*Original Paper*

# Affective Response and Attraction Effect on Consumer's Intention to Buy

Eric Santosa[1*]

[1] Economics & Business Faculty, Unisbank University, Semarang, Indonesia

[*] Eric Santosa, Economics & Business Faculty, Unisbank University, Semarang, Indonesia

*Abstract*

*Studies of attraction effects commonly exercised by an experimental techniques, in which the effect is truly experienced. While the effect is apparently obvious, what is the consequence of generating an intention to buy? In addition, do the consumer's moods and emotions affect the intention? If the moods are not fine does the consumer still want to choose the same brand/product? The answers are the purpose of the study. A sample which consists of 100 respondents is withdrawn by convenience and judgment method. Amos 16.0 and SPSS 16.0 are employed in analyzing data. The result shows that both, the attitude and subjective norm, are affected by the attraction effect. In addition, while the creation of attitude is affected by the attraction effect, it also influenced by the affective response. Futhermore, the customer's intention to buy is built up as theorized.*

*Keywords*

*affective response, attraction effect, attitude, subjective norms, perceived behavioral control*

## 1. Introduction

The attraction effect phenomenon declares that a particular object will be seemingly more appealing when another close objects' attributes are inferior (Huber, Payne, & Puto, 1982; Huber & Puto, 1983; Ratneshwar, Shocker, & Stewart, 1987). In marketing the effect might lead to a tactical sales which let a particular product has higher transaction. Say, a Korean leather jacket which its price is $500 has no much attention when it is displayed alone in the corner of a perticular store. It will later on, be more attractive when the store owner pickes up other jackets which apparently their quality are not similar, look like inferior to the Korean jacket, while its prices are more expensive and they are placed around. Consumers likely prefer the product which is dominant to other/others. Its superiority obviously makes somebody to eagerly choose the product. Sentient Decision Science (2014) gives examples of two

high-end toasters. Toaster A has two slots which are wide enough for bagels, and costs $49. Toaster B has four slots which are wide enough for bagels as well, and costs $89. Which one will be choosen? By trading-off between number of slots and price, a customer might be willing to pony up the extra $40 bucks and go fo Toaster B. When a third Toaster is added, it likely the choice changed. How come? It happens as follows. Toaster C has two slots, it costs $49, but it is not wide enough for bagels. Toward Toaster A, it has similar price, but based on the width it is inferior than A since it is not wide enough for bagels. It produces an attraction effect toward the Toaster A. While the Toaster A has a dominating position, it looks more appealing which inevitably increases the preference for Toaster A.

Some studies also confirm the phenomenon, such as Kardes et al. (1989), Aaker (1991), Simonson and Tversky (1992), Lehman and Pan (1994), Sivakumar. and Cherian (1995), Lianxi et al. (1996), Doyle et al. (1999), Dhar and Simonson (2003), Kim and Hasher (2005), Kohler. (2007), Won (2012), Howes et al. (2016), and Gluth et al. (2017). Such occurrence also happens when the superiority does not only denote to both attributes, but also in a particular attribute only (asymmetrical dominance) (Simonson, 1989; Simonson & Tversky, 1992; Huber & Puto, 1983; Hedgcock & Rao, 2009).

Concerning with marketing, the attraction effect is basically not far from an individual's desicion to choose a particular product. It is proclaimed that because of the effect, an individual might alter his/her choice from non-dominating product to dominating product. From psychological point of view, somebody might ask, what is the chronology of decision? What part of the process which finally activates the behavior (e.g., to choose the dominating product)? Santosa (2014, 2015) explores the influence of the effect on the activation of behavioral intention. While the activation of a particular behavior is preceded by a behavioral intention, the intention itself is ignited by an attitude, a subjective norm and a perceived behavioral control (Ajzen, 1991). Further, Santosa (2013, 2014, 2015) finds out that the process of generating the intention is inevitably affected by the attration effect, particularly the attitude and the subjective norm. In other word, the process of generating a behavior through an intention is obviously under the influence of the attraction effect.

It is commonly understood that a behavior is resulted by affective and cognitive processes (Peter & Olson, 2002; Stangor, 2014). While Zajonc (1980) recognizes that feelings (affective) often precede cognitive processes, the thought is inevitably influenced by feelings. In addition, when cognitive is in process during making a decision, it is unavoidably affected by affective (Isen, 2001). While it is known that affect consists of positive and negative affect, some studies, such as Barone et al. (2000), Kahn and Isen (1993), Lee and Sternthal (1999) affirm that the positive affect enhances problem solving and decision making. A further study of Gable and Harmon-Jones (2010) state that positive and negative affects of low motivational intensity broaden attention, whereas positive and negative affects of high motivational intensity narrow attention.

Since the attraction effect might alter a choice, and affect whether positive or negative, affected a thought, what kind of choice when the two simultaneously influence the cognitive processes? The answer is the purpose of this study that is to intensely know the influence of affective respond and

91

effect of attraction to customer's behavior, particularly his/her behavioral intention. Some theoretically reviews are provided. An enlightenment of methods, analysis and findings are reported.

<u>Formulating Hypotheses</u>

a. The relation between the Attraction Effect (AE) with the Attitude (Ab) variable, and the Subjective Norm (SN) variable.

In a cognitive system, the work of information and evaluation are in line; they work in the same direction. Information might lead to a thought, which in turn develops into a conviction (Peter & Olson, 2002). Whether information or evaluation makes a great contribution to assessing a particular object, it is inevitably affected by the assessor's subjectivity. Thereby, an assessment towards a particular brand leads to a value, in which a consumer believes that the particular brand has a perceptive attribute in a particular product category (Pan & Lehmann, 1993). As a matter of fact, the perceptive attribute does not actually exist, it is an abstract. Therefore, each consumer might have a different perception (Schiffman & Kanuk, 2000).

About the assessment itself, the consumer firstly classifies the information, incorporates it with their past experience, and later on comes to a conclusion which arises as a response (Peter & Olson, 2002). The subjective assessment occurs by means of a learning process related to the attribute's dimensions, by comparing a brand with others, and even reducing the amount of the attribute's dimensions which had previously just been perceived.

With the great quantity of brands available and the attributes of each product category, this makes it very difficult for consumers to integrate and analyze information, so they simplify their decision making process through subjective judgments, or a belief in a particular brand. The reason is the limitations of people's cognitive capacity (Bettman, 1979; Newell & Simon, 1972). In some studies on prices, consumers compared one price with others, resulting a perception of price. The price perception inevitably affected the consumers' comprehension of the quality and value of the products, and hence the intention to buy (Dodds et al., 1991; Monroe & Petroshius, 1981). The becoming more interesting of a product when an inferior product comes closer (attraction effect) obviously demonstrates the subjective judgment of consumers, the subjective judgment will lead to an attitude creation through an integration of belief and evaluation.

