Entrepreneurship capability in industrial engineering and its effect on competitiveness

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Abstract. Entrepreneurship and competitiveness are interesting topics in regional economic development. The study aims to examine the effect of entrepreneurship on competitiveness in the leather industry. The study was applied to the leather tanning industry in Indonesia. The research method is based on a survey of 42 leather tanning companies, data analysis using the Partial Least Square. The research findings the effect of Entrepreneurship on Competitiveness has a low correlation. The cause of the low level of Entrepreneurship in SMIs is mainly in achievement motivation, leadership and business orientation factors. Therefore it is suggested to employers and the government to encourage entrepreneurial skills through entrepreneurship education, facilitation of capital and marketing and building partnerships in the leather industry.

1. Introduction
Competitiveness is a concern for entrepreneurs and government, where competitiveness reflects the ability of an organization to achieve success in the future. Competitiveness studies are grouped into three categories namely country, industry and company [1,2]. In Southeast Asia (ASEAN) Indonesia's competitiveness ranking has dropped from position 36 in 2017 to rank 45 in 2018. Indonesia's competitiveness is lower than Singapore, Malaysia and Thailand [3].

Porter said the country's competitiveness is influenced by industrial competitiveness, industrial competitiveness is determined by companies in the industry [4]. The existence of an industry as a bridge between the competitiveness of the country and the company. Competitiveness is determined by the ability of the industry to increase capacity, so competitiveness is determined by the capacity of companies in the industry [5].

Industrial competitiveness is a measure of development success, it reflects the hope that economic prosperity will be achieved. The industrial sector is the driver of the Indonesian economy. The Ministry of Industry regards industrial competitiveness as important as the National Industrial Development Master Plan 2015-2035. One potential industry is leather and shoe products. The tannery industry has been developing since the 1970s [6]. The local leather industry processes raw materials from cow, sheep and goat skin types. The Indonesian leather industry has low competitiveness in ASEAN, especially compared to Thailand and Vietnam.

Cho & Moon mentions that competitiveness is influenced by human resources, especially the role of entrepreneurs [7]. In economic dynamics with rapid changes, challenges arise, risks faced by entrepreneurs. Hisrich stated entrepreneurship related activities to find, evaluate and develop opportunities, business plans, and determination of resources in managing their businesses [8].
Entrepreneurship does not only apply to large companies, but also to small and medium enterprise. In this case the entrepreneurial relationship and competitiveness are interesting to study, especially in the SMIs manufacturing industry in Indonesia. Therefore, the research aims to measure the effect of entrepreneurship on competitiveness in Small Medium Industries (SMIs) so that this research is useful for entrepreneurs and the Government so that the performance and competitiveness of the industry can be improved.

2. Literature review
Porter discusses the relationship of a country's welfare reflected in industrial competitiveness, the relationship of state competitiveness with industrial competitiveness is illustrated in the Diamond model [4]. Economic competitiveness in an area is influenced by the structure of competition between companies in an industrial cluster [9]. While other researchers call competitiveness as success in achieving goals, where success is determined by the capacity of companies in the industry [5]. But researchers have not agreed on the measurement of competitiveness because each level of the organization has dimensions with different indicators [10].

There are differences in the measurement of competitiveness in the manufacturing industry. The characteristics of the manufacturing industry have raw material entities and machine facilities with clear stages and process flows [11]. This is as a manufacturing system including the flow of raw materials, the production process so that it becomes a product to be submitted to consumers [12]. Competitiveness is influenced by the interaction of internal and external factors as competitiveness driven. Internal driven factors are specified as Managerial and Capability of technology, while external driven factors are specified as Industrial Structure and the Role of Government [13].

Referring to the various opinions above, understanding Competitiveness is the ability to achieve future goals successfully and superior to competitors. Furthermore, in the manufacturing industry, competitiveness consists of three dimensions, namely Resources, Operational Processes and Performance [14]. Dimension grouping refers to the stages of the process in a manufacturing system, namely: resources (input), processing (process) and product output (output).

Moderate understanding of entrepreneurship is one's ability to manage, manage and take business risks [15]. While in Indonesian the term entrepreneur, consisting of the words 'wira' which means brave, mighty, and 'business' which means doing business, so entrepreneurship means someone who is brave, able to run a business to achieve success independently. The term entrepreneurial or entrepreneurship is used interchangeably as an activity in running a business, namely as an entrepreneur.

In economic dynamics challenges and opportunities and risks arise in the midst of uncertainty in business. Entrepreneurship related activities to find, evaluate and develop opportunities, business plans, resource allocation and business control [8]. The series of company activities is controlled by the leadership as an entrepreneur. Hunter & Lean mentioned the role of company leaders in business capability is reflected through the character of Entrepreneurial Leadership [16].

