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A Study of Relationship between Accruals over Life Cyclesof Food and Drug Companies Listed in Tehran Stock Exchange

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ABSTRACT: Accruals are among important variables often used in accounting studies as a proxy for quality of information. Recently, a number of studies have examined the effects of lifecycle stages on accruals. The present study was designed to investigate the relationship between accruals over firm lifecycles for food and drug companies listed in Tehran Stock Exchange (TSE).The sample used in this study consists of 51TSE firms selected through systematic elimination and observed over a period of 8 years (408 observation points). Variance analysis and least significant difference (LSD; a post-hoc test) were used to analyze the collected data. Our findings suggest no significant relationship between accruals of the firms over their lifecycles.
Keywords: Accruals; Lifecycle; Startup (Fast Growth); Consolidation (Slow Growth); Mature; Declining; Declined.

INTRODUCTION

All living organisms - including plants, animals, and humans - follow some form of life curve or life cycle. They come to life, become mature, grow old, and finally die. Life cycle theory assumes that firms and organizations are born, grow old, and die just like living organisms and have their own life cycles (Adizes, 1989).

Theories of economics and management divide firm life cycles into several stages. Based on the stages of their life cycles, firms and institutions follow certain policies which are reflected in some form in accounting information (Biksia, 2007). A number of researchers have examined the effects of life cycle on accounting information (Mashayekhi, 2009).

Anthony and Ramesh (1992) proposed a model for sales, net income, operational cash flow, investment, and funding in a firm life cycle and incorporated this model into their studies. They divided a firm life cycle into three stages (growth, maturity, and decline) to use it as a basis for measuring dividends, capital expenditure, growth in sales, and age of firms. In particular, Anthony and Ramesh (1992) assumed that the shift from growth to decline is identified by increased dividends, reduction in sales, reduced capital expenditure, and aging.

The authors used a multiple regression model at each stage of life cycle to examine differences in market reaction to accounting variables. With an error level of 10%, they rejected the presence of market reaction to accounting variables in organizational life cycle.

Several studies proposed that qualities of accruals probably vary as a firm moves from one stage to another. Guay, Kothari, and Watts (1996) and Healy (1996) proposed that qualities of accruals are similar to changes in stages of a firm's life cycle. Kaplan (1985) points out that a firm's working capitalis sufficient to achieve economic goals. He showed that changes in accruals depend on changes in sales and production level over a year. Dechow and Ge (2005) argue that accounting rules implemented in a growing firm are different from those in a declining firm, and such differences imply continuity in profit in connection to sustainable cash flow.

Zhang (2005) provided evidences that show working capital accruals are positively connected to other growth characteristics such as increased number of employees and sales growth as well as growth in fixed assets and financial activities. The nature of accruals over the growth and decline periods leads to recognition of large positive accruals for growing firms. Consequently, growing firms make investments in working capital to generate large and positive capital accruals. Liu (2006) assigned a combined rating of five items, namely capital expenditure,

variations in revenue, cost of goods sold (CGS), and selected cash flow to a compound variable of life cycle ranging from 1 to 100 in each group of industries. He assigned the scores in ranges 1-20, 21-40, 41-60, 61-80, and 81-100 to the stages "startup", "consolidation", "maturity", "declining", and "declined", respectively, based on annual observations in firms.

Following Liu, in the present study we divided life cycle into five stages. However, since only two observations were available on declined firms, this group was not studied and the link between accruals throughout the life cycle was examined using one primary hypothesis and six secondary hypotheses.

H_1: A firm's accruals are significantly different throughout the firm's life cycle.
H_{1a}: Accruals of a fast-growing (start-up) firm are significantly different from those of a slowly-growing (consolidating) firm.
H_{1b}: Accruals of a fast-growing (start-up) firm are significantly different from those of a mature firm.
H_{1c}: Accruals of a fast-growing (start-up) firm are significantly different from those of a declining firm.
H_{1d}: Accruals of a slowly-growing (consolidating) firm are significantly different from those of a mature firm.
H_{1e}: Accruals of a slowly-growing (consolidating) firm are significantly different from those of a declining firm.
H_{1f}: Accruals of a mature firm are significantly different from those of a declining firm.

MATERIALS AND METHODS

The present study covers a period starting from 2002 and ending in 2009. We examined the food and drug companies listed in Tehran Stock Exchange (TSE). Our statistical population consisted of the TSE food and drug companies that
Have not modified their fiscal year during the period covered by this study;
Were listed in TSE prior to 2001;
Publicly disclosed required information;
Made available those information needed to evaluate the variables over all years covered by the period; and
Did not experience interruption in firm activities.

Systematic screening was employed to create a sample consisting of 408firm-year (51 firms over 8 years). The variables used in this study include capital expenditure, variations in revenue, cost of goods sold (CGS), firm age, cash flow from operating activities (CFO), cash flow from financing activities (CFF), total current accruals (TCA), and average total assets (ATA). CGS and variations in revenue were extracted from income statements of the listed firms while CFO and CFF were extracted from cash flow statements and stored in Excel. Using Excel, these variables were calculated as follows, and then recorded in separate columns in the worksheets.

