

## The Dynamics of Competitiveness in Creative and Manufacturing Industries in the Indonesia Stock Exchange (IDX) of Pre and Post Crisis

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**ABSTRACT:** This study presents an empirical evidence concerning the comparison of the dynamics of competitiveness in the creative and manufacturing industries. It investigated the impact of the economic crisis on the competitive behavior of those industries. The samples were 42 firms taken from 3 sub-sectors of the creative industries and 3 sub-sectors of the manufacturing industries listed in IDX from year 2004 until 2010. This study used industrial entropy index to measure competitive interactions intra industries. The results showed that the magnitude competitiveness interactions in the manufacturing industries in average were similar to the competitiveness interactions in the creative industries; however, the competitiveness interactions of the creative industries were much more than the competitiveness dynamics in the manufacturing industries. This study also provided the evidence that after the crisis, the competitiveness of the creative industries increased sharply, however it was not the case in the manufacturing industries. Furthermore, this paper discussed the five sources of strengths affecting the dynamics of competitiveness in the creative industries and also gave some suggestions for further studies in this area.

**Keywords:** *Intellectual The dynamics of competitiveness, Industrial entropy index, Creative, Manufacturing, Industries, Economic crisis*

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### INTRODUCTION

There are many countries all around the world which have become interested in the creative industries that would give more significant contribution to their national economy. Although there are various definitions of the creative industry in each country, the data showed that the creative industries are growing at a faster rate than the aggregate economy. As The European Commission (2006) found, the average growth of cultural and the creative sector proceeded in 30 European countries was 8.1%. In the UK, where the most comprehensive data existed, the creative industries have been

recorded double the rate of the aggregate GDP growth, with the contributions at 8.2 % of GDP (UK Trade and Investment Service, October 2007). Australia also served similar evidence. When viewed over a longer time period, the creative industries in Australia have grown at a significantly faster pace than the aggregate economy. Over eleven years until 2007/2008, the creative industries expanded at an average annual rate of 5.8 per cent, compared to an average GDP growth of 3.6 per cent over that period (Creative Industry Economic Analysis report, June 2009). In Indonesia, the contribution

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of the creative industries was 6, 3% of GDP, which was bigger than the contribution of gas and electricity sectors, and as well as of transportation and communication sectors (The Department of Trade of the Republic of Indonesia, 2008).

The concept of the creative industry has been a feature of the academic and policy literature for over a decade (Potts et al., 2008). The standard definition that widely accepted has not changed much from its initial definition by *task force DCMS* (Departement of Cultural, Media and Sport UK Government, 1998):

*“Creative Industries as those industries which have their origin in individual creativity, skill & talent, and which have a potential for wealth and job creation through the generation and exploitation of intellectual property and content”.*

The Department of Trade of the Republic of Indonesia (2007) also used this definition (Department of Trade of the Republic of Indonesia, 2008).

There have been many grumbles and even dismissive critiques with regard to the details of the classifications of this concept. It is said that they were too narrow, too broad, too inconsistent against the existing classifications, the arbitrary and the opportunist (Hartley, 2005). The Standard Industrial Classification (SIC) was developed over half a century ago when the economy was categorized much more ready than the economy now by type of industrial activity in which the firm was engaged and the nature of its material inputs and outputs, such as agriculture, mining, manufacturing and basic industries. According to Potts, Cunningham, Hartley, and Ormerod (2008), the creative industries fit uneasily into this framework, because they shared many generic characteristics of the services economy and there was a large extent of an outgrowth of previous non-market economy of cultural goods and private imagination seeking new ways of seeing and representing the world

Since 2007 Trade Department of Republic of Indonesia has been providing the study report of a creative industry mapping in Indonesia which is divided into 14 sub-sectors based on the academic research of *Klasifikasi Baku Usaha Industri Indonesia (KBLI)* analyzed by the

Indonesian Statistics Bureau Centre (BPS-Statistics Indonesia) and other sources (creative & community associations, education and research institutions). In the present study the information about the contribution of the creative industries to the national economy was collected based on 5 main indicators, namely: (1) GDP; (2) employment; (3) number of firm; (4) export; and (5) the impact to other sectors. This study was based on a macro perspective, and recently there has been a little attention to the study of the creative industry from a micro perspective, especially in Indonesia. It aimed at conducting an empirical research of the creative industries with individual firms as a unit analysis.

