide the competitive advantage of companies in terms of higher quality, reduced cycle time and lowered costs (Mendelson, 2000). Strong links with performance would be expected for IT industry where R&D is a major competitive factor; therefore, a company that under-invests in R&D relative to its principal competitors will experience a decline in the relative competitiveness of its products and services and this will soon be reflected in its business performance (Tubbs 2007).

Intangible assets - the opposite of tangible assets - are defined as non-monetary assets that cannot be physically touched or measured, and which are created through time and/or effort (Arrow, 2002). Examples might include brands, patents, intellectual human & organizational capital, data, information, capabilities and tacit knowledge (know-how). Effectively utilization of intangible can create firms' value. For example, Teece (1998) indicated that diminishing returns activities have been replaced by activities characterized by increasing returns which is usually paramount in knowledge-based industries. Furthermore, Ritter and Wells (2006) indicated that (1) a positive association between stock prices and voluntarily recognized and disclosed identifiable intangible assets, (2) a positive association between identifiable intangible assets and realized future period income.

Performance of the IT Management Change

Muravyev (2003) finds that CEO turnover is negatively related to prior performance of firms, implying that replacement is more likely to occur in poorly performing companies. Management change is usually induced to further competitive advantages and maximize shareholder returns. Watts (2001) suggests that the technological ignorance of CEOs has been cited in the information systems and management literature as a factor limiting their ability to (1) provide effective leadership of IT, (2) to control technological projects, and (3) to facilitate the successful implementation of IT. To maintain the competitiveness of the companies, these senior managers who are obviously deficient in IT knowledge and skills may finally resign or be dismissed by the board of directors. Prior studies indicate that IT advantages have substantial capacity for maximizing stock return (Liao et al., 2006; Rajgopal et al., 2003). Such advantages (for example, network advantages) constitute vital IA and are reflected in IT firms' R&D expenditures. Therefore, the efficient and effective use of these is the key factor that enhances firms' value. Tubbs (2007) indicated that for the five years following their R&D increase, firms experienced significantly consistent positive abnormal operating performance and that shareholders experienced significantly positive abnormal stock returns. We expect that any new management occurring in IT firms will utilize IT

advantages through promoting R&D use and avoiding idle IA investment.

Data and Method

Sample Selection

422 IT firms (SIC code = 737) with accounting data were collected from the 2006 Compustat database. IT firms covers computer programming & data process (7370), computer programming service (7371), prepackaged software (7372), integrated system design (7373), processing, data preparation service (7374), computer rental & leasing (7377). Management change data were found on the SEC's EDGAR form 8-k. Management change is defined as changes of CEO, CFO, COO or directors in the current year. The 422 sample firms were classified into two groups: no management change group (160 firms) and management change group (262 firms). Table 1 reports the industrial distribution of management change firms.

<insert Table 1 here>

Model Specification

Numerous research papers investigate the empirical relation between stock market value (or changes in value) and company accounts. These "value-relevance" studies document that disclosures of annual earnings and cash flows from operations provide significant relevant information for market valuation. In practice, annual earnings and cash flows from operations are the most publicly available information for the public investors. We controlled both annual earnings and cash flows from operations and tested the associations between annual stock return (Rt) and R&D/IA performance (RD/TS, research and development expenditures divided by total sales and IA/Pt, intangible assets divided by market value of equity) for both groups. We also deflated all the control variables by the current market value of equity (Pt) in order to control the size effect. We use the following value-relevance OLS regression model, as in Cheng et al. (1997).

$$Rt = \alpha_1 + \alpha_2 * ET/Pt + \alpha_3 * \Delta Et/Pt + \alpha_4 * CFt/Pt + \alpha_5 * \Delta CFt/Pt + \alpha_6 * RD/TS + \alpha_7 * IA/Pt \quad (1)$$

where:

Rt = annual stock return from year t-1 to year t;
ET = annual earnings in year t;
CFt = annual cash flows from operations in year t;
ΔEt = changes in earnings from year t-1 to year t;
ΔCFt = changes in cash flows from year t-1 to year t;
Pt = market value of equity;
RD/TS = research and development expenditures divided by total sales;
IA = intangible assets of year t.

RESULTS

IT Management Change, R&D, and IA Analysis

Table 2 reports the OLS regression results for our sample. The model R^2 is 12.9% (12.2%) for no management change (management change) group. The coefficients for the following control variables are significant at the conventional level: ET/Pt, CFt/Pt, and Δ CFt/Pt. The coefficient for IA/Pt variable is negative and significant (-0.42, $p<.05$) in the no management change group. The decrease of intangible asset is significantly, negatively associated with stock returns. The coefficient for RD/TS variable is positive and significant (+32.92, $p<.01$) in the management change group. The increase of RD expenditure is significantly, positively associated with stock returns.

