REMark – Revista Brasileira de Marketing
e-ISSN: 2177-5184
DOI: 10.5585/remark.v13i2.2718
Data de recebimento: 09/01/2014
Data de Aceite: 14/03/2014
Editor Científico: Otávio Bandeira De Lamônica Freire
Avaliação: Double Blind Review pelo SEER/OJS
Revisão: Gramatical, normativa e de formatação

AMOS COVARIANCE-BASED STRUCTURAL EQUATION MODELING (CB-SEM): GUIDELINES ON ITS APPLICATION AS A MARKETING RESEARCH TOOL

ABSTRACT

Structural equation modeling (SEM) is increasingly a method of choice for concept and theory development in the social sciences, particularly the marketing discipline. In marketing research there increasingly is a need to assess complex multiple latent constructs and relationships. Second-order constructs can be modeled providing an improved theoretical understanding of relationships as well as parsimony. SEM in particular is well suited to investigating complex relationships among multiple constructs. The two most prevalent SEM based analytical methods are covariance-based SEM (CB-SEM) and variance-based SEM (PLS-SEM). While each technique has advantages and limitations, in this article we focus on CB-SEM with AMOS to illustrate its application in examining the relationships between customer orientation, employee orientation, and firm performance. We also demonstrate how higher-order constructs are useful in modeling both responsive and proactive components of customer and employee orientation.

Keywords: Structural Equation Modeling (SEM); Covariance-Based SEM; AMOS; Marketing Research.

MODELAGEM DE EQUAÇÕES ESTRUTURAIS BASEADA EM COVARIÂNCIA (CB-SEM) COM O AMOS: ORIENTAÇÕES SOBRE A SUA APLICAÇÃO COMO UMA FERRAMENTA DE PESQUISA DE MARKETING

RESUMO

A modelagem de equações estruturais (*Structural Equation Modeling* -SEM) é cada vez mais usada como um método para a conceituação e desenvolvimento de aspectos teóricos nas ciências sociais aplicadas, em particular na área de marketing, pois mais e mais há a necessidade de avaliar vários constructos e relações latentes complexas. Também, constructos de segunda ordem podem ser modelados fornecendo uma melhor compreensão teórica de relações com boa parcimônia. Modelagens do tipo SEM são, em particular, bem adequadas para investigar as relações complexas entre os vários constructos. Os dois métodos analíticos SEM mais prevalentes são os baseados em covariância SEM (CB-SEM) e os baseados em variância SEM (PLS-SEM). Embora cada técnica tenha suas vantagens e limitações, neste artigo vamos nos concentrar no CB-SEM com o AMOS para ilustrar sua aplicação na análise das relações entre orientação para o cliente, a orientação para os funcionários e desempenho da empresa. Também será demonstrado como constructos de segunda ordem são úteis para modelar os componentes de pró-atividade e responsividade dessas relações.

Palavras-chave: Modelagem de Equações Estruturais (SEM); Baseado em Covariância SEM; AMOS; Pesquisa de Marketing.

Joseph F. Hair Jr.[1]
Marcelo L. D. S. Gabriel[2]
Vijay K. Patel[3]

[1] Doutor em Administração pela Universidade da Flórida. Professor do Colles College of Business Kennesaw State University. **jhair3@kennesaw.edu**

[2] Doutor em Educação pela Universidade Estadual de Campinas - UNICAMP. Professor do Programa de Pós-Graduação em Administração – PPGA da Universidade Nove de Julho – UNINOVE, São Paulo, Brasil. E-mail: **marcelo.gabriel@uninove.br**

[3] Doutor em Administração pela Kennesaw State University. Consultor Internacional.

1 STRUCTURAL EQUATION MODELING

Structural equation modeling (SEM), a second-generation statistical method, is a widely used analytical tool in marketing research (Babin, Hair & Boles, 2008). Over the past three decades, SEM based research and analysis has increasingly been applied in the social sciences, and particularly marketing, as user-friendly software has become available (Chin, Peterson & Brown, 2008; Hair, Hult, Ringle & Sarstedt, 2014). Interestingly, Babin et al. (2008) indicate SEM-based research enjoys an advantage in the review process in top marketing journals. Moreover, Hair, Sarstedt, Ringle & Mena (2012) demonstrated that PLS-SEM based articles in 30 top ranked marketing journals have increased exponentially in recent years, suggesting the applicability and versatility of both covariance and partial least squares SEM techniques. The purpose of this article is to provide an overview of covariance based SEM (with software AMOS), suggest potential opportunities for its application in marketing research, and summarize guidelines for interpreting the results of marketing studies that use this method.

2 BACKGROUND

Concept and theory development as well as hypothesis testing are a demanding phase of empirical research. Both exploratory and confirmatory factor analyses are generally needed, as well as structural modeling. The latent constructs are too often ill defined and the structural relationships, particularly the directional effects, often do not have a sound theoretical foundation (Hair et al., 2014). SEM based techniques are particularly useful in developing and expanding theory, particularly when second and even third order factors provide a better understanding of relationships that may not be apparent initially (Astrachan, Patel & Wanzenreid, 2014).

SEM analysis involves the simultaneous evaluation of multiple variables and their relationships. The two SEM based techniques are covariance based SEM (CB-SEM) and partial least squares based SEM (PLS-SEM). CB-SEM involves a maximum likelihood procedure whose goal is to minimize the difference between the observed and estimated covariance matrices, as opposed to maximizing explained variance. PLS-SEM on the other hand focuses on maximizing explained variance of the endogenous constructs. As such, the two techniques have different emphasis, with CB-SEM more applicable to confirmatory factor analysis and PLS-SEM more suitable for exploratory work in finding and evaluating causal relationships (Hair, Ringle & Sarstedt, 2011; Hair, Ringle & Sarstedt, 2013).

