Budgeting Information Framing, Responsibility and Intrinsic Motivation in Investment Decision-Making of Regional Companies

Anna Sutrisna Sukirman  
*Polytechnic State Ujung Pandang*  
Makassar, Indonesia  
annasutrisnasukirman@gmail.com

Dedy Abidin  
*Polytechnic State Ujung Pandang*  
Makasar, Indonesia  
dedy.ak_poltekup@yahoo.com

Syamsinar  
*Polytechnic State Ujung Pandang*  
Makasar, Indonesia  
syamsinar_muhtar@yahoo.co.id

Abstract—This study aims to re-examine the effects of information budget framing, responsibility and intrinsic motivation in investment decision-making with group-shifts as a moderating. This study was conducted in companies located in rural areas. This study tests three possible conditions that affect whether group are more risk-taking or risk-averse based on three components: (1) forming decision alternatives, (2) the level of responsibility for a decision based on past investments, and (3) the rewards given for the success of a project. This study uses the 2 x 2 experimental design by creating a decision-making scenario. There was a total of 80 participants who work as employees in rural companies. Before this experiment was conducted, validity and reliability tests were done through a pilot test on the experimental instruments. Paired sample t-test and ANCOVA were used to test the hypotheses through SPSS for Windows. The results show that the decision-making process differed based on whether the information was framed in a positive light or not, as well as the rewards given on the success of a project.

Keywords—framing, information, intrinsic, group-shifts.

I. INTRODUCTION

Business competition is good for the development of a company but can also be the cause of corporate failure. Companies use competition as a direction and policy to maintain survival. Competition will be more beneficial for the company if it is supported by a good information system. One such system is accounting information system where a manager can use it to make decisions related to operations and controlling the company in the present and in the future. Accounting information also helps investors make investment decisions.

Accounting information used by internal actors in a company is budgeting information. A budget helps managers plan and control operations [1]. A budget contains important information used by both for-profit and non-profit organizations. A budget is used by a manager as a tool to measure efficiency, to coordinate cost control, to communicate, to evaluate performance, and to motivate. A manager should take into account the behaviour of human resources in the decision-making process. Human resources play a tremendous role in achieving corporate goals while staying within the budget. Decision-making is not done alone but rather in groups who have talents in perceiving opportunities and risks from a list of solution alternatives.

However, the level of risk associated with a sole decision-maker and a group is completely different. Rutledge & Harrel in [2] stated that group decisions indicate that interaction among members will lead to a risky shift in decision-making. A risky shift, oftentimes referred to as a group shift, is the shift of a decision between a sole decision-maker and a group. In addition, decision makers are considered capable in processing information and deciding on the best possible decision. Rationality also mandates a consistency and coherency in the decision-making process, although it is often violated. A cause of this violation is the information framed adopted by the decision maker. A frame is related to how a fact or piece of information is expressed. Kahnemen and Tversky in [3] stated that proposed a possible theory as a clarifier in this conundrum. Their theory suggests that information framing adopted by a person can influence his or her decision. Naim in [4] found that the influence of information framing is larger in groups than in individuals when aiming for success.

Framing will help clarify whether a risk-taking or risk-averse behaviour will be experienced in a group interaction. The adopted frame will help in explaining the decision shift between individual and group decision makers in a company. In addition to information framing, Bazerman [5] found that responsibility for investment decisions can influence a person or people’s decision in allocating company resources.

Responsibility over an investment project can cause someone to adopt a risk-taking approach. When an individual makes a decision, he or she will be responsible and will do what it takes to ensure that their decision will become successful. This is a psychological effect of bearing a responsibility. The social
effect is that he or she will be entirely responsible whether the investment is a failure.

Humans are social beings who have tendencies to interact with each other. They are programmed to offer help without expecting any return. In economics, this behaviour is known as intrinsic motivation. This type of motivation is not just done in social settings but also has a tendency to be applied when working in an organization or company. Conversely, extrinsic motivation is helping someone with the hope that he or she will be rewarded for their efforts. This is what causes intrinsic motivation to become increasingly scarcer.

