THE IMPLICATION OF INNOVATION STRATEGY TOWARDS CAPITAL STRUCTURE DECISIONS: A STUDY IN INDONESIAN MANUFACTURING COMPANIES

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Abstract

This explanatory study uses the panel data analysis to test the influence of innovation strategy on firm's capital structure. This study has three objectives. Firstly, the empirical investigation will assess the extent to which Indonesian manufacturing companies listed in BEI investing their money to R&D activities as the way to be an innovator in their industry. Secondly, we will investigate the role of innovation strategy in explaining the capital structure decision. Finally, the study will also examine the relationship between the interaction of innovation strategy and firm's profitability toward capital structure decision.

Previous study suggest that firms pursuing an innovation strategy require a certain level of equity that provide a financial buffer to ensure stability and availability of funds for research efforts, new product launches, and on-going development of knowledge based capabilities (O'Brien, 2003). In other words, firms need to maintain their financial slack before decided to take innovation strategy as their grand strategy. This paper is made by considering that corporate strategy can help in explaining the variation in capital structure choices made by manufacturing companies in Indonesia. In an Industry, competitive strategy forms that were chosen by managers will determine the strategic value of decision to retain their certain financial slacks.

Using Annual Report data of 67 manufacturing companies from 2000 until 2005, this study confirms that financial slack be the important determinant for the firm to lead innovation strategy. Firms pursuing an innovation strategy have low financial leverage. This study also finds that the more important innovation for company strategy, the stronger the negative relationship between profitability and leverage will be.

Key Words: **Capital Structure, Innovation strategy, Panel Data Analysis, Indonesian manufacturing firms.**

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1. Introduction

A lot of research in capital structure has been doing recently (for example Harris & Raviv, 1991, Santi 2002), nevertheless, in empirical platform, there is less disclosure regarding how firms choose their capital structure between debt and equity. There is no clear-cut consensus among the corporates' executives on how the capital structure should be, what the determining factors are, or even, whether their financial decision really matters. In fact, the financing decisions are still surrounded by puzzles for many-many years after the seminal paper of Modigliani and Miller (1958). Modigliani and Miller found that financing decisions and investing decisions were separating processes, and the strategy chosen by firms would influence the value of firms. This phenomenon would cause "capital structure puzzle" in finance. Jensen and Meckling (1976) have proposed a hypothesis that there was an interaction between investing decision and financing decision, so the opportunities to explore how a competitive strategy influenced capital structure become widely open. The choice of the firm's capital structure is generally considered a central strategic issue, and Balakrishnan and Fox (1993) argue that strategic management can improve our understanding of the capital structure decisions.

Balakrishnan and Fox (1993) found that strategic aplication would explain in understanding capital structure in industries. The basic assumptions used in strategic management are that, in a certain industry, potential customers are heterogen in terms of needs and preferences so it will cause various customers segmentations. A firm that tries to satisfy or serve all market segmentations can not treat or serve well for the whole customers (Porter, 1996). Thus far, there are various variations in conquering market. A competitive strategy will lead to firms investing decision (Porter, 1996), and investing decision will influence financing decision chosen (Williamson, 1988). It can be concluded that different strategy chosen by firms will influence the variations of capital structure. The strategic argument of capital structure can explain "capital structure puzzle" in similar industries or in different industries. These arguments not only explain the variations among industries (Harris and Raviv, 1991) but also the variations of capital structures at the same industry.

This study tries to fill in the gap by using panel data in analysis of financing decision and apply the appropriate model. This study uses Indonesian data set to assess how competitive strategy (applied to innovator firms in their industry) will influence the capital structure taken by specific firms. The previous research found that intensive investment on R&D (resarch and development) is associated with low leverage level since this investment creates intangible assets. This intangible asset can not become collateral in obtaining debt (Santi, 2002; Vincente-Lorente, 2001; Simerly & Li, 2000; Rajan & Zingales, 1995, and Balakrishnan & Fox, 1993). In other words, firm investment intensity in R&D will influence the capital structure. From this argument, it

can be proposed that "financial slack" (low leverage level) should be the primary priority for firms that compete based on innovation strategy. Competition based on innovation strategy should assure that:

- Investment on R&D implemented continuously.
- Fund needed for launching new products available at any time.
- Firms can expand or develop through profitable acquisition or merger.

The suitable proxy for innovation strategy is not depending on intensity of investment in R&D, but the intensity level of firms' investment in R&D relative to their competitors at the same industry. As a whole, we propose that firms compete based on innovation strategy will decide "financial slack" as their strategic priority. The implication of this proposition is that if capital structure decision follows the firm strategy, there would be a significant low performance when a firm can not match between capital structure and firms' strategy. On the other words, when a firm fails to maintain its financial slack, it will impact the success of implementation of innovation strategy and the success of competition.

There are two main problems will be solved empirically in this research:

- How important the influence of innovation strategy in firm's strategic scheme toward capital structure chosen by manufacturing firms?
- Based on *pecking order theory*, high profitable firms tend to reduce their debt. In terms of strategy, does the influence of profitable firm toward leverage will be bigger to the firm that implemented innovation strategy compare to the firms that do not implement innovation strategy consistently in winning the competition?

The objectives of this research are:

- To study empirically the influence of innovation strategy toward firm's capital structure chosen.
- To study the influence of interaction between innovation strategies toward firm's profitability level and firm's capital structure.

This paper will be divided into five sections. Section 1 is introduction. The remaining sections are organized as follows: Section 2 presents an overview of literature on capital structure, Section 3 describes data and research methodology, Section 4 reports results of the statistical analyses, and Section 5 summarizes the main conclusions of the study.

