

## **Comparative Effects of Environmental Components on Managerial Accounting**

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**Abstract:** *The application of managerial accounting in organizations has been regarded as a result of environmental uncertainty. The effects of environmental components on the adoption of managerial accounting in business are different. However, this difference has not been evaluated and compared among the components of environmental uncertainty. This research applied a mean test method to evaluate the relative importance of environmental components in determining the adoption of managerial accounting in business. For the robustness of the mean test method, this project also applied an analytic hierarchy process to re-evaluate the importance levels of environmental components to managerial accounting adoption in business. The results were robust across the two methods. The uncertainty in economy and governmental policies are rated first and second important, respectively. Resources and services used by the firm are ranked third important. On the contrary, the competing level and the change in technology are evaluated as fourth and fifth. The uncertainty in product market and demand takes the final importance in adopting managerial accounting in business. This research offers some contributions on how business executives should adopt managerial accounting facing different environmental conditions.*

**Keywords:** *Managerial accounting, Environmental uncertainty, Analytic hierarchy process, Mean test method*

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### **I. Introduction**

Johnson and Kaplan (1987) suggest that businesses require managerial accounting systems to offer appropriate business information to facilitate the management of expenses, the measurement and the improvement in effectiveness. Several researchers have emphasized that various advanced managerial accounting practices, have been developed to supplement for traditional ones in meeting the needs of the contemporary management (Otley 1999; Hoque et al. 2001; Haldma and Laats 2002). The new practices have affected the entire procedure of managerial accounting and have turned its focus from a simple function of financially oriented determination and management to a more comprehensive function of generating value by more wisely utilizing organizational assets. Galbraith (1974) anchors the contingency theory of managerial accounting to explain the effect of the environmental contexts on the use of managerial accounting in firms. The contingency theory of managerial accounting emphasizes an importance of contextual conditions on managerial accounting (Harash et al. 2014). Business environment facing a firm is very important to the management of business activities (Ajayi 2016). A change in the business environment will force the firm to adjust and fit with the change. Business environment is considered as one of the major contingencies of a firm (Galbraith 1973). Moreover, based on contingency theory, Galbraith (2002) refers to business environment as the variable that creates contingent conditions on the firm. The perspective of contingency theory emphasizes that, there is no best approach to controlling a firm and administrative ways are not equally helpful. Managerial accounting is necessary to firms; because it offers suitable business information to facilitate the management of business activities. For (Otley 2016), the contingency theory of managerial accounting argues that, there is no single managerial accounting system suitable to all organizational kinds or any system which is satisfactory in all business contexts in a single firm. Numerous prior studies have discussed and explored the role of business environments on the adoption of managerial accounting in business (e.g., Pfeffer and Leblebici 1973; Masrek 2009; Ashill and Jobber 2010; Ibadin and Imoisili 2010; Bello-Pintado and Merino-Díaz-de-Cerio 2012); nevertheless, to the best of the author's knowledge, current scholars have not implemented adequate research on the relative contributions of environmental components to managerial accounting in business. Business environments are changing rapidly, especially in Asia (Wang and Huynh 2014). Although increasingly interested in research on managerial accounting, a lack of organized literature on managerial accounting in Vietnam (Ngoc Phi Anh et al. 2011). This research seeks to assess the relative importance of environmental components to managerial accounting in Vietnam. The current research is expected to offer insight into the complicated link among business environment uncertainty and the adoption of managerial accounting in business.

## **II. Effect Of Environmental Uncertainty On Managerial Accounting**

Managerial accounting is developed to supply reliable and essential business information that a firm desires for the process of making decisions relevant to business. They are deemed as a part of controlling systems. Their main functions offer supportive business information for planning and management to augment organizational effectiveness (Kaplan 1983). Based on the contingency theory of managerial accounting, Galbraith (1974) emphasizes the important role of the environmental contexts on the adoption of managerial accounting in business. Environmental uncertainty is referred to as imperative contextual contingencies, involved in social-political issues, customers, suppliers, competitors and technologies (Duncan 1972). According to Miles et al. (1978), the uncertainty of business environment is identified by the predictability of contextual conditions in an organization's business environment. Miller (1993) classifies the uncertainty of business environment into six areas; namely (1) economy, (2) resources and services used by the company, (3) product market and demand, (4) competition, (5) technology and (6) governmental policies. Following the suggestion by Miller (1993), I would like to employ the measure with the previous mentioned six dimensions for the uncertainty of business environment in this research.