The subjective norm, which is developed through a normative belief and the motivation to comply, is apparently subjective. The more favorable aspects of the subjective norm clearly are in accordance with the inner wants, which always care for other people's intentions. Therefore the subjective judgment of the attraction effect will also likely affect the subjective norm, when other people's intentions arise from their subjective judgment of the attraction effect.

These views apparently correspond to Santosa's studies (2014, 2015) which show the influence of attraction effect on consumer's attitude and subjective norm. Consequently, two hypotheses can be formulated as follows,

        H1:      The Attration Effect (AE) affects the Attitude's creation (Ab).

        H2:      The Attration Effect (AE) affects the Subjective Norm (SN).

The affective system, as another point of view, automatically produces affective responses such ass emotions, specific feeling, moods and evaluation when stimuli come around (Peter & Olson, 2002). Since an attitude is one's total evaluation to do something (Ajzen, 1991), it is assumed that the affective respons will unavoidably color an attitude. Some studies can be implemented, such as the finding of Mishra et al. (1993) which suggests the influence of motivation on attraction effect; Hedgcock and Rao (2009) proclaim that the introduction of a decoy into a trade-off-type choice set reduces "trade-off aversion", or the decision maker's experienced trade-off difficulty. A decoy is an option which causes preference reversals between the two other options in choice set (Herne, 1997). A work of Kim and Hasher (2005) demonstrate that the efficacy of the attraction effect will be reduced in a particular condition.

Some other studies are evidence for the effect of affect on decision making (Kahn & Isen, 1993; Lee & Sternthal, 1999; Barone et al., 2000; Isen, 2003). Isen and Erez (2002) indicate that positive affect interacts with task conditions in influencing motivation. Fredrickson and Branigan (2005) and Hicks and King (2007) assert that positive affect broadens attention. Harmon-Jones and Gable (2008) suggest that the intensity of approach motivation should be considered as this intensity plays a role in whether positive affect causes broadening or narrowing of attention. Fredrickson and Branigan (2005) and Gable and Harmon-Jones (2008) intensify their study and find out positive affects low in approach motivational intensity broaden attentional scope. Likewise, Gable and Harmon-Jones (2008) and Harmon-Jones and Gable (2009) emphasize positive affects high in approach motivational intensity narrow attentional scope. Gable and Harmon-Jones (2010) finally affirm that the effect of emotion on local/global precedence is not due to negative versus positive affect but is instead due to motivational intensity. Positive and negative affects of low motivational intensity broaden attention, whereas positive and negative affects of high motivational intensity narrow attention. The next hypothesis can be formulated as follows:

        H3:      Affective Response (AR) affects the Attitude's creation (Ab).

b.   The relation of Attitude toward behavior (Ab), the Subjective Norm (SN), and Perceived Behavioral Control (PBC) with Behavioral Intention (BI).

While it is in accordance with the TRA and/or TPB that behavioral intentions can be predicted by attitude toward behavior, subjective norm and perceived behavioral control (Fishbein & Ajzen, 1975; Ajzen, 1991), some studies (e.g., Jyh, 1998; Okun & Sloane, 2002; Martin & Kulinna, 2004; Wiethoff, 2004; Marrone, 2005; Kouthouris & Spontis, 2005; Santosa, 2013; Santosa, 2014; Santosa, 2015) are also in line with this theory. Thereby, the next hypotheses can be formulated as follows:

H4:     The more favorable that the Attitude toward behavior (Ab) is, the greater the Behavioral Intention (BI) will be.

H5:     The more favorable the Subjective Norm (SN) is, the greater the Behavioral Intention (BI) will be.

H6:     The more favorable Perceived Behavioral Control (PBC) is, the greater the Behavioral Intention (BI) will be.

<u>Research Model</u>

Based on the hypotheses a research model can be developed as follows in Figure 1.
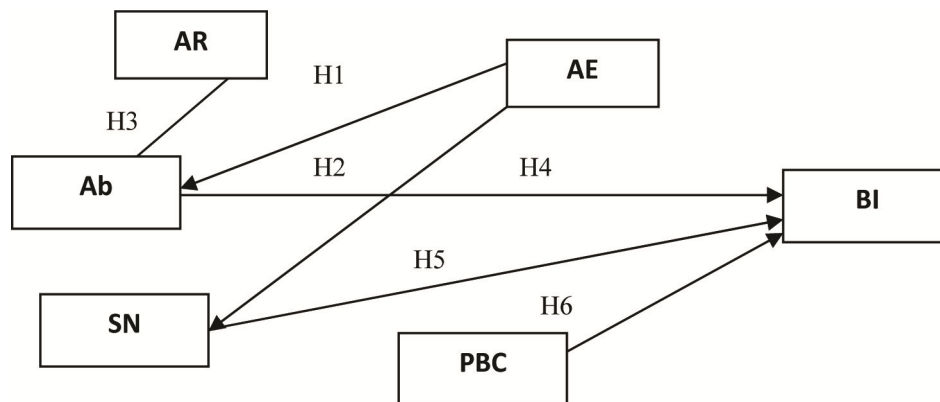


**Figure 1. Research Model**

| Identification : | AE | : | Attraction Effect |
|---|---|---|---|
| | AR | : | Affective Responds |
| | Ab | : | Attitude toward behavior |
| | SN | : | Subjective Norm |
| | PBC | : | Perceived Behavioral Control |
| | BI | : | Behavioral Intention |

## 2. Methods

A sample is drawn using the convenience and judgment technique (Cooper & Schindler, 2001, 2008). Data are collected by questionnaires, distributed to respondents who have either already bought, or are interested in buying matic motorcycles. After examining the forms for the data's completion, 100 out of the 106 questionnaire forms were accepted which supposed meet the sample adequacy (Ghozali, 2004, 2007; Hair et al., 1995). A Likert scale is operated corresponding to a five-point scale ranging from 1 (=completely disagree) to 5 (=completely agree). The instrument, which denotes to indicators, will firstly be justified through confirmatory factor analysis. Further, data are analyzed by employing Amos 16.0.