2. Literature Review

2.1 Traditional Perspective of Capital Structure

The study of capital structure has been started by Modigliani and Miller in 1958. They argued that the value of the firm is independent of capital structure under certain conditions or assumptions. One important condition was perfect capital markets, i.e., no taxes, no transaction costs, and no bankruptcy costs. Another condition was information symmetry, i.e., investors and managers have equal information about the firm's potential investment. In a subsequent paper Modigliani and Miller (1963) eased the conditions and showed that under a capital market imperfection where interest expenses

are tax deductable, firm value will increase with higher financial leverage. In this situation, the optimal capital structure will be determined by a trade-off between increased bankruptcy risk from a higher debt load and the tax advantage associated with debt (Rajan & Zingales, 1995; La-Porta *et.al.*, 2000; Balakrishnan & Fox, 1993; Santi & Prijadi, 2006). Furthermore, Jensen & Meckling (1976) argued that not only the bankruptcy risk, the possibility of agency cost will also determine the firm optimal capital structure. Jensen and Meckling (1976) also showed that there is cost of debt if equity holders using debt as their sources of funds. Since high risky project will damage bondholders, bondholders may ask protection through monitoring and bonding mechanism.

Debt will reduce agency cost. Jensen (1986) argued that debt will reduce "free cash flows." Free cash flow may control menager to use it for other than improving firm's value and shareholder's wealth. The potential of reducing agency cost and the benefit of using debt tax shield push the researchers to study whether optimal capital structure can balance the cost and benefit because of debt (Mahadwarta, 2006). Some empirical studies gave different results. Shyam-Sunder and Myers (1999) found there was no possibility of optimal capital structure. Miller (1997) mentioned that there was no benefit using debt, and DeAngelo and Masulis (1980) said there was other "tax shield" as a substitution of debt.

Myers and Majluf (1984) proposed a quite different perspective namely *'pecking order theory*' of capital structure. According to pecking order perspective, there was no optimal capital structure. Asymmetry information cause firms prefer internal funding (e.g., from retained earnings) rather than external funding. If internal funds are lacking, then firms looking for riskier external funds (with the order of issuing obligation then issuing issuing stock). In sum, when firms' profitability reduces, debt level will increase, and when firms' profitability improves, manager will use idle cash for paying debt.

2.2. Initial Perspective Regarding Interaction of Strategic Decision with Capital Structure

The first paper about the relationship between strategic decisions with firm's capital structure was proposed by Jensen and Meckling (1976). They found that owner-manager would issue bond (debt) then decided to invest in certain project. Since owner-manager has a limited liability or obligation, thus investment risk was held by bondholders rather than by equity holders (owner-manager). When investment decision has been made after issuing bond, then equity holders may take "high risk and grow strategies." If the return from investment is low or facing a bankruptcy, the risk laid on bondholders shoulder.

Brander and Lewis (1986) examined the capital structure using "game theory" perspective. They illustrated the game as a "two-stage sequential duopoly game," where 2 firms choose capital structure on the first step and then arranged the output on the second step. When the high risk increase the incentive to accept high risk strategy, then the 2 firms will adopt high debt as a signal to their competitors that they will produce

high risk output on the second step. Finally, the two firms will reach the equilibrium stage. Both firms took high risk strategy with net-effect similar worst.[1]

2.3. Modern Perspective Regarding Interaction of Strategic Decision with Capital Structure

There were so many researchers have studied empirically regarding capital structure such as: Santi & Ruslan (2006); Bevan & Danbold (2001); Purba (2001); Fatemi *et.al.* (1997); Indrawati (1997); Rajan & Zingales (1995); Demirgüç-Kunt *et.al.* (1994); and Homaefar *et.al.* (1994). Barton and Gordon (1987) initially tried to explore whether capital structure had strategic implication to firm value, then Harris and Raviv (1991) did a similar research. They found that different strategic orientation (strategic diversification chosen by firms) tended to have different debt level. They also found that there was a significant interaction between strategy and finance variables. This proved that finance variables and capital structure may be influenced by strategies taken by firms.

Strategy as a predictor of capital structure has been developing when research in this area accelerated by, and the literature of strategic management has been shifting from industrial structure mainstream to firm's heterogenity mainstream. The firm heterogenity mainstraem initially proposed by Penrose (1959), and become the initial theory of resource-based. The resource-based view became popular in the-1980es (Schendel, 1994). The resource-based theory focus on imperfect competition market that cause the heterogenity of resources distribution among firms (Barney, 1991). This theory may cause some firms have competitive advantages (Hunt, 1997).

The *heterogeneity perspective* in capital structure has been shown by the application of *transaction cost economics* framework (Williamson, 1988). This perspective stressed that corporate governance was influenced by the characteristics of assets owned by firms. Even though, in general, firms prefer debt financing than equity financing, the number of specialized assets and intangible assets owned by firms will create cost of debt financing higher than governance cost of equity. Specialized assets and intangible assets are difficult to exchange and their collateral values are also low.[2] Based on transaction cost literature, Balakrishnan and Fox (1993) examined whether the size of intangible capital has a significant contribution in explaining leverage level variations. If the correlation found, it indicated there is a strategy, meaning that intangible assets owned by firms will influence capital structure taken by firms. By using panel data and variance decomposition regression model, they showed that industry effects and time effects had a small impact in deciding capital structure; compare to firm's intangible assets variables and firm's heterogenity variables.

Kochhar (1996) who studied *transaction cost economics* regarding capital structure in the field of strategic management, argued that LBO (leverage buyout) has a tendency happened to the firms that own non-unique assets and has a low investment opportunity. The less of specialized assets owned by firms could cause the low of governance cost for obtaining source of funds from debt. By implementing the

[1] This theory is *Cournot oligopoly model*, where the company has an incentive to produce bigger output and will push the competitors to produce less.