This study is a continuation and development of the research conducted Susanto in [6] with several new additions. First, although this study uses the exact same theory, the objects and subjects are different, so this study contributes to the general theories regarding management accounting and financial management in rural areas, as well as behavioural accounting in Indonesia. Specifically, this study contributes in such a way that can be used to develop the performance of rural companies in Indonesia. Throughout time, state-owned companies in Indonesia (Badan Usaha Milik Negara or BUMN for short) and regional-government-owned companies (Badan Usaha Milik Daerah or BUMD) have oftentimes reported losses. Those losses have been proven through various research such as in Furqon in [7] study which showed that the corporate performance of BUMDs have not been optimal in their finances. Graha in [8] research showed the same, stating that BUMDs have difficulties in making a return on their investments, even though the government owns and monitors their companies’ operations and financial performance reports in the same manner as private parties own and monitor their companies. The odd thing is that managers and employees working in BUMDs are oftentimes contract or freelance workers and have not yet reached the status of civil servants.

One main difference in this study compared to previous ones is that past studies mainly used college students as the subjects of their research when in fact they have yet to have any real-life experience in corporate decision-making. The subjects of this study are those who act in the decision-making processes in their companies.

This study empirically tests the effects of budgeting information framing in a positive and negative light; responsibility which is further divided into two factors, namely high and low responsibilities; and decision-making, of which there are two factors, namely individual and group decision-making. As for the investment decision factor, this can be divided into two different components, namely risk-taking (negatively framed information) and risk-averse (positively framed information). Based on these theories, this study will answer the following hypotheses:

**H1a:** The preference to invest in risk-bearing projects will be lower by group-shifts than by individual decision-makers when information is framed positively

**H1b:** The preference to invest in risk-bearing projects will be lower by group-shifts than by individual decision-makers when information is framed negatively

**H2a:** The preference to add an investment in risk-bearing projects will be higher by group-shifts than by individuals who are not responsible for the initial investment

**H2b:** The preference to add an investment in risk-bearing projects will be higher by group-shifts than by individuals who are responsible for the initial investment

**H3:** The intrinsic motivation preference in risk-bearing projects will be lower in groups than in individuals when given rewards for their accomplishments.

The rest of this paper is organized as follow: Section II describes the proposed research methodology. Section III describes the obtained result and following by discussion. Finally, Section IV presents the conclusion and recommendation.

### II. RESEARCH METHODOLOGY

This study aims to understand human behaviour in decision-making when affected by budgeting information framing, responsibility and intrinsic motivation. The total number of participants in study were 80 people. In the demographic questionnaire distributed to the participants, they were asked about their age and work experience. These two items could be used to potentially gauge differences in their decision-making processes. They were also asked to fill in their gender and intelligence levels, though differences in these two items could be managed by identical working environments. The demographic questionnaire was used as an additional analysis for this study. This experiment was designed using the 2 × 2 experimental design for the independent variables (budgeting information framing and responsibility). The intrinsic motivation variable acted as the covariate variable which measures the before and after effects of being rewarded for their decisions.

This study is comprised of two steps. The first step was dividing the 80 participants into two groups of 40 people. Each person in the first group was given a case study, and the results of the case study showed the decision he or she would make in that particular scenario. The second group of 40 people was also given a case study to work with, though they could work with another person of the group, further dividing the second group into 20 groups of two members. The results of the case study were used to gauge the decisions made by a group of people.

The second step was dividing the second group into individual groups and giving them an identical case study based on the group-treatment of each and every group. This was done because the research did not want the group decision to be influenced by an individual or vice versa. Each person was asked to give their input on a case study both as an individual and as a group member. For each case study, the participants were given 10 minutes to work.

The participants were randomly given research instruments for the treatment phase of this study. Before filling in the instrument, the research manager told and emphasized to each participant to read the study case carefully and to imagine themselves as the acting manager in the case study. The participants were also asked to discuss the decision they would
make with their partner. The participants were not given calculators or other tools since there were no right or wrong answers in the study cases. The research manager gave a signal to the participants to begin filling in their instruments. After the signal was given, each participant began reading the study case and continued by choosing a manipulating check, as well as gauging their level of their conviction of their decision.

Filling in the instrument by individuals and groups were done similarly. However, the participants were randomly chosen to work in groups of two. They were given 10 minutes to discuss with their partners the type of decision they would make and to make a consensual decision.

III. RESULTS AND DISCUSSION

The total number of participants who joined this study was 80. However, due to time constraints, this experiment was conducted in four different cities: Makassar, Gowa, Palopo, and Malili. Each location conducted the experiment by following the aforementioned standards and procedures. In the first step, 40 participants were divided into two groups consisting of 20 people each. Each of the 20 people in the first group was a study case to gauge their decisions made individually. The second group of 20 people was split into 10 groups of two members each. They were asked to discuss a study case. Their decisions were recorded as a group-made decision.