The contingency theory of managerial accounting is applied in the view that when executives face the high uncertainty of business environments, they have a tendency to decide on which managerial accounting practices are the most fitting with those business environments to help their firms to survive and develop. To further support for that viewpoint, this research starts with a study by Iacovou et al. (1995). In that study, they document that external conditions put a positive impact on electronic data interchange system selected by organizations. Besides, Wierenga and Ophuis (1997) analyze managerial information systems; recommend that a higher uncertainty of business environments might lead to a higher adoption of managerial tools in business. And a few years later, Haldma and Laats (2002) claim that business environments positively impact the adoption of managerial accounting tools. Moreover, Masrek (2009) confirms a positive linkage from the uncertainty of business environments to the use of managerial tools. When the uncertainty of business environment becomes higher, executives need more formal procedures to deal with it (Pfeffer and Leblebici 1973). Research by Chenhall and Morris (1986) reveals that, the design of managerial accounting system is significantly associated with environmental uncertainty facing firms. Additionally, the association between the uncertainty of business environments and the adoption of managerial tools is documented by Masrek (2009). The uncertainty of business environments is also suggested by some previous research (Ibadin and Imoisili 2010; Ashill and Jobber 2010) to affect the adoption of marketing information system as well as the design of managerial accounting system. Similar to other managerial tools, managerial accounting is also a control tool adopted by a firm to achieve competitive advantages, so improve business performance. Furthermore, Bello-Pintado and Merino-Díaz-de-Cerio (2012) report evidence that firms facing high uncertainty of business environment more likely apply managerial accounting for their firms. The uncertainty of business is also established in a study by Ashill and Jobber (2010) as a driving force of the adopting level of marketing information systems. In the same year, other studies also find out statistical evidence on a positive correlation between the uncertainty of business environments and the design of managerial accounting systems (Ajibolade et al. 2010; Ibadin and Imoisili 2010). Additionally, Jusoh (2010) shows that the uncertain level of business environments is significantly interrelated to the adoption of organizational performance measuring instrument in business. That author also regards the importance of environmental uncertainty as a substitute for external variables to the firm in explaining the extent of the choice of managerial tools. Grounded on Wang et al. (2012), the adoption of managerial accounting in business is dependent on changes in environmental conditions to achieve the highest organizational performance. Hence, it can conjecture that the uncertainty of business affects the application of managerial accounting systems in organizations.

## **III. Uncertainty Of Business Environment**

The uncertainty of business environments is a situation in which executives have difficulty in forecasting their environmental conditions. They undergo environmental uncertainty, since they do not have much information to accurately predict environmental conditions (Milliken 1987). According to Duncan (1972) the uncertainty of business environments is referred to as a significant environmental contingency to business. He mentions environmental uncertainty as a variable connected with social-political issues, customers, suppliers, competitors, technologies and governmental policies. A study by Miles et al. (1978) defines environmental uncertainty as managers' predictability of business conditions. The predictability is considered as the ability of an organization to guess the situations of business environment in the future (Steers 1977 and Jusoh 2010). Miller (1993) in his study on environmental uncertainty, classifies environmental uncertainty into six areas: (1) governmental policies- BUE1, (2) economy- BUE2, (3) resources and services used by the company- BUE3, (4) product market and demand- BUE4, (5) competition- BUE5 and (6) technology- BUE6. This definition is employed for this paper. Product market and demand, competition, governmental policies, economy, resources and services used by the firm and technology are important dimensions making up "environmental uncertainty". Their roles in forming "environmental uncertainty" are at different extents.

#### IV. Mean Test

To rank the importance of environmental components in making up or predicting the adoption of managerial accounting in business, a method named ‘Mean Test’ was applied. ‘Mean Test’ is to test how important component A is comparative to component B. For each component, respondents are asked to rank the importance of the six environmental components in resulting into the application of managerial accounting for firms with a five point scale (from 1.not imperative at all, 2.a little imperative, 3.fairly imperative, 4.significant, to 5.very imperative). For each pair of environmental components, ‘Mean Test’ is utilized to test which one is more important than the next one. The six components of business environment- namely product market and demand, competition, governmental policies, economy, resources and services used by the firm and technology, are compared with the next one in mean. Finally, the whole six components are ranked for their importance. Mean test is a tool to check for the difference between two averages. This process consists of three main steps as follows.

