

TRANSFORMATIONAL & TRANSACTIONAL LEADERSHIP STYLE MEASURED BY STRUCTURE EQUATION MODELLING (SEM)

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Abstract

The construction industry is one of the leading industries in which various sectors are interrelated. Any organization requires well developed and skilled leaders to be sustainable in the industry. A strong leadership style is imperative for the success of every organization and the performance of the industry largely depends on the skills of the leaders and their management tactics. This paper discusses the influence of different leadership styles on the performance of the construction industry and the various factors affecting those leadership styles. Data was collected from middle managers working in large construction companies in UAE. SEM was used to analyse the data. The findings show that Transformational leadership style has a positive outcome on Extra Effort, Satisfaction and Effectiveness of the Organization. The direct path coefficient between Transformational Leadership style and Outcome are highly correlated and statistically significant.

Keywords: Transformational leadership, Transactional leadership, SEM, UAE, Construction

1. Introduction

As increasing demands are made on all organizations to improve their performance, to anticipate change and develop new structures, effective leadership performance may be essential to ensure that change leads to increased effectiveness, efficiency and profitability (Pittaway *et al.*, 1998; Zhao and Merna, 1992). Lowe *et al.* (1996) found that individuals, who exhibited transformational leadership were perceived to be more effective leaders with better work outcomes than were individuals who exhibited only transactional leadership. Also, the subordinates' satisfaction with their supervision in organizations has been found to be related to the leadership behavior used by managers (Rahim, 1989).

This paper begins with a brief introduction to transformational and transactional leadership style will be highlighted. Then, Structural Equation Modelling (SEM) to conduct a simultaneous test of the entire system of variables in the hypothesized model to determine the extent to which it is consistent with the data (Byrne, 1994) were applied. The maximum likelihood estimation technique was used to estimate the models because this technique has generally been found to generate reliable results even in situations where the data may violate the assumptions of SEM such as normal distribution and large sample size (Chou & Benter, 1995). Following the introduction, the measurement model will be explained. Then, an assessment of the structural model 1 will be presented that is the impact of transformational leadership on the outcome of which will include Conceptual Model to be tested, Pathway Coefficient for the structured model, Model estimation and hypotheses testing. Similarly, assessment of the structured model 2 will presented that will address the impact of transactional leadership on the outcome going through the same tests. The following section is a brief introduction about transformational and transactional leadership style.

2. Transformational & Transactional Leadership Style

Transformational leadership is related to inspiring associates to perform over and above their initial expectations. This expectation is linked to an initial level of confidence or efficacy in the associates' perceived ability and motivation. Thus, associates' perceptions of self-efficacy or confidence, as well as their developmental potential, are enhanced through the transformational leadership process. Transformational leadership transforms goals and objectives in order to develop others into leaders and/or a collective leadership group, such as in self-directed teams (Avolio, Bass, & Jung, 1996). They shift from being purely transactional to being transformational because of a developmental orientation. The process of transforming associates does not merely empower them or delegate to them the responsibility for fulfilling a goal, but rather, it develops their capability to determine their own course of action, if they lack that ability.

Transactional leadership can be attributed in various forms. In its constructive form, transactional leadership is enhanced by working with individuals or groups, establishing and defining agreements or contracts to achieve specific work objectives, learning individuals' abilities and outlining the expectations in compensation and rewards once assigned tasks are successfully completed. In terms of corrective form, transactional leadership is direct towards actively establishing standards. In its passive form, transactional leadership involves waiting for mistakes to happen before an action is taken while in its active form, transactional leadership closely monitors the occurrence of errors and both forms focuses on identifying mistakes (Bass, 1985).

3. Measurement Model

The methodology used to test the congeneric models is the strictly confirmatory approach (Joreskog and Sorbom, 1993). This form of confirmatory test is considered the most rigorous, since the focus is on accepting or rejecting a given model. In this approach, the researcher uses data to either accept or reject a single a priori measurement model. Similar to the present study, a priori model may be derived from a combination of both theory and data (Joreskog and Sorbom, 1993). The co-variance matrix and parameter estimates from the items in each a priori dimension were obtained using LISREL (8) and the maximum likelihood method is used to test the model fit in order to analyse each congeneric model (Joreskog and Sorbom, 1989). The maximum likelihood method of estimation with medium to large samples, even with any violations of the multinormality assumptions of the model, has been shown to be relatively robust (Tabachnick and Fidell, 2001). The statistics used to evaluate model fit are parameter estimates (Lambda), t-values and goodness of fit indices. The Lambda coefficients indicate the loading of the latent variable on the items. The associated t-values indicate whether or not a Lambda coefficient is significantly different from zero (Byrne, 1994). T-values greater than 2.00 are regarded to be statistically significant (Byrne, 1994). The goodness of fit indices used in this study is measures of incremental fit. Incremental fit indices test the incremental fit of each a priori model over that of a null **model**. Thus, incremental fit indices provide measures of the proportional improvement in the fit of a substantive model relative to a null model. The null model specifies zero or null covariance among the manifest variables (manifest variables in the present study are the items in each dimension) and is the most widely accepted form of the null model (Widaman and Thompson, 2003). The model being tested hypothesises that the covariance among the items significantly differs from zero (Widaman and Thompson, 2003). The commonly used incremental fit indices are relatively independent of the sample size. Thus, they are appropriate goodness of fit measures for smaller to medium samples (Widaman and Thompson, 2003). The model fit was estimated using the Comparative Fit Index (CFI), the

