Bowman's Paradox: Prospect-Theory-Based Risk-Return Relationship (Some Recent Evidence in Indonesia)

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There is extensive evidence indicating a negative risk–return relation when a firm's performance is measured based on accounting measures, such as its Return on Assets (ROA) and Return on Equity (ROE). Previous studies show that the risk-return paradox can be explained by the prospect theory, which predicts that managers' risk attitudes are different for firms with differing performance. This study will test whether there is a risk-return paradox in the context of Indonesian companies. This study uses ROA and its standard deviation to define return and risk. Industry level and market level median ROA are used as reference points. Three control variables (firm size, leverage as a proxy of firm risk, and company age) are included in the model to increase the robustness of this research. A new sample of nine industries (about 488 firms) over a 10-year period (2008-2017) provides strong evidence that the risk-return paradox exists in Indonesia. In particular, firms which are below their target level are found to be risk takers (Hl) while organizations above their target level are risk averse (H2); moreover, the below-target slope was generally steeper than the above-target slope (H3). These results support the basic propositions of the prospect theory.

Keyword: *Bowman's paradox, prospect theory, risk-return paradox*

JEL Classification: G32, G40, G41

Introduction

Various studies have been conducted in many countries to find the relation between risk and return. According to the classical proposition, which is mostly based on the expected utility theory (Von Neumann and Morgensten, 1944), the risk-return relation is assumed to be positive (high risk, high return). The positive relationship could be interpreted as risk-averse behavior by a company for its returns. There are some theories determining asset price, such as the Capital Asset Pricing Model (CAPM) by Sharpe(1964) and the Arbitrage Pricing Theory (APT) by Ross(1976) which are based on the

classical assumption. Although the theories are still used as the basis for analysis in financial management, much of the empirical evidence shows opposite results.

The result of Bowman's study (1980) is one of the distinctive samples that proved a negative relationship between risk and return, which is known as the risk-return paradox. Based on a sample of firms in 85 US industries over a nine-year sample period, Bowman found such a negative relation between Return on Equity (ROE) and ROE variance. This paradox was then studied by many other researchers. One of the most interesting results is the prospect-theory-based risk-return paradox developed by Fiegenbaum

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and Thomas (1988) and Fiegenbaum (1990). They show that the paradox can be explained by the prospect theory of Kahneman and Tversky (1979), which said that investors have different risk attitudes toward gain and loss situations, measured against specific reference points. By adopting Fiegenbaum's model (1990), Chou, Chou, and Ko (2009) also studied Bowman's paradox by utilizing median market returns and industry returns as their reference points, instead of the median industry return only, as was used by Fiegenbaum (1990).

Based on the previous empirical studies, there are three important results, namely: (1) Negative relation of risk-return exists for companies having returns below their target levels (or reference points); (2) positive relationship exists for companies with returns above their target, and (3) the below-target trade-off is generally steeper than that for the above-target. These results also support Bowman's paradox, since the estimate of the slope's term is dominated by the below-target companies, which have a greater negative risk-return relation.

Many studies about the risk-return relation did not incorporate control variables in their models, therefore, control variables are included in our study, and are there to obtain a robust model. By using the case of Indonesian companies, our study tries to examine the prospect-theory-based Bowman's paradox by employing industry level and market level median return on asset (ROA) reference points as Chou, Chou, and Ko (2009) suggested and provided more recent evidence on the risk-return relation. Inclusion of the companies' size, their leverage as their risk proxy, and age as control variables is done as suggested by Gupta (2017).

The objectives of the study are: (1) To analyze the risk-return relations of companies wih returns below the refrence point, both for industry and market levels; (2) to analyze the risk-return relations of companies with returns above the refrence point, both for industry and market levels; and (3) to know the magnitude of the relation risk and the returns of the companies with returns below and above the reference points, both for industry and market levels.

The rest of the paper is organized as follows.

Section 2 discusses the literature reviews and a summary of the previous research into the risk-return paradox. Section 3 describes the hypotheses, the data and the empirical methodology. Section 4 presents the empirical results and Section 5 concludes the paper.

Literature Review

Risk-Return Relationship

The relationship between risk and return has received considerable attention from research into business administration, economics, and finance. Fiegenbaum and Thomas (1988), Brealey and Myers (1981) all suggest that risk and return are positively correlated.

As stated by Fiegenbaum and Thomas (1988), positive risk-return relationships have commonly emerged in cross-sectional studies examining both industry-level and firm-level data, even when the researchers controlled for the industry effect. Conrad and Plotkin (1968) found a statistically significant positive relationship between risk and return from 783 US companies representing 59 industries during their observation period from 1950 to 1965. The industry effect was included in the research. Similar results were also founded by Fisher and Hall (1969) and Hurdle (1974), who used a smaller sample size and period (11 industries, 15 years' sample period and 39 industries, 10 years' sample period). Cootner and Holland (1970) incorporated a time effect, aside from industrial control and discovered a significant positive risk-return relationship (industry effect was consistent for every year). The relationship appears to hold regardless of the firms' national identities. More than 300 West German firms used as samples in Neumann, Bobel, and Haid (1979) also showed a significant positive result.

