

ENTREPRENEURIAL ORIENTATION: PRIORITISING AND MAPPING IN THE CONTEXT OF SMALL AND MEDIUM- SIZED ENTERPRISES

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Abstract: Understanding the degree of entrepreneurial orientation (EO) in the context of small and medium-sized enterprises (SMEs) is vitally important, since its priorities may vary among business sectors. Previous studies have extensively studied EO using simple and common methods of measuring EO at the construct level (summated scale), ignoring the fact that different business sectors have different priorities in terms of the dimensions of EO. The purpose of this paper is to discuss these limitations based on a multi-criteria decision making (MCDM) method for each dimension and items using the Analytic Hierarchy Process (AHP). This method is used to analyse and classify the perception of managers or owners-managers of SMEs based on each dimension of EO. 409 SMEs were involved in ranking the EO score based on the dimensions (criteria) and multiple items (sub-criteria) at the industry and business sector level (e.g., handicraft, cakes, embroidery, and crackers). To illustrate the findings, a Cartesian diagram exhibits the priority of EO level in different business sectors. The findings indicate that innovativeness is the most important or main criteria, followed by proactiveness. At the level of sub-criteria, 'research and product development' obtained the highest score of innovativeness. Finally, mapping based on business sectors showed that cakes, as well as embroidery, considered innovativeness as main criteria compared with proactiveness, contrary to the handicraft, and crackers business sectors that have high proactiveness, but low innovativeness. The empirical findings hold important implications for SMEs managers and contribute to EO literature by using the AHP approach as a meaningful tool in management.

Key words: entrepreneurial orientation, Analytic Hierarchy Processes, manufacturing

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Introduction

Entrepreneurial orientation (EO) is one of the strategic options of a firm that governs its management philosophy and behaviour to compete and outperform the competitors (Engelen et al. 2016). As noted by Lumpkin and Dess (2001), EO is a strategy-making process. Many proponents of EO concurred that EO is identified based on firm-level predominant strategic posture which is divided into three dimensions i.e., innovativeness, risk-taking and proactiveness (Covin and Slevin, 1989; Gupta and Gupta, 2015; Wales, 2016) and has been widely accepted as a tool

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to evaluate the level of entrepreneurial firms (Gupta and Dutta, 2018; Rezaei et al. 2013). Originally, these dimensions have been introduced by Miller (1983) and operationalized by Covin and Slevin (1989) to test the relationship between EO and performance of small manufacturing firms. Empirically, the relatedness between EO and size of the businesses have influenced more research of EO in small and medium-sized enterprises (SMEs) setting (e.g., Sok et al., 2017; Tang and Tang, 2012; Wales et al., 2013). It has triggered interest among the researchers to investigate and understand the EO in the context of SMEs (Eshima and Anderson, 2017; Kraus et al., 2012; Tabor, 2011; Wardi et al., 2018). Although EO is one of the established constructs in management research, the issue of how EO construct can be measured has become a challenge and little attention was given to understand the level of EO in previous studies (Covin and Wales, 2019). Importantly, SMEs managers need to know the level of entrepreneurial orientation before engaging in entrepreneurial activities to achieve greater performance (Rezaei et al., 2013). Obviously, the level of EO is important to be explored more in the context of SMEs.

According to Miller (2011), variation in the components of EO are emerging issues for understanding entrepreneurial behaviour among firms; for example innovativeness component may be more important in the high-technology setting, risk-taking may be more compelling to a new business, and proactiveness may be more needed in highly competitive industry. According to Shehu and Mahmood (2015), the relationship between entrepreneurial orientation and performance often yield inconsistent findings in different settings thus making environmental factors pertinent to explain the relationship. A more interesting perspective suggests that the inconsistency may be due to the dimensions; innovativeness might not always be the 'heart' of EO as discussed by Covin and Miles (1999). This is logical, taking into account that a firm may react accordingly to the environment; in a hostile environment where opportunities are scarce, the inclination of entrepreneurial orientation to be in a more aggressive mode by emphasising different dimensions in the entrepreneurial orientation construct (Parga-Montoya and Cuevas-Vargas, 2019). For these reasons, EO as a principal construct may be more effective to be analysed component-based rather than aggregately (e.g., Kreiser et al., 2002; Lumpkin and Dess, 2001; Miller, 2011). Although prior studies had analysed the components of EO, not many studies explored the issue comparatively by focussing on the significant difference between EO components in different types of businesses in SMEs setting. This implies the need for other approaches to analyse EO construct. In relation to this, multi-criteria decision-making (MCDM) methods can provide new perspective in understanding the level of EO in firms. For this study, a powerful tool in MCDM methods i.e., Analytic Hierarchy Process (AHP) (Handfield et al., 2002) is employed to assess multi-criterion framework in a decision making model. This approach can help managers of SMEs to understand the flexible side of EO; thus, making managers more sensitive and alert in managing different businesses in different sectors.