Incremental Fit Index (IFI) and the Root Mean Square Residual (RMSR) (Bentler, 1990; Bollen, 1989; Pedhazur and Pedhazur-Schmelkin, 1991). The CFI is the index of choice for model fit where the sample size is relatively small (Bentler, 1990). The IFI was also developed to take into account the issue of small sample size (Bollen, 1989). CFI and IFI values greater than 0.9 are generally accepted as indicating a good model fit (Bollen, 1989). The value of the Root Mean Square Residual (RMSR) is interpreted in relation to the sizes of the observed variances and co-variances, with obtained RMSR values indicating the average discrepancy between the samples observed and hypothesized correlation matrices (Hu and Bentler, 1998). A RMSR value of 0.05 or less indicates a good fit (Byrne, 1998) with values between 0.05 and 0.08 indicating an acceptable fit (Hu and Bentler, 1998). The standardised measure of RMSR will be used for ease of comparison across scales.

3.1 Assessment of the Structural Model 1: Impact of Transformational Leadership on Outcome

Table 1: Parameter Estimates λ , λ error, t-values, and R2 for Pathways defined in the structural model

| <i>Pathways from Scale variables to Latent Constructs</i> | <i>A (β)</i> | <i>λ error</i> | <i>t-value</i> | <i>R²</i> |
|--|-------------------------------|-----------------------------------|----------------|----------------------|
| Transformational Leadership Latent Construct | | | | |
| Influ_A → TRANSFORMATION | 0.44 | 0.23 | 14.31 | 0.45 |
| Influ_B → TRANSFORMATION | 0.40 | 0.16 | 15.44 | 0.51 |
| Ins_Moti → TRANSFORMATION | 0.45 | 0.10 | 18.71 | 0.67 |
| Ins_Stim → TRANSFORMATION | 0.43 | 0.14 | 16.75 | 0.57 |
| Ind_Cons → TRANSFORMATION | 0.38 | 0.24 | 12.70 | 0.38 |
| Outcome Latent Construct | | | | |
| Ex_effort → Outcome | 0.44 | 0.22 | 14.65 | 0.47 |
| Satisfaction → Outcome | 0.47 | 0.16 | 16.90 | 0.59 |
| Effectiveness → Outcome | 0.54 | 0.092 | 20.16 | 0.76 |
| Pathways between Latent Constructs (TRANSFORM vs OUTCOME) | | | | |
| TRANSFORMATION → OUTCOME | 0.81 | 0.03 | 28.63 | |
| Goodness of Fit Statistics: Degrees of Freedom = 19, Squares Chi-Square = 35.80 (P = 0.011), (RMSEA) = 0.047, 90 Percent Confidence Interval for RMSEA = (0.022 ; 0.071), P-Value for Test of Close Fit (RMSEA < 0.05) = 0.54; Normed Fit Index (NFI) = 0.99; Comparative Fit Index (CFI) = 0.99; Incremental Fit Index (IFI) = 0.99; Critical N (CN) = 399.49; Root Mean Square Residual (RMR) = 0.0094; Goodness of Fit Index (GFI) = 0.98; Adjusted Goodness of Fit Index (AGFI) = 0.96 | | | | |