Surprisingly, there is also much research that shows the opposite finding. Negative risk-return relationships emerge when alternative measures are included in the studies. Such measures range from the nature of the industry, the time period studied, firm size, diversification strategies, risk measures, and risk attitudes (Armour and Teece (1978), Bowman (1980),

Bowman (1982), Treacy (1980), Fiegenbaum and Thomas (1985), Fiegenbaum and Thomas (1986), Bettis (1981), Bettis and Hall (1982), and Bettis and Mahajan (1985)).

Armour and Teece (1978) found a negative relationship although it was not statistically significant from a sample of 28 US petroleum firms. Treacy (1980) used size effect to control the behavior and found a negative relationship for risk and return. Bowman (1980) examined the risk-return relation of US companies across 85 industries. The results found a negative risk-return relation in most industries. It was the first research which shows an anomaly in the risk-return relation at the organizational level, called the risk-return paradox. He named it 'paradox' since it ran counter to the well believed positive relationship expected by economists (Fiegenbaum, 1990).

According to Bowman (1980), there are several factors that cause contradictitory evidence compared to the classic positive risk-return relation. First, a good manager, having the ability to create higher profit levels with lower risk levels, thru making good decisions such as choosing the right project, right strategy, and right implementation procedure, all become drivers for creating this paradox. Second, a manager cannot have a risk-averse character, so he would choose higher risks even though there is a lower profit level. This is caused by managers' less risk-averse behavior and will also cause such a paradox.

The same result is shown by Bowman (1982). He conducted a deeper analysis to prove that firms in trouble would exhibit a stronger negative relationship within industries. Three industries are included as the samples (food processing, computers, and containers) and resulted in significant negative associations for troubled firms within these industries.

Negative risk-return relationships are more common when measures are accounting-based rather than market-based (Fiegenbaum and Thomas (1985), Fieganbaum and Thomas (1986)). Finally, the evidence about diversification strategies and risk indicates that related diversification strategies exhibit negative risk-return associations, whereas unrelated strategies exhibit a positive relationship (Bettis (1981), Bettis and Hall (1982), Bettis & Mahajan (1985)).

Behavioral Decision Theory and Risk Taking

Most of the literature dealing with risky choice behavior assumes that decision makers are risk averse. That assumption is a basic premise of much of the research into business, finance, economics, and management science. In terms of the utility theory, the assumption implies that a decision maker has a utility function that is uniformly concave or that individuals depart from risk-averse behavior only under unusual circumstances. Many researchers (Friedman and Savage (1948), Markowitz (1952), Grayson (1959), and Swalm (1966)) have questioned global risk aversion on both theoretical and empirical grounds. Their research found that the utility functions are not uniformly concave.

Friedman and Savage (1948) proposed a theoritical utility function with a mixture of risk seeking and risk aversion. Three segments of the function are convex (risk seeking) and are surrounded by two concave segments. Markowitz (1952) proposed a four-segment bounded utility function of wealth (convex-concave-convex(around present wealth)-concave). An empirical study by Grayson (1959) also showed similar results. With nine executives, who are engaged in oil and gas drilling decisions, used as the sample, Grayson (1959) found a mixture of risk seeking and risk aversion in the domain of losses and evidence of risk-seeking behavior for gains. Swalm (1960) conducted research to analyze the behavioral decisions of 13 executives in the chemical industry, which resulted in nine out of the 13 utility functions being risk averse for gains and risk seeking for losses.

Recent advances in the behavioral decision theory (Fishburn (1977), Fishburn and Kochenberger (1979), Kahneman and Tversky (1979), Laughhunn, Payne, and Crum (1980)) have emphasized the role of reference, or target, levels in the analysis of risky choices. Current evidence reveals that most individuals exhibit a mixture of risk-seeking and risk-averse behavior, with

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the range of the returns where those two risk preferences are the predominant modes of behavior being intimately connected with the notion of a target return. For returns below-target, most individuals appear to be risk seeking. For returns above-target, a large majority appear to be risk averse, which is consistent with one of the main predictions of the prospect theory (Kahneman & Tversky, 1979).