Competitiveness of firms while being a central concern of a strategic theorist is also a major concern to industrial organization (IO) economist, either on theoretical framework or on an empirical work. The competitiveness of a firm is the competitive advantage it has over its rivals in a market or market it operates in (Gupta, 1997). Moreover, Gupta added a dynamic to this concept by defining a competitiveness of a firm as a capacity to sustain above normal profitability over time. A firm operating in a competitive industry has to make strategic decisions, and those decisions will affect other firms that operate in the market, supplier, and distributor. As a result, the rivals or other firms which have been affected by those decisions will react and adjust their decisions. Therefore, there are competitive interactions among firms, and the interactions are in a dynamic nature. Competitiveness dynamics is a set of competitive activities and of responses among firms in a certain industry.

While there had been a numerous theories and empirical studies of the competitiveness of firm, used both by the firm and the industry as the unit analysis, the research had three purposes. First, this study was addressed to describe a form of dynamic competitiveness in the creative and manufacturing industries. Second, the research continued to seek for differences between these two industries, if any. Finally, this research also investigated the impact of economic crisis on the behavior of competitiveness of those industries.

## **RESEARCH METHOD**

### **Data**

Source of data used in the empirical test was the Indonesia Stock Exchange (IDX) publication. The difficulties to select the sample were: 1) there was not any identified creative industry sector in the system of the Jakarta Stock Industrial Classification (JASICA), 2) JASICA spread the sub-sectors known under creative industry by the Departement of Trade of the Republic Indonesia in any sector in JASICA. As we know that the basic classification used by the Department of Trade of the Republic of Indonesia was based on KBLI (Indonesian classification industries based on SIC). The groups sectors within the JASICA fit uneasily into KBLI. Therefore the sample was far from being perfect.

As above mentioned, in JASICA there were 9 sectors which were divided by 57 sub sectors, and there was not any creative industry sector in there. Based on the classification of the creative industry by the Department of Trade of the Republic of Indonesia, there were 14 subsectors, namely: advertising, architecture, art and antique markets, craft, design, designer fashion, film and video, interactive leisure, music, performing arts, publishing, software and computer services, television and radio. There were only 3 out of 57 subsectors in JASICA that can be identified as the creative industry, namely computer and services; advertising, printing and media; and footwear (based on JASICA subsector code numbers of 97, 95 and 44). Of 20 firms of those subsectors, however, there were only 12 samples of firms which met our criteria. Therefore 12 firms were taken as the samples out of 3 subsectors of the creative industry. In the manufacturing industry available in IDX, there were 5 subsectors; however, we excluded 2 subsectors, i.e. footwear which can be categorized as the creative industry as it has more fashion design elements, and the electronic industry which only had 1 firm. In an industry having 1 firm, the competitive dynamics measurement could not be executed. The textile industry and garment subsectors were remain categorized in the manufacturing industry because this subsector in Indonesia was more like a manufacturing firm rather than a fashion firm. In those 3 subsectors manufacturing, there were 30 firms of which 42 firms were selected

using the criteria for the samples. To select the sample, we use criterion that the firms as they had complete records of variable data used in the analysis from the of period 2004 until 2010. Thus there were 42 firms (12 firms in the creative industry, 30 firms in the manufacturing industry) out of 62 satisfied the aforementioned criteria. Quarterly the data of ROA of the firms were used to yield annually entropy index. In total there were 1470 (42 firms x 4 quarter x 7 years) ROA data used for the analysis.

### **Measures of Competitiveness**

Proxies for interactive competitiveness are usually employed in the IO literature. Traditional approach to measure competitiveness in IO was used the market structure and market power measurement (Pepall, Richards, & Norman, 2005). The most popular index for measuring market structure is concentration ratio (CR<sub>n</sub>) and Herfindahl-Hirschman Index (HHI). CR<sub>n</sub> is defined as the market share of the top n firms, so that it focuses on the size of firms relative to the industry. HHI is the sum of the squares of the market share of all of the firms in the industry. This index attempts to reflect more full information rather than CR<sub>n</sub>. HHI reflects the combined influences of unequal firm sizes and the concentration of activity in a few large firms. According to Lyandres (2007), those indexes could be misleading as a measure of the extent of the competitive interactions. High HHI might be due to the low number of firms operating in the industry, and thus be positively related to the extent of the competitive interactions. However, it was also due to the high variation in industry participants' sizes. Empirical analysis gave evidence that the larger the differences in a firm's characteristics such a size, the smaller the influences of the rivals firms' actions values expected. Therefore, the relations between HHI and the extent of the interactions among firms in product markets were ambiguous.