*(i). State the hypotheses*

A null hypothesis is hypothesized with “ $\mu_1 - \mu_2 \leq 0$ ” and while a state “ $\mu_1 - \mu_2 > 0$ ” is the alternative hypothesis. This is a one-tailed Test. The  $\mu_1$  is the average of one population, while the  $\mu_2$  is the average of another population.

*(ii). Analyze sample data*

The sample data is employed to calculate for the degrees of freedom, the test statistic, standard error and the P related to the test statistic. Standard error is equal to  $\sqrt{(s_1^2/n_1) + (s_2^2/n_2)}$ . The  $s_1$  is the standard deviation of sample one. The  $s_2$  is the standard deviation of sample two. The  $n_1$  is the sample size one. The  $n_2$  is the sample size two. Test statistic is equal to  $(x_1 - x_2)/$  Standard error. The  $x_1$  is the average of sample one. The  $x_2$  is the average of sample two and SE is the standard error. P is the probability of observing a sample statistic as extreme as the test statistic.

*(iii). Interpret results*

If the P is less than the significance value (often 5%, then the null hypothesis is rejected and the alternative hypothesis is statistically significant; otherwise the null hypothesis cannot be rejected.

#### V. Analytic Hierarchy Procedure

**Table 1:** The rating scale of relative importance of factors

Strength of significance	Description	Explanation
1	Equally imperative	Two components contribute equally
3	More imperative	Experience and judgment favor one over the other.
5	Absolutely more imperative	The evidence favoring one over the other is of the highest possible validity.
2, 4	Intermediate levels	When compromise is needed

Another procedure used to rank the comparative importance of environmental components in making up or predicting the adoption of managerial accounting in business was an analytic hierarchy procedure. The analytic hierarchy procedure is a tool used for multi-criteria judgment as well as for analyzing the decision-making process, suggested by Saaty (1980). The analytic hierarchy process has the subjective judgment of each judgment-maker as input and the quantified weight of each option as output. This process is considered as a compensatory method that decomposes a complex judgment problem into a hierarchy. Pair-wise comparisons between all choices with each other are employed to obtain the weights and scores.

The assessing scale used for pair-wise comparisons is exhibited in Table 1. If attribute A is as equally imperative in explaining their factor as attribute B, it is rated at 1. If A is completely more imperative in explaining their factor than B, it is graded with 5. If B is completely less imperative in explaining their factor than A, it is valued at 1/5. It is similar for “more important- 3” or “intermediate values- 2 and 4”. There are three steps to conduct an analytic hierarchy process.

**(i). Stratifying the framework of decision-making**

A decision problem is decomposed into its components. Organizing all the constituents in a hierarchy offers an overall view of the complicated relationships and allows decision-makers to evaluate whether components in each level have the same magnitude in order that they can be precisely compared. A constituent in a given level functions as an attribute for comparison. A hierarchy in this research consists of product market and demand, competition, governmental policies, economy, resources and services used by the firm and technology.

**(ii). Pair-wise comparison of options on each criterion**

For each pair of components, decision-makers are asked to assess how important component A is compared to component B. Each judgment is given a number on a scale (from 1 to 5) as above discussed. Product market and demand, competition, governmental policies, economy, resources and services used by the firm and technology are compared with one another. Then the matrix of the judgments is produced.

**(iii). Obtaining the relative weights or importance of components**

The relative weights or importance of components are calculated from the matrix of the judgments. In order to test the consistence of judgments, a consistency ratio (CR) is computed to measure how consistent the judgments are. CR is a ratio of consistency index (CI) to random index (RI<sub>n</sub>), where RI<sub>n</sub> is obtained from Table 2 based on the values of n, while CI is equal to  $(\lambda_{\max}-n)/(n-1)$ .  $\lambda_{\max}$  is the maximum eigenvalue, whereas 'n' is the number of components needed to be compared. CI and CR should be less than 0.1, the preferred value stipulated by Saaty (1980).