Behavioral Decision and Risk-Return Relationship

The prospect theory of Kahneman and Tversky suggests that each individual will act differently in a different situation. The situation is divided into two, a gain and loss situation. Then, Kahneman and Tversky (1979) described that there is a reference point for each individual, used as the reference to determine whether the individual is in a gain or loss position. The concept is then used as the research base for decision making at the organizational or company level, which is conducted by other researchers (Fiegenbaum and Thomas (1988), Fiegenbaum (1990), Miller and Bromley (1990), Jegers (1991), Johnson (1993), Kliger and Tsur (2011)). From many theories, one of the well-known theories is the prospect-theory-based risk-return relation research by Fiegenbaum and Thomas (1988). They proposed that Bowman's risk-return paradox can be described by Kahneman and Tversky's (1979) prospect theory at the organizational level. By using Spearman's correlation test, they found a negative risk-return relation in companies with returns below the reference point and a positive risk-return relation in the companies with returns above the reference point. Fiegenbaum and Thomas's (1988) findings are in line with the behavioral assumptions of the prospect theory; that most firms may be risk seeking when they are suffering losses or are below their targeted return levels. Conversely, they will tend to be risk averse following the achievement of their targeted returns. The prospect theory describes that an individual will show risk-seeking behavior below the reference point, so the paradox would be shown in companies with returns

below their reference point.

Fiegenbaum (1990) used new samples of about 3,300 firms across 85 industries to conduct a further examination of the risk-return relation under the prospect theory's explanation by using regression as the method of analysis. In general, the empirical findings provide further support for the argument that the prospect theory could explain the risk-return paradox. Fiegenbaum's (1990) study was built upon Fiegenbaum and Thomas's (1980) approach to explain the risk-return relation. The difffference is Fiegenbaum (1990) tried to estimate the trade-off between risk and return rather than confirming that it obeys the risk-averse and risk-seeking behavior. However, Fiegenbaum only analyzed the risk-return relation at industy level.

Chou, Chou, and Ko (2009) studied the risk-return relation in 27,416 companies selected from 45 industries in the United States, based on Fiegenbaum's (1990) approach. However, Chou, Chou and Ko (2009) tried to investigate not only at the industry level but also at the market level. In their observational period from 1984 until 2003, they found a negative risk-return relation in companies with returns below the reference point, both at the market and industry levels. The research also found a positive risk-return relation in the companies with a return level above the reference point both at the market and industry levels. Although any extreme observations have been trimmed, the results are still consistent.

More recent study by Patel, Li, and Park (2017) assessed the generalizability of Bowman's paradox across 12,235 firms in 28 countries. Using median ROA as reference point, Both cross-sectional and longitudinal relationship between risk and return provided broad support for the presence of Bowman's paradox in diverse country settings (Asia, Europe, and South Africa), except for India, Japan, and South Korea where the relationship was positive. Patel, Li, and Park (2017) confirmed that Bowman's paradox generally held across diverse institutional and cultural settings and supported prior studies on Bowman's risk paradox drawn from the US sample

Many other researchers including Jegers

Table 1. Summary of risk-return paradox empirical studies

Studies	Measurement			Sample			Findings
	Return	Risk	Reference Point	Companies	Industry	Period	
Bowman (1980)	ROE	Content Analysis	Quartile	1,587	85	1968-1976	Negative risk-return relation
Fiegenbaum and Thomas (1988)	ROE	Variance	Median	2,322	45	1960-1979	Negative relation below reference point and positive relation above reference point
Fiegenbaum (1990)	ROA	Variance	Median	330	85	1977-1982	Negative relation below reference point and positive relation above reference point
Miller and Bromiley (1991)	ROA and ROE	Income Variability, market risk, and strategic risk	Mean	746,526	-	1978-1982	Did not support prospect-theory-based risk-return paradox
Jegers (1991)	ROA and ROE	Variance	Median	3,250	110	1977-1982	Negative relation below reference point and positive relation above reference point
Sinha (1994)	ROA	Standard Deviation	Median	341	22	1977-1985	Negative relation below reference point and positive relation above reference point
Chou, Chou, and Ko (2009)	ROA and ROE	Standard Deviation	Median	27,416	45	1984-2003	Negative relation below reference point and positive relation above reference point
Patel, Li, and Kim (2017)	ROA	Standard Deviation	Median	12,235	41	1998-2002	Negative relation below reference point and positive relation above reference point

(1991), Johnson (1993), and Sinha (1994) also obtained similar results to the prospect-theory-based risk-return relation. The study by Miller and Bromiley (1991) is one of the studies which did not support the findings of Fiegenbaum and Thomas (1988) and Fiegenbaum (1990). A summary of the previous research into the risk-return paradox is shown in the table above.