Another potential proxy for the extent of the competitive interactions was the degree of advertising competition in an industry. Lyandres (2007) gave an explanation why advertising competition used. Advertising competition was the primary component of firms' interactions in output market which was not based by price or quantity, but by the willingness for a firm to engage in costly actions affecting their output

market rivals. Thus, advertising expenditure was expected to be positively related to the extent of the competitive interactions, but there was an opportunity that advertising expenditures had possibility of reverse causality. Advertising level may be a result of firms' choices, which might not be related to the extent of a product market competition.

Sundarmanto et al. (1996), developed CSM (Competitive Strategy Measure) as the proxy for competitiveness interactions. CSM was the correlation between the ratio of the change in a firm's profit and the change in its sales, and the change in the firm's rivals' combined sales. Competitive values of CSM corresponded to the competition in strategic complements, while negative values of CSM corresponded to the competition in substitutes. However, Lyandres (2007) pointed out that it was not clear whether CSM was a valid measure of the nature of market output competition when the possibility of shock to a firm's own value function of a change in firm's value function was an industry-wide shock to firms competing in the strategic competition.

Ruefli (1990) introduced an entropy index as a proxy for the competitive interactions intra industries. The entropy index is a measure of the volatility over a period of time in a market, industry, or industry subgroup along each of the dimensions for which it was computed. It was measured by relative uncertainty involved in rank shift activity of a group of entities over number periods. By using the entropy index, the weakness of CSM as above mentioned would be solved. Ruefli (1990) argued that ordinal data were not affected by the price changes, since all firms were affected proportionally. This paper used the entropy index as the measure for competitiveness.

The method to produce the entropy index according to Collins & Ruefli (1992) is:

(1) Set the ranks over time table contains of the rank of firms in an industry from first period  $t_0$  to  $t_m$ ; in this research we used Return on Asset (ROA) as proxy of performance, thus ROA was ranked for each sub-sector industries.

(2) Use information from the ranks over time table to make individual firm incidence matrices

for each firm  $\Phi_i$  whose elements  $\Phi_{jk}$ , indicates the number of times firm  $i$  made the transition from state  $j$  to  $k$  in the period of  $t_0$  to  $t_m$ . This matrix provides a convenient representation of an individual firm's dynamic behavior relative to the system of firms as a whole;

(3) Set system incidence matrix  $\Phi$ , describing individual firm  $i$  are summed over  $i$ , then a matrix  $\Phi = [\sum_i \Phi_{jk}] = [\Phi_{jk}]$ , which describe the incidence of state transition for the entire system is created;

(4) Transforms the system incidence matrix  $\Phi$  to transition probabilities matrix  $P = [p_{jk}]$ , whose elements are the conditional probabilities:

$$p_{jk} = p_k = \frac{\phi_{jk}}{\phi_{.j}}$$

The row and column marginal, respectively are defined by

$$p_{.j} = \sum_k p_{jk} = 1 \text{ and } p_{.k} = \sum_j p_{jk} = 1.$$

Thus the matrix is double stochastic

(5) Entropy index is conditional entropy relative  $H_{(K/J)rel} = H_{(K/J)} / H^*_{K/J}$ , which  $H_{(K/J)}$  was the average conditional entropy and  $H^*_{K/J}$  is the maximum average conditional entropy of such of a system.

$$H_{(K/J)} = - \sum_j \sum_k \left[ \frac{p_{k/j} \ln(p_{k/j})}{n} \right];$$

$$H^*_{(K/J)} = - \sum_j \sum_k \left[ \frac{\ln 1/n}{n \times n} \right] = \ln(n)$$

$H_{(K/J)rel}$  expresses the relative uncertainty of the system, that was, the relative degree to which an analyst, by virtue of having observed the system, has more information than by only knowing the number of the firms in the system.

