Indonesian Journal of Computing, Engineering, and Design

Journal homepage: http://ojs.sampoernauniversity.ac.id/index.php/IJOCED/

Institutional Change and the Impact Towards Innovation Competitiveness in the Industrial Development of The Batam Free Trade Zone

B. A. Wiryawan

Nagoya University Furo-cho 1 Chikusa-ku Nagoya Aichi

Correspondence: E-mail: Wiryawan.bangkit.aditya@g.mbox.nagoya-u.ac.jp

ABSTRACT

The purpose of this study to evaluate an implementation of the Batam Free Trade Zone (FTZ) in industrial development. A survey was conducted in 2015 involving 17 firms from different areas of the zone. Relationships between variables were established using Fischer's Exact Test. Result indicates that there is significant relationship between institutions and innovation, judging by research, designing, and development related activities, fewer than 95% confidence level. The problem lies in the conflicts between the FTZ Authority and the local governments, as the latter continued to dominate the institutional settings. The results indicated that weak vision towards FTZ policy and zero-sum approach by key actors contributed the most to the failure in reindustrialize the zone.

ARTICLE INFO

Article History:
Received 8 Dec 2018
Revised 6 Feb 2019
Accepted 2 Mar 2019
Available online 21 April 2019

Keywords:
Free Trade Zone,
Competitiveness,
Innovation,
Industrial Development,
Institutions.

1. INTRODUCTION

Rapid industrial growth had stopped due to the notorious Asian financial crisis in 1997 (Wade, 2004), and then followed also by deep multidimensional crisis that led to the 1998 'Reformasi' (Perbawaningsih, 2008). The reform was also contributing to the huge institutional change through the introduction of regional autonomous policy (UU No. 22/1999, then replaced by UU No.32/2004). The policy resulted in the formation of the city government of Batam. Also, many countries suffering from a condition called premature deindustrialization (Rodrik, 2015) where a country has lost its industry before being able to get rich first.

Since then on there exist the dual-authority problem in the island, especially related to investment and industrial development, between the FTZ authority and the city government. This will be the underlying institutional factor in this paper. Farole & Akinci (2011) shows that a preferential policy can enhance industrial competitiveness by way of attracting FDI. They observed that the early wave of regional preferential policy was mainly aims at providing fiscal incentives to value add-

ed industries and improving investment climate, while the latter generation of zone policies is giving more attention in improving backward linkages. However, in contrast with both authors, (Milberg, 2007) found out that the evidence of backward linkages is minimum in many duty-free areas, with only 3 - 9% of domestic component contributing to FDI activities.

Van Campenhout & de Graaf (2013) reported that in the electronic industries in Batam showed that industries only involved with "low value-adding activities such as production and procurement", while higher value adding activities such as marketing, design, and development are rare and limited. The two authors describe industrial upgrading, using UNCTAD concept in 2013 (UNCTAD, 2006), as "the development to higher value adding, more knowledge-intensive activities in a specific region". Further study by Grunsven & Hutchinson (2014) explains that the electronic industries in Batam were outgrowth in a wide margin by Johor Iskandar development region, its competition. From these empirical studies based on the electronic industries, it can be concluded that innovation and business sophistication is not evidence in Batam yet.

This paper will focus on Indonesia's attempt to keep industrial growth through the use of an investment policy geared towards Foreign Direct Investment (Borensztein et al., 1998). The attempt was first formulated in the form of a Free Trade Zone (Hendrawan, 2012), located in the Island known as Batam, four decades ago. The zone is strategically located in the Malacca strait, just an hour ferry ride from Singapore. This paper aims at explaining the institutional problems related to the failure of industrial upgrading in Batam FTZ (innovation factor). The significant focus in this paper will be given to the dynamics between the FTZ Authority and the local government of the city of Batam.

2. METHODS

Research data was gathered in summer 2015, for two weeks between August and September, applying mostly quantitative approach. Unit of research is manufacturing firm that have been operated in Batam for at least three years, and are oriented in export. Data were collected using questionnaire from 4 industrial parks in the Batam FTZ. Samples were drawn using simple random technique, with 10 samples in each park. Questionnaires are sent by post or through email. After distributed, only 17 returned and fit for analysis (**Table 1**). The low response was due to various factors; unwillingness to participate is one of the most frequent reasons. All participants are engaged in manufacturing activity, ranging from large-size modern industries to low-mid level industries.