Hypotheses and Research Methodology

The hypotheses in this research are adopted from Chou, Chou, and Ko (2009). Determining the reference point is the most important part of the prospect theory. In Kahneman and Tversky (1979), there is no clear explicit description of how they determined the reference points. However, there are many researchers using either the median or mean of company returns as their reference points. Although Fiegenbaum and Thomas (1988) argued that such a mixture of risk attitudes may exist both within and across industries, most research, including that by Fiegenbaum (1990) and Patel, Li, and Park (2017), only use the industry return me-

dian as the reference point. To obtain evidence of different behavior at the industry and market levels, this research used the median of industry and market returns as its reference point, which is similar to Chou, Chou, and Ko (2009).

Based on previous studies, the Return on Assets (ROA) or Return on Equity (ROE) could be used as a proxy for the company's return. Chou, Chou, and Ko (2009) used both ROA and ROE as the proxy of company returns. In this research, only ROA was used as the company return, since the research samples are taken across industries in the market. The standard deviation of return is used as a risk proxy, as in Chou, Chou, and Ko (2009)

Either in Fiegenbaum and Thomas (1988) or Chou, Chou, and Ko (2009), the hypotheses' development are based on Kahneman and Tvesrky (1979). The prospect theory describes that an individual will show risk-seeking behavior below the reference point. By assuming that the company will attempt to turn a position of loss into one of gain, a company with returns below the reference point will take bigger risks (Kliger, 2011). Bigger company losses will lead to bigger company risks, which are shown by

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a higher standard deviation return. Contrary to this, a smaller company loss (showing a closer position to the reference point) will lead to smaller company risks, and this is shown by a lower standard deviation return. Thus, it is expected that there will be a negative risk-return relation in a company with returns below the reference point.

Different behavior is shown by a company with returns above the reference point. Based on the prospect theory, a company will show risk-averse behavior when it is positioned above the reference point. By assuming that the company won't take a greater risk if it creates a smaller return than its risk, the risk-return relation is assumed to be positive.

According to Kahneman and Tversky (1979), the prospect theory's value curve shape resembles an asymmetric S. The curve in the loss area will have a steeper slope or gradient than in the gain area. Such behavior is called loss aversion. By the above assumption, the company's behavior will also indicate the same thing. The function slope of the risk-return relation in a company with its return below the reference point is expected to be greater than that of a company with its return above the reference point.

Based on the above description, the hypotheses to be tested in this research are the following:

Hypothesis 1: A negative relation between risk and return exists for firms performing below the target level.

Hypothesis 2: A positive relation between risk and return exists for firms performing above the target level.

Hypothesis 3: The relation between risk and return is steeper for firms that underperform the target level than the relation for firms that outperform the target level.

The three hypotheses will be tested at the market level with the reference point being the market and industry levels. Our research used all public companies registered on the Indonesian Stock Exchange in the period from 2008 until 2017. The period and samples were selected to examine Bowman's paradox in Indonesian companies during the last decade. Then, the companies were grouped again into nine industries based on the Jakarta Stock Industrial Classification (JASICA)[1].

To determine the risk-return relation in the context of an organization, based on the prospect theory, it is necessary to build an arithmetic model which then will be tested in this research. The model used in this research is a development of the model used in the research by Chou, Chou, and Ko (2009) as well as by Gupta (2017). The model will test the risk-return relation if a company obtained a return above or below the reference point. Also, it will determine how the manager's attitude towards risk leads to different company decision-making behavior. The initial model, by Fiegenbaum (1990), that was developed by Chou, Chou, and Ko (2009) is shown below:

$$Risk_{ij}=ai+b_i Return_{ij}+\varepsilon_{ij}$$

Where i = 1,…, m; j = 1,…, Ni. a_i is the intercept term for industry i, and b_i is the slope coefficient of the risk–return relation for industry i. To make a more robust model, our research will add three control variables, namely company size, leverage, and company age. The control variables are taken from the research by Gupta (2017). Woo (1987) stated that a company with great market power will create a higher return for a smaller risk and will be one of the causes of the risk-return paradox. Company size also directly affects this, so that the use of these variables can describe the market power (Gupta, 2017). In addition to the company's size, the company's age also directly affects the market power, so the use of these variables can describe the market power.

The research by Miller and Bromiley (1991) mentioned that already-exist-risks in a company can also affect that company's performance.

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[1] Based on JASICA, industries are classified into 9 industrial groups (agriculture, mining, basic industry and chemicals, miscellaneous, consumer goods, property, real estate, and building construction, infrastructure, utilities, and transportation, finance, trade, service, and investment.)

Table 2. Summary of operationalization of variables used in the research

Variable	Operationalization of variable
Return (ROA)	$\overline{ROA} = \dfrac{\sum ROA_{i,t}}{n}$
Risk (RISK)	$RISK = \sigma ROA_i$
Company Size (SIZE)	$SIZE = \dfrac{\sum TA_{i,t}}{n}$
Leverage (DER)	$DER = \dfrac{\sum DER_{i,t}}{n}$
Company Age (AGE)	Difference between the last year of the obseravtion period and the year the company was established

Where $i = 1,…,$ m companies; $t = 1,…,$ N years$_;$ n = number of data; σ = standard deviation, Σ = Sum.

