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International Quality Certification and Firms' Innovation Performance in Bali, Lampung, and South Sulawesi

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Budi Harsanto [1*], Egi Arvian Firmansyah [2]
[1]Faculty of Economics and Business Universitas Padjadjaran
[2]Faculty of Economics and Business Universitas Padjadjaran, School of Business and Economics Universiti Brunei Darussalam
*email: budi.harsanto@unpad.ac.id

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ABSTRAK

Tujuan dari studi ini adalah untuk menganalisa perbedaan antara performa inovasi perusahaan yang memiliki dan tidak memiliki sertifikasi kualitas internasional di Bali, Lampung, dan Sulawesi Selatan. Ketiganya adalah tiga provinsi di luar pulau Jawa yang tercakup dalam Enterprise Survey gelombang terakhir di Indonesia (Bank Dunia, 2015). Ada 288 perusahaan di tiga provinsi tersebut yang menjadi partisipan dalam survey. Data hasil survey dianalisa menggunakan statistik deskriptif, uji chi-square (dengan Yates' continuity correction dan Fisher's Exact Test) serta uji Mann-Whitney U. Hasil analisa menunjukkan bahwa hanya 9,7 persen perusahaan memiliki sertifikasi kualitas internasional sebagai cerminan standar kualitas mereka. Uji chi-square memperlihatkan bahwa perbedaan signifikan tampak pada tipe inovasi proses dan organisasi, sementara inovasi produk tidak signifikan. Bila dihubungkan dengan kendala, uji Mann-Whitney mengungkapkan bahwa kendala-kendala yang dihadapi perusahaan dengan dan tanpa sertifikasi tidak signifikan secara statistik. Berbeda dengan studi terdahulu yang dominan menganalisa dampak sertifikasi terhadap performa operasional, penjualan, atau finansial, studi ini memberikan fokus kepada performa inovasi dengan data empiris unik berkonteks tiga provinsi di Indonesia yang berlokasi di luar pulau Jawa.

Kata kunci: sertifikasi kualitas internasional, sertifikasi, kualitas, inovasi, ISO

ABSTRACT

This study aims to analyze the differences between firms' innovation performance that have and do not have international quality certifications in Bali, Lampung, and South Sulawesi. Those three provinces are outside Java Island included in the last batch of the Enterprise Survey in Indonesia. There were 288 firms within the three provinces that participated in the survey. Survey data were analyzed using descriptive statistics, the Chi-square test (with Yates' continuity correction and the Fisher's Exact Test), and the Mann-Whitney U test. The analysis showed that only 9.7 percent of firms had international quality certification to reflect their quality standards. The Chi-square test reveals significant differences in process and organizational innovation, while product innovation is not significant. Concerning obstacles, the Mann-Whitney test revealed that the obstacles faced by companies with and without certification were not statistically significant. In contrast to previous studies that predominantly analyzed the impact of certification on operational, sales, or financial performance, this study focuses on innovation performance with unique empirical data in three provinces in Indonesia located outside of Java Island.

Keywords*: international quality certification, quality, innovation, ISO*

INTRODUCTION

International quality certification is a means to ensure that the products delivered to consumers are of the desired standard quality and can facilitate a more streamlined international trade (Clougherty & Grajek, 2014; Guo et al., 2018). International quality certification helps improve competitiveness and efficiency and ensures the company's operating processes run based on standards. In the end, it can improve the company's overall performance (Harsanto, 2013; Lassaad, 2017). An example of international quality certification is ISO 9001.

Each certification has a series of policies, standards, and systems that the company must fulfill. In any certification, various standards focusing on consumers, leadership, and continuous improvement are measured (Manders et al., 2016). These standards are prepared so that various parties will have the same perception regarding the quality standards implemented by the company. This certification is voluntary, meaning that a company can have high standards in its operations without being certified. However, for ease of communication between companies, especially in global scope, certification can help related parties understand each other's quality standards set by companies.

Companies with international quality certification should have different characteristics from companies that do not have it. It is common because to obtain certification, a company must go through various stages ranging from internal preparation to an independent audit by a certification body. In addition to differences in characteristics, companies with and without proper certification can perform differently. Ali & Yusuf (2019) found that companies possessing international quality certification have significant differences from companies that do not have it in terms of sales performance, the growth rate of workers, and capacity utilization. Lakhal (2009) documented that international quality certification benefits organizations primarily related to competitive advantage and organizational performance.