Table 1. Distribution of Questionnaires

Industrial Parks	Expected	Collected
Citra Buana Center Park	10	7
Batamindo Industrial Park	10	4
Executive Industrial Park	10	4
Panbil Industrial Estate	10	2
Total	**40**	**17**

More than half (53%) of the companies participating in this survey had been operated in between 10 years and 20 years, which means they were established closely during the Asian Crisis and in the early phase of decentralization in Batam. Four companies had been running their business since the early 1990s, a few years after the first industrial park is set up in the island amidst the booming domestic economy, while four others begun their operation from 2005 or later, around the time the new FTZ policy is being discussed and eventually implemented as law in 2006. Research variables used for analysis are derived from variables used by the Global Competitiveness Report, which consisted of 12 variables divided into three sequential stages that reflect development level of each economy. To grasp the rather abstract idea of competitiveness, 1-5 Likert scale is used ranging from very disagree (1) to very agree (5). To establish relationship between the above variables, Pearson Chi-Squared test are used. SPSS 22 software is used as the main tool to carry out the analysis (Coakes & Steed, 2009). Relationships between variables were established using Fischer's Exact Test to consider the limited number of samples; violation of assumptions is expected during analysis. Exact test, following Fischer (Levine et al., 1999) is used, as it's known to be more accurate with small numbers of data. Each cell of the 2x2 Table are labelled as *a*, *b*, *c*, and *d*.

3. RESULTS AND DISCUSSION

Figure 1 shows company operations in Batam FTZ. Regarding to each company operation in Batam FTZ, more than half of them stated that their companies had been scaling down operation since the first year of operation. The same number of respondents also stated that their companies had been scaling down production in recent year. It can be interpreted that many companies in Batam are experiencing production decline in linear trajectory since their first year of operation. Only five of them are experiencing scaling up production since their first year, and even less of them are scaling up in recent years. Only three companies stated that they had been scaling up their production level recently.

None of them stated that their companies planning to close down production in the next few years, although this data might not reflect the true condition of the companies.

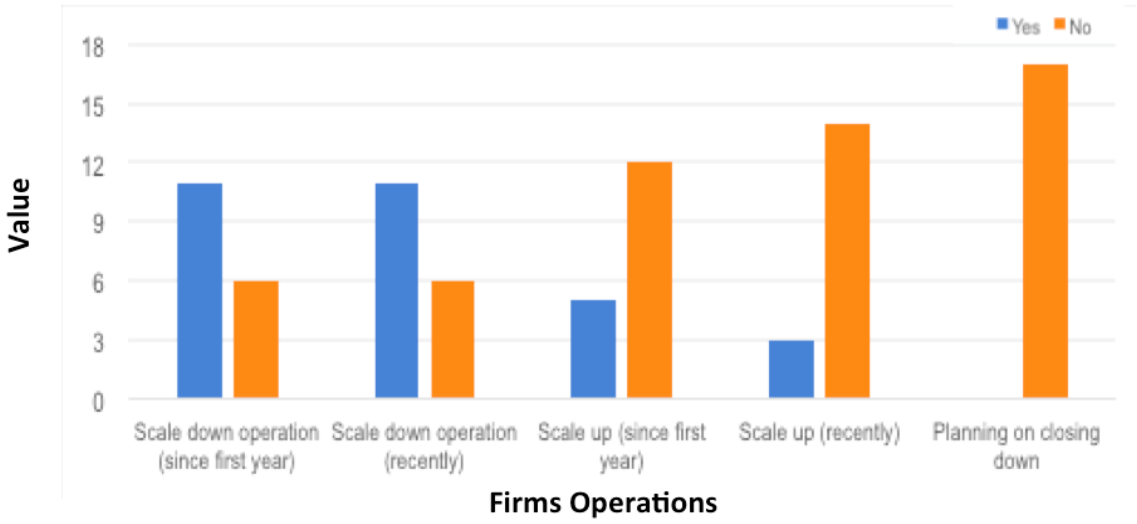

Figure 1. Company operationsOn Competitiveness

Figure 2 reported that Batam FTZ scored 2.99 with 0.33 standard deviation. This means that firms are relatively not gaining nor losing from Batam's competitiveness. The histogram bar in **Figure 2** showed that the distribution of competitiveness score is leaning towards the center although it's also a little skewed to the left, which explains the 2.99 overall score. Minimum overall competitiveness score is recorded at 2.35, while maximum is at 3.68 with 1.33 range. Neither of the responses are at the extreme end (1 or 5) in this overall score.

The result of the field survey shows that overall competitiveness scores for the Batam FTZ is 2.98. The overall result was not something that is really bad, but it was also a result that the government cannot be too proud of. Among 12 variables, institutions, business sophistication and innovation are among the competitiveness variables that scored lowly (see **Table 2**). Meanwhile, productivity is considered as the highest variable of competitiveness.