## 3. Result

### 3.1 Confirmatory Factor Analysis

First Phase CFA. The confirmatory factor analysis is not simultaneously carried out, but done in phases. The first phase contains two of independent variables, i.e., Attraction Effect (AE) and Attitude toward behavior (Ab). It actuslly also encloses two stages as well, firstly a relation which originally drawn from the variables' character theirselves and secondly a relation which has already been repaired corresponding to good indices. Table 1 shows scores of indicators which relate to goodness of fit, and Figure 2, 3 and 4 depict the CFA itself.

**Table 1. First Phase, Second Phase, and Third Phase of CFA**

| Indicators | 1st Phase/2nd Stage | 2nd Phase/2nd Stage | 3rd Phase/2nd Stage | Threshold |
|---|---|---|---|---|
| Chi-square/Prob | 666/0,717 | 226,220/0,000 | 434,905/0,000 | 29.588/p>0.05 |
| Cmin/df | 0,333 | 13,307 | 24,161 | $\leq 5$ |
| GFI | 0,997 | 0,800 | 0,749 | High |
| AGFI | 0,965 | 0,577 | 0,498 | $\geq 0,9$ |
| TLI | 1,007 | 0,616 | 0,390 | $\geq 0,9$ |
| RMSEA | 0,000 | 0,333 | 0,457 | 0.05 s.d 0.08 |

*Source*: data analysis.

Second Phase CFA. It also contains two independent variables, i.e., Affective Responds (AR) and Subjective Norm (SN). It encloses two stages as well. While scores of indicators are represented at Table 1, the CFA itself is illustrated at Figure 3.



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chi-square= ,666
prob = ,717
cmin/df = ,333
GFI = ,997
AGFI = ,985
TLI = 1,007
RMSEA = ,000
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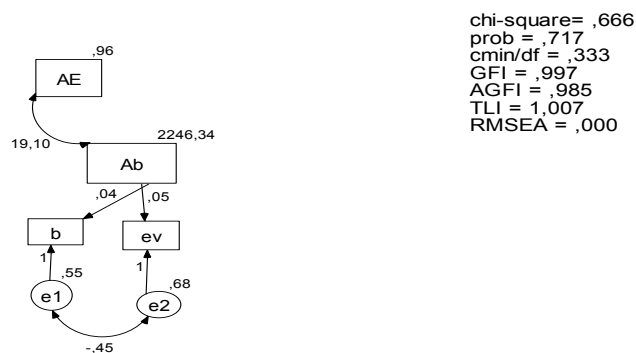
**Figure 2. The CFA of AE and Ab**

Third Phase CFA. It is similar with the previous two. It testifies the CFA between variable Perceived Behavioral Control (PBC) and Behavioral Intention (BI) which demonstrated whether at Table 1 or Figure 4.
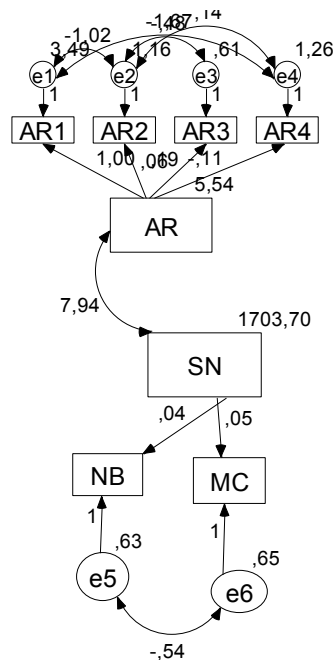
chi-square= 226,220
prob = ,000
cmin/df = 13,307
GFI = ,800
AGFI = ,577
TLI = ,616
RMSEA = ,333

**Figure 3. the CFA of AR and SN**

chi-square= 434,905
prob = ,000
cmin/df = 24,161
GFI = ,749
AGFI = ,498
TLI = ,390
RMSEA = ,457

**Figure 4. The CFA of PBC and BI**

<u>Standardized Regression Weight of Indicators</u>. The modification models of 1st, 2nd and 3rd phase CFA produce standardized regression weight for all indicators >0,4 which denote that the factor loading of the manifests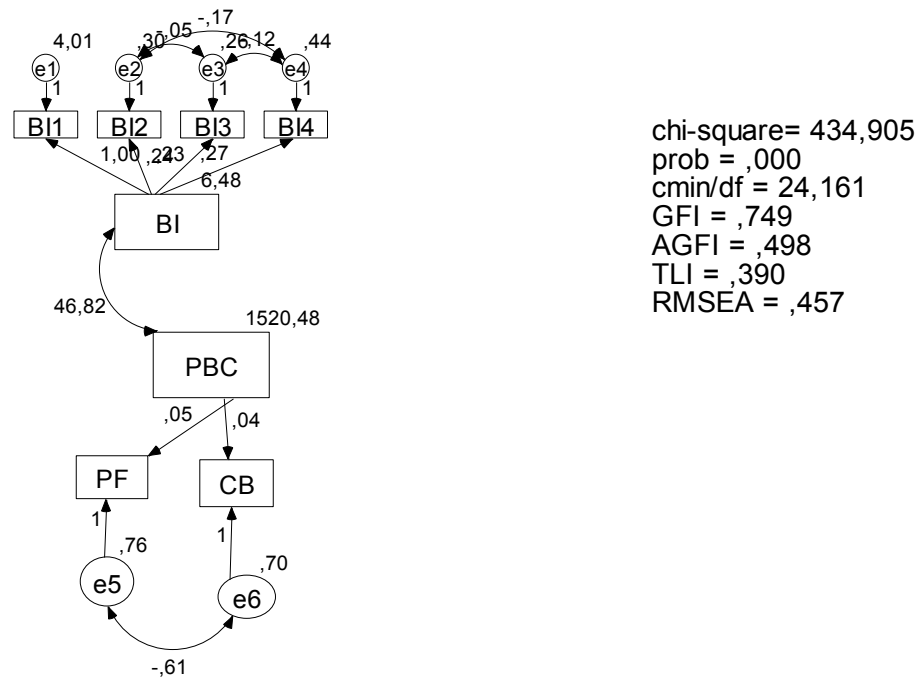 are above the minimum requirement (Ferdinand, 2002) (Table 2). It indicates that all indicators of AR (AR1, AR2, AR3, AR4), Ab (b, ev), SN (NB, MC) and PBC (PF, CB), BI (BI1, BI2, BI3, BI4) are valid.

*3.2 The Structural Equation Model*

The model has three initial independents variable (AE, AR, PBC) and three dependent variables (Ab, SN, BI) in which the primary two dependent variables (Ab, SN) at some extent are treated as independent variables as well. Since the purpose of the study is eagerly to know the relationship between the two initial independents variable (AE, AR) and the primary dependent variables (Ab, SN), likewise among the three dependent variables separately and simultaneously, a structural equation modelling (sem) is employed (Hair et al., 1995). In addition, the use of SEM will give advantages such as fast, accurate and more detail. It is possible since the method performs a unification of factor analysis and path analysis (Ghozali, 2004, 2007).