EO has been widely and empirically investigated in developed countries or mature economies such as United States, United Kingdom, and Spain, however are still limited in developing countries (e.g., Gupta and Batra, 2016; Kreiser et al., 2002) and in different industries. Despite EO is a concept that can be applied in cross-cultural setting, entrepreneurial predispositions may not be similarly effective in developing countries due to substantial difference in economic structures, public policy, resources, and capabilities (Dennis Jr., 2011; Gupta and Batra, 2016). For example, Rezaei et al. (2013) evaluated level of EO in developed country such as Holland and found proactiveness as the most important dimension rather than innovativeness in ICT industry. In similar vein, innovativeness is found not have significant relationship to performance in insurance industry because it is believed to be an action-based capacity that cannot enhance performance directly (Nazri et al., 2015). This indicates that contextual factors can influence the strategies adopted by firms to enter into industries and markets as discussed by Zahra et al. (2014). In other words, EO may be dissimilar in different types of businesses and environments (Wiklund and Shepherd 2005) in terms of magnitude and importance. Therefore, researchers should explore the characteristics of the components of EO that may be uniquely featured in different types of businesses, especially within SMEs context in facing many challenges to survive and achieve high growth performance in the industry. To fill this gap, we need to assess EO phenomena in SMEs from the lens of different types of businesses in a developing country. Taking Indonesia as the geographic setting for this study, four leading businesses in the manufacturing sectors were comparatively analysed i.e., the handicraft sector, cakes sector, embroidery sector, and crackers sector (Bank-Indonesia, 2012).

This study focuses on assessing and mapping the EO components in SMEs in the manufacturing sector in Indonesia. Firstly, the study aims to identify what are the main criteria of the three components of EO (i.e., innovativeness, risk-taking, and proactiveness) in terms of decision-making. This is followed by the mapping among the different business groups in a Cartesian diagram that includes handicraft, cakes, embroidery, and crackers business sectors to visually highlight the differences among the sectors in terms of EO components. The study contributes in terms of giving a new perspective of EO research by examining in-depth the differences of EO in different business sectors. Understanding the differences will address the following issues (1) in relation to evaluation of EO concept introduced by Miller (2011), EO construct may be more effective to be analysed by using components rather than aggregate in understanding organizational behaviour using AHP approach; (2) acknowledges EO transcends to decision-making styles, methods and practices, making it relevant towards development of a decision support model (e.g., AHP); and (3) EO as a multidimensional construct can generate different outcomes based on different combinations of the components. The findings also provide important practical implications for practitioners and policymakers in developing countries like

Indonesia especially in resources allocation in the pursuit of building entrepreneurial culture.

Literature Review

Entrepreneurial Orientation (EO)

EO is defined as “driving force behind the organizational pursuit of entrepreneurial activities” (Covin and Wales, 2012). EO is reflected in the entrepreneurial practices and firm behaviours (Zahra et al., 2014). Originally, EO concept was introduced by Miller (1983) that illustrates EO as “*an entrepreneurial firm that engages in product-market innovation, undertakes somewhat risky ventures, and is first to come up with ‘proactive’ innovations, beating competitors to the punch*”. Based on this definition, EO is recognized by three components i.e., innovativeness, proactiveness, and risk-taking (Covin and Miller, 2014). Practically, entrepreneurial-oriented firms should have the willingness to predict risks, be proactive to explore opportunities and accentuate futurity in strategic decision-making (Audretsch, 2015; Zahra et al., 2014). Although the conceptualization of EO has been deliberated with many viewpoints, majority concurred that EO is reflected by product-market innovation, calculated risks, and proactive behaviour in the pursuit of opportunities (Rauch et al., 2009).

The initial work of Miller (1983) conceptualized EO based on three components i.e., innovativeness, risk-taking, and proactiveness, and these components were universally accepted to reflect EO in different context and issues. Emerging phenomenon that is reshaping business landscape invigorates current research to identify differences in the EO concepts (Covin and Miller, 2014). In line with this, Miller (2011) suggested that the prominence of EO components might be differently manifested in different contexts, and understanding of the differences will produce better application of the constructs to improve performance (e.g., Kreiser et al., 2002; Lumpkin and Dess, 2001; Miller, 2011). Furthermore in his recent work, Miller (2011, p.880) conclude that “*disaggregation of components sometimes distances the research from the original EO construct, it may not make sense in these divergent situations to combine them. Perhaps, in some research contexts, ‘the best of both worlds’ may entail analyses that present results for the EO construct and for each of its components*”. In other words, upcoming studies may enrich the analysis of the EO components by using other perspectives and approaches to contribute to the EO literature.

Studies that incorporate EO as one of the constructs often measure level of EO using summated scale approach whereby all values of the items are combined to determine final score of EO using 5 or 7 point Likert scales. Although this approach can imply the weight for dimensions and items, it does not capture the preferences of the decision-maker in the firm (Rezaei et al., 2013). Second, using multi-criteria decision-making (MCDM) methods such as Analytic Hierarchy Process (AHP) can assess the importance (weight) of different dimensions and items within dimension to understand better the decision making in the firm

(Amrita et al., 2018). Therefore, this study explores the EO components to provide a new perspective of decision making, particularly in different sectors by using management science tool such as Analytic Hierarchy Process (AHP).

Analytical Hierarchy Process as a Decisions Support Tool for Managers

The Analytic Hierarchy Process (AHP) is a rational decision-making technique to determine the choice based on a structured process (Kinoshita and Taji, 2015). The AHP as a decision support tool for managers was originally formulated to provide a framework for problem-solving in a multi-criterion context based on the relative priorities to achieve certain objective (Handfield et al., 2002; Saaty, 2008). AHP is described as an effective tool in complex problem solving that involves a systematic process of evaluating alternatives using a step-by-step approach to ultimately arrive to a decision. According to Saaty (2008), AHP allows one to arrive to a decision in an organized way and according to priorities using several steps, i.e. (1) define the main problem within the context of the body of knowledge; (2) prepare the structure of the decision hierarchy that comprises the goal of decision (at the top of the hierarchy) to the alternatives (at the lowest point) based on wide-ranging perspective, and the transition will go through the intermediate levels of relevant criteria (3) the criteria is analyzed using pairwise comparison matrices that compares each element in the upper level to the element in the level immediately below it with respect to the desired goals; and, (4) determine the scale based on the comparisons to weigh the priorities in the level immediately below and this is done for every element until the final priorities score is achieved. Based on these steps, managers can apply a clear cognitive process to make decision, taking into consideration all factors and possible alternatives that are involved in a complex decision-making (Handfield et al., 2002; Yang and Chen, 2006).