However, Guo, Jong, & Yeung (2018) revealed that there is a tendency of companies with international quality certification, which is only on the surface, meaning the certification does not reflect the operation quality of the company. Some researchers researching various industries indicated a low correlation between international quality certification and the company's financial performance and overall company performance (e.g., Kumar & Balakrishnan, 2011; Lakhal, Lassâad & Pasin, 2008; Sadikoglu & Olcay, 2014). Therefore, it is interesting to explore the performance difference between companies with international quality certification and those that do not. More specifically, the company's performance becoming the concern in this paper is innovation performance.

The focus on innovation performance is unique because many previous studies focused on the impact of international quality certification on operational and financial performances (Terziovski & Guerrero, 2014). Based on a literature review, the relationship between innovation performance and companies with and without certification is unclear (Manders et al., 2016). This study aims to determine the difference in three Indonesian provinces, namely Bali, Lampung, and South Sulawesi. The difference in innovation in those three provinces covers three types of innovation: product, process, and organizational innovations. Therefore, the hypotheses in this study can be formulated as follows:

H1: product innovation performance of the companies with international quality certification is different from the product innovation performance of the companies without it.

H2: process innovation performance of the companies with international quality certification is different from the process innovation performance of the companies

without it.

H2: organizational innovation performance of the companies with international quality certification is different from the organizational innovation performance of the companies without it.

These three provinces become an interesting context because only these three provinces revealed their data in the latest batch of Enterprise Survey conducted by the World Bank in 2015. To the best of our knowledge, there has been no previous research examining the differences in innovation performance between companies with and without certification in those three provinces.

The structure of this paper consists of an introduction explaining topic selection based on literature development and the uniqueness of the study. Next is the methodology, which reviews data and variables used in this research in more detail. The data analysis technique is also presented in this section. Subsequently, the results and discussion are presented as the results of data analysis and their relationships with various relevant literature. Finally, a conclusion recapitulates the essential points of this paper.

RESEARCH METHODS

This research is quantitative research utilizing several statistical techniques to determine the differences in innovation performance between companies that have and do not have an international quality certification. The data in this study are obtained from the latest batch of Enterprise Survey conducted by the World Bank in Indonesia in 2015 (The World Bank, 2015). This survey examined business conditions in Indonesia by covering various aspects ranging from firm detailed characteristics to firm performances. The survey instrument consists of more than one hundred question items. Some survey question items are companies' characteristics, international quality certification, innovation, and business barriers they faced. These data are used in this study.

Companies' characteristics relate to their sector, region (province), industry, size, and age, which were asked at the beginning of the survey questionnaire. The main question item relevant to this research which discusses international quality certification, is coded B.8. This question says, "Does this company have an internationally recognized quality certification?" The answer to this question is a binary of yes and no. There are several relevant questions for innovation performance, namely questions H.1, H.3, and H5. Those three items ask the three types of innovation standards in the literature: product, process, and organizational innovations.

The question used in item H.1 is, "In the last three years, has this company introduced new products or services or have them significantly changed (from previous products or services)?" Questions for items H.3 and H.5 are the same as item H.1, except for 'product or service,' which is changed to 'process' and 'organization.' In line with the item of international quality certification, the answers to these questions are also binary, i.e., yes and no.

For additional analysis, the questions related to obstacles in doing business are also analyzed. These questions are spread in various parts of the survey questionnaire. A typical question asked is, "To what extent that [certain aspect] becomes an obstacle to the operations of this company?" There are 16 specific aspects asked using these sentences, ranging from electricity to the availability of educated workers. Answers to these questions are on an ordinal scale of 0 to 4 (0 = not an obstacle, 4 = severe obstacle).

We used some statistical techniques to analyze the data, namely, descriptive statistics,

chi-square test, Yates' continuity correction, Fisher's Exact Test, and Mann-Whitney U test. Descriptive statistics describe the characteristics of the companies sampled in the survey, covering the sector, province, firm size, and firm age. The chi-square test (including Yates' continuity correction and Fisher's Exact Test) and the Mann-Whitney test were used after checking the non-normally distributed data patterns. The chi-square test was used to analyze the differences in characteristics and innovation performance between companies with and without certification.