An initial structural equation model is drawn by connecting all variables as hypothesized. This model is likely not thoroughly appropriate to expectancy, since all indicators, i.e., Chi-Square/Prob, Cmin/df, GFI, AGFI, TLI, RMSEA, do not meet the criteria (Appendix A). Consequently, a modification model is generated by connecting e13 ↔ e14, e12 ↔ e14, e11 ↔ e14, e11↔ e13, e7 ↔ e8, e2↔ e8, e2↔ e4, e2↔ e3, e1↔ e4, and e9↔ e10. This modification model seemingly produces better scores than before

97

(Table 3, Figure 5).

**Table 2. Standardized Regression Weights**

|  |  | **Estimate** |
|---|---|---|
| AR1 <--- | AR | 0.658 |
| AR2 <--- | AR | 0.557 |
| AR3 <--- | AR | 0.498 |
| AR4 <--- | AR | 0.556 |
| NB <--- | SN | 0.912 |
| MC <--- | SN | 0.920 |
| BI1 <--- | BI | 0.736 |
| BI2 <--- | BI | 0.712 |
| BI3 <--- | BI | 0.728 |
| BI4 <--- | BI | 0.641 |
| PF <--- | PBC | 0.908 |
| CB <--- | PBC | 0.893 |
| ev <--- | Ab | 0.935 |
| b <--- | Ab | 0.944 |

*Source*: Amos output.

**Table 3. The Second Indicators Resulted from Modification**

| Indicators | Initial Scores | Second Scores | Threshold | Justification |
|---|---|---|---|---|
| Chi-square/Prob | 922,427/0,000 | 334,423/0,000 | 31.264/p>0.05 | Not meet the criterion |
| Cmin/df | 5,557 | 2,130 | ≤ 5 | Meet the criterion |
| GFI | 0,646 | 0,781 | High | Not meet the criterion |
| AGFI | 0,552 | 0,707 | ≥ 0.9 | Not meet the criterion |
| TLI | 0,685 | 0,922 | ≥ 0.9 | Meet the criterion |
| RMSEA | 0,203 | 0,101 | 0.05 s.d 0.08 | Not meet the criterion |

*Source*: Data Analisis.
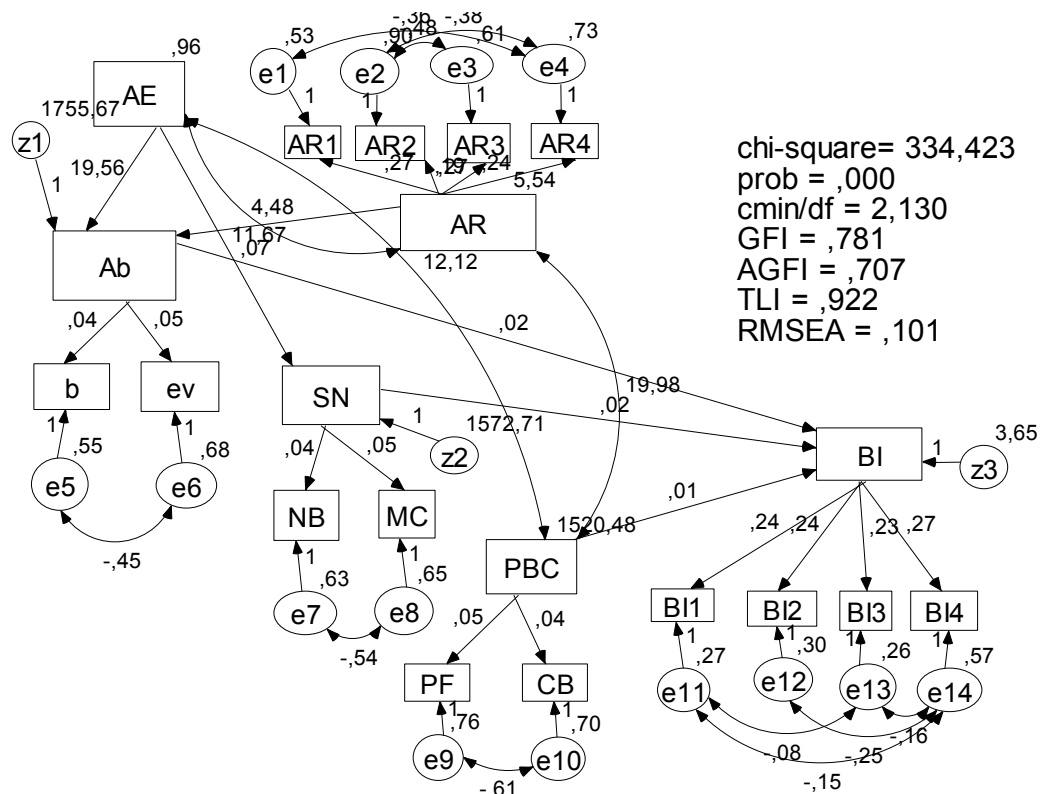
**Figure 5. Modified Model of the Initial Structural Equation Model**

Table 3 denotes that although not all the model's indicators meet the criteria, some (Cmin/df and TLI) equalize the requirements. It means that the model's data are in accordance with the structural parameter. As a consequent, the model is worthy of use.

Evaluation of Normality. Evaluation of normality is carried out by univariate test (Ferdinand, 2002; Ghozali, 2004). It is exercised by scrutinizing the skewness value whether its critical ratio values are less or equal to ±2.58. As a matter of fact, there are seven variables, i.e., AE, AR, BI1, NB, AR4, AR3, and AR1, whose c.r of the skewness value are more than ±2.58. As a consequent, it indicates that univariately the data distribution is not normal. To check further, a multivariate test is executed. The result of the data analysis shows up that the multivariate critical value is 38,594. It is more than 2.58 as required (Appendix 5). As a result, the normality test needs a bootstrap analysis.

Bootstrap Analysis. A bootstrap analysis is used to gain a fit model, since the normality test does not meet the pre-requisite. A Bollen-Stine's bootstrap analysis illustrates the following: (a) The model fits better in 498 bootstrap samples, (b) it fits equally well in 0 bootstrap samples, (c) it fit worse or failed to fit in 2 bootstrap samples, (d) testing the null hypothesis that the model is correct, Bollen-Stine bootstrap p=0.006. While the result indicates that the probability is smaller than 0.05 which denotes that it can not reject the hull hypothesis, the model;s availability of use likely depends on the goodness of fit. As shown in appendix 3, the cmin/df=2.130 and TLI=0.922 suggest that the model is still worthy of use.