Afterwards, the first group of 20 individuals were put into groups consisting of two members each, and the second group were asked to give their decisions on a study case individually. Both groups, whether in pairs or alone, were given 10 minutes to discuss and provide their decision.

A. Participants Demographic

The characteristics of the participants’ demographics were split into three categories: age, gender and work experience as a decision-maker. The results of the data regarding the participants’ demographic characteristics can be seen in Tables I, II, III, IV and V.

To obtain the demographic data, the participants were also asked about specific information regarding their experience in working as a decision-maker. They were split into four different groups namely A, B, C and D, where each group was compared against one another as shown in Tables II, III, IV and V. Each group was assigned a different letter from A to D. In all, the average work experience in years of these groups was highest in group B (12.00). Group A had the second highest average work experience with 11.15 years. Group D had 9.85 years in average, and finally Group C had the lowest average work experience with only 6.00 years. In all, the average work experience for every participant was 9.75 years.

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| TABLE I. DESCRIPTIVE STATISTICS OF PARTICIPANT DEMOGRAPHIC |
|-------------|-----------|-----------|-----------|-----------|
| Age         | Minimum  | Maximum  | Mean      | Std Deviation |
| ≤20         | 20        | 42        | 31.18     | 8.000      |
| 20-30       | 23        | 40        | 31.18     | 8.000      |
| >30         | 21        | 42        | 31.18     | 8.000      |
| Total       | 80        |           |           |            |
| Gender      | Male      | Female    |           |            |
| Total       | 80        |           |           |            |
| Work Status | Beginner  | Intermediate | 1.55 | .501 |
| Total       | 80        |           |           |            |
| Work Experience in years | 1 | 19 | 9.75 | 7.484 |
| Total       | 80        |           |           |            |
| Valid N (allwise) | 80 | | | |
Finally, H2b checks if there is a difference in decisions made between individuals and groups if investment information is provided by a manager who will pay the initial investment. It also examines whether individuals or groups are more prone to make risky investment decisions (see Table VII).

### Table VII. Testing the Average Difference Between Individual-Group (Information Framing and Responsibility)

| Pair  | Individual Positive Framing Group | Mean | N  | Std. Deviation | Std. Error |
|-------|-----------------------------------|------|----|----------------|------------|
| Mean  | 4.25                              | 20   | 1.410 | .315 |
| Sig. (2-tailed) | 1 | .456 |

### Table VIII. Percentage of Subjects (Individual and Group) Who Chose Each Alternative When Information Is Provided in a Positive Frame

| Decision | A | B | Total |
|----------|---|---|-------|
| Count    | 9 | 31 | 40   |
| % within | 22.5% | 77.5% | 100.0% |
| Count    | 11 | 9  | 20   |
| % within | 55.0% | 45.0% | 100.0% |
| Count    | 20 | 40 | 60   |
| % within | 33.3% | 66.7% | 100.0% |

The H1a tests whether there is a difference between decisions made by individuals and groups when investment information is provided in a positive frame. It also compares the decision-making preference between individuals and groups in avoiding or taking risks. The following table shows the percentages of the subjects who chose each alternative as described in Table VIII.

### Table V. Demographic Descriptive Statistics for Group D

| Age       | N  | MINIMUM | MAXIMUM | MEAN | STD. DEV. |
|-----------|----|---------|---------|------|-----------|
| Gender    | 20 | 1       | 2       | 1.80 | .410      |
| Work Status | 20 | 2       | 19      | 9.85 | 7.184     |
| Work Experience in years | 20 | 19      | 2       |      |           |
| Valid N   |    | 20      |         |      |           |

### B. Hypotheses Analysis

The H1a was tested to know where there is a difference in decision made by individuals and groups if the investment decision was provided in a positive frame (see Table VI). This hypothesis also serves to understand the comparative preference in decision-making between individuals and groups in risk-bearing decisions based on the information provided.

### Table VI. Differences Between Individual- and Group-Decision-Makers (Framed Information and Responsibility)

| Paired Differences | Mean | Std. Deviation | Std. Error | 95% Confidence Interval of the Mean | Std. Error | Mean | T | DF | Sig. (2-tailed) |
|--------------------|------|----------------|------------|------------------------------------|------------|------|---|----|----------------|
| Individual         |      |                |            |                                    |            |      |   |    |                |
| Group – Positive Frame | 1.350 | 2.159 | .483 | .340 | 2.360 | 2.797 | 19 | .012 |
| Individual         |      |                |            |                                    |            |      |   |    |                |
| Group – Negative Frame | 2.650 | 1.761 | .394 | -2.874 | -1.226 | -5.205 | 19 | .000 |
| Group – Low Response Ability | -1.800 | 2.419 | .541 | -1.32 | -1.479 | -1.479 | 19 | .156 |
| Group – Low Response Ability |      |                |            |                                    |            |      |   |    |                |

The H1b examines whether there is a difference in decision made by individuals and groups if investment information was provided in a negative frame. In addition, it also examines whether the comparative preference between individuals and groups in determining which of the two are more willing to bare or avert from risky investment decisions.