3.2 Assessment of the Structural Model 1: Impact of Transformational Leadership on Outcome

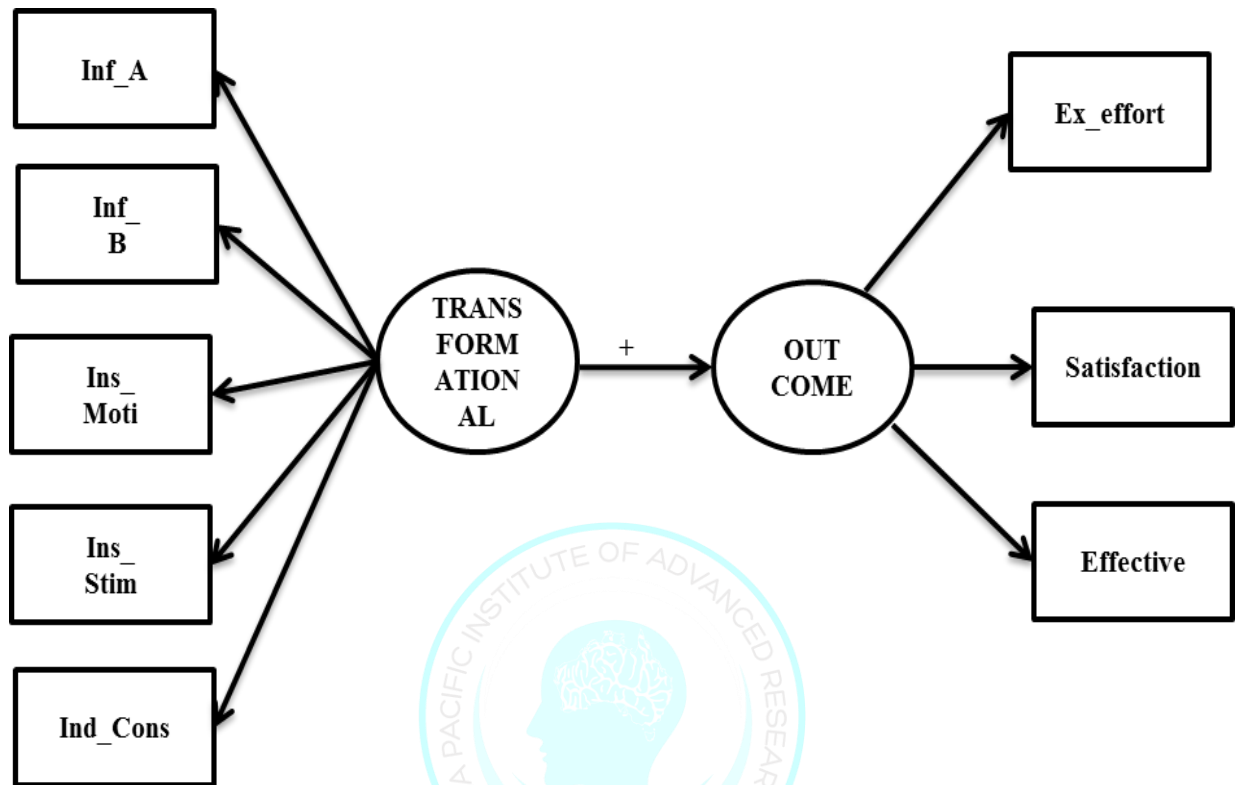


Figure 1: Conceptual Model to be tested

Summary of the Conceptual Model:

Transformational leadership style is based on five factors. Those factors are Idealized Influence (Attributed aspect), Idealized Influence (Behavior aspect), Inspirational Motivation, Intellectual Stimulation and Individual Consideration. Bass and Avolio (1990), Bryman (1992) and Lowe *et al.* (1996) have confirmed that each of those factors are positively contributed toward transformational leadership style. The outcome latent construct is measured by Extra Effort, Satisfaction, and Effectiveness (Howell and Avolio, 1993; Tracey and Hinkin 1996). The following section presents details on the nature of relationship found in this study.