<u>Outliers.</u> Evaluation of the outliers can be carried out by either a univariate test or a multivariate test (Ferdinand, 2002). The univariate test is successfully employed by firstly converting the data to Z-scores, which should be less than ±3.0 (Hair et al., 1995). The result indicates that most of the variables' Z-scores are less than ±3.0, except AE, AR, NB1, NB, and MC2, which their scores are more than ±3.0 (Appendix 3). Therefore, the existence of outliers is indicated.

To check further, a multivariate outliers test is needed. It determines the *chi-square* value which subsequently is used as the upper limit, which could be calculated by searching on a *chi-square* table whose degree of freedom is equal to the number of variables employed, which is 37, under the degree of significance (p)=0.001. The *chi-square* value is found to be 69.292. In fact, most of the scores for Mahalanobis's distance are less than 69.292, except observations number 1, which inevitably suggests outliers (Appendix 2). However, because there is no specific reason to dismiss them, the outliers are worth being used (Ferdinand, 2002).

<u>Multicollinearity and Singularity.</u> According to the output from Amos, the determinant of the sample covariance matrix should be equal to 835,553. This value is far above zero. As a consequence, it belongs to no multicollinearity or singularity category (Appendix 4).

<u>Test of Hypotheses.</u> The regression weights output indicates that the influence of AE on Ab and SN are significant. Likewise, the influence of AR on Ab. In addition, the influence of Ab on BI, SN on BI and PBC on BI are also significant (Table 4).

**Table 4. Regression Weights: Group Number 1-Default Model**

|     |      |     | Estimate | S.E. | C.R. | P | Label |
|-----|------|-----|----------|------|------|---|-------|
| Ab  | <--- | AE  | 19.558   | 4.058 | 4.820  | *** | par 12 |
| SN  | <--- | AE  | 11.672   | 3.839 | 3.041  | ,002 | par 13 |
| Ab  | <--- | AR  | 4.481    | 1.690 | 2.652  | ,008 | par 21 |
| BI  | <--- | Ab  | .017     | 005  | 3.558  | *** | par 18 |
| BI  | <--- | PBC | ,014     | ,,005 | 2.584 | ,010 | par 19 |
| BI  | <--- | SN  | .017     | ,006 | 2.759  | ,006 | par 20 |
| AR1 | <--- | AR  | ,269     | ,029 | 9.207  | *** | par 2 |
| AR2 | <--- | AR  | .271     | .038 | 7.065  | *** | par 3 |
| AR3 | <--- | AR  | ,191     | ,032 | 6.054  | *** | par 4 |
| AR4 | <--- | AR  | .243     | .034 | 7.052  | *** | par 5 |
| NB  | <--- | SN  | .043     | ,002 | 23.480 | *** | par 6 |
| MC  | <--- | SN  | .046     | ,002 | 24.753 | *** | par 7 |
| BI1 | <--- | BI  | ,240     | ,019 | 12.490 | *** | par 8 |
| BI2 | <--- | BI  | ,239     | ,021 | 11.656 | *** | par 9 |
| BI3 | <--- | BI  | ,234     | ,019 | 12.224 | *** | par 10 |
| BI4 | <--- | BI  | ,270     | ,028 | 9.616  | *** | par 11 |
| PF  | <--- | PBC | ,049     | ,002 | 22.904 | *** | par 14 |
| CB  | <--- | PBC | ,042     | ,002 | 20.890 | *** | par 15 |
| ev  | <--- | Ab  | ,046     | ,002 | 27.808 | *** | par 16 |
| b   | <--- | Ab  | ,045     | ,001 | 30.129 | *** | par 17 |

*Source*: Amos output.

## 4. Discussion

Table 4 shows that both the influence of AE on Ab and AE on SN are significant, which denoted by p=0.000 and p=0.002. These lead to the consequence that the hypotheses, i.e., "The Attration Effect (AE) affects the Attitude's creation (Ab)", and "The Attration Effect (AE) affects the Subjective Norm (SN)" are really empirically supported. This results are in accordance with the expectation which are in line with other Santosa's studies findings (2013; 2014; 2015).

The Table 4 also demonstrates that the influence of Affective Response (AR) to the attitude's creation (Ab) is also empirically supported (H3). The finding is also in favor with other studies such as Mishra et al. (1993), Hedgcock and Rao (2009), Kim and Hasher (2005), Kahn and Isen (1993), Lee and Sternthal (1999), Barone et al. (2000), Isen (2003), Isen and Erez (2002), Fredrickson and Branigan (2005), Hicks and King (2007), Harmon-Jones and Gable (2008), Gable and Harmon-Jones (2008), Harmon-Jones and Gable (2009). However it is actually slightly different, since the finding denoted to the creation of an individual's attitude concerning with the theory of planed behavior. Therefore, the attitude formed is not an attitude toward object, but an attitude toward behavior.

The mentioned findings indicate that the attraction effect which simultaneously works with the affective response can develop a consumer's subjective judgment, which through the integration of a consumer's belief and evaluation can build up the consumer's attitude. Meanwhile, the consumer's subjective judgment leads to the consumers' attitude, which is motivated by the need to comply with the desires of the people around him/her. Eventhough they do not look like totally new, it should be appreciated as a significant new facts in theoretical development, and obviously need further exploration and development.

In accordance with the theory of planned behavior, the three predictors of behavioral intention, i.e., attitude, the subjective norm and perceived behavioral control work well. The results also support the studies of Jyh (1998), Okun and Sloane (2002), Martin and Kulinna (2004), Wiethoff (2004), Marrone (2005), Kouthouris and Spontis (2005), Santosa (2013), and Santosa (2015).

The findings likely lead to managers to be very cautious of launching products. While the products should be carefully posted to generate an attraction effect, it is not easy to control consumers to be continuously happy since the consumers are vary. Many affairs are out of control. One way still open is to create, communicate and deliver excellent consumers' value. It includes not only quality, but also feature, design, package, and price. The company should constantly develop brand and/or brand equity. In addition, the way of marketing the products should be well-performed, for instances, nice ads, showroom's well-interior designed, interesting brochures, excellence support service, and salesforces' well-performed. Any modes should lead to good first impression. Consequently, while the attraction effect is succesfully generated, the marketing efforts are obviously lead to good impression, the brand equity is well-developed it hopefully produces the intention to buy.