The primary assumption in the chi-square test is the minimum value of 'expected cells frequency' ≥ 5 or at least 80% of cells have "expected frequency" ≥ 5 (Pallant, 2011). Yates' continuity correction was used to evaluate the calculation results of chi-square when the comparison is 2 categories vs. 2 categories (Pallant, 2011). Yates continuity correction was employed to compare two categories in which one of them has a small frequency or less than ten (Hartono, 2015). For instance, it compared international quality certification (yes and no) vs. sector (manufacturing and service). Fisher's exact test was used to replace chi-square, as Pallant (2011) suggested when an assumption could not be fulfilled in the chi-square test. The Mann-Whitney U test was used to analyze the differences in constraints faced by companies with and without an international quality certification. For data processing, we utilized IBM SPSS 25 software.

RESULTS AND DISCUSSION

Company characteristics of the respondents in this study can be seen in Table 1. Table 1 shows that most of the companies participating in the survey were from the manufacturing sector consisting of 234 companies or 81.8 percent. The proportion of companies is equal for each province, namely 33 percent.

In terms of size, most companies are small-sized companies consisting of 117 companies (40.6 percent), followed by medium-sized firms of 112 companies or 38.9 percent. The large-sized companies are around one-fifth of the total respondents, namely 57 companies or 19.8 percent. In Enterprise Survey, the basis for classifying firm size is the number of workers. Small-sized firms have 5 to 19 employees, while medium firms have 20 to 99 employees. The large-sized firms have more than 100 employees.

The age of companies varies where most of them (102 companies or 25.4 percent) are 10 to 19 years. These data are processed based on years of establishment, and in this paper, we divided them into four age classifications. Of the 288 companies, most did not have international quality certification, namely 258 companies or 89.6 percent, while the remaining 9.7 percent already have it.

Table 1. Firm Characteristics

Characteristic	Level	Frequency	Percentage (%)
Sector	Manufacturing	234	81.8
	Service (including retailer)	54	18.8
	Total	288	100.0
Province	Bali	97	33.7
	Lampung	96	33.3
	South Sulawesi	95	33.0
	Total	288	100.0
Firm Size	Small	117	40.6
	Medium	112	38.9
	Large	57	19.8
	Total	286	100.0

Age of Company	< 10 years		77	26.7
	10-19 years		102	35.4
	20-29 years		67	23.3
	> = 30 years		42	14.6
		Total	288	100.0
International quality certification	Yes		28	9.7
	No		258	89.6
		Total	286	100.0

Source: Processed data
Note: The total percentage is not exactly 100% because of the rounding and missing values.

Details of firm characteristics and results of the difference test, based on international quality certification, are shown in Table 2. Table 2 reveals that most companies with international quality certification are manufacturing companies, namely, 23 or 82.1 percent. Chi-square analysis (with Yates' continuity correction) indicates that there is a statistically significant difference in the frequency of firms with and without international quality certification in the manufacturing and service sectors (X^2=1.000; p<0.01). Indeed, quality is essential for the manufacturing and service sectors (Harsanto, 2009; Prayudha & Harsanto, 2014). The dominance of the manufacturing sector in possession of international quality certification is not surprising because the nature of the manufacturing sector is more standardized than the service sector (Wang et al., 2016).

Of the three provinces investigated in this study, Lampung has the highest proportion of companies having the international quality certification, namely 18 companies or 64.3 percent, followed by Bali Province with eight companies or 28.6 percent. South Sulawesi Province only has two companies or 7.1 percent with international quality certification. Chi-square test shows that the difference in the proportion of the three provinces is statistically significant (X^2=15.133; p<0.01). Although all three provinces are located outside Java Island, there is a tendency that Lampung, which is located in the west of Java Island, has much more companies than the other two provinces located in the east of Java Island, namely Bali and South Sulawesi.

Table 2. Chi-Square Test of Firm Characteristic Differences based on International Quality Certification

Characteristics	International Quality Certification				Chi-square/ Yates' correction	df	p-value
	Yes		No				
	N	%	N	%			
Sector							
Manufacturing	23	82,1	210	81,4	1.000**	1	0.000
Service (including retailer)	5	17,9	48	18,6			
	28	100,0	258	100,0			
Province							
Bali	8	28,6	89	34,5	15.133**	2	0.001
Lampung	18	64,3	78	30,2			
South Sulawesi	2	7,1	91	35,3			
	28	100,0	258	100,0			
Firm Size							
Small	0	0,0	117	45,7	39.237**	2	0.000
Medium	11	39,3	100	39,1			
Large	17	60,7	39	15,2			
	28	100,0	256	100,0			

Age of Company							
< 10 years	2	7,1	74	28,7	25.050**	3	0.000
10-19 years	5	17,9	97	37,6			
20-29 years	9	32,1	57	22,1			
> = 30 years	12	42,9	30	11,6			
	28	100,0	258	100,0			

Source: Processed data
Note: N=288. Two (2) respondents did not answer questions about firm size and
** significant at the 0.01 level; *significant at the 0.05 level.