In the remainder of this article we first look more closely at the benefits and limitations of SEM. We then briefly discuss the relative merits and applicability of CB-SEM versus PLS-SEM, with a primary focus on CB-SEM. Finally, we illustrate the application and interpretation of CB-SEM with an example that examines the relationship between two exogenous constructs – customer and employee orientation – and a single endogenous construct of firm performance.

➢ Why use SEM?

SEM facilitates the discovery and confirmation of relationships among multiple variables. Perhaps the most important strength of SEM is that the relationships among numerous latent constructs can be examined in a way that reduces the error in the model (Hair, Hult, Ringle & Sarstedt, 2014). This feature enables assessment and ultimately elimination of variables characterized by weak measurement (Chin, Peterson & Brown, 2008). SEM techniques are well suited to achieve these objectives (Astrachan, Patel & Wanzenreid, 2014; Hair et al., 2010; Ringle, Sarstedt and Hair, 2013).

➢ Application of CB-SEM

The widespread application of CB-SEM has led to numerous advances that extend the method's capabilities. Several of these advances include approaches that enable more complex and comprehensive analysis than with first generation methods. Included in these advances is assessment of mediating effects, moderation, invariance/equivalence of constructs across multiple groups, and higher order modeling of constructs.

Bagozzi & Yi (2012) summarize the benefits of SEM techniques by suggesting 'The use of SEMs yields benefits not possible with first-generation statistical methods' (p. 10). Concept and theory development require the ability to operationalize hypothesized latent constructs and associated indicators, which is only possible with SEM. Moreover, structural models can be complex and interactive effects can be assessed when using CB-SEM. When CB-SEM is executed the error terms are modeled for each indicator and loadings of the individual indicator are obtained. This enables elimination of indicators with large error terms and/or low loadings, thus improving the quality of the latent constructs modeled. Specifically, the confirmatory factor analysis (CFA) stage of CB-SEM allows all latent constructs to covary mutually and thereby permits quantitative assessment of both convergent and discriminant validity for each construct. Moreover, the congeneric covariance model also permits optimization of correlations among all constructs simultaneously (Bagozzi & Yi, 2012; Hair et al., 2010; Wang & Wang, 2012). The objective of the process of eliminating high measurement errors and

lower loading items is to obtain a model with an acceptable fit between the observed and estimated models so that structural models can then be assessed.

Almost all CB-SEM models involve mediation. A SEM includes a mediation effect when a third variable intervenes between two other related constructs (Hair et al., 2010). With a SEM mediation could be examined if a third variable is modeled between an exogenous construct and an endogenous construct. Both direct and indirect effects of full or partial mediation among constructs can be assessed and the optimal path coefficients among exogenous and endogenous constructs can be determined (Bagozzi & Yi, 2012; Fabrigar, Porter, & Norris, 2010; Schreiber, 2008). The examination of mediation using CB-SEM is a considerable improvement over that with first generation multiple regression. The reason is that with multiple regression the technique must be applied separately several times, whereas with a SEM the mediation is executed with a single calculation of model results. That is, direct, indirect, and total effects are all assessed simultaneously and can be interpreted.

A CB-SEM approach can also be applied to examine a moderating effect. When a third variable changes the relationship between two related variables (e.g., an exogenous and an endogenous construct), a moderating effect is present (Hair et al., 2010). Moderating effects are often examined in cross-cultural studies. For example, if data were collected in Brazil and the U.S. we would conclude that a relationship is moderated by the culture of the country if we found that the relationship between two variables differed significantly between Brazilian respondents and U.S. respondents. In such a situation we would divide the respondents into two groups based on which country the respondents were from and then estimate and interpret the results to see if they are different.

An important first step before examining a moderating effect is to assess measurement invariance, sometimes referred to as measurement equivalence. Measurement invariance exists when the measurement models for two or more groups are equivalent representations of the same constructs (Hair et al., 2010). For example, if customer satisfaction is being measured for the same product sold in both Brazil and the U.S. then the researcher must first confirm that the customer satisfaction construct used is measuring the same thing in both countries and is therefore a valid construct in both countries. To assess invariance using CB-SEM, the researcher would impose a constraint of equivalence between the Brazilian and U.S. measurement models and apply a change in Chi square value test, which is included in most software packages such as AMOS. For more information on this concept see Hair et al. (2010).

The CB-SEM method also facilitates assessment of theoretical models with second or even third order constructs. A first-order measurement model is one in which the covariances between the constructs are explained by a single layer of latent constructs, whereas a second-order measurement model contains two layers of latent constructs. That is, the measurement model is drawn in a manner that indicates the second-order construct theoretically causes the first-order constructs, which in turn cause the measured variables (Hair et al., 2010). A second order construct (Combined CO & EO) is shown in Figure 3. The use of higher order constructs can contribute to both a more parsimonious model and theory development. But it should be emphasized that the ultimate justification for using higher order constructs is theory. If it does not make theoretical sense to propose higher order constructs in a SEM then they should not be used.

While the benefits of SEM techniques are significant there are limitations. CB-SEM requires 5-10 observations per indicator, which makes the sample size requirements large even for relatively simple models. Also, CB-SEM requires data to be normally distributed, which is often not the case in marketing studies. Moreover, the challenges of obtaining adequate model fit for the CFA can result in elimination of meaningful content for measuring constructs, and sometimes make it difficult to retain the recommended minimum of 3 items per construct (Hair et al., 2010). Indeed, several authors advise that construct content should be weighted above model fit adjustments when they result in the loss of meaningful scale content, particularly in situations where scale development is a major aspect of the research objectives (DeVellis 2011, Byrne 2010, Hair et al., 2010).

- **The usage of SEM in Brazilian marketing research**

Despite growing research in marketing over the years, SEM is not yet a popular technique in Brazil. Bido et al. (2012) evaluated the articles that used SEM based studies published in top Brazilian journals in management (broad scope) from 2001 to 2010 and found 68 articles related to SEM based on the following keywords search: structural equation modeling, confirmatory factor analysis and path analysis. The distribution of published papers with related keywords over the years is shown on figure 1.