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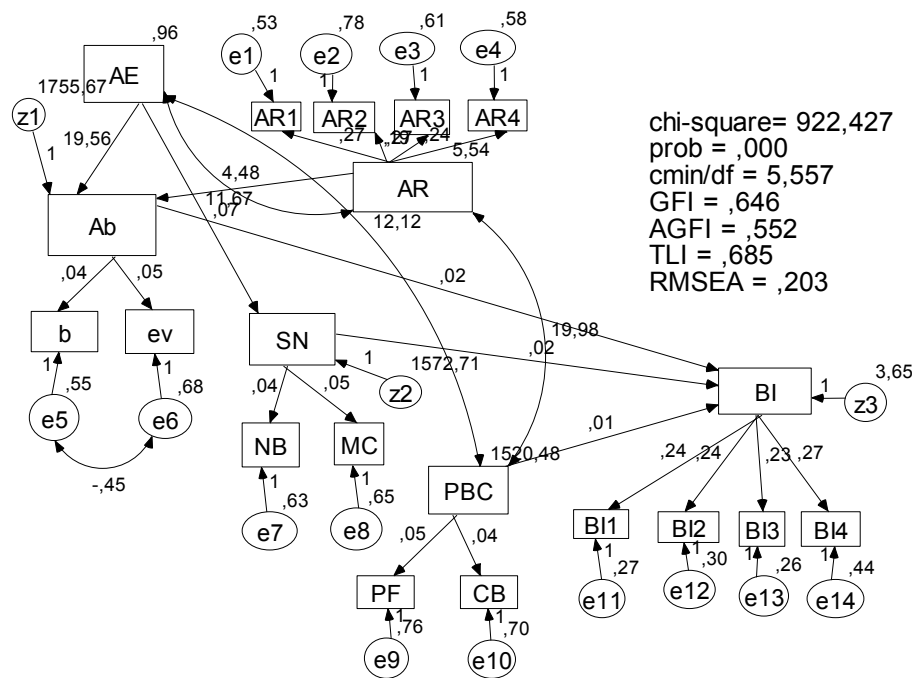Ghozali, I. (2004). *Model Persamaan Struktural: Konsep dan Aplikasi dengan Program Amos Ver 5.0*. Semarang: BP Undip.

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## Appendix

### Appendix 1. Initial SEM



chi-square= 922,427
prob = ,000
cmin/df = 5,557
GFI = ,646
AGFI = ,552
TLI = ,685
RMSEA = ,203

### Appendix 2. Observations Farthest from the Centroid (Mahalanobis Distance) (Group Number 1)

| Observation number | Mahalanobis d-squared | p1 | p2 |
|---|---|---|---|
| 1 | 111,000 | ,000 | ,000 |
| 65 | 64,831 | ,000 | ,000 |
| 21 | 63,752 | ,000 | ,000 |
| 76 | 63,752 | ,000 | ,000 |
| 28 | 60,727 | ,000 | ,000 |
| 96 | 53,733 | ,000 | ,000 |
| 3 | 46,118 | ,001 | ,000 |
| 15 | 44,600 | ,001 | ,000 |
| 4 | 43,170 | ,002 | ,000 |
| 95 | 41,399 | ,003 | ,000 |
| 107 | 39,629 | ,006 | ,000 |
| 41 | 38,779 | ,007 | ,000 |
| 12 | 36,648 | ,013 | ,000 |
| 82 | 35,400 | ,018 | ,000 |

| Observation number | Mahalanobis d-squared | p1 | p2 |
|---|---|---|---|
| 27 | 34,659 | ,022 | ,000 |
| 60 | 32,429 | ,039 | ,000 |
| 59 | 29,437 | ,080 | ,007 |
| 31 | 27,110 | ,132 | ,222 |
| 24 | 27,043 | ,134 | ,166 |
| 35 | 26,821 | ,140 | ,152 |
| 5 | 26,510 | ,150 | ,160 |
| 103 | 26,395 | ,153 | ,128 |
| 55 | 25,973 | ,167 | ,165 |
| 70 | 25,631 | ,178 | ,190 |
| 13 | 25,498 | ,183 | ,164 |
| 56 | 25,295 | ,190 | ,157 |
| 10 | 24,963 | ,203 | ,186 |
| 88 | 24,853 | ,207 | ,158 |
| 47 | 24,332 | ,228 | ,250 |
| 53 | 24,249 | ,232 | ,211 |
| 67 | 23,566 | ,262 | ,394 |
| 32 | 23,161 | ,281 | ,491 |
| 105 | 21,566 | ,365 | ,951 |
| 33 | 21,522 | ,367 | ,934 |
| 40 | 20,936 | ,401 | ,979 |
| 29 | 20,559 | ,424 | ,990 |
| 93 | 20,327 | ,438 | ,992 |
| 38 | 20,240 | ,443 | ,990 |
| 51 | 20,085 | ,453 | ,990 |
| 72 | 19,363 | ,498 | ,999 |
| 6 | 19,267 | ,505 | ,999 |
| 104 | 19,132 | ,513 | ,999 |
| 66 | 19,106 | ,515 | ,998 |
| 77 | 19,018 | ,521 | ,998 |
| 83 | 18,990 | ,522 | ,996 |
| 2 | 18,987 | ,523 | ,993 |
| 90 | 18,477 | ,556 | ,999 |

| Observation number | Mahalanobis d-squared | p1 | p2 |
|---|---|---|---|
| 46 | 18,037 | ,585 | 1,000 |
| 50 | 17,916 | ,593 | 1,000 |
| 14 | 17,890 | ,595 | ,999 |
| 58 | 17,686 | ,608 | 1,000 |
| 48 | 16,398 | ,692 | 1,000 |
| 57 | 16,394 | ,692 | 1,000 |
| 81 | 16,238 | ,702 | 1,000 |
| 74 | 15,921 | ,722 | 1,000 |
| 99 | 15,629 | ,739 | 1,000 |
| 37 | 15,625 | ,740 | 1,000 |
| 106 | 15,593 | ,742 | 1,000 |
| 75 | 15,498 | ,747 | 1,000 |
| 87 | 15,451 | ,750 | 1,000 |
| 17 | 15,401 | ,753 | 1,000 |
| 68 | 15,171 | ,767 | 1,000 |
| 94 | 14,995 | ,777 | 1,000 |
| 49 | 14,811 | ,787 | 1,000 |
| 80 | 14,799 | ,788 | 1,000 |
| 63 | 14,649 | ,796 | 1,000 |
| 102 | 14,599 | ,799 | 1,000 |
| 101 | 14,368 | ,811 | 1,000 |
| 45 | 14,331 | ,813 | 1,000 |
| 89 | 14,028 | ,829 | 1,000 |
| 36 | 14,018 | ,830 | 1,000 |
| 84 | 13,707 | ,845 | 1,000 |
| 11 | 13,634 | ,849 | 1,000 |
| 7 | 13,629 | ,849 | 1,000 |
| 25 | 13,416 | ,859 | 1,000 |
| 44 | 12,641 | ,892 | 1,000 |
| 69 | 12,641 | ,892 | 1,000 |
| 26 | 12,638 | ,892 | 1,000 |
| 100 | 12,066 | ,914 | 1,000 |
| 43 | 12,051 | ,914 | 1,000 |