<insert Table 2 here>

U.S. and Foreign Firms Analysis

Zhang et al. (2007) finds that there are deficiencies in the process of intellectual property management of Chinese enterprises have hindered the effective R&D performance. Such deficiencies include poor relevant regulations and inadequate shareholding mechanism. Recent comparative data from the U.S. and Germany demonstrates that U.S. firms are more likely to be associated with commercial success of new products and R&D efficiency (Ettlie and Elsenbach 2006). To explore the potential culture influences on our sample, we further perform a nationality analysis by separating the sample into two groups: U.S companies and foreign companies. Table 3 reports management *c*hanges based on nationality. In the group of U.S companies, 248 of the 369 firms (67%) experienced management *c*hanges. In the group of foreign companies, however, 14 of the 53 firms (26%) experienced management *c*hanges. The results indicate that there is a significant difference (Chi-square test, $p<.001$) between the two groups. U.S companies experienced a significantly higher frequency of management *c*hanges.

<insert Table 3 here>

CONCLUSIONS

Muravyev (2003) indicates management change is an important factor of business performance. In the IT industry, successful R&D will have much less effect on the performance of a company that makes a large and ill-chosen acquisition or has poor marketing (Tubbs 2007).

In summary, this study shows that:

- First, RD/TS is positively significant associated with stock returns only in the management change group. Our results support the preposition that management change results in effective R&D use for IT companies.
- Second, IA/Pt is negatively significant associated with stock returns in the no management change group, but insignificant in the management change group. New management is therefore more likely to curb idle/inefficient IA investment for IT companies.
- Third, U.S companies experienced a significantly higher frequency of management changes.
- Overall, our study provides evidence of R&D/IA performance on stock returns for new IT management and reinforces that efficiency improvements occur through the turnover of existing managers (Muravyev 2003).

In 2002, the Sarbanes-Oxley Act enacted in response to a number of major corporate and accounting scandals including those affecting Enron, Tyco International, Adelphia, Peregrine Systems and WorldCom. Nowadays, the financial reporting processes of many companies become more and more dependent on IT systems. CEO and CIO are responsible for the IT operation and IT personnel are involved in SOX compliance efforts. The findings of this study contribute to the financial reporting concerns of the regulators and public investors that change of CEO/CIO in IT companies promotes R&D as well as improvements in IA performance.

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TABLES

Table 1 Distribution of Management Change Firms

By Industry: Defined by SIC Code	2006	%
CMP PROGRAMMING,DATA PROCESS (7370)	67	25.6%
COMPUTER PROGRAMMING SERVICE (7371)	7	2.7%
PREPACKAGED SOFTWARE (7372)	113	43.1%
CMP INTEGRATED SYS DESIGN (7373)	54	20.6%
CMP PROCESSING,DATA PREP SVC (7374)	21	8.0%
Total	262	100.0%

Table 2 Management Change Regression Analysis: RD and IA

No Management Change Group			***Management Change Group***		
	Coefficient	p-value		Coefficient	p-value
Intercept	0.22	0.00	Intercept	0.17	0.00
ET/Pt	0.27	0.39	ET/Pt	0.71	0.00
△ Et/Pt	0.28	0.33	△ Et/Pt	0.02	0.93
CFt/Pt	1.09	0.04	CFt/Pt	-0.03	0.94
△ CFt/Pt	0.49	0.38	△ CFt/Pt	0.79	0.07
RD/TS	14.61	0.47	RD/TS	32.92	0.01
IA/Pt	-0.42	0.03	IA/Pt	-0.16	0.23
Adj R^2	12.9%		Adj R^2	12.2%	
N	160		N	262	

Dependent Variable:

Rt: annual stock return from year t-1 to year t;

Independent Variable:

Et: annual earnings in year t;
CFt: annual cash flows from operations in year t,
△ Et: changes in earnings from year t-1 to year t;
△ CFt: changes in cash flows from year t-1 to year t;
Pt: market value of equity;
RD/TS: research and development expenditures divided by total sales;
IA: intangible assets of year t.

Table 3 Management Change Analysis: U.S. / Foreign

	US Firms	Foreign Firms
No Management Change Group	121	39
(%)	33%	74%
Management Change Group	248	14
(%)	67%	26%
Total	369	53
Chi-square test (p-value)	0.0001	