**Table 2:** Random indices

n.	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15
RI <sub>n</sub>	0.00	0.00	0.58	0.90	1.12	1.24	1.32	1.41	1.45	1.49	1.51	1.48	1.56	1.57	1.59

**VI. Data Collection**

Vietnam is selected for analysis in this study, since it is one of the fastest developing markets in Asia. The sample for this study is a total population of 1142 firms which are publicly listed in the Vietnamese Stock Exchanges in the fourth quarter of 2016. There are 6 observed items in this research. Therefore, a sample of 60 observations (=6\*10), stipulated by Hair et al. (2010), is needed. For a sufficient sample of usable responses, a survey of 90 publicly listed firms is performed (an increase by 50% compared to the required sample size of 60). For each firm, we get in touch with a manager involved in knowledge management to fill a questionnaire. Of the 90 questionnaires that were handed out, there are only 72 which offered positive outcomes with useful answers.

**VII. Results**

**Mean Test**

Applying the mean test procedure, this research obtained mean importance, standard errors, t-statistics and P, as displayed in Table 3. Then, the importance of components was ranked in Table 4. Pairs of components that have adjacent mean values are compared with each other. The mean test procedure is to test whether a component with the larger mean importance has a statistically significant bigger mean than the one with the smaller mean importance. The five pairs of components were compared. They were economy- BUE2 versus governmental policies- BUE1, governmental policies- BUE1 versus resources and services employed by the firm- BUE3, resources and services employed by the firm- BUE3 versus competition- BUE5, competition- BUE5 versus technology- BUE6, technology- BUE6 versus product market and demand- BUE4. Table 3 reveals that all the compared pairs achieve statistical significance at levels less than 5%. Consequently, the importance of elements is significantly ranked as in Table 4, which indicates that economy- BUE2, governmental policies- BUE1, resources and services used by the company- BUE3 are assessed as the first, second and third. On the other hand, competition- BUE5, technology- BUE6 and product market and demand- BUE4 take the fourth, fifth and sixth positions, respectively.

**Table 3:** Paired comparisons of mean importance: Mean-test statistics

Compared Pair	Paired Means	SE	t	P	Result
ENU2- ENU1	2.72-2.41	0.101	2.33	0.008	Significant
ENU1- ENU3	2.41-2.25	0.103	2.32	0.012	Significant
ENU3- ENU5	2.25-2.10	0.102	2.38	0.009	Significant
ENU5- ENU6	2.10-1.74	0.093	2.68	0.004	Significant
ENU6- ENU4	1.74-1.39	0.088	3.72	0.000	Significant

Governmental policy is one of the most important elements that urge managers to choose quality management system. This element takes the first important position. In contrast, economy, and resources and services employed by the firm are less important elements which are the eighth and ninth, while competition, product market and demand and technology are the least important. Product market and demand and competition are ranked as the third and second least important, whereas technology plays the least imperative role in making managers to adopt managerial accounting for firms.

**Analytic Hierarchy Process**

With the sample of 72 observations, taking an average for each element and using the Saaty procedure, we obtain element weights of each level as shown in Tables 5; where: Weight:  $w_j$  = the 6<sup>th</sup> root of product of

value/ the total of the 6<sup>th</sup> root of product of values, New vector:  $[v_{ij}] = [a_{ij}] \times [b_{ij}]$ ,  $[a_{ij}]$  is the matrix of the 6 components with 6 columns and 6 rows,  $[b_{ij}]$  is the matrix of the weights with 1 column and 6 rows. The figures in Table 5 show the importance levels that environmental elements play in the adoption of managerial accounting. CI is 0.099, while CR is both 0.080. They are all smaller than 0.1, the biggest level stipulated by Saaty (1980). The consistency tests are satisfied. As a consequence, the weights are suitable for our research model.

**Table 4:** Ranking of elemental importance

Items	BUE2	BUE1	BUE3	BUE5	BUE6	BUE4
Mean	2.72	2.41	2.25	2.10	1.74	1.39
Ranking	1	2	3	4	5	6

The findings also reveal that, economy- BUE2 is ranked first, then governmental policies- BUE1 and resources and services used by the company- BUE3 are rated the second and third positions. On the contrary, competition- BUE5 and technology- BUE6 take the fourth and fifth positions, respectively. Product market and demand- BUE4 take the last position. The results from the analytic hierarchy process are consistent with those from the mean test method. The uncertainty of economy plays the most significant role in executives' decision to adopt managerial accounting in business. The certainty of governmental policies- BUE1 and resources and services used by the company- BUE3 are ranked as the second and third importance. The competition- BUE5 takes the fourth importance in adopting managerial accounting in business. The change in technology- BUE6 takes the fifth positions importance and product market and demand- BUE4 take the final importance in managerial accounting.