3.3 Assessment of the Structural Model 1: Impact of Transformational Leadership on Outcome

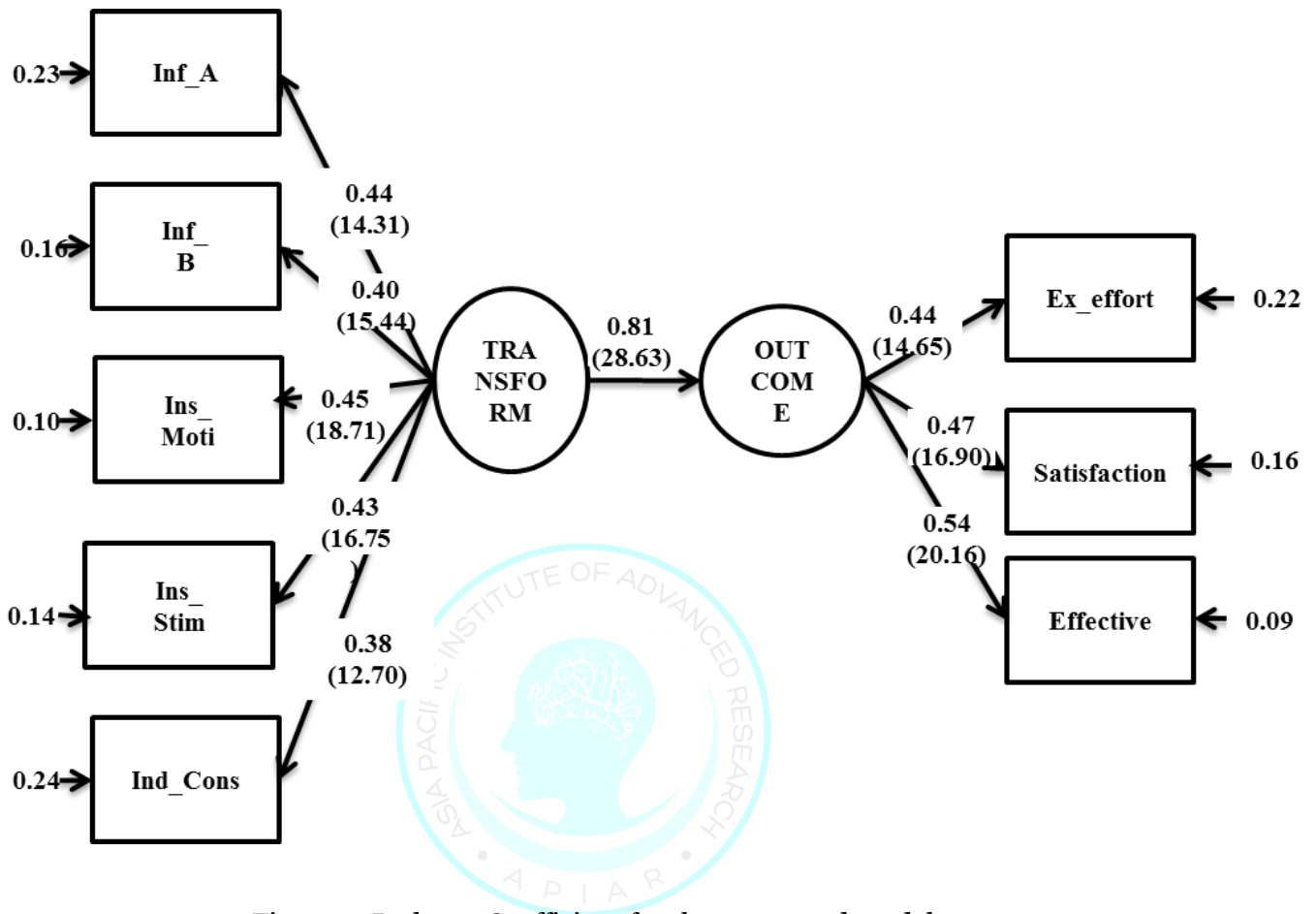


Figure 2: Pathway Coefficient for the structured model

For Transformational Leadership structural model, absolute fit indices determine how well the prior model fits the data. Degrees of Freedom = 19, Squares Chi-Square = 35.80 and $p < .011$, RMSR = 0.047 ($< .05$), GFI = 0.98, AGFI = 0.96 demonstrate that model is a good fit to data. Moreover, incremental fit statistics (NFI = 0.99, CFI = 0.99, IFI = 0.99, and RMR = .009) also indicate that Transformational Leadership model is a good fit to the data. The direct path coefficient between Transformational Leadership style and Outcome are highly correlated and statistically significant ($\beta = 0.81$, $t\text{-value} = 28.63$). That means transformational style of leadership has a positive influence on achieving successful outcome of the organization. This finding is consistent with previous research suggesting that transformational leadership is positively correlated with subordinate satisfaction, commitment and performance (Bass and Avolio, 1990; Loweet *al.*, 1996; Bass, 1998).

As shown in the table, the direct path coefficient between Idealized Influence (Attributed aspect) and Transformational leadership style latent construct indicates that Transformational leadership style is significantly and positively ($\beta = 0.44$, $t\text{-value} = 14.31$) affected by Idealized Influence (Attributed aspect). Furthermore, Idealized Influence (Attributed aspect) explains 45% of the variance of Transformational leadership latent construct. More specifically, idealized

Influence (Attributed aspect) helps to promote Transformational leadership among managers which is concurring with literature (Bryman, 1992).