[2] In the economy with high bankruptcy cost, the value of special assets and intangible assets will easily diminish or even dissappear when a firm approaches to bankruptcy condition.

transaction cost framework, Kochhar and Hitt (1998) were able to prove empirically that firm strategic financing and diversification strategic chosen have a *reciprocal relationship*. Empirical study of transaction cost done by Simerly dan Li (2000), which inserted agency theory elements and the dinamics of environment, found that most of creditors were risk averse, and strategic cost from debt financing will increase in accordance to the increase of environment uncertainty, so equity financing was more interested than debt financing.

2.4. Innovation and Capital Structure

Some new studies regarding interaction between innovation strategies with capital structure showed that innovation strategy become determinant of capital structure. Jordan, Lowe, and Taylor (1998) that used generic strategies typology from Porter found that innovation strategy was associated with low debt ratio, and cost leadership strategy had a higher debt level. The similar research from Vincente-Lorente (2001) found that there was a negative association (correlation) between investment in R&D and leverage. Investment in R&D will create intangible assets and intangible assets may not be used as collateral in debt financing (Long & Malitz, 1985; Rajan & Zingales 1995; and Santi, 2002). The interrelated between R&D and leverage is still in interested question. If R&D and leverage have a negative correlation because R&D investment will create intangible assets that can not be used as collateral, then why the intensity of R&D investment still become a significant leverage predictor after controlling intangible assets variable (see Hovakimian, Opler and Titman, 2000)? Hovakimian, Opler and Titman (2000) mentioned that, as on going expenses, R&D tends to become a minor line item except for some outliers.

In this research, it can be proposed that a firm's R&D intensity relative to its competitor in the industry was an indication of how important innovation strategy for that firm. High R&D expenditure can not guarantee that the firm already be an effective innovator. For sure, higher investment in R&D compare to its competitor means the firm try to compete based on innovation strategy. The high investment in R&D compare to its competitor at the same industry indicated that the firm tries to become a good innovator, and it is predicted that this firm will maintain low leverage level. Cyert dan March (1963) proposed a preposition that organizational slack made entrepreneurs created innovations. They suggest that the different between costs to maintain organization with its environment resources through coalition (e.g., organizational slack) could be sources of funds for innovation activities. Organizational slack was based on financial proxy, included leverage (see Singh, 1986; Zajac *et al.*, 1991, Nohria and Gulati, 1996; Davis and Staut, 1992; Zajac *et al.,* 1991; Brealey and Mayers, 1996).

The firms competing based on innovation strategy have to be innovated continuously. The needs of doing innovation continuously make financial slack become important for three reasons: first reason, Froot, Scharfstain, and Stein (1993) disclosed that cash flow volatility has a potential to damage R&D investment as a strategy to reach competitive position. Maintaining R&D investment level to be smooth and sustain is a key factor for innovator. Dierickx dan Cool (1989) argued that maintaining a certain rate of R&D investment in a certain interval period will increase bigger knowledge accumulation compare to invest in R&D twice but for half of interval period. Thus,

R&D expenditures can not be let fluctuated with cash flow fluctuation, and financial slack can help to isolate or reduce cash flow volatility. R&D investment should be kept at a certain rate even though the firm in a difficult condition.

The second reason, *financial slack* become important related to firm new product. After creating new products for market, effective innovators need certain money to launch the new products. Without financial slack, big expenses to launch new products may cause the firm 'bloodless', and this may make entrepreneurs cancel the capital investment for those new products (Bromiley, 1991).

The third reason, some researchers (e.g., Huber, 1991; Kogut dan Zander, 1992; and Karim & Mitchell, 2000) suggested that the firms use acquisition strategy for developing their stock of knowledge. Through acquisition, the firm can increase its competitive position, and compete by using innovation strategy. The availability of financial slack can help firms to accelerate in doing acquisition on time.

Based on the above explainations, it can be estimeted that the firm which has high intangible assets (e.g., accumulation knowledge) will not make a significant debt. R&D intensity can be used as a proxy for *intangible assets* owned by firms. The firm that will compete through innovation strategy will provide financial slack as a strategic imperative, so that firm will not create a big debt to retain its financial slack in a safety level. Innovation strategy is important depending on whether the firm want to be an innovator, *fast follower*, or *low-cost mass producer*. The firms that choose to compete through innovation generally choose capital structure that creates suitable financial slack.

Simerly and Li (2000) found that mismatch between capital structures with the dinamic of firm environment will create a negative impact for firm value. To maintain the harmony of capital structure with the dinamic of firm's environment, the firm needs a suitable financial slack. The firm that choose to compete through innovation strategy should maintain suitable financial slack, if not, it is difficult for them to be an innovator (doing R&D continuously) in the dinamic environment of competition. It can be predicted the negative correlation between innovation strategy and leverage related to its impact to firm's performances. This prediction indicated that the firm which running innovation strategy but still maintains a high level of debt will pay a high cost for the imbalances between strategy and capital structure. Based on the above arguments, the hypothesis proposes for this research is:

H_1: The more focus the firm to its innovation strategy, the lower the leverage ratio.

Previous researchers such as Hovakimian *et al.* (2000) found a strong relationship between R&D (proxied by firm's R&D intensity deviation to its average industry) and leverage. Thus far, there was no publication of research result inserted R&D intensity together with control variable the existence of tangible assets. Researchers believed there was a strong relationship between R&D intensity and leverage, and this relationship is important to the firm financial slack position.