AHP gain popularity as a good alternative tool in multiple criteria decision-making (MCDM) due to its simplicity, flexibility and ease of use for managers (Ho and Ma, 2018). This approach is really helpful as AHP can be considered as an effective system that is based on the concept of bounded rationality that acknowledges the limitation of the cognitive processes (Kinoshita and Taji, 2015). AHP attempts to consider all of the relevant factors at its best to arrive to a complex decision (Handfield et al., 2002). Without AHP, the complexity of the decisions may not be handled accordingly as decisions are made based on overt factors, leaving out many others that may actually have significant impact to the decision. As put forth by Handfield et al. (2002), AHP is an appropriate and effective tool if several conditions are fulfilled i.e. *“the goal for a decision can be clearly stated, a set of relevant criteria can be determined, and a set of alternatives can be described using these criteria”*. In this study, following the procedure of AHP, EO as a construct is positioned as goal, while the three dimensions (i.e., innovativeness, proactiveness and risk-taking) are considered as criteria, and the multiple items in each dimension are viewed as sub-criteria. These steps are called

multi-criterion decision-making problem using the AHP tool. Therefore, AHP is an effective decision support system to solve MCDM problem (Ahn, 2017).

The application of AHP involves the process of determining relative weights (i.e., firms will give different weights to different criteria depending on importance of the factor to the firm), and priority weights is determined by using pairwise comparisons (Yang and Chen, 2006). As presented by Borade et al. (2013), the steps applied in their research are (1) determine the model problem in a hierarchy setting inclusive of decision goal, alternatives, and criteria for evaluating the alternatives; (2) establish priorities among these elements and make a series of judgements of these elements based on pairwise comparison; (3) check the consistency of these judgements; (4) synthesise all the judgements, and finally; (5) make decision based on this process. This study will follow these steps to determine the level of EO construct. To our knowledge, categorisation and prioritisation of EO level using AHP can be considered as a novel attempt in EO literature since it has not been explicitly used. Furthermore, this approach is relevant, efficient and effective in the categorisation and prioritisation of EO construct based on their dimensions. Finally, AHP can help to explain the level of EO construct in more detail for the reference and practice of managers.

Research Method

The multi-criterion decision-making (MCDM) preference process by using AHP is a quantitative method that requires selected respondent to rank priorities of each criteria based on pairwise comparison (Mosadeghi et al., 2015). For this study, a survey questionnaire is used and a total of five-hundred questionnaires were distributed to managers or owners-managers of small and medium-sized enterprises (SMEs) in Indonesia, especially in West-Sumatera Province as the central of SMEs in Indonesia. Specifically, data was collected from four business sectors in the manufacturing industry, i.e. handicraft, cakes, embroidery, and crackers business sectors which are leading sectors in the manufacturing industry as reported by Bank of Indonesia (2012). Accordingly, as noted by Ho and Ma (2018), AHP based research generates more meaningful perspective and more established in the manufacturing industry as compared to the service industry. In relation to this, Thabrani et al. (2019) suggest that manufacturing sector competes in a more dynamic business and therefore easier to measure entrepreneurial activities such as innovation process, proactive behaviour and risk-taking in performing business functions.

During the data collection, the respondents were asked to rank the level of EO construct based on criteria and sub-criteria according to a numerical scale of 1 to 9 (see Table 1). The respondents selected in this study were managers or owners-managers following their involvement in strategic decision making of the firms. In addition, another criterion for SMEs in this study is that the firm must have been in operation for more than 5 years, taking into consideration experiences and abilities to survive in market uncertainty. As discussed by Littunen (2000), firm that has

less than 5 years of operation is still unstable in relation to management concepts such as goal of the firm, strategic choice, product policy, and market adaptation, thus making it difficult to determine their strategy. As noted by Rezaei et al. (2013), after surviving the first phase of business cycle (first three years), firms will establish their strategy or determine their future direction. Based on these arguments, firms under five years were excluded from the data analysis.

As the objective of this study, AHP approach was used to rank the level of EO construct; the dimensions of EO as the criteria (i.e., C1: innovativeness, C2: proactiveness, and C3: risk-taking) and the items as sub-criteria e.g. C1.1: emphasis on R & D, C1.2: emphasis on technology leadership and innovation, C1.3: produce new line of products and services (see Figure 2). This criteria and sub-criteria were derived from Covin and Slevin (1989) and were validated for face validity by three experts in the field of management. The detailed process of the AHP data analysis is illustrated in Figure 1. The AHP as a multi-criteria decision making consist of a multi-stage process such as determining objective, defining the criteria, specifying alternative, assigning weights, and applying mathematical algorithm (Mosadeghi et al. 2015). More specifically, the process involves eight steps as suggested by Saaty (2008) and Ghatak and Pal (2016), which is, (1) state the goal or objective; (2) develop the subordinate level criteria or sub-criteria; (3) arrange the problem into a hierarchy for analysis; (4) collect empirical data for pair-wise comparison; (5) perform pair-wise comparison between each level of criteria and sub-criteria; (6) check consistency in pair-wise comparison; (7) calculate the global weights of each criteria and sub-criteria; (8) combine findings and drawing inference for EO components. Finally, findings of the AHP approach are presented through mapping of the manufacturing sectors in a Cartesian diagram to understand the EO phenomenon among the business sectors.