Table 1 shows that the direct path coefficient between Idealized Influence (Behaviour aspect) and Transformational leadership style latent construct are also positive and statistically significant. It means that Idealized Influence (Behaviour aspect) is significantly and positively ($\beta=0.40$, $t\text{-value}=15.44$) contributed to Transformational leadership style that is in line with literature (Howell and Avolio, 1993). Furthermore, Idealized Influence (Behaviour aspect) explains 51% of the variance of Transformational leadership latent construct. More specifically, Idealized Influence (Behaviour aspect) helps to promote Transformational leadership among managers (Howell and Avolio, 1993). In addition and as shown in the table, the direct path coefficient between Inspirational Motivation and Transformational leadership style latent construct indicates that Transformational leadership style is significantly and positively ($\beta=0.45$, $t\text{-value}=18.71$) influenced by Inspirational Motivation. Moreover, Inspirational Motivation explains 67% of the variance of Transformational leadership latent construct. As highlighted by Tracey and Hinkin (1996), Inspirational Motivation is the most influential factor that promoting Transformational leadership among managers.

Table 1 shows that the direct path coefficient between Intellectual Stimulation and Transformational leadership style latent construct are also positive and statistically significant. It means that Intellectual Stimulation has significantly and positively ($\beta=0.43$, $t\text{-value}=16.75$) contributed to Transformational leadership style. This finding is consistent with previous research suggesting that transformational leadership is positively correlated with subordinate satisfaction, commitment and performance (Bass and Avolio, 1990; Loweet *al.*, 1996; Bass, 1998). Furthermore, Intellectual Stimulation explains 57% of the variance of Transformational leadership latent construct. More specifically, Intellectual Stimulation helps to promote Transformational leadership among managers. Finally, as shown in Table, the direct path coefficient between Individual Consideration and Transformational leadership style latent construct indicates that Transformational leadership style is significantly and positively ($\beta=0.38$, $t\text{-value}=12.70$) influenced by Individual Consideration. Moreover, Individual Consideration explains 38% of the variance of Transformational leadership latent construct. However, Individual Consideration is the least influential factor that promoting Transformational leadership among managers that contradicts with what has been highlighted in literature by Zhao and Merna (1992).

The table below highlights the outcome of latent constructs:

Table 2: Assessment of Outcome Latent Construct Covariance Matrix:

| | Influ_A | Influ_B | Ins_Moti | Int_Stim | Ind_Con | Ex_Effor | Satisfac | Effectiv |
|----------|---------|---------|----------|----------|---------|----------|----------|----------|
| Influ_A | 0.43 | | | | | | | |
| Influ_B | 0.20 | 0.32 | | | | | | |
| Ins_Moti | 0.19 | 0.18 | 0.30 | | | | | |
| Int_Stim | 0.18 | 0.16 | 0.20 | 0.32 | | | | |
| Ind_Cons | 0.19 | 0.16 | 0.16 | 0.15 | 0.39 | | | |
| Ex_Effor | 0.16 | 0.12 | 0.16 | 0.15 | 0.13 | 0.41 | | |
| Satisfac | 0.17 | 0.15 | 0.17 | 0.17 | 0.14 | 0.22 | 0.38 | |
| Effectiv | 0.18 | 0.17 | 0.20 | 0.19 | 0.19 | 0.24 | 0.25 | 0.38 |

4.0 Assessment of the Structural Model 2: Impact of Transactional Leadership on Outcome

Table 3 Parameter Estimates λ , λ error, t-values, and R^2 for Pathways defined in the structural model:

| <i>Pathways from Scale variables to Latent Constructs</i> | <i>λ (β)</i> | <i>λ error</i> | <i>t-value</i> | <i>R^2</i> |
|---|--|-----------------------------------|----------------|-------------------------|
| Transactional Leadership Latent Construct | | | | |
| Con_Rew → TRANSACTIONAL | 0.43 | 0.18 | 12.08 | 0.51 |
| MOE_Pass → TRANSACTIONAL | - 0.13 | 0.68 | -2.81 | 0.026 |
| Laiss_Fa → TRANSACTIONAL | - 0.34 | 0.61 | -7.06 | 0.16 |
| MOE_Acti → TRANSACTIONAL | 0.27 | 0.52 | 6.17 | 0.12 |
| Outcome Latent Construct | | | | |
| Ex_effort → Outcome | 0.44 | 0.22 | 14.65 | 0.47 |
| Satisfaction → Outcome | 0.47 | 0.16 | 16.52 | 0.58 |
| Effectiveness → Outcome | 0.55 | 0.087 | 20.08 | 0.77 |
| Pathways between Latent Constructs (TRANSFORM vs OUTCOME) | | | | |
| TRANSFORMATION → OUTCOME | 0.87 | 0.05 | 16.89 | |
| Goodness of Fit Statistics: Degrees of Freedom = 13, Squares Chi-Square =204.70 (P = 0.0), (RMSEA) = 0.19, 90 Percent Confidence Interval for RMSEA = (0.17 ; 0.22), P-Value for Test of Close Fit (RMSEA < 0.05) = 0.00; Normed Fit Index (NFI) = 0.80; Comparative Fit Index (CFI) = 0.81; Incremental Fit Index (IFI) = 0.81; Critical N (CN) = 51.75; Root Mean Square Residual (RMR) = 0.079; Goodness of Fit Index (GFI) = 0.87; Adjusted Goodness of Fit Index (AGFI) = 0.72 | | | | |