When compared to a similar study performed by Martínez-López, Gásquez-Abad & Sousa (2013) that reviewed articles published in four top global journals of Marketing (i.e., Journal of Marketing Research – JMR, Journal of Consumer Research – JCR, Journal of Marketing – JM and International Journal of Research in Marketing – IJRM) which used SEM, it is clear that Brazilian researchers still have a long way to go to incorporate SEM based analyses in their studies. Brazilian researchers will benefit from previous SEM based studies and can incorporate the lessons learned from researchers around the world to enhance their work.

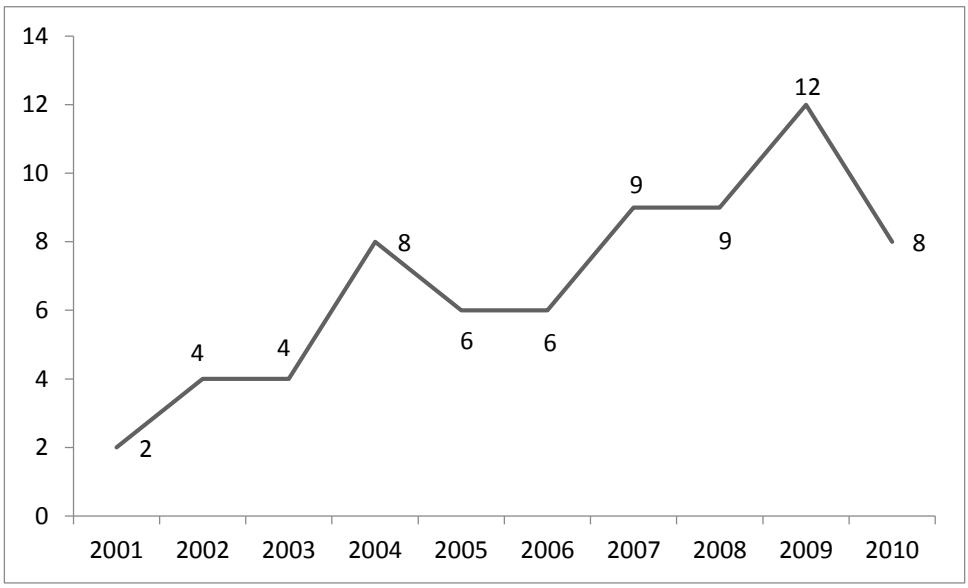

Figure 1 - Papers published in Brazilian journals using SEM from 2001 - 2010

Specifically on research in the field of marketing, two main congresses are considered paramount in the Brazilian scholar community: EnANPAD and EMA, both organized by ANPAD, the National Association of Graduate Programs in Management. In both cases the usage of SEM by marketing researchers is still limited. Brei and Liberali Neto (2006) analyzed the published articles in EnANPAD from 1994-2003 and also marketing research papers published in top Brazilian journals in the same period and found 36 articles. They noticed that more than 80% (29 of 36 articles) were published between 2001 and 2003, evidence of the early stage in which the usage of SEM is in Brazil. Together, the findings of Bido et al. (2012) and Brei and Liberali Neto (2006) are relevant indicators that justify a broader effort by Brazilian scholars to use and teach the usage of SEM by future researchers.

- **CB-SEM and the choice of what software to use**

There is no golden rule on what software a researcher should pick when developing a CB-SEM approach. Several packages are available in the market and probably the researcher's choice will be related to other factors like: previous training in a specific software package, availability of software at their university and/or company, learning style, computer programming skills, and familiarity with the CB-SEM technique itself. Moreover, Gallagher, Ting and Palmer (2008) also recommend to beginners in SEM that another criterion to pick a package is the availability of colleagues who have experience with the chosen package. The usage of a user-friendly statistical package like AMOS instead of a computing code approach as in LISREL, is one the benefits for newcomers. For example, the lack of widespread knowledge of certain Greek notations or jargon used by advanced users of LISREL is one of the disadvantages of LISREL Kline (2011) emphasizes that current versions of CB-SEM analytical software are are similar. All are designed to help researchers focus more on the research problem itself rather than to learning the complexity of the software.

While LISREL used to be the first choice among researchers, AMOS is gaining momentum since the software is being sold by IBM with SPSS as a package and is much more user friendly. Several other software packages are also available, like EQS, Mplus and SEPATH, just to mention few. Improvements have been made in the latter to help non-expert users and new releases are more user-friendly than before, encouraging researchers to apply SEM techniques to their studies.

The focus in this article is on CB-SEM but it is worth noting that PLS-SEM is considered complementary to CB-SEM and for exploratory versus confirmatory analysis, PLS-SEM is considered the better approach. PLS-SEM does not require normally distributed data and considerably smaller sample sizes are considered adequate. Also, the PLS-SEM approach seeks to maximize predictive accuracy (R^2) of the endogenous variables while at the same time permitting retention of more indicators for each construct (Hair et

al., 2014; Astrachan, Patel & Wanzenried, 2014). For additional information on PLS-SEM, see Ringle, Silva and Bido (forthcoming, 2014).

- **Illustration of CB-SEM**

To illustrate the opportunities for application of the CB-SEM method to research in marketing, we have chosen to explore the relationship between customer and employee orientation and firm performance. As noted earlier, CB-SEM is helpful in scale development, exploratory and confirmatory analyses, relative salience of latent constructs, and evaluation of causal relationships (Babin et al., 2008; Byrne, 2010; DeVellis, 2011; Hair, Black, Babin & Anderson, 2010). Recent empirical research has sought to integrate market orientation and stakeholder theory (Maignan, Gonzales-Padron, Hult & Ferrell, 2011; Matsuno, Mentzer & Rentz, 2005; Patel, 2012), which provides support for the exploration of the link between customer and employee orientation.

Market orientation relates to a firm's culture, policies and processes that influence customers, competitors and organizational effectiveness when gathering, disseminating and acting upon market intelligence (Deshpande & Farley, 1998; Deshpande & Webster, 1989; Jaworski & Kohli, 1993; Kohli and Jaworski, 1990; Narver & Slater, 1990). Customer orientation is a key component of market orientation and Deshpande et al. (1998) have shown that customer orientation is a good representation of market orientation.