In this study, we conduct the procedure of AHP following the structured approach. Firstly, we need to state the goal or objective that will define the priorities of the EO construct as key element in decision making. Although all firms are within the manufacturing industry, the main idea of this study is that different sectors in the manufacturing industry will exhibit differences in entrepreneurial priorities. Therefore, in this study we determine the objectives and priorities at two different levels; the objective for EO components in all the businesses sectors in the manufacturing industry, and the objectives of EO in each business sectors within the manufacturing industry i.e. handicraft, cakes, embroidery, and crackers business sectors.

Secondly, we explore EO concept based on three dimensions as criteria (i.e., C1: innovation, C2: risk-taking and C3: proactiveness) and sub-criteria which were developed by Covin and Slevin, (1989). Each component of the dimensions is considered as sub-criteria. Basically the sub-criteria includes (C1.1) Emphasis on R&D (ERD); (C1.2) Technological leadership, and innovations (TLI) (C1.3) Many new lines of products/ service (NLP); (C1.4) Change in products/services line (CPL); (C2.1) Initiates actions which competitors then respond to (IAC) (C2.2)

First business to introduce new products/services (FBI) (C2.3) Avoid competitive clashes (ACC); (C3.1) Proclivity in high-risk project (PRP); (C3.2) Owing to the nature of environment (ONE); and, (C3.3) Adopt a cautious behaviour (ADC). These components were validated through a focus group discussion, in which we asked expert to evaluate these criteria and sub-criteria before data collection. Originally, EO concept was only comprised of nine items, however the result of validation process by experts generated ten items and all were used in this study. The new item was generated from sub-criteria “a strong emphasis on R&D, technological leadership, and innovations” which was split into two items, i.e. (C1.1) emphasis on R&D (ERD), and (C1.2) emphasis on technological leadership, and innovations (TLI).

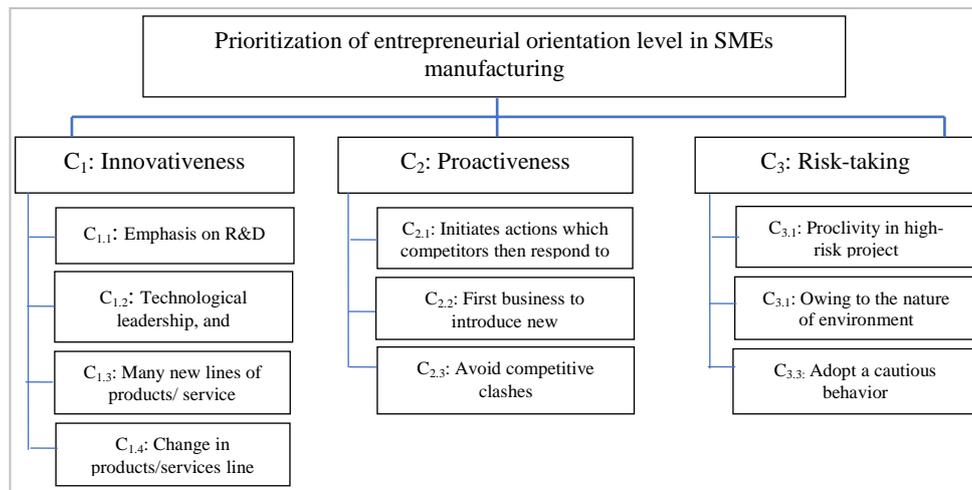


Figure 1: Modelling hierarchy structure for entrepreneurial orientation level

Thirdly, after subordinate level criteria and sub-criteria of EO were developed, all were arranged accordingly into a hierarchy process. Following the work of Saaty (2008), the hierarchy process entails three levels, namely goal or objective (level 1), criteria (level 2), and sub-criteria (level 3) (see Figure 1).

Table 1: Scale for performing Pair-Wise Comparison

Rating Scale	Preference of verbal judgments
$a_{ij} = 1$	The two parameters are equally critical
3	Parameter i is weakly more critical than parameter j
5	Parameter i is strongly more critical than parameter j
7	Parameter i is very strongly critical than parameter j
9	Parameter i is absolutely more critical than parameter j
2, 4, 6, 8	Intermediate value between the two-adjacent judgments

(Adopted from Ghatak and Pal (2016))

In the final step, empirical data for pair-wise comparison was collected using a survey to managers or owners-managers of SMEs in the four different businesses sectors i.e., the handicraft, cakes, embroidery, and crackers in the manufacturing industry. This survey involved 409 managers with the objective to gauge what is the priority in their business in relation to entrepreneurial orientation level. Based on the empirical data, we compared the priority using pair-wise approach. Following Saaty (2008), researcher need to designate a scale of numbers for making comparisons, that reflects how many times more important or dominant one element is over another element based on their perception. This scale is applied in the pair-wise comparison between each level of the criteria and sub-criteria. For more details, we can see in the Table 1.