This is caused by companies that already have a high degree of variability in their performance (ROA and ROE), triggering investor distrust. That makes it necessary for the investors to obtain greater incentives. The amount of incentives will lead to increased transaction costs, so that the company's performance will be reduced. Gupta (2017), in his study, used the debt-to-equity ratio as a proxy of the company's risk variable. This is because the leverage of debt obligations will increase the company's risk variability. After adding the control variables, the model used for this research's hypotheses testing is as follows:

$$RISK = \alpha + b_1 ROA + b_2 SIZE + b_3 DER + b_4 AGE + \varepsilon_{ij}$$

Where α is the intercept term for industry, and $b_{1,2…i}$ is the slope coefficient of the independent variables. RISK is the standard deviation of the ROA, ROA is the median return of ROA, SIZE is the mean of the company total assets[2], DER is the mean of companies debt-to-equity ratio, and AGE is the difference between the last year of the obseravtion period and the year the company was established. The three hypotheses are tested entirely by using the above model with the reference level being the market and industry median ROA. A table of the operationalization of variables is shown in table 2.

For the market reference point, the hypotheses are tested by cross-sectional regressions for both groups. The first group are the companies with returns above their reference point with the median reference point of market return, and the second group are those companies with returns below their reference point with the median reference point of market return. Initially, data from all the companies are sorted, from the ones with the lowest returns to the highest one. Then, they are divided by two (median) and used as the reference point for the market level. The data are then grouped into two, namely all the companies with returns above the market reference point and below the market reference point. Afterwards, both groups are tested.

For the industry reference point, the hypotheses are tested by cross-sectional regressions for both groups. The groups are the companies with returns above their reference point with the median return of the industry as the first group, and the companies with returns below their reference point with the median return of industry as the second group. The data are initially divided into nine different industry groups. Then, a reference point for each industry from the median ROA is chosen as the reference point, and the data for each industry is divided into the two groups listed above. After all of them are divided, the data are placed into two groups, namely all the companies with the returns on the industry reference point and below the industry reference point. Finally, the hypotheses' testing is conducted on both groups.

The hypotheses testing used a cross-section-

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[2] Following the Gupta (2017) research that used non-logged total company assets as a proxy of company size, we did not transform "SIZE" measured (Tompany Asset) into logged version, which can be found in the common practice. The non-logged version in this research also showed a good statistical results, hence it was not necessarily needed to be transformed.

Table 3. Descriptive statistics for companies below market reference point (Median ROA = 4.36%)

	ROA(%)	RISK(%)	SIZE (IDR)	DER(Ratio)	AGE (Years)
Mean	-2.54	9.15	1,610,000,000,000	4.46	32.05
Maximum	4.32	50.52	51,051,147,545,000	317.50	106
Minimum	-45.25	0.18	7,859,562,000	-61.22	5
Observations	244	244	244	244	244

Table 4. Descriptive statistics for companies above market reference point (Median ROA = 4.36%)

	ROA(%)	RISK(%)	SIZE (IDR)	DER(Ratio)	AGE (Years)
Mean	11.21	6.67	5,200,000,000,000	1.66	36
Maximum	36.97	31.88	154,280,898,909,000	89.22	161
Minimum	4.36	0.39	4,041,113,000	-13.01	3
Observations	244	244	244	244	244

al regression with an Ordinary Least Square (OLS) model with the EVIEWS 10.0 application. If the data from the regression results did not meet the classical assumption test, then an alternative method, the Generalized Least Square (GLS) was used. GLS is a weighted least square regression model with variance as the weighting in the regression model. This regression model is used when there is a specific correlation problem causing one or more of the classical assumptions not to be met. By this method, the estimates are assumed to meet the classical assumptions and have BLUE (Best Linear Unbiased Estimator) characteristics.

Empirical Results

Descriptive Statistics

The descriptive statistics of the selected variables are provided in tables 3,4,5 and 6. As explained previously, our study would separately regress the samples categorized into four groups. The first two groups are companies with returns below and above the market reference points. The last two groups are companies with returns below and above the industry reference points.

There were 604 companies listed on the Bursa Efek Indonesia (Indonesian Stock Exchange) up to 2017. With our observation period (2008-2017), 488 companies are obtained as research objects. The difference in the numbers is caused by eliminating companies that did not publish their financial reports consistentlyfor 2 years.

All the obtained samples were distributed between each group. The median ROA for both the industry and market levels was used as the reference point. From the grouping process, all the groups have an equal number of obsevations (244 each).