Table 2 also shows the frequency of companies that have and do not have certification based on firm size. Although quality is a factor that is essential for all sizes of companies, including the small-sized companies (Azis et al., 2017; Ilyasa et al., 2016), our analysis result reveals that none of the small-sized firms in this research already has the international quality certification. The companies with certification are medium and large-sized companies, with 11 companies (39.3 percent) and 17 companies (60.7 percent), respectively. The difference in frequency of these three firm sizes is statistically significant (X^2=39.237; p<0.01).

Astrini (2018) pointed out that most companies having international quality certification are large-sized companies. It is because of various factors, such as the high cost of certification and the obligation to have certification in selling the products to the markets requiring international quality certification (Heras et al., 2002; Tsekouras et al., 2002).

The last interesting characteristic is the company's age, showing a straight comparison between the number of companies that have certification and the company's age. Of the four age classifications shown in Table 2, it can be seen that the percentage of companies that have certification continues to increase as ordered from the youngest to oldest, namely 7.1 percent; 17.9 percent; 32.1 percent; and 42.9 percent. The chi-square test results show that the difference in certification possession based on age is statistically significant (X^2=25.050; p<0.01). It indicates that the interest in having an international quality certification aligns with the age of the company doing its business (Ali & Yusuf, 2019).

Differences in companies' innovation performance based on international quality certifications are shown in Table 3. Previous studies used various performance indicators, such as financial performance (Galetto et al., 2017) and sales performance (Guo et al., 2018). In this study, the focus of the firm performance is on innovation performance. Specifically, it deals with three types of innovation: product innovation, process innovation, and organizational innovation. Although product innovation is essential for a company (Putri & Yasa, 2018), the result of the chi-square test using Yates' continuity correction shows that there is no statistically significant difference between the companies which have certification in product innovation and the companies which do not (X^2=0.027; p>0.05). Thus, the first hypothesis (H1) in this study cannot be accepted.

The analysis result reveals that most companies (92 percent) with certification did not conduct product innovation. This percentage is not far from the percentage of companies that do not have certification, i.e., 95 percent. This result is different from the findings of Bourke & Roper (2017) and Kafetzopoulos, Gotzamani, & Psomas (2013), revealing that companies possessing international quality certification have a higher level of product innovation than the companies that do not have an international quality certification. The result of our study is more closely related to previous studies which showed a neutral relationship between those two variables, i.e., Al-Khaled (2019) and Martínez-Costa & Martínez-Lorente (2008).

This phenomenon can be explained more by various factors affecting product innovation than the possession of certification itself. Manders, De Vries, & Blind (2016) revealed those factors, consisting of the company's motivation to apply international quality standards, the location where the company operates, which has an impact on the business environment, the sector in which the company operates, the firm size, and certification version that is adopted. For example, the latest version of ISO emphasizes a higher focus on customers than the previous versions.

Table 3. Chi-Square Test of Innovation Performance Differences based on International Quality Certification

Type of Innovation		International Quality Certification				Chi-square/ Yates' correction	df	p-value
		Yes		No				
		N	%	N	%			
Product	Yes	2	8.0	13	5.0	0.027	1	0.870
	No	23	92.0	245	95.0			
Process	Yes	6	23.1	21	8.1	4.513**	1	0.034
	No	20	76.9	237	91.9			
Organizational	Yes	6	23.1	7	2.7	18.004**	1	0.000
	No	20	76.9	251	97.3			

Source: Processed data
Note: N=288. The total may not be equal to N if there are respondents who do not answer certain questions.
** significant at the 0.01 level; *significant at the 0.05 level.

In contrast to product innovation, the results of the chi-square test (with Yates' continuity correction) interestingly showed different results because there is a significant difference between international quality certification for process innovation (X^2=4.517; $p<0.05$) and organizational innovation (X^2=18.004; <0.01). These results show that the second (H2) and third hypotheses (H3) in this study are accepted. Besides, these results indicate that international quality certification impacts a company's process and organizational innovations. It is understandable considering that international quality certification is closely related to processes and organizations within the company.

This study found that the difference between companies with or without international quality certification in product innovation was not significant. Nonetheless, it was significant in terms of process innovation, as found in Ratnasingam, Yoon, & Ioras (2013). The implementation of international quality certification can help improve the processes within the company, which in turn can increase the firm competitiveness.