Matsuno et al. referred to entrepreneurship as determination, enthusiasm to improve the company's business performance by taking into account the orientation of meeting market needs [17]. Jones and George added that entrepreneurial abilities include experience, risk taking, high self-esteem, a sense of ability, the need for achievement [18]. While Lee & Hsieh called the ability of entrepreneurship as the ability of marketing, innovation, to achieve sustainable excellence [19].

Referring to the opinion above, entrepreneurial abilities include enthusiasm, courage to take risks and achievement motivation, manage resources with organizational leadership to gain profits and achieve excellence on an ongoing basis. In this study the entrepreneurial ability variable has three dimensions, namely: Entrepreneurial Spirit, Leadership and Goal Orientation.

The linkages of entrepreneurship to competitiveness were examined by Buckley et al. and Man et al. [20,21]. They analysed the effect of entrepreneurship on competitiveness in SMI companies. Entrepreneurial ability translates as leadership and managerial. Furthermore Man et al. examined entrepreneurial competencies in small and medium industries (SMIs) and socio-cultural influences on
the formation of entrepreneurial competencies [22]. He found that entrepreneurial competence was a high characteristic related to company performance.

This study discusses the effect of entrepreneurship on competitiveness in the leather industry in Indonesia. The entrepreneurial ability of SMIs is also reviewed based on the conditions and scope of competition and organizational capability. The pattern of the relationship between Entrepreneurship Capability to Competitiveness was also examined by Bulis-Skapars [23]. He found that the effect of Entrepreneurship on industrial competitiveness would fail if it did not pay attention to environmental factors in the region. The study discusses the effect of entrepreneurship on competitiveness in the manufacturing industry, namely the tannery industry.

3. Research methodology

This Research aims to examine the effect of entrepreneurship on competitiveness is carried out in the tanning industry. The structural model with formative patterns and validated empirically in the manufacturing industry. The population consists of 300 consisting of 50 formal companies and 250 informal firms of the SMI's leather tanning industry in Garut, Indonesia. Data collecting on purposive sampling (non-probability sampling) to 50 formal companies, with the number of questionnaires collected 42 companies or a response rate of 84%. Respondents are entrepreneurs as owners or factory managers, while competitiveness is measured through self-assessment. The questionnaire contains the respondents' responses as a Likert scale which has the smallest range of values = 1 and the largest = 5. Data processing is displayed descriptively, and analysed data using Partial Least Square (PLS).

4. Result and discussion

The results of analysis and processing data of Entrepreneurship (EP) influence Industrial Competitiveness (IC), shown below:

Table 1. Dimensions of industrial competitiveness.

| Dimensions          | Indicators                     | Loading Factor | Notes  | mean  |
|---------------------|--------------------------------|----------------|--------|-------|
| Resources (RC)      | Raw material supplies;         | 0.820          | valid  | 3.24  |
|                     | Production facilities;         | 0.862          | valid  | 3.07  |
|                     | Market Information;            | 0.687          | Not valid | 3.24 |
|                     | Capital Capability;            | 0.618          | Not valid | 2.86 |
|                     | Skilled workers                | 0.841          | valid  | 3.10  |
| Operational Processes (OP) |
|                     | Have a Firm Strategy;          | 0.857          | valid  | 3.24  |
|                     | Production Mgt                 | 0.788          | valid  | 2.57  |
|                     | Technology levels;             | 0.865          | valid  | 3.05  |
|                     | Production capacity;           | 0.689          | Not valid | 3.02 |
|                     | Collaboration Sup’s & Dist's   | 0.712          | valid  | 3.02  |
| Performance (PF)    | Turnover Volume;               | 0.864          | valid  | 2.64  |
|                     | Profit margin;                 | 0.869          | valid  | 2.64  |
|                     | Product quality;               | 0.566          | Not valid | 3.21 |
|                     | Worker Welfare                 | 0.753          | valid  | 3.00  |
| Entrepreneur Spirit (ES) |
|                     | Strong spirit;                 | 0.757          | valid  | 3.52  |
|                     | Dare to take risks;            | 0.896          | valid  | 3.33  |
|                     | Achievement motive;            | 0.514          | Not valid | 3.62 |
| Organizational Leadership (OL) |
|                     | Clear vision                   | 0.860          | valid  | 3.02  |
|                     | Seeking opportunities;         | 0.920          | valid  | 3.00  |
|                     | Creativity & Innovation;       | 0.851          | valid  | 2.98  |
|                     | Leadership;                    | -0.022         | Not valid | 3.14 |
|                     | Business Networking;           | 0.830          | valid  | 3.10  |
|                     | Cooperation                    | 0.818          | valid  | 2.95  |
| Goals Orientation (GO) |
|                     | Target of sales;               | 0.910          | valid  | 2.83  |
|                     | Profit target;                 | 0.916          | valid  | 2.81  |
|                     | Business continuity;           | 0.047          | Not valid | 3.17 |
The outer model test show several indicators of competitiveness are invalid, namely: market information, capital availability, production capacity, collaboration within the cluster, and product quality. While the indicators of entrepreneurship that not valid are: achievement motivation, leadership and business continuity. The reliability test by Confirmatory Factor Analysis (CFA) shows all dimensions of the construct are valid and reliable. The validity of the measuring instrument refers to the convergent validity and discriminant validity based on loading factors > 0.7. The testing procedure starts from checking the outer model with convergent validity and discriminant criteria, while the reliability test refers to composite reliability. Measurements are reliable if the composite reliability > 0.7; Cronbach's Alpha > 0.7 and discriminant analysis AVE> 0.5 [7]. The results test indicate the measuring instrument is reliable and can be applied to test research models.