4.1 Assessment of the Structural Model 2: Impact of Transactional Leadership on Outcome

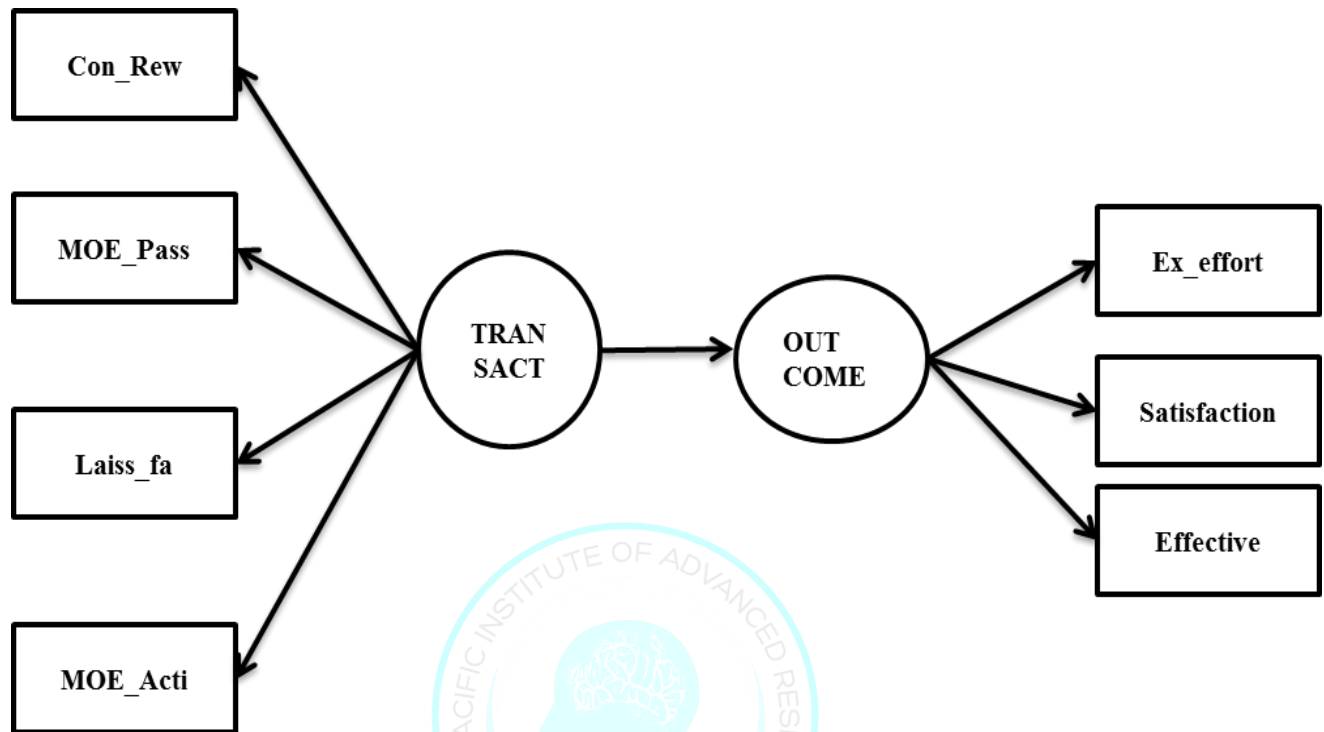


Figure 3: Conceptual Model to be tested

Summary of the Conceptual Model:

Transactional leadership style is based on four factors. Those factors are Contingent Reward, Management by Exception (Passive), Laissez-faire Leadership and Management by Exception (Active). Bass and Avolio (1990), Bryman (1992) and Lowe *et al.* (1996) have confirmed that each of those factors are positively contributed toward transformational leadership style. The outcome latent construct is measured by Extra Effort, Satisfaction, and Effectiveness (Howell and Avolio, 1993; Tracey and Hinkin 1996). Following section presents details on the nature of relationship found in this study.