Stakeholder orientation based on stakeholder theory (Freeman, 1984) addresses primary stakeholders including customers, competitors, employees, suppliers and shareholders. Among the stakeholders, employees constitute a key resource that can deliver a competitive advantage (Harrison, Bosse & Phillips, 2010). For this illustration we focus on the customer and employee stakeholder components. Employee orientation assesses the aspects of the firm's culture and decision making related to employees. To the extent employees are both a front line and central aspect in serving customer requirements we propose that interactions between customer and employee orientations will influence firm performance.

Customer Orientation

Successful firms are committed to monitoring and servicing customer requirements to deliver high levels of total customer satisfaction consistently. Research has shown customer oriented firms tend to be innovative, develop competitive advantages and deliver superior firm performance on both financial and non-financial measures (Grinstein, 2008; Hult & Ketchen, 2001; Kirca, Bearden & Hult, 2011; Kirca, Jayachandran & Beard, 2005). Moreover, both responsive and proactive customer orientation are seen as vital to sustained performance. Responsive customer orientation is based on readily available feedback and information; it is reactive and involves a time lag. In contrast, proactive customer orientation is forward-looking and focused on discovering and serving customers' latent unexpressed needs preemptively, and consistently includes delivering products and services that customers are delighted with, such as the Apple iPhone (Blocker, Flint, Myers and Slater, 2011; Narver et al., 2004; Zeithaml, Bolton & Deighton et al., 2006). Accordingly we propose customer orientation has both responsive and proactive components.

H1: *Customer orientation is a construct with responsive and proactive components.*

- **Employee Orientation**

Employees have a range of critical responsibilities from customer facing and support, to market sensing and organizational culture and learning. Human capital is critical in supporting customer orientation. Creative response to turbulence and the need to build dynamic organizational capabilities while sustaining an ethical climate are all employee-based (Babin et al., 2000; Baker & Sinkula, 1999; Deconinck, 2010; Delaney & Huselid, 1996; Lings & Greenley, 2005; Zhang, 2010). Research indicates that employees, and therefore employee orientation, interact with customer facing issues on an ongoing basis. Moreover, just as forward looking proactive issues are important for customers (Narver et al., 2004) they are equally so for employees. Management needs to pay preemptive attention to employee development and concerns about distributive justice, compensation, promotion, gender issues and equity before breakdowns occur while simultaneously embedding a culture that is responsive to market and customer concerns. Not being proactive can result in debilitating lawsuits, activist action and breakdown in trust (Harrison et al., 2010; Hult et al., 2004; Teece, Pisano & Shuen, 1997). In sum, employee orientation addresses a core stakeholder group that closely interacts with customers and is essential to sustainable firm performance. Therefore, we propose the following;

H2: *Employee orientation is a construct with responsive and proactive components.*

H3: *Customer and employee orientation together form a combined customer and employee orientation (CCEO) second-order factor.*

H4: *CCEO is positively correlated with firm performance*

Figure 2 displays the theoretical model and associated hypotheses.

3 METHODOLOGY

Customer and employee orientation constructs were adapted from Deshpande et al. (1998) for customer orientation and Zhang (2010) for employee orientation. Firm performance was measured using scales from Jaworski et al. (1993) and Narver and Slater (1990). The questionnaire was designed to prevent common method bias. Following data collection expert judgment was used to examine each case for outliers and straight lining (Dillman, Smyth & Christian, 2009; Podsakoff, MacKenzie, Podsakoff & Lee, 2003). The questionnaire is shown in Appendix 1. Covariance-based SEM was chosen for the analysis because the customer and employee constructs were adapted from previously developed scales, and were extended to include both responsive and proactive components, thus requiring scale assessment. Moreover, the data was relatively normally distributed and the emphasis was on testing the theory of proactive and responsive components and a second-order construct combining both employee and customer aspects (Hair et al., 2014).

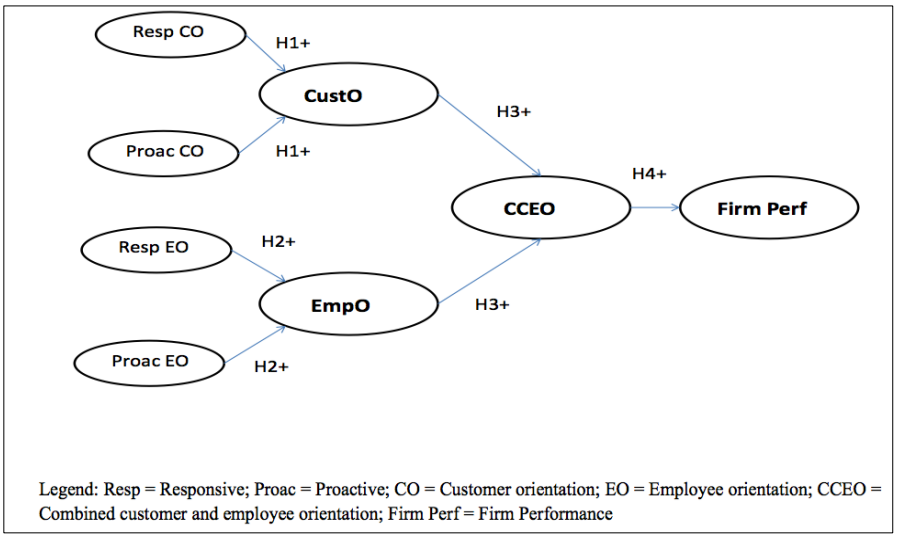

Figure 2 – Theoretical Model and Hypotheses

A professional marketing research firm was employed in July 2011 to gather data from key informants (management level executives from public and private firms with a minimum of 30 employees) representing a broad range of industries in the U.S. Usable data was obtained from 193 firms. Almost 80% of respondents were C-level, 82% of the firms were older than 5 years, 82% of firms had 100 or more employees, 61% were private firms, and 66% of firms were involved in manufacturing, information technology, financial services or health care and construction.