This research proposed that firms retaining financial slack as their strategic imperative will follow *the pecking order theory*. Using this proposition, it can be predicted the negative relationship between profitability and leverage. The firm will pay

debt when the profitability is high, and create debt when the profitability is low. The firm that assume financial slack is not part of strategic imperative, may parallel with pecking order theory. Nevertheless, the researchers believe that the negative relationship is not that strong compare to that firm that implement innovation strategy. The improvement of profitability is not directly pushing innovator firm to reduce leverage. The firm that focus on innovation strategy and maintain its suitable financial slack position will tend to shift its cash or its profit to be used for supporting its innovation strategy. Shyam-Sunder and Myers (1999) admitted the probability of interaction between innovation strategy and leverage to influence capital structure. Based on the above descriptions, the second hypothesis proposed is:

H_2: The more important the innovation strategy by firm, the negative relationship between profitability and leverage become stronger.

3. Data and Methodology

3.1 Dependent Variable

To examine the hypotesis, the dependent variable used is firm's leverage level (LEV), that calculated by dividing debt book value with firm's total assets. The firm's capital structure was measured as the ratio of debt to total assets and will be calculated as all fixed charge debt obligations and preferred stock divided by total assets. We then calculated the debt to equity ratio for each firm in each year of the 15-years period 1990-2005. The study assessed the leverage based on realized economic performance rather than the market value of debt and assets, which is influenced by investor expectations about the firm's future financial performance and general market prospects.

3.2 Independent Variables and Control variables

There were two types variables for this research, namely, firm's level variables (these variables may change in value among firms, industries, and periods, the notation is $_{ijt}$), and industry level variables (these variables may change in value among firms, industries, and periods, the notation is $_{jt}$). Independent variables and control variables used in this research are:

a. Independent variables. Primary independent variables used in this research is the proxy of how important innovation strategy by firm (INO_{ijt}). The researchers believed that the important of innovation strategy is not reflected by absolute R&D expenditures, but R&D expenditures relative to their competitors at the same industry. Innovation strategy (INO_{ijt}) was measured by R&D intensity calculated as all costs incurred by the firm to develop new products and services divided by total sales, then divided by average R&D intensity of it's industry. The firm's R&D intensity was then compared to its industry peers to capture a distinct strategy dimension indicating the importance the firm assigns to innovation (O'Brien, 2003). Hence, we calculated the Innovation (INO_{ijt}) for each firms every year in the sample, averaged the ratio within industry over the 15-year period 1990-2005, and standardized the firm measures within the industries identified by their two-digit SIC codes. This procedure captured the relative

emphasis the firms put on innovation as a strategic approach compared to peers within their own industries.

b. Control variables. Control variables in this research are used to control the influence of other variables mentioned in previous research that influence capital structure (see Santi, 2002; Vicente-Lorente, 2001; Bevan & Danbold, 2001; Purba, 2001; Simerly & Li, 2000; Hovakimian *at al.*, 2000; Booth *et al.*, 2000; Opler *et al.*,1999; Berger *et al.*, 1997; Indrawati, 1997; Rajan & Zingales, 1995; Demirgüç-Kunt *et al.*, 1994, 1996, 1998; Harris & Raviv, 1990, 1991; and Titman & Wessel, 1988).

The following are control variables that may influence capital structure:

a. *R&D intensity* (RDI_{ijt}), measured by dividing firm's R&D expenditures with firm's sales value each year. This control variable is a common proxy used by researcher in measuring firm R&D intensity.
b. *Advertising intensity* (AI_{ijt}), measured by dividing firm's advertising expenditures with firm's sales value each year.
c. Firm's size ($SIZE_{ijt}$), measured by calculating natural logarithm of firm's total assets each year.
d. Firm's profitability (PRO_{ijt}), measured by dividing operational income excluding depreciation and amortization with firm's total assets.
e. *Capital intensity* (CIN_{ijt}), measured by dividing total assets book value with firm's sales value.
f. *Tangible Asset* (TAN_{ijt}), measured by dividing net total fixed assets (net property, plant and equipment) with firm's total assets book value.

3.3 Data

The whole data are yearly audited firm's financial statements from 1990-2005. Considerations of sample firms chosen are:

a. Manufacturing firms listed listed in the Indonesian Stock Exchange (ISX) previously the Jakarta Stock Exchange (JSX) since 1990-2005.
b. If in the sub manufacturing industry, there are more than two suitable sample firms, those firms will be dropped, because 2 samples in each industry is not sufficient in calculating variable data related to innovation strategy in the industry.

Based on the above considerations, there were 67 manufacturing firms matched the criteria from population of 155 manufacturing firms listed in the Indonesian Stock Exchange. The total numbers of observations were 1072 observations. Since there were missing data, so the number of observations can be run were 1047.

3.4 Analysis Method

As mentioned previously, there were two hypothesis will be examined econometrically. Before testing the hypothesis, data pattern will be checked. The data will be checked by multicollinearity test, homogeneity test, autocorrelation test, and panel model specification test (Hausman specification test). After the data fulfill the

requirements in multiple regressions, the regression coefficient will be interpreted. There are two multiple regression equations used to test the hypothesis. To test the hypothesis 1, the multiple regressions used is:

$$LEV_{ijt} = \alpha + \beta_1 INO_{ijt} + \beta_2 RDI_{ijt} + \beta_3 AI_{ijt} + \beta_4 SIZE_{ijt} + \beta_5 PRO_{ijt} + \beta_6 CIN_{ijt} + \beta_7 TAN_{ijt} + \varepsilon_{ijt} \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \text{ equation 1.}$$

To test the hypothesis 2, the multiple regression equation used is:

$$LEV_{ijt} = \alpha + \beta_1 INO_{ijt} + (\beta_2 INO_{ijt} \cdot PRO_{ijt}) + \beta_3 RDI_{ijt} + \beta_4 AI_{ijt} + \beta_5 SIZE_{ijt} + \beta_6 PRO_{ijt} + \beta_7 CIN_{ijt} + \beta_8 TAN_{ijt} + \varepsilon_{ijt} \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \text{ equation 2.}$$

Since there is a cross-sectional heterogeneity, the GLS (generalized least square) estimation is used in this study rather than OLS (ordinary least square) estimation. By using first order autoregressive in the model, first-order positive serial correlation can be removed in the GLS model. After looking at Table 1, the matrix of correlation coefficients between the dependent and independent variables, it showed that most of cross-correlation terms are fairly small (below 0.3), thus there were no multicollinearity problems.