With a median ROA value of 4.36, Table 3 indicates companies with returns below the market reference point and Table 4 indicates companies with returns above the market reference point. From Table 3, the lowest ROA obtained is -45.25 with a maximum value for ROA of 4.32. It shows that the biggest average net loss generated is 45.25% of the total assets and the maximum average net income generated is 4.32% from its total assets, 0.04% lower than the market's target net income (4.36%). It indicates a loss position for all of the first group's companies. Table 4 indicates that the minimum average net income generated from a company with a return above the market reference point is 4.36% of its total assets. The maximum average net income generated is 36.97% from its total assets.

The maximum mean average ROA for group 1 was valued at -2.54 indicating a worse below-target company performance than that of the above-target companies (Table 4) which was valued at 11.21. It implies that on average, a company with a return above the reference point at the market level displays about 13.75% better performance than a company with a return below the reference point at market level.

Table 3 also shows that the mean average risk for the below-target market return group is

Table 5. Descriptive statistics for companies below the industry reference point (Median ROA = different for each industry[3])

	ROA(%)	RISK(%)	SIZE (IDR)	DER(Ratio)	AGE (Years)
Mean	-2.39	8.90	2,010,000,000,000	4.80	32
Maximum	7.48	50.52	51,051,147,545,000	317.51	106
Minimum	-45.25	-0.80	7,859,562,000	-22.67	4
Observations	244	244	244	244	244

Table 6. Descriptive statistics for companies below the industry reference point (Median ROA = different for each industry2)

	ROA(%)	RISK(%)	SIZE (IDR)	DER(Ratio)	AGE (Years)
Mean	11.33	6.84	4,970,000,000,000	1.65	36
Maximum	53.46	31.88	154,280,898,909,000	89.21	161
Minimum	2.58	0.39	4,041,113,000	-13.61	3
Observations	244	244	244	244	244

9.15%, almost 3% higher than the above-target market return group (6.66%). That value indicates that on average, a company with a return below the market level reference point exhibits a greater risk than that of an above-target company. Group 1 also have less average total assets (about 1.6 IDR trillion) compared with the second group (5.2 IDR trillion), indicating firms with greater assets would generate bigger returns for smaller risks. It showed the same behavior as Woo (1987) stated. A company with great market power will create a higher return with a smaller risk, and will be one of the causes of the risk-return paradox.

Companies with returns below the reference point also have a bigger debt-to-asset ratio (4.46), almost three times higher than that of the above reference point companies, which is valued at 1.65 (Table 4). This indicates firms with internal risks tend to be more risky, as Miller and Bromiley (1991) proposed. The average age for below-target companies (32 years) is younger than that of the above target companies (36 years). This indicates that firms that are older generate bigger returns with smaller risks compared to younger ones. According to Woo (1987), this behavior would trigger the paradox behavior of risk and return.

The descriptive statistic results for the group with median industry ROA are shown in tables 5 and 6. The overall result of the descriptive statistics is quite similar to that of the first two groups. Companies with returns below the industry reference point tend to yield smaller returns (even negative returns) than companies with returns above the industry reference point and face bigger risks. Larger and older companies also tend to generate bigger returns for smaller risks. Companies with bigger debt-to-equity ratios are also more risky and generate smaller returns (Miller and Bromiley, 1991). From all of the explanations above, it can be inferred that whether they use the median market return or the median industry return as the reference point, companies with returns below and above the reference point would show similar risk and return behavior.

Result and Discussion

Results of the data's analysis conducted by this research strongly support the prospect-theory-based Bowman's paradox, which proposed different decision-making behavior in different conditions. In this case, different behavior is shown at the organizational level. In this research, the results produce the same relationship direction as the hypotheses used in the research by Fiegenbaum and Thomas (1988), Fiegenbaum (1990), and Chou, Chou, and Ko (2009). According to them, the risk-return paradox is only shown by companies with returns below the reference points. Tables 7 & 8 show the results of the regression at the market level

[3] Median return of each industry are: Agriculture= 6, mining= 2.58%, basic industry and chemicals= 3.52%, miscellaneous= 3.27%, consumer goods= 7.37%, property, real estate, and building construction= 5.72%, infrastructure, utilities, and transportation= 4.17%, finance= 1.79%, trade, service, and investment= 4.12%.

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Table 7. Risk–return relation for the below- and above-target firms at the market level

This table reports summary statistics of the slopes of the following cross-sectional regression:

$$RISK=\alpha+b_1ROA+b_2SIZE+b_3DER+b_4AGE+\varepsilon_{ij}$$

Statistic	Below industry median		Above industry median	
	coefficients	t-statistics	coefficients	t-statistics
Intercept	7.10	13.29***	5.06	12.52***
ROA	-0.88	-23.06***	0.23	6.83***
SIZE	-1.53	7.29***	-4.79	-2.80***
DER	-0.02	-3.28***	0.03	2.72***
AGE	0.05	3.19***	-0.001	-1.69*
f-statistics	187.28***		15.20***	
Adjusted R-Squared	0.88		0.36	

*Significant at 10% level; **Significant at 5% level; ***Significant at 1% level.