Total accruals = variations in revenue + CFO + CFF + TCA + gross property, plant, and equipment (PPE)

To determine a firm's life cycle, which is composed of the stages startup, consolidation, maturity, declining, and declined, we need such variables as age, capital expenditure, variations in revenue, CGS, CFO, and CFF. All these variables, except for age, are divided by ATA. Then, for each firm-year, a compound score composed of six normalized variables is obtained. Scores falling in the ranges 1-20, 21-40, 41-60, 61-80, and 81-100 are assigned to the stages startup, consolidation, maturity, declining, and declined, respectively. Given the limited number of declined firms in this study, the hypotheses on declined firms were not examined.

Initial data were fed to Excel for preliminary processing and calculations. Then, descriptive statistics techniques were applied to examine frequency distribution and obtain an overall view of the variables. Finally, SPSS was used for hypothesis testing and fitting the equations on the available data. The hypotheses were tested through variance analysis and least significant difference (LSD).

Data Analysis

Table 1.comparison of accruals in the food and drug companies by type of life cycle (prior to normalization)

Type of life cycle	Frequency	Mean	Standard deviation
Maturity	200	0.14	0.71
Declining	8	0.05	0.59
Consolidation (slow growth)	175	0.11	1.14
Start-up (fast growth)	23	0.15	0.24
Total	406	0.13	0.90

F=0.07   df=(402,3)   p=0.98

As seen in the table, the largest mean of accruals (0.15±0.24) is for fast-growingfirms while the smallest mean (0.05±0.59) belongs to declining firms. According to the results of one-way analysis of variance, there is no significant difference the accruals of the firms studied here in terms of their type of life cycle (p=0.98).

Table 2. LSD results prior to normalization

	Maturity		
Declining	p=0.79	Declining	
Consolidation (slow growth)	p=0.70	p=0.87	Consolidation (slow growth)
Start-up (fast growth)	p=0.99	p=0.81	p=0.85

Due to small values of accruals, these values were multiplied by 1,000,000.

y = normalized accrual
y1 = reciprocal of normalized accrual

$$y1 = \frac{1}{(y \times 1.000.000) + 5}$$

To normalize mean values some workings were needed. To eliminate the minus sign, we add 5 to the values obtained in the previous step; that is, a logarithmic transformation was performed (we add 5 to numbers since the log of a negative number is undefined).

A basic assumption in variance analysis and multiple linear regression (MLR) is the assumption of normal distribution of error in the model fitted to the data. Since the response variable (accrual) was highly dispersed, we used the transformation $y1 = \dfrac{1}{(y \times 1.000.000) + 5}$ to obtain a normal distribution for the response variable.

Table 3.comparison of mean accruals in the food and drug companies by types of life cycle (after normalization)

Type of life cycle	Frequency	Mean	Standard deviation
Maturity	200	0.196	0.01
Declining	8	0.200	0.02
Consolidation (slow growth)	174	0.193	0.04
Start-up (fast growth)	23	0.195	0.01
Total	405	0.195	0.03

F=0.60   df=(401,3)   p=0.62

(A large mean value for accruals of a firm after normalization indicates small mean accruals for that firm). As seen in the table above, once normalization is carried out, the largest mean of accruals (0.193±0.04) is for slowly-growing firms and the smallest mean value (0.200±0.02) was obtained for declining firms. However,nostatistically significant differences was found between accruals in the firms of this industry in terms of the type of their life cycles (p=0.62).

Table 4. LSD results after normalization

	Maturity		
Declining	p=0.68	Declining	
Consolidation (slow growth)	p=0.23	p=0.45	Consolidation (slow growth)
Start-up (fast growth)	p=0.81	P=0.62	p=0.74

CONCLUSION

Based on the five types of life cycles defined in the present study, the primary hypothesis can be divided into 10 secondary hypotheses. In addition, since declined firms are removed from the sample due to their low frequency, 4 hypotheses are eliminated from these 10 hypotheses. Therefore, we are left with 6 hypotheses that need to be tested and verified.

Once tested, H_{1a}, which hypothesizes a link between accruals in fast-growing firms and consolidating firms in food and drug industry, indicated no significant difference between accruals of these two groups of firms.

Testing H_{1b}, which hypothesizes a connection between accruals in fast-growing firms and mature firms in food and drug industry, indicated no significant difference between accruals of these two groups of firms.

H_{1c} was proposed on the relationship between accruals in fast-growing firms and declining firms in food and drug industry, and once tested, no significant difference was found between accruals of these two groups of firms.

Once tested, H_{1d}, which hypothesizes a link between accruals in slowly-growing firms and mature firms in food and drug industry, indicated no significant difference between accruals of these two groups of firms.

H_{1e} hypothesizes a link between accruals in consolidating firms and declining firms in food and drug industry. Testing this hypothesis indicated no significant difference between accruals of these two groups of firms.

H_{1f} was proposed on the relationship between accruals in mature firms and declining firms in food and drug industry, and once tested, no significant difference was found between accruals of these two groups of firms.

Suggestionsfor Future Research

Accruals studied here included total CFO, CFF, current accruals, variations in revenue, and gross PPE (prior to depreciation). Future research may analyze each accrual separately or use other forms of accruals such as total operating accruals (the difference between operating income and net CFO).

The present study has examined the relationship between accruals over life cycle of firms in food and drug industry. It is recommended that future studies take into account the impact of firm age on the volume of discretionary and non-discretionary accruals.

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