After calculating the pairwise comparison to determine priority weights, the consistency of the decision is evaluated using the Consistency Ratio (CR). This process examines the consistency of a judgement whether pairwise comparisons value of the criteria is consistent or not (meaning not within the acceptable range). Commonly, a value of 10 % can be accepted as a tolerable range (Dyer and Forman, 1992). CR is calculated by considering a value of consistency index (CI) and random index (RI), which can be formulated using this formula; $CR = CI/RI$. Mathematically, CI for an n element matrix is formulated by $CI = (\lambda_{Max} - n) / (n - 1)$ and RI should be selected from Table 3. For example, $CR < 0.01$, we can conclude that the consistency of the pairwise comparison matrix is acceptable.

Table 2: RI Value for Different Matrix Orders

Order of the Matrix	1	2	3	4	5	6	7
Random Index (RI)	0	0	0.58	0.90	1.12	1.24	1.32

Result and Discussion

As discussed in prior section, the purpose of the study is to rank the level of entrepreneurial orientation (EO) based on three criteria (i.e. innovation, proactiveness, and risk-taking) and ten sub-criteria as shown in the hierarchy of the problem (see Figure 1). In practice, managers or owners-managers of SMEs from the selected manufacturing industry were asked to determine their priorities among the three level of EO in relation to business decision making. The response rate for this study is above 85.60%; out of 500 questionnaires distributed, a total of 428 questionnaires were returned by participants. However, only 409 questionnaires were deemed usable for analysis after sample requirements check (e.g., firm age and type of business sectors). Based on the demographic analysis, 72.86 percent of the SMEs involved in the survey can be considered as matured firm that have been in operation for more than 5 years and more than 50 percent are dominated by women as managers or owner-managers (51.47 percent). The responses were analysed using AHP approach to arrange priority scale for each criteria and sub-criteria. After finishing the analysis at industry level, analysis at individual level

was also done for each of the four business sectors (i.e., cakes, handicrafts, crackers, and embroidery business sectors). Finally, the results were mapping out for the four businesses sectors in a Cartesian diagram to describe the priority scale of EO components across businesses sectors in the selected manufacturing industry.

The AHP for SMEs in Manufacturing Industry

The application of AHP in the study of EO among SMEs in the manufacturing industry is an attempt to understand in depth the EO construct (dimensions and items) of all firms using an orderly approach. Referring to Figure 1, after collection of empirical data, the next step is to perform pairwise comparison matrix with respect to criteria (level 2) and sub-criteria (level 3). After the formation of the rating of pairwise comparison matrix, the next process involved generation of the normalised matrix by the sum of the elements corresponding to each column. After that, the priority weight of each criterion is calculated. Finally, validity of the model was determined by consistency check. The result is illustrated in Table 3 below for pairwise comparison and priority weights with respect to level 2 (criteria).

Table 3: Pairwise comparison and priority weights with respect to level 2 (criteria)

Criteria and sub-criteria	INN	PRO	RIS	Geometric Mean	Weights (ranking)	Checking for Consistency	
						Indicators	Scores
C ₁ : Innovativeness (INN)	1.000	1.378	2.136	1.433	0.457 (1)	λ_{max}	3.004
C ₂ : Proactiveness (PRO)	0.730	1.000	1.415	1.011	0.322 (2)	CI	0.002
C ₃ : Risk-taking (RIS)	0.462	0.718	1.000	0.692	0.221 (3)	CR	0.003
Sum	2.191	3.096	4.551	3.136	1.000		

Notes: λ_{max} = Maximum Eigenvector; CI = Consistency Index; Consistency Ratio (CR)

From Table 3, we can confirm that the highest priority in EO criteria is given to innovativeness based on evaluation of managers or owners-managers of SMEs with a weight of 0.457, followed by proactiveness (0.322) and then risk-taking (0.221). All the consistency ratios of the pairwise comparison matrix was found to be satisfactory within an acceptable range, (CR<0.01). We can conclude that weight values and consistency ratio are both consistent, and the model can be interpreted that is valid. Based on these, the result of priority weights for level 2 (criteria) has evidently shown that innovativeness as the topmost priority weights by managers or owners-managers in their decision among the EO dimensions. The findings is similar to Mishra and Mishra (2019), that concludes sub-criteria for innovativeness is main issue for SMEs managers in India. It is an interesting conclusion since the finding is different in developed region that found proactiveness as topmost priority by small firm managers (Rezaei et al., 2013). Looking at the nature

of SMEs in developing countries, the innovation practice of small firms in developing countries is limited as compared to developed countries because of less skilled labour, less financial resources, and less adoption of new technology (Hadjimanolis, 1999) and this caused less efficiency gains in developing countries (Cirera et al. 2019). Due to this constraint, innovativeness becomes the main concern and often assumed as important capability to drive performance, hence making innovativeness as a main priority for managers SMEs. For more details, refer to Table 4. Similarly to Table 2, this process is also performed to the sub-criteria to analyse the pairwise comparisons and to check the consistency ratio. The results of this process are shown in Table 4.