Table 1a. Correlation Matrix – Pooled Sample

	INO	RDI	AI	SIZE	PRO	CIN	TAN
INO	1.000	0.198	0.047	0.202	-0.014	-0.006	-0.014
RDI		1.000	-0.004	0.062	-0.029	0.009	0.049
AI			1.000	0.063	0.023	0.174	-0.053
SIZE				1.000	-0.146	0.191	0.206
PRO					1.000	-0.119	-0.152
CIN						1.000	0.193
TAN							1.000

Two steps are used in the estimation process. First, pooled GLS regressions are estimated. Pooled GLS model might produce bias result due to its failure to control for time-invariant firm-specific heterogeneity. The pooled GLS model analysis yields results that are generally consistent with other cross-sectional results. Based on Hausman test, fixed effect GLS models are used in the second step to counter for time-invariant firm-specific heterogeneity.

Table 1b. Hausman Specification Test Results

Hausman test for fixed versus random effects for equation 1

chi-sqr(7) =	5768.235
p-value =	0.000000

Hausman test for fixed versus random effects for equation 2

chi-sqr(8) =	321.415

p-value =	0.000000

4. The Results and Discussions

4.1 Data and sample Description

Sample used in this research implemented data pooling method from year 1990 – 2005. There were 67 manufacturing firms obtained with 1072 total observations. Since some data missing, the total observations become 1047 observations included in analysis. Sample statistic descriptive can be seen in Table 2 below.

Table 2. Summary of Descriptive Statistics – Pooled Data

Variables	Mean	Median	Deviation standard	Variation Coefficient	Observation
LEV	0.5794	0.5546	0.3096	0.53	1047
INO	0.1608	0.0000	0.3191	1.98	1047
RDI	0.0082	0.0000	0.0584	7.12	1047
AI	0.0135	0.0000	0.0846	6.27	1047
SIZE	26.6978	26.4680	1.7407	0.07	1047
PRO	0.1075	0.0847	0.1652	1.54	1047
CIN	2.0074	1.3571	3.6257	1.81	1047
TAN	0.3665	0.3327	0.2093	0.57	1047

Table 2 showed that sample firms in the observation period used average debt composition higher than equity in its capital structure. Debts mean is 57.94%, with debt median 55.46%. This composition variation is not large enough (coefficient of variation is 0.53 below 1. The standard deviation was 30.96%. Larger composition of debt than equity indicated that sample firms highly depend on debt financing. This independency is parallel with the improvement of banking sector in terms of size and activities. Banks are primary sources of fund in Indonesian economy.

In average, the firms spend 16.08% for R&D from its sales relative to its competitor at the same industry as a supporting factor of innovation strategy. Most firms implemented innovation strategy at low level with high deviation standard of 31.91%, and high variation coefficient of 1.98. This means that innovation strategy implemented by sample firms in the same industry is heterogenous. Meaning, eventhough, the average of INO variable in sample firms is low, there were some firms concentrated in implementing innovation strategy as a primary strategy in competing in its industry. Variable RDI told the same story. The average spending of R&D cost was 0.8% from sales, with coefficient of variation 7.12. Investment intensity is still low. There are firms spent a lot of money in R&D for innovation strategy, on the other hand, there are some firms did not spend money in R&D at all. The high variation in R&D spending means that there were still a lot of firms not implementing innovation strategy. The firms that do not implement innovation strategy may take the follower strategy.

From statistic descriptive, it showed that mean and median of advertising cost (AI) from sample firms are 1.35% and zero percent respectively. The deviation standard

is 8.46% with coefficient of variation 6.27. Higher standard deviation from its average and coefficient of variation showed that advertising cost of sample firms is varied. In fact, there are some firms spending a lot of advertising cost, but there are some firms did not spend advertising at all

In terms of size, the size of sample firms is quite similar, with coefficient of variation 0.07. Lower standard deviations from its average showed that the size of sampe firms is almost the same. The average fixed assets composition from total assets is 36.65% with low coeffient of variation (0.57). This also indicated that sample firms fixed asset composition in their total asset is similar among sample firms.

For profitability of sample firms, it showed that the mean and median are 10.75% and 8.47% respectively. The standard deviation is 1.54% with coefficient of variation 1.54. The mean of capital intensity (CIN) is 2.0074 with high coefficient of variation (1.81). These results indicated that although quite similar in size, the firms' profitability and capital intensity invested in assets to reach certain sales level is varied among sample firms.

4.2 Description Based on Industry Classification

From Table 3 debt composition in capital structure between industries is varied. Seven (7) out of 14 industries had average debt more than 60%. Chemical and allied products industry has the largest debt. The variation of leverage within each industry is not substantial. It is indicated by the coefficient of variation of leverage variable below 1, except for tobacco manufactures industry.

In terms of implementation of innovation strategy (INO), it is found that the variation within each industry is significant which indicated by coefficient of variation of this variable above 1. The biggest variation is in tobacco manufactures industry. There is a unique situation for R&D intensity (RDI) variable. Six (6) out of 14 industries observed indicates that the coefficient of variation equal zero.