**Table 5:** Weights

	BUE2	BUE1	BUE3	BUE5	BUE6	BUE4	6 <sup>th</sup> root of values	Weights	Rank	New Vector	New Vector/ Weight
BUE2	1.000	1.120	2.010	2.040	3.440	3.990	1.995	0.291	1	1.747	6.005
BUE1	0.893	1.000	2.020	2.070	2.930	3.160	1.805	0.263	2	1.588	6.032
BUE3	0.498	0.495	1.000	1.117	2.040	2.120	1.029	0.150	3	0.904	6.020
BUE5	0.490	0.483	0.896	1.000	2.010	1.930	0.968	0.141	4	0.850	6.021
BUE6	0.291	0.341	0.500	0.498	1.000	1.200	0.556	0.081	5	0.489	6.026
BUE4	0.251	0.316	0.472	0.518	0.833	1.000	0.503	0.073	6	0.441	6.016
Total							6.856	1.000			36.120

$\lambda_{max} = \text{Sum}(\text{New Vector}/\text{Weight})/6 = 36.12/6 = 6.020$ ,  $CI = (\lambda_{max}-n)/(n-1) = (6.02 - 6) \times (6 - 1) = 0.099$ ,  $RI_n$  is 1.24 (Table 1); therefore,  $CR = CI/RI_n = 0.099/1.24 = 0.080$

### VIII. Conclusion

The link between environmental uncertainty and managerial accounting has been investigated in previous research. Nonetheless, only a little research has examined the importance of environmental components on the adoption of managerial accounting. This research sought to rank the relative importance of the components of environmental uncertainty in adopting managerial accounting in business by using a mean test method and the analytic hierarchy process. The mean test method was used the important orders of components in contributing to the application of managerial accounting for organizations. And to further for the robustness of the mean test procedure, the analytic hierarchy process was employed to make pair-wise comparisons between all the components with each other to evaluate their relative importance to the application of managerial accounting for firms.

The findings from both the procedures are consistent. The uncertainty in economy, governmental policies and resources and services employed by the firm are rated the first, second and third important positions. On the contrary, the competition and the change in technology are evaluated as fourth and fifth. The uncertainty in product market and demand takes the final importance in adopting managerial accounting in business. This research provides researchers with insight into the relative importance of environmental components in affecting the adoption of managerial accounting in business. It is also helpful to executives by offering a better understanding of the priority levels of environmental elements resulting into the adoption of managerial accounting in business. Consequently, they will better decide on the adoption of managerial accounting in business in their business, which is likely to enhance firm performance.

### References

- [1] Ajayi A. (2016). Impact of External Business Environment on Organisational Performance of Small and Medium Scale Enterprises in Osun State, Nigeria. *Scholedge International Journal of Business Policy and Governance*, 3(10), 155-166
- [2] Ajibolade S. O., Arowomole S. S. A. and Ojikutu R. K. (2010). Management accounting systems, perceived environmental uncertainty and companies' performance in Nigeria, *International Journal of Academic Research*, 2(1), 195-201