Table 4: Pairwise comparison and priority weights with respect to level 3 of sub-criteria

1) Criteria: C ₁ Innovativeness	ERD	TLI	NPL	CPL	Geometric Mean	Priority Weights	Checking for Consistency	
							Indicators	Scores
Sub-criteria								
C _{1.1} Emphasis on R&D (ERD)	1.000	3.988	1.278	2.557	1.900	0.406 (1)	λ_{Max}	4.019
C _{1.2} Technological leadership, and innovations (TLI)	0.254	1.000	0.292	0.468	0.432	0.092 (4)	CI	0.006
C _{1.3} Many new lines of products/ service (NPL)	0.808	3.392	1.000	2.178	1.563	0.334 (2)	CR	0.007
C _{1.4} Change in products/services line (CPL)	0.415	2.058	0.451	1.000	0.788	0.168 (3)		
Sum	2.477	10.438	3.022	6.203	4.683	1.000		
2) Criteria: C ₂ Proactiveness	IAC	FBI	ACC	Geometric Mean	Priority Weights	Checking for Consistency		
						Indicators	Scores	
Sub-criteria								
C _{2.1} Initiates actions which competitors then respond to (IAC)		1.000	0.561	1.154	0.865	0.274 (2)	λ_{Max}	3.005
C _{2.2} First business to introduce new products/services (FBI)		1.812	1.000	2.018	1.541	0.488 (1)	CI	0.002
C _{2.3} Avoid competitive clashes (ACC)		0.874	0.490	1.000	0.754	0.239 (3)	CR	0.004
Sum		3.686	2.050	4.173	3.159	1.000		
3) Criteria: C ₃ Risk-taking	PRP	ONE	ADC	Geometric Mean	Priority Weights	Checking for Consistency		
						Indicators	Scores	
Sub-criteria								
C _{3.1} Proclivity in high-risk project (PRP)		1.000	0.723	1.039	0.294	0.065 (2)	λ_{Max}	3.004
C _{3.2} Owing to the nature of environment (ONE)		1.376	1.000	2.015	0.455	0.100 (1)	CI	0.002
C _{3.3} Adopt a cautious behaviour (ADC)		0.947	0.493	1.000	0.251	0.055 (3)	CR	0.003
Sum		3.323	2.217	4.054	1.000	0.221		

Notes: λ_{max} = Maximum Eigenvector; CI = Consistency Index; Consistency Ratio (CR)

The AHP for SMEs among Businesses Sectors

We can see that the highest priority in the sub-criteria of C1 Innovation is given to C1.1 Emphasis on R&D (ERD) with weight value of 0.406, followed by C1.3 Many new lines of products/service (NPL) (0.334), C1.4 Change in products/services line (CPL) (0.334) and lastly C1.2 Technological leadership, and innovations (TLI) (0.092). Similarly, the sub-criteria of C2 Proactiveness, the topmost priority is C2.2 First business to introduce new products/services (FBI) with priority weights of 0.488. Finally, for C3 Risk-taking, the sub criteria, C3.2 Owing to the nature of environment (ONE) has the highest priority weights of 0.455. As for the consistency of the pair-wise comparison matrix, it was found acceptable with value of CR < 0.1 for each sub-criterion. Based on the findings,

the sub-criteria C1.1 Emphasis on R&D becomes the main concern of SMEs managers. This is in line with recent study of Barasa et al. (2019) among small firms in developing countries, it was found that small firms face challenges in internal research and development (R&D), and negative effect on technical efficiency is apparent due to concentration of semi-skilled and/or unskilled labour. Therefore, sub-criteria R&D have become a priority for SMEs in Indonesia. After prioritizing the entrepreneurial orientation dimension in the manufacturing industry, we continue to analyse comparatively among the business sectors, i.e. cakes, handicrafts, crackers, and embroidery business sectors. Applying similar AHP process, each business sectors is prioritised accordingly based on pairwise comparison with respect to criteria (level 2) and sub-criteria (level 3). The analysis at level 2 (criteria) revealed that C1 Innovativeness has the topmost priority weights for three sectors i.e. cakes, handicrafts, and embroidery with value of consistency ratio (CR) within an acceptable range (CR<0.1). However, crackers give highest priority to C2 Proactiveness rather than innovativeness as topmost priority within their business sector. Details of the result are shown in Table 5.

Table 5: Pair-Wise Comparison and Priority Weights with Respect to Criteria and Sub-criteria

Hierarchy	Factor Categories/Criteria and Entrepreneurial Orientation Sub-Categories Sub-Criteria	Businesses sectors				
		Cakes Weights (ranking)	Handicrafts Weights (ranking)	Crackers Weights (ranking)	Embroideries Weights (ranking)	
With respect to entrepreneurial orientation priorities of dimensions categories						
Level 2 (criteria)	Innovativeness	0.582 (1)	0.503 (1)	0.239 (2)	0.521 (1)	
	Proactiveness	0.213 (2)	0.290 (2)	0.531 (1)	0.276 (2)	
	Risk-taking	0.205 (3)	0.206 (3)	0.230 (3)	0.204 (3)	
	Sum	1.000	1.000	1.000	1.000	
	Maximum Eigenvector (λ)	3.018	2.997	2.996	2.001	
	Consistency Index (CI)	0.009	-0.001	-0.002	-0.499	
	Consistency Ratio (CR)	0.015	-0.003	-0.003	-0.861	
	With respect to Innovativeness					
Level 3 (sub-criteria)	Emphasis on R&D (ERD)	0.514 (1)	0.348 (2)	0.331 (2)	0.431 (1)	
	Technological leadership, and innovations (TLI)	0.094 (4)	0.117 (4)	0.089 (4)	0.070 (4)	
	Many new lines of products/services (NPL)	0.247 (3)	0.372 (1)	0.413 (1)	0.309 (2)	
	Change in products/services line (CPL)	0.145 (2)	0.164 (2)	0.168 (3)	0.190 (3)	
	Sum	1.000	1.000	1.000	1.000	
	Maximum Eigenvector (λ)	3.983	4.030	4.011	4.087	
	Consistency Index (CI)	-0.006	0.010	0.004	0.029	
	Consistency Ratio (CR)	-0.006	0.011	0.004	0.032	
	With respect to Proactiveness					
	Initiates actions which competitors then respond to (IAC)	0.309 (2)	0.308 (2)	0.312 (2)	0.178 (3)	
	First business to introduce new products/services (FBI)	0.504 (1)	0.499 (1)	0.417 (1)	0.509 (1)	
Avoid competitive clashes (ACC)	0.186 (3)	0.193 (3)	0.272 (3)	0.313 (2)		
Sum	1.000	1.000	1.000	1.000		
Maximum Eigenvector (λ)	3.011	3.007	3.000	3.014		
Consistency Index (CI)	0.006	0.003	0.000	0.007		
Consistency Ratio (CR)	0.010	0.006	0.000	0.012		
With respect to Risk-taking						
Proclivity in high-risk project (PRP)	0.251 (3)	0.177 (3)	0.345 (2)	0.441 (1)		
Owing to the nature of environment (ONE)	0.452 (1)	0.546 (1)	0.446 (1)	0.350 (2)		
Adopt a cautious behaviour (ADC)	0.296 (2)	0.277 (2)	0.209 (3)	0.209 (3)		
Sum	1.000	1.000	1.000	1.000		
Maximum Eigenvector (λ)	2.974	3.016	2.988	3.039		
Consistency Index (CI)	-0.013	0.008	-0.006	0.019		
Consistency Ratio (CR)	-0.022	0.014	-0.010	0.033		