The structural model test with path analysis and model capability test with the Stone Gesser. Structural models explain the relationship of exogenous variables to endogenous variables. The test results are shown in Table 2 and Figure 1. Path analysis shows that the entrepreneurship variable has a coefficient β1 = 0.674 with a determination (R²) of 0.454. Effect of Entrepreneurship on competitiveness (R²) 0.25-0.5 as a weak correlation. Furthermore, the model capability test (predictive relevance) with Stone-Geisser's obtained Q² = 0.213, the criteria of Q²> 0.15 indicate the model's capability as moderate.

### Table 2. Path coefficient.

| Path Analysis | Orgl Sample | T Statistics | P Values |
|---------------|-------------|--------------|----------|
| EP -> IC      | 0.674       | 4.785        | 0.000    |
| IC -> RC      | 0.831       | 17.748       | 0.000    |
| IC -> OP      | 0.946       | 57.133       | 0.000    |
| IC -> PF      | 0.897       | 27.069       | 0.000    |
| EP -> ES      | 0.725       | 6.015        | 0.000    |
| EP -> OL      | 0.986       | 234.100      | 0.000    |
| EP -> GO      | 0.497       | 4.243        | 0.000    |

Figure 1 shows the structural model reflects relationship between variables. The coefficient of determination (R²) = 0.454 this means that the three variables can explain competitiveness variance of 45.4%. The test results also showed that the entrepreneurship variable was strongly reflected by the Leadership dimension of 0.973, while the Entrepreneurship (EP) dimension was 0.526 and the weakest was the Goal Orientation dimension (GO) of only 0.247.

The model capability test with the Stone-Geissler's parameter denoted by Q². Capability Test reflects the ability of the model to predict relationships between variables (predictive relevance). PLS analysis with blindfolding procedure shows the value of Q² = 0.276, the category of value of Q² > 0.15 shows that the model has great capabilities so that the model is stated as moderate.
Hypothesis Testing evaluates the effect of Entrepreneurship on Competitiveness. Decision criteria refer to calculated (t-values) compared to t-tables at Alpha significance level (α=5%). The result analysis in Table 2 shows that variable has a positive with coefficient of $\beta_1 \neq 0$, t-value $> 1.96$ so $H_0$ is rejected. Thus the alternative hypothesis ($H_1$) is accepted and stated that Entrepreneurship have a positive effect on the competitiveness. The results of analysis show the overall model is fit but the correlation is weak.

Related to the theory, why is the model entrepreneurship has a low correlation with competitiveness? This explanation refers to a descriptive analysis of the educational background of employers in the leather industry. In theory, education has strong influence on entrepreneurship [24]. While, the education level of leather entrepreneurs is low. The proportion of entrepreneur who have graduated from college is very small, only 14.3%. The greater proportion each: have a high school education of 40.5%; 31% of junior high school and 9.5% graduated from elementary school, and the others 4.8%. The level of education of workers is generally a senior high school.

5. Conclusion
The results found the effect of entrepreneurship on competitiveness has a low correlation. The reason for the low influence of entrepreneurship on competitiveness is: there is a weakness in the dimensions of entrepreneurship. There are weaknesses in the organizational leadership dimension, the dimension of goal orientation, and the entrepreneur's educational background. The dimensions of organizational leadership with creative and innovative indicators showing low scores. The dimension of Goal Orientation with sales achievement indicators and profit achievement indicators also showing low scores. While overall the entrepreneurship is moderate, meaning the capability of entrepreneurship has not been categorized as good.

Based on their educational background, the majority of SMIs entrepreneurs have low levels of education. Therefore it is necessary to improve education so that they able to improve the entrepreneurial capability and competitiveness of SMIs in the future. Related to the limitations of the scope of research, in addition to considering the level of education, we suggest conducting research in other industrial sectors with a larger sample size. And need to include other variables such as regional economic conditions that tend to decline, Related to the limitations of the scope of research, in addition to considering the level of education, we recommend conducting research in other industrial sectors. As well as the need to include other variables such as regional economic conditions that tend to decline, in order to obtain comprehensive and useful research results in improving the performance and competitiveness of the industry in general.

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