| Observation number | Mahalanobis d-squared | p1 | p2 |
|---|---|---|---|
| 8 | 11,194 | ,941 | 1,000 |
| 92 | 11,109 | ,943 | 1,000 |
| 71 | 10,893 | ,949 | 1,000 |
| 97 | 10,508 | ,958 | 1,000 |
| 52 | 10,477 | ,959 | 1,000 |
| 19 | 10,402 | ,960 | 1,000 |
| 30 | 10,286 | ,963 | 1,000 |
| 20 | 10,218 | ,964 | 1,000 |
| 42 | 9,258 | ,980 | 1,000 |
| 16 | 8,965 | ,983 | 1,000 |
| 39 | 8,840 | ,985 | 1,000 |
| 54 | 8,599 | ,987 | 1,000 |
| 108 | 8,414 | ,989 | 1,000 |
| 79 | 8,200 | ,990 | 1,000 |
| 73 | 7,580 | ,994 | 1,000 |
| 98 | 7,333 | ,995 | 1,000 |
| 78 | 7,243 | ,996 | 1,000 |
| 109 | 6,999 | ,997 | 1,000 |
| 91 | 6,697 | ,998 | 1,000 |
| 61 | 6,577 | ,998 | 1,000 |

## Appendix 3. Z-SCORE

| **Descriptive Statistics** | | | | | |
|---|---|---|---|---|---|
| | N | Minimum | Maximum | Mean | Std. Deviation |
| Zscore(AE) | 112 | -3.10031 | .96091 | .0000000 | 1.00000000 |
| Zscore(AR1) | 112 | -2.62146 | 1.51380 | .0000000 | 1.00000000 |
| Zscore(AR2) | 112 | -1.56694 | 2.08925 | .0000000 | 1.00000000 |
| Zscore(AR3) | 112 | -2.83332 | 1.57406 | .0000000 | 1.00000000 |
| Zscore(AR4) | 112 | -2.90498 | 1.27968 | .0000000 | 1.00000000 |
| Zscore(AR) | 112 | -4.05821 | 2.70673 | .0000000 | 1.00000000 |
| Zscore(b1) | 112 | -1.96997 | 1.38998 | -2.1529163E-16 | 1.00000000 |
| Zscore(b2) | 112 | -2.71300 | 1.47812 | -1.4487270E-16 | 1.00000000 |

| | | | | | |
|---|---|---|---|---|---|
| Zscore(b3) | 112 | -2.18318 | 1.15113 | .0000000 | 1.00000000 |
| Zscore(b) | 112 | -2.35666 | 1.63580 | .0000000 | 1.00000000 |
| Zscore(ev1) | 112 | -2.68286 | 1.37769 | .0000000 | 1.00000000 |
| Zscore(ev2) | 112 | -2.74946 | 1.45449 | .0000000 | 1.00000000 |
| Zscore(ev3) | 112 | -2.21975 | 1.29834 | .0000000 | 1.00000000 |
| Zscore(ev) | 112 | -2.20775 | 1.64912 | .0000000 | 1.00000000 |
| Zscore(Ab) | 112 | -1.97744 | 1.99244 | .0000000 | 1.00000000 |
| Zscore(NB1) | 112 | -3.22802 | 1.59249 | -1.3896141E-15 | 1.00000000 |
| Zscore(NB2) | 112 | -2.70077 | 1.64114 | -1.0294074E-15 | 1.00000000 |
| Zscore(NB3) | 112 | -2.75263 | 1.74802 | .0000000 | 1.00000000 |
| Zscore(NB) | 112 | -3.58129 | 2.05364 | -1.3717487E-16 | 1.00000000 |
| Zscore(MC1) | 112 | -1.91645 | 1.49057 | .0000000 | 1.00000000 |
| Zscore(MC2) | 112 | -3.25126 | 1.37275 | .0000000 | 1.00000000 |
| Zscore(MC3) | 112 | -1.48560 | 1.82010 | .0000000 | 1.00000000 |
| Zscore(MC) | 112 | -2.35117 | 2.00541 | -2.2601550E-16 | 1.00000000 |
| Zscore(SN) | 112 | -2.86260 | 2.49178 | .0000000 | 1.00000000 |
| Zscore(PF1) | 112 | -3.72033 | .90941 | -1.1742841E-15 | 1.00000000 |
| Zscore(PF2) | 112 | -3.10558 | 1.50138 | -7.5403932E-16 | 1.00000000 |
| Zscore(PF3) | 112 | -2.34377 | 1.90728 | -4.0168166E-16 | 1.00000000 |
| Zscore(PF) | 112 | -3.88076 | 1.85713 | .0000000 | 1.00000000 |
| Zscore(CB1) | 112 | -2.59820 | 1.06985 | -3.1902962E-15 | 1.00000000 |
| Zscore(CB2) | 112 | -2.01890 | 1.62815 | -8.3293832E-16 | 1.00000000 |
| Zscore(CB3) | 112 | -2.44287 | 1.84892 | .0000000 | 1.00000000 |
| Zscore(CB) | 112 | -2.71984 | 2.11543 | .0000000 | 1.00000000 |
| Zscore(PBC) | 112 | -2.51454 | 2.54053 | -7.4558275E-17 | 1.00000000 |
| Zscore(BI1) | 112 | -3.41551 | 1.56869 | -3.4337064E-16 | 1.00000000 |
| Zscore(BI2) | 112 | -2.07084 | 1.57210 | .0000000 | 1.00000000 |
| Zscore(BI3) | 112 | -2.67441 | 1.11716 | -2.5150896E-15 | 1.00000000 |
| Zscore(BI4) | 112 | -2.65744 | 1.51987 | -9.9782980E-16 | 1.00000000 |
| Zscore(BI) | 112 | -2.76612 | 1.92790 | -2.6997041E-15 | 1.00000000 |
| Valid N (listwise) | 112 | | | | |