Valid	17
Missing	0
Mean	2.9894
Std. Error of Mean	.08071
Median	3.0200
Mode	3.16
Std. Deviation	.33276
Variance	.111
Range	1.33
Minimum	2.35
Maximum	3.68

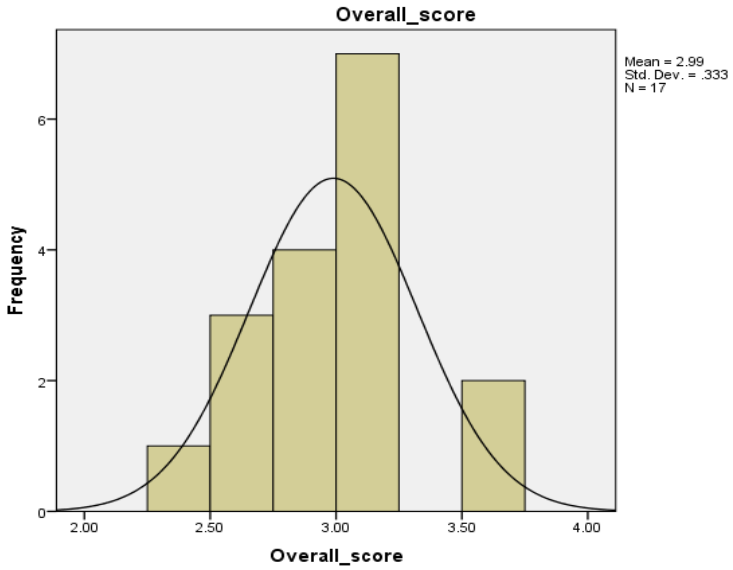

Figure 2. Distribution of competitiveness score

Table 2. Batam FTZ Overall Competitiveness Score

Variables	Score	Remark
Productivity	3.34	Highly satisfied
Advanced Infrastructure	3.27	Slightly satisfied
Basic Infrastructure	3.22	Slightly satisfied
Financial market support	3.01	Indifferent
Labor market	3.00	Indifferent
Macroeconomic Condition	2.99	Indifferent
Goods market support	2.98	Indifferent
Business sophistication	2.91	Slightly not satisfied
Institutions	2.82	Slightly not satisfied
Governance	2.78	Not satisfied
Labor policy	2.76	Not satisfied
Innovation	2.63	Highly not satisfied

One of highest component of competitiveness according to the result are infrastructures, both basic and advanced. Basic infrastructures include road, ports, electricity, while advanced infrastructures are IT services such as telecommunication and Internet. The result came as no surprise as the government spent decades on building more and more reliable infrastructures, especially roads and ports. Major development plans were carried out under the coordination of the FTZ Authority, particularly under the 2007 FTZ policy. Out of 12 tested variables, these two are the least problematic.

The biggest surprise of the survey is the level of labor productivity, which scored the highest (3.34). It seems to reflect that most of the manufacturing companies are satisfied with labor production output, under a given wage level. Estimated average yearly revenue (for the past three or four years) of the respondents varied. 41% of them were having revenue between USD 500,000 and 2 million, while 29% are having yearly revenue between USD 2 million and 5 million. Three firms (18%) are recorded to have more than USD 10 million of yearly revenue. The positive result is something that closely affected by their own management, such as training programs and adequate standard operating procedures. The low wage level in the region, especially when compared to the other neighbouring areas, might also contribute significantly to the result.

Institutions, as well as governance, are considered as key and basic variables that needed to be maintained in order to support industrial growth to the next stage that is maintenance and effectiveness (World Economic Forum, 2014). Batam FTZ's failure in providing competitive institutional setting is theoretically hampering its progress, as suggested by several studies (Van Campenhout & de Graaf, 2013) while at the same time confirming (Milberg, 2007) finding.

3.1. Towards Innovation Stage

Batam FTZ's problem lies on several variables that considered as basic, such as institution and governance. Everywhere else in the world, mostly government or zone operator would give extra attention to improve their institutional setting as to be able to attract more investment to the

zone. A special autonomous body (FTZ Authority) was formed in order to manage the zone. Its role was crucial during the 80s and 90s in providing assistance to foreign corporations. However, during the decentralization process following the 1998 reform, institutional changes had taken effect in the area. Local government (The City Government of Batam) with more autonomous power was introduced, resulting in a dual authority presence in the zone.

Friction of power between the two institutions was perceived negatively by business, as proven by in this research (scoring 2.82 in institution and 2.78 on governance). Under this huge power shift, local governments, both at the provincial and city level, began dominating the institutional settings (Kam & Kee, 2009). Governor and mayors took part in the council for the free trade zone, meaning that they have huge control over the direction of the Batam FTZ, undermining BP Batam's role as an independent operator of the zone. During 2005-2015 there were disputes between the city government of Batam with the FTZ Authority over several assets, in which it was dragging the zone's performance significantly. Under the shift towards the decentralization, local government was burdened with high responsibilities in developing their areas, however they only have little incentive in providing public service and investment as the fiscal structure doesn't match the change (Grunsven & Hutchinson, 2014).