$H_{(K/J)rel}$  ranges from 0 to 1. If the system completely certain, that is when  $H_{(K/J)rel} = 0$ .

Respectively, if the  $H_{(K/J)rel}$  approaches unity (the maximum entropy), that is the probability of each transitions in the transition matrix approaches  $1/n$ , that of the random system.

**RESULT AND DISCUSSION**

As above explained, the entropy index for the extent of the competitive interactions was employed.

Figure 1 demonstrates the competitiveness interactions dynamics in the creative industries and manufacturing industries from 2004 to 2010.

As discussed above, the entropy index ranges from 0 to 1. As shown in figure 1, the creative industries represented by advertising, printing, media, foot wear and computer & services were very volatile, especially computer & services industry. Sometimes, they were in the minimum conditions of the entropy meaning they didn't have change in this industries' rank, however in the other period, the entropy index was very high. The higher entropy index showed that there was a significant change of rank among firms in that industry. For example, if there are 5 firms (A,B, C, D, E, F) in the sub-sector, firm A

can move from rank 1 to rank 5 in the next period, and in the same period, other members change the rank from 4 to 1, and so on. In contrast, in the manufacturing industries represented by automotive & component, textile and garment, and cable industries, the entropy index had more flat range from 0.5 to 0.75. The patterns exhibits that the competitive interactions in the manufacturing industries had a moderate competitive interactions, but the dynamics from period to period was more stable, especially in the automotive & component sub-sector. Overall, we can conclude that the competitive interactions in the creative industry are more dynamics than in the manufacturing industries.

To strengthen the conclusion about the differences of the competitive interactions dynamics between the two industries, I used independent sample t-test. Table 1 presents the result of the test.

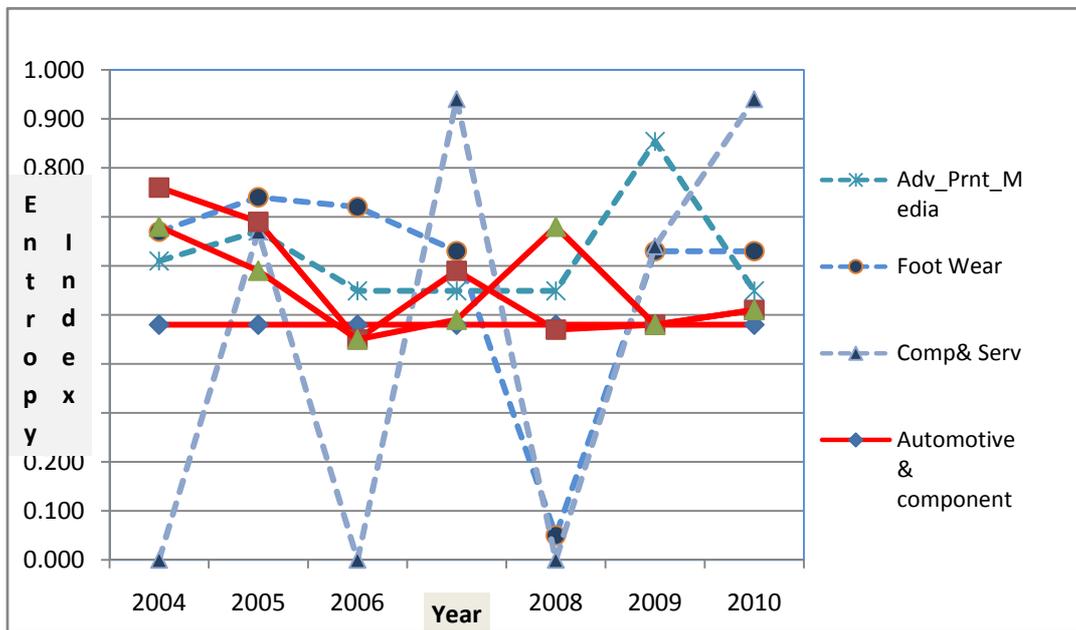


Figure 1: Competitive Interactions Dynamics in Creative and Manufacturing Industries

**Table 1. Result for independent sample t-test between creative and manufacturing industries**

		Independent Samples Test								
		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	95% Confidence Interval of the Difference				
						Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Competitiveness interaction	Equal variances assumed	8.507	0.006	0.287	40	0.776	0.019095	0.066641	-0.115591	0.153781
	Equal variances not assumed			0.287	24.017	0.777	0.019095	0.066641	-0.118439	0.156629

The important finding in table 1 was that the significant probability of Levene's test was lower than 0.05. This explains that the variances of two industries were significantly different. However, the equality of means in the entropy index between the two industries were not proven, as we see in the table the significant probability of t-test for equality of means was 0.777. We can interpret that even though the competitive interactions levels of the two industries were similar, but the dynamic of competitive interactions were significantly different.