- [3] Ashill N. J. and Jobber. D. (2010). The Impact of Environmental Uncertainty Perceptions, Decision-Maker Characteristics and Work Environment Characteristics on the Perceived Usefulness of Marketing Information Systems: A Conceptual Framework. *Journal of Marketing Management* 15(6): 519-540
- [4] Bello-Pintado A. and Merino-Díaz-de-Cerio J. (2012). Determinants of the use of quality management practices in Latin America: the case of Argentina and Uruguay, *Total Quality Management & Business Excellence*, DOI:10.1080/14783363.2012.669544
- [5] Chenhall R. H. and Morris. D. (1986). The Impact of Structure, Environment, and Interdependence on the Perceived Usefulness of Management Accounting Systems. *The Accounting Review*, American Accounting Association 61 (1): 16-35
- [6] Duncan R. B. (1972) Characteristics of Organizational Environments and Perceived Environmental Uncertainty. *Administrative Science Quarterly*: 313-327
- [7] Galbraith J. R. (1973). *Designing Complex Organizations*, Addison-Wesley Pub Co, Boston: MA, USA
- [8] Galbraith J. R. (1974). Organization design: an information processing view. *Interfaces*, 4(3), 28-36
- [9] Galbraith J. R. (2002). *Designing organizations – an executive guide to strategy, structure, and process*. San Francisco: Jossey-Bass, USA
- [10] Hair J. F., Black W. C., Babin B. J., Anderson R. E. and Tatham R. L. (2010). *Multivariate Data Analysis*. New Jersey: Pearson Prentice Hall, USA
- [11] Haldma T. and Laats K. (2002). Influencing contingencies on management accounting practices in Estonian manufacturing companies, Faculty of Economics and Business Administration, University of Tartu, Tartu
- [12] Harash E., Al-Timimi S. N., Alsaad F. J., Al-Badran A. Y. Z. and Ahmed E. R. (2014). Contingency Factors and Performance of Research and Development (R and D): The Moderating Effects of Government Policy. *Journal of Asian Scientific Research*, 4(2), 47-58
- [13] Hoque Z, Mia L. and Alam M. (2001). Market competition, computer-aided manufacturing and use of multiple performance measures: An empirical study, *British Accounting Review*, 33(1), 23-45
- [14] Iacovou C. L., Benbasat I. and Dexter A. S. (1995). Electronic Data Interchange and Small Organizations: Adoption and Impact of Technology, *Management Information System Quarterly*, 19(4), 465-485
- [15] Ibadin, P. O., and Imoisili. O. (2010). Organization Contexts and Management Accounting System Design: Empirical Evidence from Nigeria. *International Journal of Current Research*, 10: 064-073
- [16] Johnson H. T. and Kaplan R. S. (1987). *Relevance Lost: The Rise and fall of Management Accounting*, Harvard Business School Press: Boston, USA
- [17] Jusoh R. (2010). The influence of perceived environmental uncertainty, firm size, and strategy on multiple performance measures usage. *African Journal of Business Management* 4 (10): 1972-1984
- [18] Kaplan R. S. (1983). Measuring manufacturing performance: a new challenge for managerial accounting research, *The Accounting Review*, 58(4), 686-705
- [19] Masrek, M. N. (2009). Determinants of Strategic Utilization of Information Systems: A Conceptual Framework. *Journal of Software* 4 (6)
- [20] Miles R. E., Snow C. C., Meyer A. D. and Coleman H. J. (1978). *Organizational Strategy, Structure, and Process*. The Academy of Management Review, 3(3), 546-562
- [21] Miller K. D. (1993). Industry and country effects on managers' perceptions of environmental uncertainties. *Journal of International Business Studies*, 24(4), 693-714
- [22] Milliken F. J. (1987). Three Types of Perceived Uncertainty about the Environment: State, Effect, and Response Uncertainty. *The Academy of Management Review*, 12(1), 133-143
- [23] Ngoc Phi Anh D., Nguyen D. T. and Mia L. (2011). Western management accounting practices in Vietnamese enterprises: Adoption and perceived benefits. *Pacific Accounting Review*, 23(2), 142-164
- [24] Otley D. T. (1999). Performance management: a framework for management control systems research, *Management Accounting Research*, 10(4), 363-382
- [25] Pfeffer J. and Leblebici. H. (1973). The Effect of competition on some Dimensions of Organizational Structure. *Social Forces*: 268-279
- [26] Saaty, T.L. (1980). *The Analytic Hierarchy Process*. New York, McGraw-Hill, USA
- [27] Steers R. M. (1977). *Organizational Effectiveness*. CA: Goodyear Publishing Co, USA
- [28] Wang C. H., Chen K. Y. and Chen S. C. (2012). Total quality management, market orientation and hotel performance: The moderating effects of external environmental factors. *International Journal of Hospitality Management*, 31(1), 119-129
- [29] Wang D.H.M. and Huynh Q.L. (2014). Linkages among corporate governance, management accounting practice and organizational performance: Evidence from a Southeast Asian country, *Romanian Economic and Business Review*, 9(1), 63-81
- [30] Wierenga B. and Ophuis P. A. M. O. (1997). Marketing decision support systems: Adoption, use, and satisfaction, *International Journal of Research in Marketing*, 14(1997), 275-290

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