Table 3 Summary of Descriptive Statistics of Each Industry

	Food and Baverage					*Tobacco manufactures*				
variabel	**Mean**	**Median**	**Dev. Std.**	**coef. of var**	**N**	**Mean**	**Median**	**Dev. Std.**	**coef. of var**	**N**
LEV	0.4855	0.4748	0.2252	0.46	128	0.4717	0.4299	1.1640	2.47	48
INO	0.1598	0.0000	0.3216	2.01	128	0.1458	0.0000	2.0040	13.74	48
R&D	0.0012	0.0000	0.0058	4.83	128	0.0011	0.0000	2.9075	0.00	48
AI	0.0280	0.0025	0.0750	2.68	128	0.0179	0.0000	0.9347	52.24	48
SIZE	26.3845	26.6815	1.6140	0.06	128	28.2990	28.5953	0.3779	0.01	48
PRO	0.1273	0.1143	0.1144	0.90	128	0.1873	0.1913	0.3452	1.84	48
CIN	2.3962	1.1416	7.7528	3.24	128	0.9472	0.8751	2.7110	2.86	48
TAN	0.4043	0.3777	0.1859	0.46	128	0.2247	0.2266	0.1035	0.46	48
	Textille Mill Products					*Apparel and Other Textille Products*				

variabel	Mean	Median	Dev. Std.	coef. of var	N	Mean	Median	Dev. Std.	coef. of var	N
LEV	0.5957	0.5913	0.2896	0.49	96	0.6605	0.6047	0.2578	0.39	110
INO	0.1147	0.0000	0.2741	2.39	96	0.1274	0.0000	0.2634	2.07	110
R&D	0.0008	0.0000	0.0021	2.63	96	0.0172	0.0000	0.1646	9.57	110
AI	0.0009	0.0000	0.0017	1.89	96	0.0046	0.0000	0.0126	2.74	110
SIZE	26.8617	26.5615	1.2262	0.05	96	26.5297	26.0766	1.4332	0.05	110
PRO	0.0625	0.0563	0.1037	1.66	96	0.0780	0.0653	0.1225	1.57	110
CIN	1.7188	1.5499	0.7684	0.45	96	1.7188	1.3700	1.5518	0.90	110
TAN	0.4994	0.5118	0.1667	0.33	96	0.3618	0.3386	0.2076	0.57	110
	Paper and Allied Products					*Chemical and Allied Products*				
variabel	**Mean**	**Median**	**Dev. Std.**	**coef. of var**	**N**	**Mean**	**Median**	**Dev. Std.**	**coef. of var**	**N**
LEV	0.7857	0.6739	0.3644	0.46	48	0.8740	0.6383	0.5498	0.63	48
INO	0.1250	0.0000	0.3342	2.67	48	0.0417	0.0000	0.2019	4.84	48
R&D	0.0018	0.0000	0.0048	2.67	48	0.0000	0.0000	0.0000	0.00	48
AI	0.0003	0.0000	0.0015	5.00	48	0.0006	0.0000	0.0011	1.83	48
SIZE	28.5131	28.6517	2.0740	0.07	48	27.6530	27.4381	1.5145	0.05	48
PRO	0.0516	0.0474	0.1106	2.14	48	0.0829	0.0853	0.0871	1.05	48
CIN	4.7737	3.9179	5.4412	1.14	48	2.5171	2.1366	2.2412	0.89	48
TAN	0.5991	0.6265	0.2293	0.38	48	0.4657	0.4528	0.2096	0.45	48
	Adhesive					*Plastic and Glass Product*				
variabel	**Mean**	**Median**	**Dev. Std.**	**coef. of var**	**N**	**Mean**	**Median**	**Dev. Std.**	**coef. of var**	**N**
LEV	0.2534	0.2262	0.1169	0.46	64	0.5031	0.4662	0.2345	0.47	64
INO	0.2236	0.0000	0.3542	1.58	64	0.1719	0.0000	0.3786	2.20	64
R&D	0.0005	0.0000	0.0009	1.80	64	0.0054	0.0000	0.0156	0.00	64
AI	0.0015	0.0000	0.0038	2.53	64	0.0008	0.0000	0.0023	2.88	64
SIZE	25.1880	25.2257	0.6986	0.03	64	26.3177	26.2668	1.4613	0.06	64
PRO	0.1205	0.1124	0.0894	0.74	64	0.1189	0.1017	0.0641	0.54	64
CIN	1.5283	1.4912	0.5959	0.39	64	1.6316	1.4295	0.8952	0.55	64
TAN	0.2164	0.1899	0.1284	0.59	64	0.4375	0.4522	0.1711	0.39	64

Table 3 Summary of Descriptive Statistics of Each Industry (cont.)

	Cement					*Metal and Allied Product*				
variabel	**Mean**	**Median**	**Dev. Std.**	**coef. of var**	**N**	**Mean**	**Median**	**Dev. Std.**	**coef. of var**	**N**
LEV	0.6089	0.6058	0.3312	0.54	48	0.6186	0.6431	0.3725	0.60	77
INO	0.3333	0.2210	0.3563	1.07	48	0.1708	0.0000	0.2952	1.73	77
R&D	0.0311	0.0314	0.0325	1.05	48	0.0188	0.0000	0.0472	0.00	77
AI	0.0024	0.0001	0.0058	2.42	48	0.0002	0.0000	0.0008	4.00	77
SIZE	29.0618	29.5181	0.9815	0.03	48	25.4953	25.4389	1.1721	0.05	77
PRO	0.0746	0.0717	0.0539	0.72	48	0.0863	0.0640	0.1202	1.39	77
CIN	4.8774	3.2357	6.6403	1.36	48	1.2512	0.9924	0.9398	0.75	77
TAN	0.5856	0.6323	0.2395	0.41	48	0.3063	0.2822	0.1838	0.60	77
	Cable					*Electric and Electronic Equipment*				