A confirmatory factor analysis (CFA) was executed to check for model goodness of fit. The normed chi-square was 2.168, the comparative fit index (CFI) was 0.954, RMSEA was 0.079, and all indicators were statistically significant ($p<.01$). All of these indices met recommended guidelines so model fit was considered acceptable (Byrne, 2010; Hair et al., 2010). The results are shown in Figure 3.

The next step is to examine composite reliability as well as convergent and discriminant validity. Table 1 shows composite reliabilities, average variance extracted (AVE), and the squared interconstruct correlations. The composite reliabilities ranged from .82 to .90, which is considered very good. AVE is a measure of the convergent validity of the model's constructs and should be .50 or higher (Hair et al., 2010). Convergent validity is defined as the extent to which a specified set of indicators for a construct converge or share a high proportion of variance in common. For this model the AVEs ranged from .77 to .84, so all constructs exhibit convergent validity. The Fornell-Larcker (1981) criterion assesses discriminant validity between the constructs. Discriminant validity is the extent to which the indicators of a construct represent a single construct and the construct's indicators are distinct from other constructs in the model. The results indicated a lack of discriminant validity between the proactive customer orientation and proactive employee orientation constructs (cell in grey – table1). However, an assessment of content validity by a panel of experts indicated the indicators loaded on the separate constructs are distinct and nomologically valid (Narver et al., 2004; Zhang, 2010). Overall, therefore, we concluded that the model's constructs were reliable and valid, so the next step was to examine the structural model results, as shown in Figure 3.

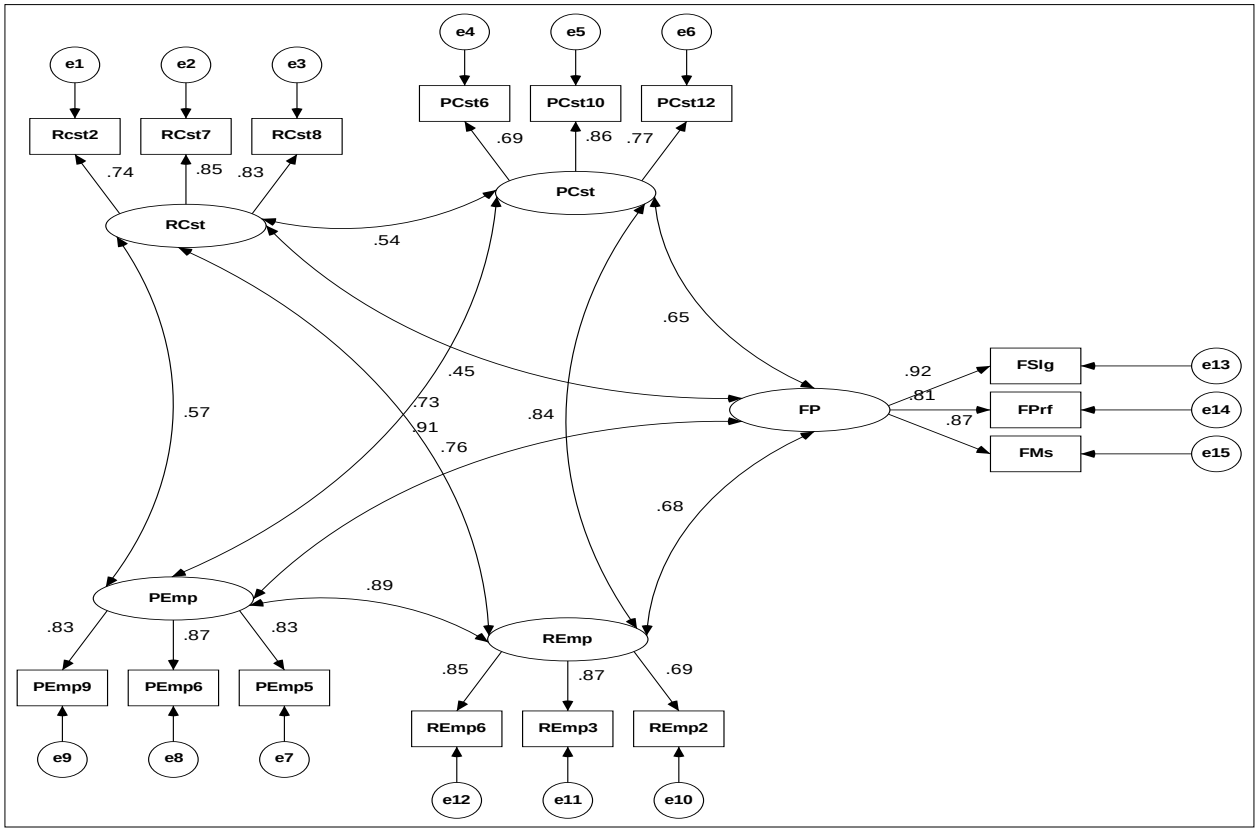

Figure 3 – Confirmatory Factor Analysis Results

The normed chi-square was 2.317, CFI was 0.944, RMSEA was .083 and the significance level for coefficients was p<.001. The structural model was therefore judged to also have acceptable goodness of fit (Hair et al., 2010). The loadings of the first-order constructs were .87 for Responsive Employee, .98 for Proactive Employee, .91 for Proactive Customer, and .63 for Responsive Customer. Three of the four loadings met the minimum criteria of .70, and the Responsive Customer was only somewhat below.

Moreover, all four relationships between the first and second-order constructs were statistically significant. Thus, all four relationships were considered important components of the combined stakeholder orientation second-order construct (CCEO), and all hypotheses were supported. The sizes of the loadings can be interpreted as their relative importance to CCEO as well as their influence in predicting firm performance. The path coefficient for the relationship between combined stakeholder orientation and firm performance (FP) was .75, and R^2 was .56.