Table 8. Risk–return relation for the below- and above-target firms at the industry level

This table reports summary statistics of the slopes of the following cross-sectional regression:

$$RISK=\alpha+b_1ROA+b_2SIZE+b_3DER+b_4AGE+\varepsilon_{ij}$$

Statistic	Below industry median		Above industry median	
	coefficients	t-statistics	coefficients	t-statistics
Intercept	6.26	9.03***	2.37	2.20**
ROA	-0.80	-26.41***	0.36	6.09***
SIZE	-3.61	7.64*	1.08	0.32
DER	-0.03	-4.54***	1.43	5.08***
AGE	0.06	3.23***	-0.07	-2.53**
f-statistics	381.44***		13.97***	
Adjusted R-Squared	0.94		0.40	

*Significant at 10% level; **Significant at 5% level; ***Significant at 1% level.

and industry level reference points.

The coefficient of the ROA variable describes the negative risk-return relation for companies below the reference point. This indicates the risk-return paradox in the companies below the reference point, as described by Fiegenbaum and Thomas (1988), Fiegenbaum (1990), Chou, Chou, and Ko (2009) for both reference point levels. The below the reference points' group regression result supports the first hypothesis. From the table above, it can be seen that there is a positive risk-return relation for companies above the reference points in both levels. This is shown by the positive coefficient of ROA. The results are similar to previous research by (Fiegenbaum and Thomas (1988), Fiegenbaum (1990), Chou, Chou, and Ko (2009)). It also supports the second hypothesis. Based on Table 7, the coefficient of RISK for a company above the reference point at the market level is valued at 0.23. It is smaller than the slope coefficient of below-target companies. Thus, there is a stronger risk-return relation in the below-target companies. The results are also similar for the

industry level regression. This is in accordance with the statement in the third hypothesis and the result is in line with previous research (Fiegenbaum and Thomas (1988), Fiegenbaum (1990), Chou, Chou, and Ko (2009).

Our research results can be strengthened by looking at the risk-return relation graph (figures 1&2). The downward trend line for the companies below the reference point indicates a negative risk-return relation, and vice versa. In addition, it can be seen that the risk-return relation for the companies under the reference point is steeper than that for the companies above the reference point. This suggests a stronger risk-return relation in companies below the reference point. This patterns are similar with previous research (Chou, Chou, and Ko (2009) and Patel, Li, and Park (2017)).

Three control variables were also added into the model adopted from the research by Gupta (2017), namely company size, leverage, and company age. In his research, the direction of the control variables' relationship is not explained explicitly. At the market level, two of

Figure 1. Risk-return relation for all companies with market median as reference point
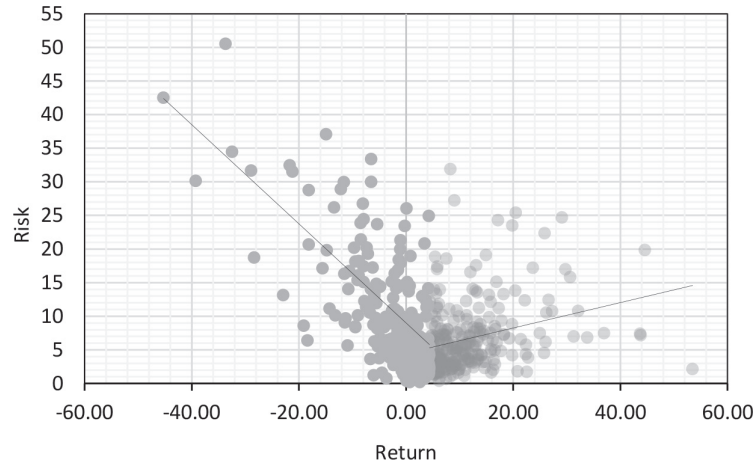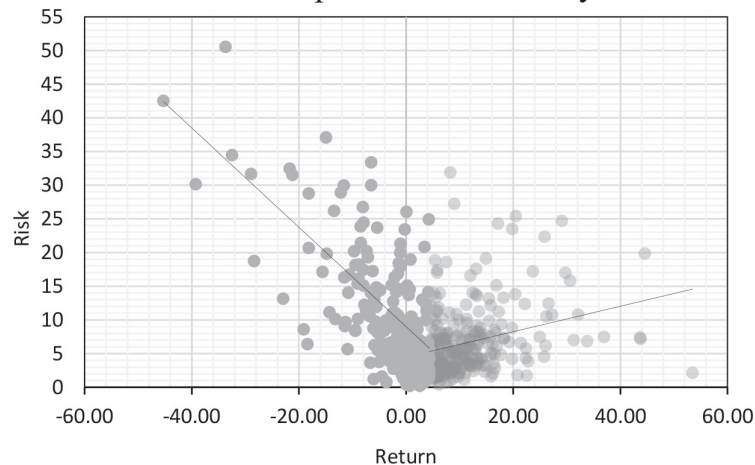