Statistical analysis proved that the prolonging institutional conflict has brought undesired effect in Batam's inability to expand on the more advanced – innovation aspects. Chi-Square result (**Table 3**) suggests that under 0.05 alpha level, there are significant relationship between institutions and innovation. The later variable consisted of two components. The first is related to research and development activity, which the zone lacks off. The result confirmed (Van Campenhout & de Graaf, 2013) that found out the lack of industrial upgrading in Batam.

The second part of innovation variable is related to business sophistication that is the ability of the foreign industry to strengthen backward linkage in the FTZ. Although the overall score only showing slight dissatisfaction, it came from the fact that access to foreign market is easy, not because of the reliability of local supplier. Recently, involvement local supplier mostly is to conform to nation-wide policy such as local content requirement, which is ranging from 20% to 40% depending on the type of activity.

Table 3. Institution * Innovation Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	6.804[a]	1	0.009		
Continuity Correction[b]	4.380	1	0.036		
Likelihood Ratio	7.197	1	0.007		
Fisher's Exact Test				0.035	0.018
Linear-by-Linear Association	6.403	1	0.011		
N of Valid Cases	17				

[a] 3 cells (75.0%) have expected count less than 5. The minimum expected count is 2.47,

[b] Computed only for a 2x2 Table

This research showed that actually the FTZ Policy can be associated with innovation, under a high significant level (0.018). This might also the same case with labor market, which respondents failed to disassociate between the policy and evidence of innovation. It is also important to mention that most firms are having only limited innovation activity in Batam. Only four out of 17 companies surveyed are engaging in R&D activity. Therefore, their level of perception on the policy is going to be reflected to their level of perception on innovation ability.

4. CONCLUSION

The results indicated the strong relationships between innovation and institution, judging by research, designing, and development related activities, fewer than 95% confidence level. However, there is a problem between the FTZ Authority and the local governments due to the domination of the institutional settings. The study shows an indication that weak vision towards FTZ policy and zero-sum approach by key factors contributed the most to the failure in reindustrialize the zone.

REFERENCES

Borensztein, E., De Gregorio, J., & Lee, J. W. (1998). How does foreign direct investment affect economic growth? *Journal of International Economics*, *45*(1). https://doi.org/10.1016/S0022-1996(97)00033-0

Farole, T., & Akinci, G. (2011). *Special Economic Zones : Progress, Emerging Challenges, and Future Directions*. The World Bank. http://hdl.handle.net/10986/2341

Grunsven, L. van., & Hutchinson, F. E. (2014). The Evolution of the Electronics Industry in the SIJORI Cross-Border Region. *ISEAS Yusof Ishak Institute*. http://hdl.handle.net/11540/6720.

Hendrawan, B. (2012). The Small Medium-Sized Enterprise's Characteristic in Batam Free Trade Zone that Able to Acquire Debt. *Procedia Economics and Finance*, *4*. https://doi.org/10.1016/s2212-5671(12)00323-1

Kam, W. P., & Kee, N. . (2009). *Batam, Bintan and Karimun - Past History and Current Development Towards Being A SEZ*.

Levine, D. M., Stephan, D. F., Krehbiel, T. C., & Berenson, M. L. (1999). *STATISTICS FOR MANAGERS USING Microsoft Excel*. Prentice Hall. https://wps.prenhall.com/bp_levine_statsexcel_6/

Milberg, W. (2007). Export Processing Zones , Industrial Upgrading and Economic Development : A Survey. *October*.

Perbawaningsih, Y. (2008). *A Case Study on Megawati Soekarnoputri, the Fifth President of the Republic of Indonesia and the Multidimensional Crisis 1998-2004* [Technical University of Ilmenau Germany]. https://d-nb.info/992943663/34

Rodrik, D. (2015). Premature Deindustrialization National Bureau of Economic Research Working Paper 20935. *National Bureau Economic Research*, *21*(1), 1–33. https://doi.org/10.3386/w20935

UNCTAD. (2006). World Investment Report 2006, FDI from Developing and Transition Economies: Implications for Development. *World Investment Report 2006*, *18*(3).

Van Campenhout, M., & de Graaf, J. R. (2013). *In search for a silver lining: The evolution of the E&E industry of Batam* [University of Utrecht]. http://dspace.library.uu.nl/handle/1874/287892

Wade, R. (2004). *Governing the Market: Economic Theory and the Role of Government in East Asian Industrialization*. Princeston University Press. https://press.princeton.edu/books/paperback/9780691117294/governing-the-market

World Economic Forum. (2014). *The Global Competitiveness Report 2014–2015*. http://www3.weforum.org/docs/WEF_GlobalCompetitivenessReport_2014-15.pdf