Table 1 - Convergent Validity, Reliability and Discriminant Validity (Fornell-Larcker criterion)

	Responsive Customer Orientation	**Proactive Customer Orientation**	**Responsive Employee Orientation**	**Proactive Employee Orientation**	**Firm Performance**
RCst2	0.735				
RCst7	0.851				
RCst8	0.828				
PCst6		0.689			
PCst10		0.857			
PCst12		0.773			
REmp2			0.693		
REmp3			0.873		
REmp6			0.845		
PEmp5				0.834	
PEmp6				0.865	
PEmp9				0.830	
FSlg					0.918
PPrf					0.809
FMs					0.866
Average Variance Extracted	0.805	0.773	0.804	0.843	0.864
Composite Reliability	0.847	0.818	0.848	0.881	0.899
Fornell-Larcker Criterion*	**RCstO**	**PCstO**	**REmpO**	**PEmpO**	**FP**
RCstO	0.805				
PCstO	0.287	0.773			
REmpO	0.539	0.701	0.804		
PEmpO	0.324	0.835	0.801	0.843	
FP	0.205	0.428	0.468	0.572	0.864

* **Note**: Numbers on diagonal are the AVEs and off-diagonal numbers are squared inter-constructs correlations.

The results of the structural model are considered robust overall and comparable to previous market orientation studies (Kirca et al., 2005). This finding suggests the synergistic effects of customer and employee orientation combined with proactive practices could be an important focus for further research. The structural model shows that while responsive and proactive orientations load highly on the combined orientation construct (CCEO), for both employee and customer orientation, the proactive elements are more salient. These findings suggest, in line with Narver et al. (2004), that greater emphasis on proactive elements in management will have direct payoffs. Interestingly, employee orientation seems to be more salient overall than customer orientation. The logic may well be that employee orientation reinforces and potentially is an antecedent to customer orientation. The coefficient of 0.75 between CCEO and firm performance is strong (Hair et al., 2014) and the R2 of 0.56 suggests that management focus on customers and employees may well be justified in terms of higher resource allocations relative to other firm aspects.

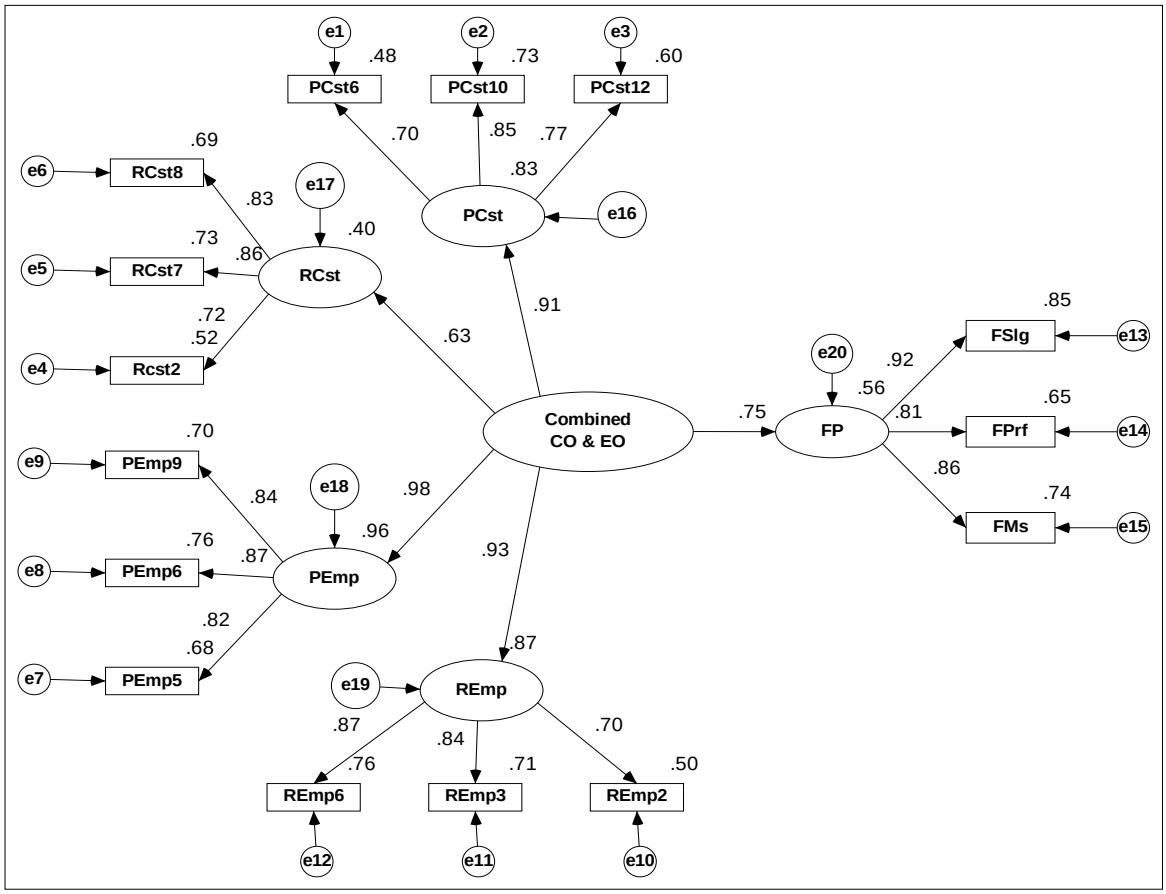

Figure 3 – Structural Model and Path Coefficients

4 OBSERVATIONS AND CONCLUSIONS

Theories in marketing have become increasingly complex in recent years, thus necessitating more complex model structures. Our purpose in this article was to explore an important and complex set of relationships and thereby illustrate the power of CB-SEM. As structured, this SEM could not have been examined without the application of the second-generation statistical method of structural equation modeling. The CB-SEM approach was chosen because scale extension and assessment was an integral component of the modeling process. Moreover, we were able to explore a complex structure involving a higher level of abstraction using a theoretically based higher order factor/construct. Specifically, in this study we modeled four first-order components of stakeholder orientation and confirmed that together they make up a second-order construct of combined customer and employee stakeholder orientation. This higher-order modeling approach leads to more theoretical parsimony and reduces model complexity. It can also be useful in obtaining more accurate solutions in situations where there is high multicollinearity between exogenous constructs.