variabel	Mean	Median	Dev. Std.	coef. of var	N	Mean	Median	Dev. Std.	coef. of var	N
LEV	0.6770	0.6042	0.3053	0.45	64	0.5329	0.5438	0.1910	0.36	63
INO	0.2344	0.0000	0.3691	1.57	64	0.2233	0.0002	0.3888	1.74	63
R&DI	0.0122	0.0000	0.0183	1.50	64	0.0313	0.0001	0.0625	0.00	63
AI	0.0020	0.0000	0.0036	1.80	64	0.0334	0.0000	0.2503	7.49	63
SIZE	26.2796	26.3264	0.6204	0.02	64	26.4307	25.9812	1.3053	0.05	63
PRO	0.0567	0.0618	0.0668	1.18	64	0.1522	0.0878	0.4871	3.20	63
CIN	1.5527	1.1697	1.3014	0.84	64	1.3942	0.9906	1.2355	0.89	63
TAN	0.3369	0.2930	0.1633	0.48	64	0.1888	0.1594	0.1443	0.76	63
	Authomotive and Allied Products					*Pharmaceuticals*				
variabel	**Mean**	**Median**	**Dev. Std.**	**coef. of var**	**N**	**Mean**	**Median**	**Dev. Std.**	**coef. of var**	**N**
LEV	0.6083	0.6114	0.2512	0.41	126	0.5327	0.5168	0.2596	0.49	63
INO	0.1014	0.0000	0.2733	2.70	126	0.1836	0.0000	0.3377	1.84	63
R&D	0.0016	0.0000	0.0079	4.94	126	0.0010	0.0000	0.0019	0.00	63
AI	0.0122	0.0000	0.0502	4.11	126	0.0790	0.0000	0.1844	2.33	63
SIZE	26.9912	26.5640	1.8985	0.07	126	25.7415	25.6467	1.7216	0.07	63
PRO	0.1066	0.0841	0.1338	1.26	126	0.2225	0.2224	0.1601	0.72	63
CIN	1.9857	1.3793	2.2590	1.14	126	1.1969	0.7445	1.2674	1.06	63
TAN	0.3380	0.3286	0.1605	0.47	126	0.2019	0.1847	0.1149	0.57	63

C. Hypothesis Testing and Discussion

Table 4 presents the regression result of equation 1 in testing the first hypothesis. At the aggregate level, we find that the adjusted R^2 measure of the regression is 87.82%. The findings of the influence of each independent variable will be discussed in the following paragraphs.

Innovation Strategy: This study finds a significant negative relationship between innovation strategy and leverage. This finding is in line with Vicente-Lorente (2001), Hovakimian *et.al* (2000), and Hitt (1998) studies and parallel to Jensen and Mecling (1976) opinion. This result described that firms used innovation strategy will create the availability of financial slack as strategic imperative. This also supports collateral value explanation. This result suggests that firms will not create debt vastly to maintain their safe financial slack level. The availability of financial slack can make them innovated freely and become innovators in their industry.

The significant and negative influence of innovation strategy toward capital structure was also found in Vicente-Lorente (2001) and Hovakimian *et.al* (2000) studies. Nevertheless, it is needed to control the existence of the intangible assets in the model, so the interpretations of strong relationship between innovation strategy and leverage more related to the strategic importance of firms financial slack positions. The firm's R&D expenditures relative to their competitors at the same industry (INO) can be a proxy for firm intangible stock. That is why in this research tangibility of firm assets (FAN variable) is also included as a control variable. From the estimation result for equation 1, coefficient of tangibility (TAN) is positive and significant.

Table 4. Estimation Result for Equation 1.

Method: Pooled EGLS (Cross-section weights)

Dependent Variable: (LEV?)

Variable	Coefficient		Std. Error	t-Statistic	Prob.
C	α	0.056464	0.123963	0.455487	0.6489
INO?	β_1	-0.019443	0.010874	-1.788094	0.0741*
AI?	β_2	-0.041435	0.042242	-0.980879	0.3269
RDI?	β_3	0.000764	0.040225	0.018996	0.9848
SIZE?	β_4	0.020100	0.004532	4.434856	0.0000***
PRO?	β_5	-0.043038	0.018725	-2.298408	0.0218**
CIN?	β_6	-2.04E-05	0.001059	-0.019306	0.9846
TAN?	β_7	0.067986	0.025602	2.655530	0.0081***
AR(1)	ρ	0.710687	0.021212	33.50368	0.0000***

Effects Specification

Cross-section fixed (dummy variables)

Weighted Statistics

R-squared	0.887267	Mean dependent var	0.843206
Adjusted R-squared	0.878209	S.D. dependent var	0.463307
S.E. of regression	0.161687	Sum squared resid	24.07756
Durbin-Watson stat	1.869955		

Unweighted Statistics

R-squared	0.749769	Mean dependent var	0.592705
Sum squared resid	24.27791	Durbin-Watson stat	1.908686

******* denotes coefficient is significant at the 0.01 level.
****** denotes coefficient is significant at the 0.05 level.
***** denotes coefficient is significant at the 0.10 level.

The multivariate-fixed effect GLS regression results show that the coefficient of RDI (as a proxy of R&D intensity variable) is positive but not significant. This result suggests that, in Indonesia, especially manufacturing firms, the existence of R&D Intensity is not a determinant variable in deciding firms' debt level. As mention before, six (6) of 14 industries observed showed that coefficient of variation in RDI equal to zero. Most of previously cited research on capital structure had found negative impact of RDI on leverage (Hovakimian *et al.,* 2000; and Vicente-Lorente, 2001). As discussed in literature reviews section, considerable firm's expenditure in R&D does not guareantee that a firm will become an effective innovator. Nevertheless, a firm that invests substantial money in R&D compared to its competitor at the same industry is more possible to compete based on innovation strategy. Our finding in this variable confirms and strengthens this statement. However, the current study inclusion of a variable that explicitly proxies for the importance of innovativeness, as well as controls for the tangibility of assets, the lack of significant impact of RDI on leverage is not surprising.