The H2a questions whether there is a difference in decision between individuals and groups if investment information is provided without a manager who will bear the responsibility of the initial investment. It also compares between individuals and groups about which of the two is more prone to making risky decisions.
The test shows that when information is positively framed, of the 40 individuals, nine chose A (22.5%) and 31 chose B (77.5%). When making decisions in groups, 11 people chose A (55%) and the rest chose B (45%).

This test was done with a significant level of 5% and a confidence level of 95% with a degree of freedom (df) of 19. This shows that the t-count is 2.797 for individuals-positive framing and group-positive framing. Since t-count is greater than t-table, then we can conclude that there is a difference between decisions made by individuals and groups when information is provided in a positive frame.

Based on the results, we found a difference in decision and preferences in decision-making following the way information is framed. This shows that framing information will positively affect the decision-making process regarding risky decisions made between individuals and groups. In conclusion, H1a is supported.

2) Hypothesis 1b

Testing H1b was done to understand whether there is a difference in decisions made by individuals and groups when information is provided in a negative frame. It also examines the comparison between decision preferences between individuals and groups to see which is more risk-taking and risk-averting based on the information available. The following Table IX shows the percentages of the subjects’ choices from the alternative decisions.

| TABLE IX. PERCENTAGE OF SUBJECTS (INDIVIDUAL AND GROUP) WHO CHOSE EACH ALTERNATIVE WHEN INFORMATION IS PROVIDED IN A NEGATIVE FRAME |
|---------------------------------------------------------------|
| Decision Total   | A | B |
|------------------|---|---|
| Count            | 23 | 17 | 40 |
| % within decmaker | 57.5% | 42.5% | 100.0% |
| Group            | 3 | 17 | 20 |
| % within decmaker | 15.0% | 85.0% | 100.0% |
| Total            | 26 | 34 | 60 |
| % within decmaker | 43.3% | 56.7% | 100.0% |

The results show that when information is given in a negative frame, of the 40 participants, 23 of them chose A (57.5%) while only 17 chose B (42.5%). When deciding in groups, 2 chose A (15%) while the rest went with B (85%).

The results above show that there is a difference in the decision made in terms of the participants’ preferences when deciding individually or in groups. This shows that framing information negatively will result in a more risk-taking decision. This is proven by the average value of negative framing for individuals compared to that of groups of 3.00 and 5.05, respectively.

From the results, there appears to be a difference in decision and preference between individual- and group-decision-makers. This shows that negatively framing information will result in a difference in risk-taking decisions between individuals and groups. This is shown by the average value of the individual negative framing of 3.00 and group negative framing of 5.05. Basically, decisions made by groups are more prone to make risky decisions when information is framed negatively than individuals. This finding supports H1b, and we can conclude that framing information negatively will affect the decision preference for individual- and group-decision-makers.

3) Hypothesis 2a

Testing H2a was done to find out whether there is a difference in decision made by individuals and groups when investment information is provided without a manager responsible for the initial investment. It also serves to deepen our understanding on the decision makers’ preference to choose between risk-taking or risk-averting decision-making of individuals and groups. It also tests how they will behave when a manager is and isn’t bearing the financial risk of the decision. The following Table X shows the percentages of their decisions.

| TABLE X. PERCENTAGES OF THE SUBJECTS WHO CHOSE EACH ALTERNATIVE WHEN NO MANAGER IS RESPONSIBLE FOR THE INITIAL INVESTMENT |
|---------------------------------------------------------------|
| Decmaker (Individual and Group) | Decision Total | A | B |
|---------------------------------|----------------|---|---|
| Count                           | 15 | 25 | 40 |
| % within decmaker               | 37.5% | 62.5% | 100.0% |
| Group                           | 6 | 14 | 20 |
| Count                           | 30.0% | 70.0% | 100.0% |
| Total                           | 21 | 39 | 60 |
| % within decmaker               | 35.0% | 65.0% | 100.0% |

The results of the test show that when there is not a manager to bear the responsibility of the initial investment, of the 40 participants, 15 chose A (37.5%) and 25 chose B (62.5%) individually. When split into groups, 6 chose A (30%) and the remaining 14 groups chose B (70%).