REFERENCES

Astrachan, C.B., Patel V. K., &Wanzenried G. (2014). A Comparative Studyof CB-SEM and PLS-SEM for Theory development in Family Firm Research. *Journal of Family Business Strategy*, 5, 116-128.

Babin, B. J. , Boles, J. S., & Robin, D. P. (2000). Representing the perceived ethical work climate among marketing employees. *Journal of the Academy of Marketing Science. 28*(3), 345-358.

Babin, B.J., Hair, J.F., & Boles, J.S. (2008). Publishing Research in Marketing Journals Using Structural Equation Modeling. *Journal of Marketing Theory & Practice*, 16(4), 279-285.

Bagozzi, R., & Yi, Y. 2012. Specification, evaluation, and interpretation of structural equation models. *Journal of the Academy of Marketing Science*, 40(1): 8-34.

Blocker, C., Flint, D., Myers, M., & Slater, S. (2011). Proactive customer orientation and its role for creating customer value in global markets. *Academy of Marketing Science Journal, 39*(2), 216-233.

Baker, W., E., & Sinkula, J., M. (1999). Learning orientation, market orientation, and innovation: Integrating and extending models of organizational performance. *Journal of Market - Focused Management*, 4(4): 295-308.

Bido, D. D. S., Souza, C. A. D., Silva, D. D., Godoy, A. S., & Torres, R. R. (2012). Quality of reporting methodological procedures in national publications in the area of business administration: the case of structural equation modelling. *Organizações & Sociedade*, *19*(60), 125-144.

Brei, V. A., & Liberali Neto, G. (2006). O uso da técnica de modelagem em equações estruturais na área de marketing: um estudo comparativo entre publicações no Brasil e no exterior. *Revista de Administração Contemporânea*, *10*(4), 131-151.

Byrne, B. M. (2010). *Structural equation modeling with AMOS: Basic concepts, applications, and programming* (2nd. Edition) New York: Routledge.

Chin, W.W., Peterson, R.A., & Brown, S.P. (2008). Structural Equation Modeling in Marketing: Some Practical Reminders. *Journal of Marketing Theory & Practice*, 16(4), 287-289.

Churchill, G. A., Jr. (1979). A paradigm for developing better measures of marketing constructs. *JMR, Journal of Marketing Research, 16*(1), 64-73.

DeConinck, J. B. (2010b). The influence of ethical climate on marketing employees' job attitudes and behaviors. *Journal of Business Research*, 63(4): 384-391.

Delaney, J. T., & Huselid, M. A. (1996). The impact of human resource management practices on perceptions of organizational performance. *Academy of Management Journal*, 39(4): 949-969.

DeVellis, R. F. (2011). *Scale development: Theory and applications* (Vol. 26): Sage Publications, Inc.

Deshpande, R., & Farley, J. (1998). Measuring market orientation: Generalization and synthesis. *Journal of Market-Focused Management, 2*(3), 213-232.

Deshpande, R., & Webster Jr, F. E. (1989). Organizational culture and marketing: defining the research agenda. *The Journal of Marketing*, 3-15.

Dillman, D. A., Smyth, J. D., & Christian, L. M. (2009). Internet, mail, and mixed-mode surveys: The tailored design method (3rd ed.). Hoboken: John Wiley & Sons Inc.

Fabrigar, L. R., Porter, R. D., & Norris, M. E. 2010. Some things you should know about structural equation modeling but never thought to ask. *Journal of Consumer Psychology*, 20(2): 221-225.

Ferrell, O., Gonzalez-Padron, T., Hult, G., & Maignan, I. (2010). From market orientation to stakeholder orientation. *Journal of Public Policy & Marketing, 2010, 29*(1), 93-96.

Freeman, R. (1984). *Strategic management: A stakeholder approach*: Pitman Boston, MA.

Fornell, C., & Larcker, D. F. (1981). Evaluating structural equation models with unobservable variables and measurement error. *Journal of Marketing Research*, 18(1), 39–50.

Gallagher, D., Ting, L., & Palmer, A. (2008). A journey into the unknown; taking the fear out of structural equation modeling with AMOS for the first-time user. *The Marketing Review*, *8*(3), 255-275.

Grinstein, A. (2008). The effect of market orientation and its components on innovation consequences: A meta-analysis. *Journal of the Academy of Marketing Science*, *36*(2), 166-173.

Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2010). *Multivariate Data Analysis* (7th Edition). NJ: Prentice Hall.

Hair, J. F., Hult, G. T. M., Ringle, C. M., & Sarstedt, M. (2014). *A Primer on Partial Least Squares Structural Equation Modeling (PLS-SEM)*. Thousand Oaks: Sage.

Hair, J. F., Ringle, C. M., & Sarstedt, M. (2011). PLS-SEM: Indeed a Silver Bullet. *Journal of Marketing Theory and Practice*, *18*(2), 139-152.

Hair, J. F., Ringle, C. M., & Sarstedt, M. (2013). Partial Least Squares Structural Equation Modeling: Rigorous Applications, Better Results and Higher Acceptance. *Long Range Planning*, *46*(1-2), 1-12.

Harrison, J., Bosse, D., & Phillips, R. (2010). Managing for stakeholders, stakeholder utility functions, and competitive advantage. *Strategic Management Journal*, *31*(1), 58-74.

Hair, J. F., Sarstedt, M., Ringle, C. M., & Mena, J. A. (2012). An assessment of the use of partial least squares structural equation modeling in marketing

research. *Journal of the Academy of Marketing Science, 40*(3), 414-433.