Based on analysis at level 3 (criteria), the result shows that two business sectors (i.e., cakes, and embroidery) put more emphasis on C1.1 Research and development (R&D) as topmost priority within decision making. However, handicrafts and crackers manufacturers prioritise more on C1.3. Many new lines of products as topmost priority weights in their decisions. However, for C2 Proactiveness sub-criteria, all businesses sectors selected the same sub-criteria as topmost priority namely C2.2 First business to introduce new products/services. As for C3 Risk-taking, the highest priority weight is given to sub-criteria C3.2 Owing to the nature of environment as the most dominant factor in making decisions except for embroidery sector that gave more prominence to C3.1 Proclivity in high-risk project. All in all, although the pattern shows some similarities among the four business sectors in the manufacturing industry, there exist some apparent differences in priority weights at the sub-criteria level. The differences indicate that the nature of business and competition may affect concerns of managers in terms of making strategic decisions within the entrepreneurial orientation scope.

Mapping EO among Businesses Sectors

In order to visually illustrate the different priorities of entrepreneurial orientation in terms of sub-criteria among the four business sectors, Cartesian diagram is used. The purpose of mapping the EO dimensions among the four business sectors in a Cartesian diagram is to exhibit the emphasis of the priority scale of EO components across businesses sectors in the manufacturing industry. The mapping show that main priority weights for the four business sectors namely (1) cakes, (2) handicrafts, (3) crackers, and (4) embroidery business sectors have two tendencies. As shown in Figure 3, the Cartesian diagram shows that both cakes and embroidery business sectors have the same tendency as shown in quadrant III, illustrating emphasis on innovation, but low in risk-taking and proactiveness. On the other hand, handicrafts and crackers exhibit high proactiveness and risk-taking, but low in innovation. Figure 3 below illustrates the mapping of the four sectors in relation to EO.

Conclusion

The findings of this study show that entrepreneurial firms put different emphasis or prioritised differently among the EO dimensions in relation to business decision-making. In addition to this, using AHP approach, a more thorough analysis can be conducted to the sub-criteria level and this further amplify the understanding of EO in individual firms. This study offers the conclusion that among the criteria (level 2) of entrepreneurial orientation (i.e., innovativeness, proactiveness, and risk-taking), innovativeness was found to be the top most priority as compared to proactiveness and risk-taking among the managers or owner managers of the four sectors in the manufacturing industry in Indonesia.