Figure 2. Risk-return relation for all companies with industry median as reference point

the three control variables show a negative and significant relationship for companies below the reference point. Only one control variable shows a positive relationship, namely company age. While for the companies above the reference point, there is only one control variable that shows a positive relationship with the dependent variable, and is nearly the same as the results for the market level regression. But the results are similar to those in the research by Gupta (2017). In his research, there is no definite pattern of relationship for the control variables. This relation could be the focus for later empirical studies.

In a simpler manner, the overall results of the regression model show the prospect-theory-based risk-return paradox phenomenon is present in Indonesian companies. Based on the prospect theory of Kahneman and Tversky (1979), the risk-return paradox only occured in companies in a loss position. Companies with-

out the ability to create returns above the reference point or that are in the loss condition will try to select any investment with higher risk, though with a lower return. The adverse logic behavior is described completely in research by Miller and Bromiley (1991). Their research assumed that each company establishes a performance target by taking guidelines from the market or industry performance mean, and that there are many available investment options to be selected by the managers. Each investment assessment is based on risk and return and will be added to the company's overall performance.

In Miller and Bromiley (1991), a company that is not able to achieve its target will sacrifice its returns to increase its return variance. Projects with high return variance will be able to create enormous returns, although with a very small probability. This behavior happens because the company does not want to continue to be in a loss-making position and will choose an

investment that may restore the company's position, no matter how much risk the investment may have (Kliger and Tsur, 2011). The greater that the loss position of a company is, will lead to more investments with a high return variance being undertaken by the company. This will cause a greater distance between risk and return. The company's loss position will also lead to further position from the reference point. The above explanation explains the occurrence of a negative risk-return relation for a company under the reference point. In general, companies in Indonesia with poor performance exhibit behavior such as that in the above explanation. That behavior will cause a risk-return paradox in the below-target firms.

Unlike firms with below the reference point returns, there is no sign of a negative risk-return relation in companies with returns above the reference point. The companies with returns above the reference point in our sample generally have larger total assets and are older, and thus have stronger market power, which would cause the risk-return paradox as stated in Woo (1987), but the relationship is still a positive one. This behavior could be justified if we refer to Kliger and Tsur's (2011) study. According to Kliger and Tsur (2011), a well-performing company will only take more risks when it knows it will obtain greater returns. Better company performance will cause smaller companies to take more risks. Thus, when companies with good performance dare to take investment options with more risks, there will be higher returns to be earned too. This underlies a positive risk-return relation for the companies above the reference point. In general, companies with good performance in Indonesia show the behavior described above.

For the regression results at the industry level, they show relatively similar results to the regression at the market level. There is a negative risk-return relation for the companies under the reference point, which proves the first hypothesis. Also, a positive risk-return relation for the companies above the reference point is found, which proves the second hypothesis. This indicates that in general, in Indonesia, the prospect-theory-based risk-return paradox is in

both reference points, the market and industry median of returns.

Conclusion

This research was conducted to examine the relationship between risk and return for Indonesian companies using the prospect theory approach and to adopt the research models by Chou, Chou, and Ko (2009) and Gupta (2017). This research used all the companies registered on the Indonesian Stock Exchange in the period from 2008 to 2017. Return on Assets (ROA) was used as the independent variable and the standard deviation of ROA was used as the dependent variable. This research also used three control variables that were adopted from research by Gupta (2017). The three variables were company size, company risk, and company age.

Overall, the results are similar to previous empirical studies (Fiegenbaum and Thomas (1988), Fiegenbaum (1990), Chou, Chou, and Ko (2009)) and support all the hypotheses proposed. This indicates that companies facing losses tend to be more willing to take alternative investments, with higher risks but lower profit levels. The attempt is made to try to restore the company's position from a loss position to the profit position. A company with good performance will be willing to take higher risks if the profits earned from the investment are greater than the risks.

The addition of three control variables in this research also indicates significant effects on some models. There are many studies into Bowman's paradox and the prospect theory that do not add any control variables into the research. The variables' addition is expected to add robustness to the research model, as in the research by Gupta (2017). Although in this research, the data used are in the form of a pooled cross-section, control variables in the form of company size, leverage, and company age show significant effects on the research model in its cross-sectional manner. Though it could not ensure the theoretical effects of the control variables, this can be studied further as a new research topic by other researchers.

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