4.2 Assessment of the Structural Model 2: Impact of Transactional Leadership on Outcome

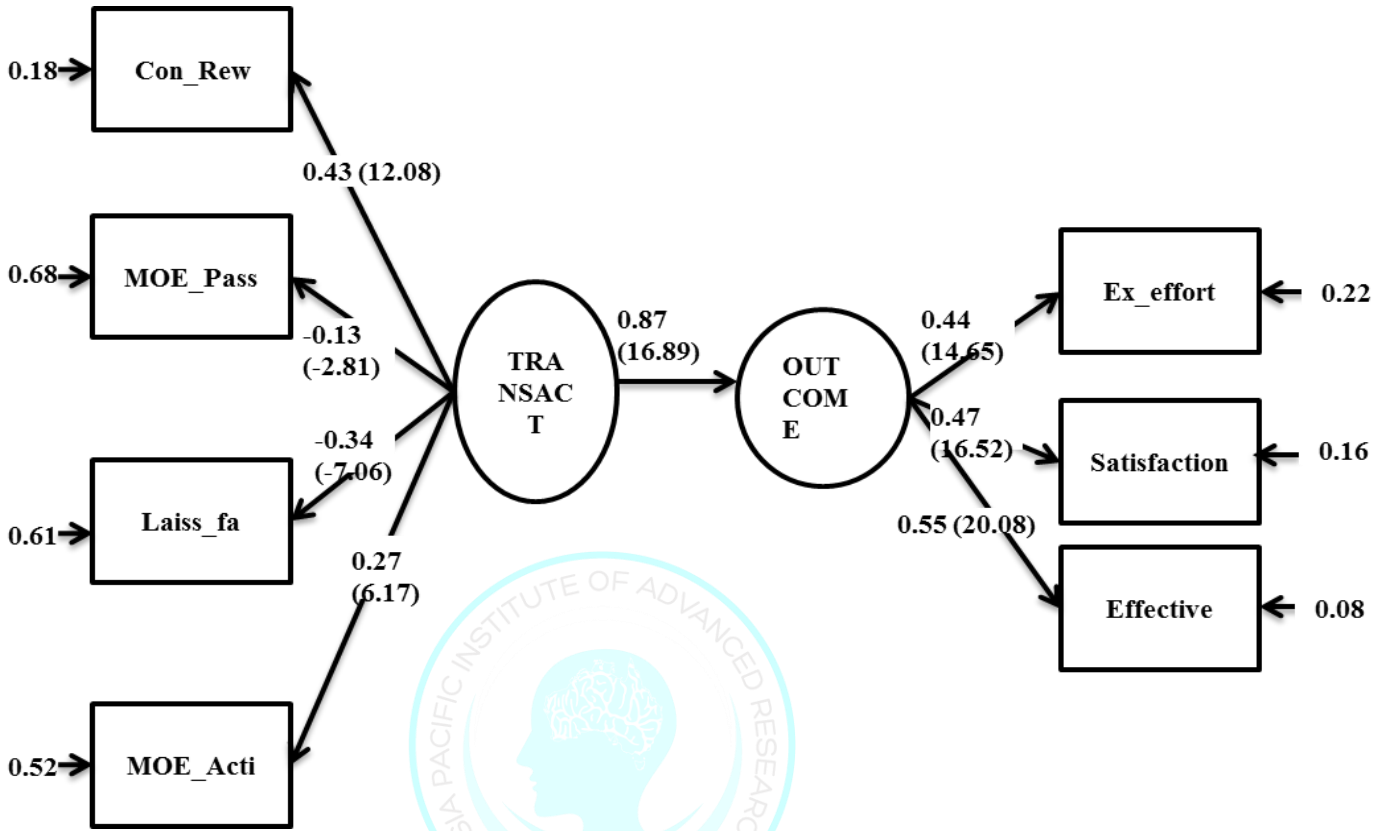


Figure 4: Pathway Coefficient for the structured model

For the Transactional Leadership structural model, absolute fit indices determine how well the prior model fits the data. Degrees of Freedom = 13, Squares Chi-Square = 204.70 and $p < .00$, RMSR = 0.19, GFI = 0.87, AGFI = 0.72 demonstrate that model is not a good fit to data. Moreover, incremental fit statistics (NFI = 0.80, CFI = 0.81, IFI = 0.81, and RMR = .079) also indicate that Transactional Leadership model is failed to prove an acceptable fit to the data. However, the direct path coefficient between Transactional Leadership style and Outcome are highly correlated and statistically significant ($\beta = 0.87$, $t\text{-value} = 16.89$). That means that the Transactional style of leadership has a positive influence on achieving successful outcome of the organization. This finding is consistent with previous research suggesting that transformational leadership is positively correlated with subordinate satisfaction, commitment and performance (Bass and Avolio, 1990; Lowe *et al.*, 1996; Bass, 1998). As shown in the Table, the direct path coefficient between Contingent Reward and Transactional leadership style latent construct indicates that Transactional leadership style is significantly and positively ($\beta = 0.43$, $t\text{-value} = 12.08$) affected by Contingent Reward. Furthermore, Contingent Reward explains 51% of the variance of Transactional leadership latent construct. More specifically, Contingent Reward helps to promote Transactional leadership among manager that is remarkably concurring with literature (Bryman, 1992). Contingent Reward is the most significant factor for Transactional leadership practices (Howell and Avolio, 1993). As shown in Table, the direct path coefficient between Management by Exception (Passive) and