The industrial dynamics caused by the changes in these industries affected the disequilibrium, both positive and negative disequilibrium. Dean, Meyer, & Castro (1993) argued that there were five sources of strengths affecting the market changes: 1) the increasing and growth of demand, 2) the modification or changes on demand characteristics, 3) development and innovation of technology, 4) the new source of supply, and 5) the political and regulation changes. Although the argument of Dean, et.al (1993) was directed to the context of the manufacturing industries, all the reasons were relevant to other industries, such as the creative industries as the main discussion in this paper. Dean, et.al (1993) arguments' proves the creative industries conditions in Indonesia now. First, the demand is increasing and growth is

closing along with the increasing of population and the increasing of PDB. Second, the demand characteristics are definitely changing and different caused by life style and consumer behavior. Nowadays, people need more unique product rather than standard product; therefore, the creative industries are more developing than the manufacturing industries. The third and the fourth sources are tied each other. The new source of supply also becomes the source of strength of the creative industries. Previously, each firm produced goods or services after having had the R&D result of a big firm, and it was difficult to access the R&D result. In line with the improvement and the innovation of the information technology, everybody has much easier to access the idea, and can build his own network for knowledge, marketing and finance. These advantages make new industries spring up and create more market niches. The growing speed of the process innovation also supports the growing speed of the new industries including the creative industries. Finally, regulation that supports the creative industries also has positive impact on the industrial dynamics of the creative industries.

To answer the third purpose of this research investigating the impact of economic recession on the behavior of competitiveness, paired sample t-test was used. The result is reported in table 2.

**Table 2. Result for paired samples test before and after crisis**

Paired Samples Test									
Pair	Competitiveness interaction – Befor C_After C	Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
1		-0.886167	0.559994	0.086409	-1.060673	-0.711660	-10.255	41	0.000

The last column of table 2 shows that significant probability of two tailed test was 0,000. The value indicated that there were significance differences between the competitive interactions before and after the crisis. If we refer to figure 1, we can see that during 2008<sup>th</sup> crisis the competitive interactions of all the sub-sector (exception cable industry) decreased. The most decreasing entropy index was occurred in the computer services and footwear industry. After 2008<sup>th</sup> crisis, all of the sub-sectors in the creative industries increased sharply in the competitive interactions, but it did not happen in the manufacturing industries. This result supported the creative economy report of 2010 stating that those creative industries had shown more resilience to the impact of the global economic crisis than to the traditional manufacturing industries (UNDP, 2011).

**CONCLUSION**

This study provides the evidence of the competitiveness interactions comparison between the manufacturing and creative industries in IDX. The competitiveness interactions of the manufacturing industries were more stable compared to the competitiveness interactions of the creative industries which were very volatile. Thus the conclusion was supported by a statistical test giving evidence that there were not differences on means on the competitive interactions of the two industries, but there were significant differences on the variances of two industries. It can be concluded

that the competitiveness interactions of the creative industries were more dynamics than in the manufacturing industries. Finally, this study also provides the evidence of the impact of economic crisis on the behavior of competitiveness in both industries. The result shows that after crisis, all of the sub-sector in creative industries increased sharply in the competitiveness interactions, but that was not the case in the manufacturing industries. It seems that the creative industries shows more resilience to the impact of the global economic crisis than the traditional manufacturing industries as UNDP stated in the creative economy report of 2010 (UNDP, 2011).

This research used sample from IDX only. For further study we may use wider samples such as cross countries data, so that we can have a comprehensive view about the comparison of both industries. Another suggestion for further research is to analyze the impact of some crises on both industries so that we will be able to understand whether or not the more resilience of the creative industries of manufacturing industries is persistent to any kind of crisis. The next study is also suggested to investigate factors that influence the resiliences of the creative industries in facing the crisis.

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