Hinkin, T. R. (1998). A brief tutorial on the development of measures for use in survey questionnaires. *Organizational Research Methods, 1*(1), 104-121.

Hult, G. T. M., Hurley, R. F., & Knight, G. A. (2004). Innovativeness: Its antecedents and impact on business performance. *Industrial Marketing Management, 33*(5), 429-438.

Hult, G. T. M., & Ketchen, D. J. (2001). Does market orientation matter?: a test of the relationship between positional advantage and performance. *Strategic Management Journal, 22*(9), 899-906.

Jaworski, B. J., & Kohli, A. K. (1993). Market orientation: Antecedents and consequences. *Journal of Marketing, 57*(3), 53-70.

Kirca, A., Bearden, W., & Hult, G. (2011). Forms of market orientation and firm performance: A complementary approach. *AMS Review, 1*(3), 145-153.

Kirca, A. H., Jayachandran, S., & Bearden, W. O. (2005). Market orientation: A meta-analytic review and assessment of its antecedents and impact on performance. *Journal of Marketing, 69*(2), 24-41.

Kohli, A. K., & Jaworski, B. J. (1990). Market orientation: The construct, research propositions, and managerial implications. *Journal of Marketing, 54*(2), 1-18.

Lings, I., N., & Greenley, G., E. (2005). Measuring internal market orientation. *Journal of Service Research : JSR*, 7(3): 290-305.

Maignan, I., Gonzalez-Padron, T. L., Hult, G. T. M., & Ferrell, O. C. (2011). Stakeholder orientation: development and testing of a framework for socially responsible marketing. *Journal of Strategic Marketing, 19*(4), 313-338.

Martínez-López, F. J., Gázquez-Abad, J. C., & Sousa, C. M. (2013). Structural equation modelling in marketing and business research: Critical issues and practical recommendations. *European Journal of Marketing,47*(1/2), 115-152.

Matsuno, K., Mentzer, J., T. , & Rentz, J., O. (2005). A conceptual and empirical comparison of three market orientation scales. *Journal of Business Research, 58*(1), 1-8.

Narver, J. C., Slater, S. F., & MacLachlan, D. L. (2004). Responsive and proactive market orientation and new-product success. *Journal of Product Innovation Management, 21*(5), 334-347.

Narver, J. C., & Slater, S. F. (1990). The effect of a market orientation on business profitability. *Journal of Marketing, 54*(4), 20-35.

Patel, V. (2012). Extended stakeholder orientation: Influence on innovation orientation and firm performance. Dissertion, Kennesaw State University.

Podsakoff, P. M., MacKenzie, S. B., Podsakoff, N. P., & Lee, J.-Y. (2003). Common method biases in behavioral research: A critical review of the literature and recommended remedies. *Journal of Applied Psychology*, 88(5), 879–903.

Ringle, Dirceu and Bido (forthcoming, 2015), PLS-SEM article in special methods issue, *Brazilian Journal of Marketing*.

Schreiber, J. B. 2008. Core reporting practices in structural equation modeling. *Research in Social and Administrative Pharmacy*, 4(2): 83-97.

Teece, D. J., Pisano, G., & Shuen, A. (1997). Dynamic capabilities and strategic management. *Strategic Management Journal, 18*(7), 509-533.

Zeithaml, V. A., Bolton, R. N., Deighton, J., Keiningham, T. L., Lemon, K.N., & Petersen, J.A. (2006). Forward-looking focus: Can firms have adaptive foresight? *Journal of Service Research : JSR, 9*(2), 168-183.

Zhang, J., & Duan, Y.(2010). Empirical study on the impact of market orientation and innovation orientation on new product performance of chinese manufacturers. *Nankai Business Review International*, 1(2): 214-231.

APPENDIX 1

➢ Customer Orientation

Please select your response from 0-10 scale from strongly disagree (0) to strongly agree (10)

- Responsive Customer Orientation

RCst1_We develop our business objectives to primarily achieve customer satisfaction.
RCst2_We constantly monitor our level of commitment to serving customer needs.
RCst5_We measure customer satisfaction frequently.
RCst6_We regularly measure our quality of customer service.
RCst7_We work to be more customer focused than our competitors.
RCst8_We ensure our business exists primarily to serve customers.
Proactive Customer Orientation
PCst1_We help our customers anticipate developments in their markets.
PCst2_We continuously try to discover additional needs of our customers of which they may be unaware.
PCst3_We incorporate solutions to customer needs before they are able to tell us about their preferences.
PCst6_We search for opportunities in areas where customers have a difficult time expressing their needs.
PCst10_We incentivize employees to develop new product concepts.
PCst12_We often test new products in selected markets.

➢ Employee Orientation

Please select your response on 0-10 scale, from strongly disagree (0) to strongly agree (10)

- Responsive Employee Orientation

REmp1_We ensure people in this organization are rewarded based on their job performance.
REmp2_The management team encourages a relaxed working climate.
REmp3_We ensure a promotion system that helps the most capable person rise to the top.
REmp4_The management team and workers in this organization develop trust in one another
REmp5_We provide a user-friendly confidential website for employees to provide feedback to management.
REmp6_The philosophy of our management team is based on meeting employees' needs.
Proactive Employee Orientation
PEmp1_We carry out regular staff appraisals to determine merit based compensation.
PEmp2_We routinely identify high potential employees for fast track development.
PEmp3_Top management awards incentive pay that could be more than base pay to high performers.
PEmp5_We maintain an employee bonus pool with cash and/or options incentives.
PEmp6_We analyze feedback from employees to quickly implement improvements.
PEmp9_We provide staff training to create a trust based working climate.

➢ Firm Performance

The following statements represent possible results or outcomes of your management team's efforts to deliver firm performance. Please indicate the extent to which you are Satisfied or Dissatisfied with these outcomes, using the 100-point scale.

1. How satisfied are you with your firm's performance in terms of the following: Sales growth.

2. How satisfied are you with your firm's performance in terms of the following: Profitability.

3. How satisfied are you with your firm's performance in terms of the following: Market share.