Pertaining to organizational innovation, the result of this study is in line with Mangiarotti & AF Riillo (2014), documenting that the implemented ISO 9001 did not affect product innovation but affected organizational innovation. Mangiarotti & AF Riillo (2014) further found that certification improves technological innovation in manufacturing companies and non-technological innovation in service companies.

In running its business, a company faces a dynamic environment that includes obstacles or constraints. In the Enterprise Survey, the factors inhibiting a company's success are measured through ordinal responses with a scale of 0 (no obstacle) to 4 (severe obstacle) on 16 question items regarding obstacles. The analysis results of the differences between companies with and without certification in perceiving the obstacles, using the Mann-Whitney U test, are shown in Table 4.

Table 4 reveals no statistically significant difference in the company's obstacles, both

in the companies with international quality certification and without it. In general, companies that have certification perceive the barriers they face less overwhelmingly than those without certification. However, this difference is not significant in all items of obstacle parameters.

This result has also been documented in previous studies (e.g., Islam & Zunder, 2014; Wiengarten & Pagell, 2012), evidencing that the implementation of international quality certification does not make the obstacles different from without certification. It is because the companies with and without certification operate in the same business environment, so the obstacles they face tend to be the same (Wiengarten & Pagell, 2012).

Table 4. Mann-Whitney U test of Company's Obstacles based on International Quality Certification

Obstacle	International Quality Certification Mean rank		Mann-Whitney U	z-score	Sig.
	Yes	No			
Electricity	136.82	144.22	3425	-0.478	0.632
Telecommunication	136.26	143.73	3410	-0.479	0.632
Transportation	138.64	144.03	3476	-0.343	0.731
Customs and trade regulations	142.75	142.47	3577	-0.018	0.986
Practices of competitors from the informal sector	133.11	144.08	3321	-0.694	0.488
Access to land	146.77	143.15	3521	-0.235	0.815
Crime, theft and harassment	137.13	143.64	3434	-0.433	0.665
Access to financing	160.39	141.67	3139	-1.209	0.227
Tax tariff	155.68	142.18	3271	-0.874	0.382
Tax administration	149.63	142.28	3413	-0.489	0.625
Business permit	152.05	142.01	3345	-0.664	0.507
Political instability	151.79	137.00	3100	-1.014	0.310
Corruption	138.13	137.43	3427	-0.048	0.961
Court system	125.31	136.63	3006	-0.769	0.442
Employment regulations	139.07	143.43	3488	-0.283	0.778
Insufficient educated workforce	135.77	144.34	3396	-0.554	0.579

Source: Processed data

** significant at the 0.01 level; *significant at the 0.05 level.

CONCLUSION

Based on the analysis results and discussion, only 9.7 percent of companies in Bali, Lampung, and South Sulawesi that are participants in the Enterprise Survey have international quality certifications. The small number of firms having an international quality certification is because of the limited financial capability, primarily the small and medium firms. Applying and implementing international quality certification is relatively expensive; thus, only larger firms could apply and implement this certification.

The chi-square test results to determine the differences in the characteristics of companies that have and do not have certification indicate that all characteristics (sector, province, size, and age) are significantly different. An analysis of the difference in the innovation performance, based on international quality certification, shows that the difference in product innovation was not significant. However, it was significant for process innovation and organizational innovation. It indicates that international quality certification can improve the process and organizational innovations in the companies, encouraging the companies to be more competitive. In terms of barriers, there is no significant difference between companies with and without certification.

This study certainly has limitations. First, this study uses cross-sectional data so that the analysis is limited to one particular point in time. Future studies can use a longitudinal design to allow analysis in a more extended period. Second, this study examines the difference between companies with and without certification but does not focus on causality. Thus, further studies may focus on the causality of the observed variables utilized in this research. Third, in terms of context, this study focuses on three provinces outside Java, namely Bali, Lampung, and South Sulawesi. So, the relevance of the study results applies primarily to these three provinces. However, the results may also apply to other provinces outside Java.

Despite those limitations, this study is expected to help provide an overview of the relatively small number of companies that have international quality certification, primarily in Bali, Lampung, and South Sulawesi provinces. Theoretically and practically, this study is also expected to be useful for other researchers and practitioners to understand the similarities and differences in characteristics, innovation performance, and the obstacles faced by companies that have and do not have an international quality certification.

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