This shows that there is no difference in decision nor a specific preference when deciding individually or in groups. By looking at the average value of each treatment, we can conclude that in the scenario where no manager bears the initial investment, there will not be a significant difference in decisions made by individuals and groups. We further conclude that H2a is not supported.

4) Hypothesis 2b

The H2b tests whether there is a difference between individually- and group-made decisions when investment information is provided when a manager is bearing the initial investment. This hypothesis will also test groups and
individuals prefer making risky or safer decisions in this scenario. The following Table XI shows the percentages of the subjects’ decisions in the aforementioned scenario.

**TABLE XI. PERCENTAGE OF SUBJECTS WHO CHOSE EACH ALTERNATIVE WHEN MANAGERS BEAR THE RESPONSIBILITY OF THE INITIAL INVESTMENT**

| Decider | Decision | Count | % within decider | Total | % within decider | % | % |
|---------|----------|-------|------------------|-------|------------------|---|---|
|         | A        | 17    | 42.5%            | 60    | 41.7%            | 100.0% | 100.0% |
| Individuals | B     | 23    | 57.5%            |       | 58.3%            |       |       |
| Groups before and after reward | | | | | | |
| % within decider | | | | | | |
| Total | Count | 25 | 60 | | | |

The data shows that when a manager bears the responsibility for the initial investment, of the 40-individual decision-makers, 17 chose A (42.5%) and 23 chose B (57.5%). When deciding in groups, 8 groups chose A (40%) and the rest chose B (60%). Looking at the average treatment value, the researchers concluded that there is not a significant difference in decisions made or preference in choosing the riskier or risk-averting option.

The average value for individuals was 4.25 whereas for groups it was 3.85 and 4.25 for groups. These values show that groups are more willing to make riskier decisions than individuals when a manager is bearing the responsibility of the initial investment. This does not support H2b. This finding differs from that of Rutledge & Harrelin [2] who showed a significant difference in preference between individual and group decision-makers.

**C. Hypothesis 3**

The H3 tests whether the behaviour of each individual and group plays a significant role in their decisions when they are promised a reward for their performance as described in Table XII.

**TABLE XII. DIFFERENCE BETWEEN INDIVIDUALS AND GROUPS BEFORE AND AFTER REWARD**

|          | Mean | N  | Std. Dev | Std. Error Mean |
|----------|------|----|----------|-----------------|
|          | Paired Differences | t  | df | Sig. |

**TABLE XIII. DIFFERENCE BETWEEN INDIVIDUALS AND GROUPS BEFORE AND AFTER REWARD**

In testing H3, the significance level was 5% and the confidence level was 95% with a 79 df, showing t-count to be 1.876 for individuals before reward and individuals after reward. Because the t-count is greater than the t-table, the researchers concluded that there is no significant difference in behaviour in individuals and after rewards are given. However, a difference exists for groups at the same significance and confidence levels with a 39 df. From Table XIII, we see that the t-count of -2.556 before and after groups are given rewards. Because of t-count is less than the t-table, we conclude that there is a difference between behaviours of groups in before and after reward scenarios.

These findings support H3, and the researchers concluded that the intrinsic motivations in risky projects will be lower in groups compared to individual decision-makers when given rewards for their accomplishments. This indicates that a reward will affect both individual and group decision preferences.

**TABLE XIV. ANOVA**

The following table shows that responsibility does not have any significant effect on the decision. This can be seen in the table above where the significance level for responsibility, both individually and in interacting with other variables, has no effect on the decision. TO support H1, we can see an interaction between the decision maker and budgeting information framing with a significance of 5% and a confidence level of 95%. It is empirically proven that the way information is framed will affect a decision-maker’s decision in a significant manner.

a R Squared = .346 (Adjusted R Squared = .299)

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IV. CONCLUSION AND RECOMMENDATIONS

This study has aimed to gauge the quality of the decisions made by decision-makers working in BUMDs. The quality of their decisions are tied closely to the profits and losses of the company and how they can provide supreme service to the community. The researchers conclude this study by saying that decisions are affected based on how information is framed, both positively and negatively, and when rewards are given for successes of a project.

The findings of study support several theories, though future research should put an emphasis on timeliness in the decision-making process. Whether decision-makers are aware or not, time plays a significant role in the quality of their decisions. Moreover, timeliness can affect the condition of the BUMD and can increase the risk of losses.

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