## Appendix 4. Sample Covariances (Group Number 1)

| | PBC | AE | AR | Ab | SN | BI | CB | PF | ev | BI4 | BI3 | BI2 | BI1 | MC | NB | AR4 | AR3 | AR2 | AR1 | b |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PBC | 1520,482 | | | | | | | | | | | | | | | | | | | |
| AE | 12,117 | ,961 | | | | | | | | | | | | | | | | | | |
| AR | 19,983 | ,066 | 5,544 | | | | | | | | | | | | | | | | | |
| Ab | 674,394 | 19,099 | 26,138 | 2246,337 | | | | | | | | | | | | | | | | |
| SN | 832,073 | 11,222 | 7,937 | 1187,777 | 1703,697 | | | | | | | | | | | | | | | |
| BI | 46,822 | ,675 | ,386 | 67,829 | 60,451 | 6,477 | | | | | | | | | | | | | | |
| CB | 64,514 | ,684 | ,293 | 36,250 | 45,921 | 2,746 | 3,434 | | | | | | | | | | | | | |
| PF | 73,756 | ,440 | 1,243 | 24,510 | 31,384 | 1,688 | 2,520 | 4,335 | | | | | | | | | | | | |
| ev | 30,631 | ,885 | ,990 | 102,960 | 56,217 | 3,159 | 1,562 | 1,295 | 5,397 | | | | | | | | | | | |
| BI4 | 9,143 | ,239 | ,022 | 15,440 | 14,742 | 1,747 | ,653 | ,214 | ,676 | ,909 | | | | | | | | | | |
| BI3 | 12,309 | ,244 | ,207 | 17,492 | 12,001 | 1,518 | ,707 | ,424 | ,786 | ,294 | ,620 | | | | | | | | | |
| BI2 | 13,805 | ,060 | ,176 | 19,319 | 18,801 | 1,548 | ,715 | ,597 | ,929 | ,250 | ,311 | ,672 | | | | | | | | |
| BI1 | 12,225 | ,130 | ,030 | 16,073 | 15,705 | 1,554 | ,704 | ,485 | ,798 | ,311 | ,289 | ,325 | ,638 | | | | | | | |
| MC | 33,740 | ,490 | ,184 | 52,735 | 78,107 | 2,733 | 1,964 | 1,097 | 2,540 | ,747 | ,508 | ,735 | ,784 | 4,230 | | | | | | |
| NB | 38,183 | ,447 | ,389 | 53,224 | 73,185 | 2,581 | 1,983 | 1,653 | 2,573 | ,523 | ,510 | ,953 | ,632 | 2,811 | 3,777 | | | | | |
| AR4 | 11,395 | ,173 | 1,348 | 13,407 | 4,930 | ,373 | ,434 | ,517 | ,427 | ,086 | ,178 | ,104 | ,049 | ,138 | ,284 | ,906 | | | | |
| AR3 | 8,496 | ,023 | 1,060 | 5,222 | 1,607 | ,129 | ,268 | ,398 | ,163 | -,008 | ,121 | ,106 | -,075 | ,010 | ,059 | ,190 | ,816 | | | |
| AR2 | -1,610 | -,074 | 1,501 | 5,693 | -,705 | ,047 | -,196 | ,033 | ,320 | -,050 | -,003 | ,014 | ,060 | -,077 | -,020 | ,142 | -,114 | 1,186 | | |
| AR1 | 4,130 | -,020 | 1,492 | 7,281 | 4,355 | ,051 | -,069 | ,366 | ,329 | ,030 | ,018 | ,024 | -,004 | ,219 | ,174 | ,111 | ,239 | ,287 | ,927 | |
| b | 29,927 | ,814 | 1,224 | 100,402 | 52,607 | 3,031 | 1,686 | ,991 | 4,149 | ,705 | ,812 | ,869 | ,670 | 2,321 | 2,360 | ,739 | ,223 | ,196 | ,279 | 5,036 |

*Note*. Condition number=143039,807.

Eigenvalues

3718,823     1136,082     642,633     6,541     4,399     1,559     1,256

1,041 ,869 ,739 ,633 ,480 ,417 ,285 ,248 ,160 ,085 ,063 ,040 ,026

Determinant of sample covariance matrix=835,553

**Appendix 5. Assessment of Normality (Group Number 1)**

| Variable | min | max | skew | c.r. | kurtosis | c.r. |
|----------|-----|-----|------|------|----------|------|
| PBC | 27,000 | 225,000 | ,029 | ,123 | -,120 | -,259 |
| AE | 1,000 | 5,000 | -1,073 | -4,637 | ,462 | ,999 |
| AR | 4,000 | 20,000 | -,647 | -2,794 | 1,616 | 3,492 |
| Ab | 36,000 | 225,000 | ,109 | ,471 | -,524 | -1,133 |
| SN | 3,000 | 225,000 | ,240 | 1,039 | ,625 | 1,351 |
| BI | 8,000 | 20,000 | -,363 | -1,567 | ,089 | ,193 |
| CB | 6,000 | 15,000 | -,369 | -1,595 | ,215 | ,465 |
| PF | 3,000 | 15,000 | -,736 | -3,181 | 1,425 | 3,079 |
| ev | 6,000 | 15,000 | -,432 | -1,867 | -,328 | -,708 |
| BI4 | 1,000 | 5,000 | -,592 | -2,556 | -,307 | -,664 |
| BI3 | 2,000 | 5,000 | -,975 | -4,213 | 1,039 | 2,244 |
| BI2 | 2,000 | 5,000 | -,577 | -2,492 | -,095 | -,205 |
| BI1 | 1,000 | 5,000 | -,867 | -3,746 | ,910 | 1,967 |
| MC | 6,000 | 15,000 | -,165 | -,712 | -,094 | -,203 |
| NB | 4,000 | 15,000 | -,615 | -2,658 | 1,220 | 2,634 |
| AR4 | 1,000 | 5,000 | -,910 | -3,932 | ,375 | ,811 |
| AR3 | 1,000 | 5,000 | -1,085 | -4,688 | ,186 | ,402 |
| AR2 | 1,000 | 5,000 | ,460 | 1,985 | -,892 | -1,928 |
| AR1 | 1,000 | 5,000 | -,701 | -3,030 | -,360 | -,778 |
| b | 6,000 | 15,000 | -,369 | -1,595 | -,229 | -,495 |
| Multivariate | | | | | 216,362 | 38,594 |