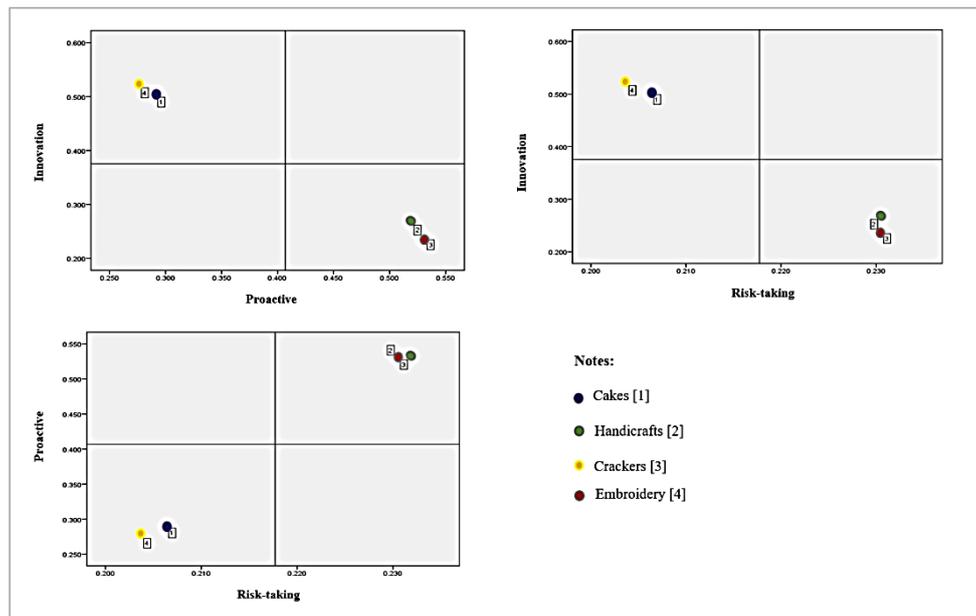


Figure 3: Mapping of entrepreneurial orientation level among businesses sectors

In relation to this, further analysis of the sub-criteria of innovativeness reveals that the most important sub-criteria (level 3) is Research and Development (R&D) based on the highest priority weights given using pairwise comparison approach. Comparatively, cakes, handicrafts, and embroideries business sectors exhibit highest priority to innovativeness; however crackers sector gives more emphasis to proactiveness. Finally, using Cartesian diagram, the study found significant tendencies of cakes and embroidery business sectors to be high in innovation, but low in proactiveness and risk taking (as shown in quadrant III). On another note, handicrafts and crackers show greater tendencies to proactiveness and risk taking, but low in innovation. This implies that the type of industry may have significant impact to the emphasis of EO among the business sectors.

The result of this study shows that exploration into the sub-criteria of entrepreneurial orientation brings meaningful differences that may impact the influences of the strategic orientation to other constructs. The significant differences found in the emphasis (priority) of EO dimensions among the different business sectors in a single industry setting provide an avenue to enrich the understanding of the EO concept. Future studies involving more sectors or multiple industries may enhance understanding of how EO is being applied in different settings. The use of AHP can be further enhanced and the application of Cartesian diagram can indicate the tendencies of the sectors to draw interesting conclusions. The application of this approach gives greater perspective that enriches our understanding of established concepts in management literature.

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ORIENTACJA PRZEDSIĘBIORCZA: PRIORYTETOWANIE I MAPOWANIE W KONTEKŚCIE MAŁYCH I ŚREDNICH PRZEDSIĘBIORSTW

Streszczenie: Zrozumienie stopnia orientacji na przedsiębiorczość (EO) w kontekście małych i średnich przedsiębiorstw (MŚP) jest niezwykle ważne, ponieważ priorytety mogą się różnić w zależności od sektora biznesowego. Wcześniejsze badania dogłębnie badały EO przy użyciu prostej i powszechnej metody pomiaru EO na poziomie konstrukcyjnym (skala sumowana), ignorując fakt, że różne sektory biznesu mają różne priorytety pod względem wymiarów EO. Celem tego artykułu jest omówienie tych ograniczeń w oparciu o metodę podejmowania decyzji wielokryterialnych (MCDM) dla każdego wymiaru i pozycji przy użyciu Procesu Hierarchii Analitycznej (AHP). Metodę tę stosuje się do analizy i klasyfikacji postrzegania menedżerów lub właścicieli-menedżerów MŚP na podstawie każdego wymiaru EO. W rankingu EO wzięło udział 409 MŚP na podstawie

wymiarów (kryteriów) i wielu pozycji (podkryteriów) na poziomie przemysłu i sektora biznesowego (np. Rękodzieło, ciasta, hafty i krakersy). Aby zilustrować te ustalenia, diagram kartezjański pokazuje priorytet poziomu EO w różnych sektorach biznesowych. Wyniki wskazują, że najważniejszym lub głównym kryterium jest innowacyjność, a następnie proaktywność. Na poziomie podkryteriów „badania i rozwój produktu” uzyskały najwyższy wynik w zakresie innowacyjności. Wreszcie, mapowanie oparte na sektorach biznesowych wykazało, że ciasta, podobnie jak hafty, uważały innowacyjność za główne kryteria w porównaniu z proaktywnością, w przeciwieństwie do rękodzieła, oraz sektory biznesu crackerów, które mają wysoką proaktywność, ale niską innowacyjność. Ustalenia empiryczne mają ważne implikacje dla menedżerów MŚP i wnoszą wkład w literaturę EO, wykorzystując podejście AHP jako znaczące narzędzie w zarządzaniu.

Słowa kluczowe: orientacja na przedsiębiorczość, procesy hierarchii analitycznej, produkcja

创业方向: 中小企业背景下的优先和制图

摘要: 了解中小企业(SME)背景下的创业导向程度(EO)非常重要, 因为它的优先级可能会因企业部门而异。先前的研究已经使用简单且通用的方法在构造级别(总规模)上对EO进行了广泛的研究, 而忽略了不同的业务部门在EO的维度上具有不同的优先级这一事实。本文的目的是使用分析层次结构(AHP), 基于针对每个维度和项目的多标准决策(MCDM)方法来讨论这些限制。此方法用于根据EO的各个维度对中小企业的经理或所有者-经理的看法进行分析和分类。

409家中小型企业参与了在工业和商业部门级别(例如手工艺品, 蛋糕, 刺绣和饼干)的维度(标准)和多项(子标准)的基础上对EO评分进行排名。为了说明这一发现, 笛卡尔图展示了不同业务部门中EO水平的优先级。研究结果表明, 创新是最重要或最主要的标准, 其次是积极主动。在次级标准方面, “研究和产品开发”获得了最高的创新分数。最后, 根据业务部门进行的映射显示, 与手工相比, 蛋糕和刺绣将创新作为主要标准, 而与手工业相反, 饼干行业的主动性却很高, 但创新性较低。实证结果对中小企业管理者具有重要意义, 并通过使用AHP方法作为管理中的一种有意义的工具, 为EO文献做出了贡献。

关键词: 创业导向层次分析法制造业