It is difficult to predict the effect of advertising intensity to leverage. From Table 4, it is showed that the coefficient of advertising intensity is negative but insignificant. This result suggests that, in sample firms, the existence of advertising intensity variable is not a determinant variable in deciding firms' debt level. Some previous study had found a negative effect of advertising intensity on leverage (Hovakimian *at al.*, 2000; Berger *et al.*, 1997), while others had found either no effect, or a positive effect (Vicente-Lorente, 2001). Similarly, it was difficult to predict the effect of capital intensity would have. Estimation result in Table 4 showed that the coefficient of capital intensty is negative but insignificant

In terms of other three control variables (SIZE, PRO, and TAN), the positive effect of size, the negative effect of profitability, and the positive effect of tangibility on leverage were all consistent with other previous studies (Santi, 2002; Bevan & Danbold, 2001; Booth *et.al,* 2000; Rajan & Zingales, 1995; Balakrishnan *et al.,* 1993) This study finds that size of the firm has significant positive influence to leverage. The positive influence of size to leverage ratio confirms the argument that larger firms tend to be more diversified and less prone to bankruptcy and the direct cost of issuing debt is smaller. This study also finds that tangibility of assets of the firm has significant positive influence to leverage.This also suggests that firm with more tangible assets tend to borrow more than firm with less tangible assets. For profitability variable, this study still can find the negative and significant influence.

The second hypothesis of this research is tested by estimating the coefficient of INO*PRO in the equation 2. The result of second hyphotesis 2 that examines the influence of interaction between profitability and innovation strategy (INO*PRO) toward capital structure (LEV) is presented in Table 5.

Table 5 showed that the coefficient of INO*PRO was -0.401954 and significant. Thus, this study result support the hypothesis of the more important the innovation strategy by firm, the stronger the negative relationship between profitability and leverage. The result in Table 5 also showed that the influence of profitability (PRO) toward capita structur (LEV) is negative and significant. This suggests that a firm will pay its debt when its profitability is high and creates debt when its profitability is low.

If a firm assume a financial slack is not a strategic imperative, it s capital structure decision will parallel with pecking-order theory where states that if a firm is profitable, it will reduce its debt. Previous studies such as Santi (2002) and Purba (2001) found empirical evidence of this negative influence of profitability toward leverage of Indonesian companies, and their findings confirmed the pecking-order theory. Further more, our study able to prove the prediction that the negative relationship between profitability and leverage is not as strong as that of the firms pursuing innovation strategy. As it can be seen in Table 5, the magnitude of negative influence of profitability toward leverage increased from β_7 = -0.076352 if the firm did not pursue the innovation strategy as its main strategy to $\beta_7 + \beta_2$ = -0.076352 + (-0.401954 x INO) if it did.

Shyam-Sunder and Myers (1999) also suggest that there is an interaction between innovation strategy and profitability in explaining capital structure variation. The improvement in profitability is not directly inducing the firm to teduce its leverage. If firms have a real strategic orientation to innovation, they will tend to

shift its cash from it profit that improving to the innovation strategy activities, not to pay debt.

Table 5. Estimation Result for Equation 2

Method: Pooled EGLS (Cross-section weights)

Dependent Variable: (LEV?)

Variable	Coefficient		Std. Error	t-Statistic	Prob.
C	α	-0.643770	0.118396	-5.437427	0.0000***
INO?	β_1	-0.043371	0.021655	-2.002874	0.0455**
INO?*PRO?	β_2	-0.401954	0.135541	-2.965564	0.0031***
AI?	β_3	-0.030642	0.060000	-0.510707	0.6097
RDI?	β_4	0.079796	0.070283	1.135352	0.2565
SIZE?	β_5	0.043044	0.004556	9.446944	0.0000***
PRO?	β_6	-0.076352	0.027217	-2.805322	0.0051***
CIN?	β_7	-0.004103	0.001673	-2.452918	0.0143**
TAN?	β_8	0.250571	0.031383	7.984338	0.0000***

Effects Specification

Cross-section fixed (dummy variables)

Weighted Statistics

R-squared	0.730382	Mean dependent var	0.785153
Adjusted R-squared	0.710188	S.D. dependent var	0.402483
S.E. of regression	0.216673	Sum squared resid	46.38399
Durbin-Watson stat	1.781611		

Unweighted Statistics

R-squared	0.523458	Mean dependent var	0.582126
Sum squared resid	48.11620	Durbin-Watson stat	1.663423

******* denotes coefficient is significant at the 0.01 level.
****** denotes coefficient is significant at the 0.05 level.
***** denotes coefficient is significant at the 0.10 level.

5. Conclusion

Conclusions of this research are:

1. Innovation strategy has a negative impact on capital structure. A firm that chooses to use innovation strategy in its industry tends to have less debt portion than equity in its capital structure. This firm tends to have suitable financial slack in order to maintain its innovation activities.

2. This research also finds that the firm profitability level has a negative impact on capital structure. This negative impact becomes more substantial when a firm implemented innovation strategy.

The opportunities for future research are:

1. A strategy chosen by a firm depends on the dynamic of environtmen of competition faced by a firm. In a dynamic environtment, a firm should move fastly to adapt to the fast changing environtment and choose an innovation strategy to win the competition. To be flexible in implementing innovation strategy, a firm shoud have sufficient sources of funds. Meaning, a firm should match or balance among alternative source of funds exist. If not, this will influence the firm performance. In a dynamic environtment, the next reseach proposed is what impacts of intractions between innovation strategy and capital structure on firms' performances would be.

2. The next researches that can be explored are the relationship between capital structure and firm's performance. Is the firm's performance influence the cspitsl structure decision, or visa-versa? To answer these proposals, the next researchers can use structural equation model (SEM) method.

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