Transactional leadership style latent construct indicates that Transactional leadership style is negatively but significantly ($\beta=-0.13$, $t\text{-value}=-2.81$) affected by Management by Exception (Passive) that is not in line with literature and research of Howell and Avolio (1993). Furthermore, Management by Exception (Passive) explains only 2.6% of the variance of Transactional leadership latent construct. More specifically, Management by Exception (Passive) has a very weak relationship with transactional leadership practices and explains very marginal variance of it. In other words, this study found that Management-by-Exception (Passive) is not an appropriate leadership tool rather more management tool of which is in line with literature (Howell and Avolio, 1993).

As shown in Table, the direct path coefficient between Laissez faire Leadership and Transactional leadership style latent construct indicates that Laissez faire Leadership influences Transactional leadership style negatively but in a significantly ($\beta=-0.34$, $t\text{-value}=-7.06$) way. Furthermore, Laissez faire Leadership explains only 16% of the variance of Transactional leadership latent construct. In other words, this study found that Laissez-faire Leadership is not an appropriate leadership tool rather more management tool. Such a finding is concurring with literature of which highlighted that Laissez-faire Leadership has the highest negative relationship between income and organization commitment (Pittawayet *al.*, 1998; Zhao and Merna, 1992).

As shown in the Table, the direct path coefficient between Management by Exception (Active) and Transactional leadership style latent construct indicates that Transactional leadership style is significantly and positively ($\beta=0.27$, $t\text{-value}=6.17$) affected by Management by Exception (Active). However, Management by Exception (Active) explains only 12% of the variance of Transactional leadership latent construct. More specifically, Management by Exception (Active) helps to promote Transactional leadership among managers, which is in line with what Loweet *al.* (1996) highlighted in his research. The table below highlights the outcome of latent constructs:

Table 4: Assessment of Outcome Latent Construct (Covariance Matrix)

| | Con_Rewa | MOE_Pass | Laiss_fa | MOE_Acti | Ex_Effor | Satisfac | Effectiv |
|----------|----------|----------|----------|----------|----------|----------|----------|
| Con_Rewa | 0.36 | | | | | | |
| MOE_Pass | -0.04 | 0.69 | | | | | |
| Laiss_fa | -0.18 | 0.39 | 0.72 | | | | |
| MOE_Acti | 0.11 | 0.11 | 0.07 | 0.59 | | | |
| Ex_Effor | 0.16 | -0.02 | -0.05 | 0.13 | 0.41 | | |
| Satisfac | 0.16 | -0.04 | -0.13 | 0.16 | 0.22 | 0.38 | |
| Effectiv | 0.21 | -0.05 | -0.16 | 0.16 | 0.24 | 0.25 | |

Conclusion

In conclusion, Idealized Influence (Attributed aspect), Idealized Influence (Behaviour aspect), Inspirational Motivation, Intellectual Stimulation and Individual Considerations are positively contributing toward transformational leadership style. In addition, Transformational leadership style has positive outcome on Extra Effort, Satisfaction and Effectiveness of the Organization. The direct path coefficient between Transformational Leadership style and Outcome are highly correlated and statistically significant ($\beta=0.81$, $t\text{-value}=28.63$). Moreover, incremental fit statistics (NFI= 0.99, CFI= 0.99, IFI= 0.99, and RMR= .009) also indicate that the Transformational Leadership model is a good fit to the data. On the other hand, Contingent Reward and Management by Exception (Active) are positively correlated with transactional leadership style while Management by Exception (Passive) and Laissez-faire Leadership are negatively correlated with transactional leadership style. Also, transformational leadership style has positive outcome on Extra Effort, Satisfaction and Effectiveness of the Organization. Structural model with a Degrees of Freedom = 13, Squares Chi-Square = 204.70 and $p < .00$, RMSR = 0.19, GFI= 0.87, AGFI = 0.72 demonstrate that model is not a good fit to data. Moreover, incremental fit statistics (NFI= 0.80, CFI= 0.81, IFI= 0.81, and RMR= .079) also indicate that Transactional Leadership model is failed to prove an acceptable fit to the data. However, the direct path coefficient between Transactional Leadership style and Outcome are highly correlated and statistically significant ($\beta=0.87$, $t\text{-value}=16.89$).



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