

Global Supply Chain Operations for Investment Locations Selection in Climate Change Variation

Anita Sitawati^{1*}, Herika Taki¹, Hanny W Wiranegara¹, Yayat Supriatna¹, and Rezkia Dewi Andajani²

¹Department of Urban and Regional Planning FALTL Universitas Trisakti; e-mail: asitawati@trisakti.ac.id

²Department of Systems Innovation, the University of Tokyo, Japan

ABSTRAK

Kota layak huni adalah kota yang masyarakatnya dapat hidup nyaman dan tenteram. Keberhasilan kota layak huni tidak hanya dicapai oleh faktor keunggulan fisik, namun juga oleh faktor sosial dan ekonomi. Kota layak huni harus ramah investasi untuk mendukung fungsi perekonomian. Kota ramah investasi akan menjadi pilihan lokasi investasi bagi perusahaan multinasional. Perencana, perancang, dan manajer kota perlu merancang strategi pembangunan kota yang menarik investor. Penelitian ini bertujuan untuk mengidentifikasi faktor-faktor penting yang mendorong investor dalam memilih lokasi investasi. Kajian ini berfokus pada pengaruh operasi rantai pasok global terhadap pemilihan lokasi investasi di era perubahan iklim. Penelitian ini relatif masih tergolong jarang, karena berupaya merumuskan kebijakan pembangunan daerah berdasarkan pendekatan sisi permintaan. Pendekatan berbasis permintaan memerlukan identifikasi sudut pandang investor dalam proses pemilihan lokasi investasi. Industri Elektronika dan Otomotif di Kawasan Industri JABABEKA, Jakarta, Indonesia, digunakan sebagai studi kasus. Data primer dikumpulkan dari persepsi responden dan dianalisis menggunakan metode Structural Equation Model (SEM) yang diterapkan pada software Smart PLS 3.2.8. Model struktural yang digunakan dalam pendekatan ini bersifat formatif. Dalam skala global, pemilihan Indonesia sebagai lokasi investasi dipengaruhi oleh (i) aspek keunggulan fisik, sosial, dan ekonomi terkait perdagangan lintas batas dan (ii) aspek rantai pasok terkait dampak perubahan iklim.

Kata kunci: Perusahaan Multi Nasional, Perdagangan Lintas Batas, Rantai Pasokan, Pemilihan Lokasi Investasi, Seleksi Lokasi Investasi

ABSTRACT

A livable city is a city where people can live comfortably and peacefully. The success of a livable city is achieved not only by physical advantage factors but also by social and economic factors. Livable cities must be investment-friendly to support economic functions. Investment-friendly cities will be the preferred locations for multinational corporations. Urban planners, designers, and managers need to devise urban development strategies that attract investors. This research aims to identify pivotal factors that drive investors' decision-making in selecting investment locations. This study focuses on the influence of global supply chain operations on investment location selection in the era of climate change, which is still relatively rare as it attempts to formulate regional development policies based on a demand-side approach. A demand-based approach requires identifying the investor's point of view in the investment location selection process. The Electronics and Automotive industry in the JABABEKA Industrial Area, Jakarta, Indonesia, is used as a case study. Primary data was collected from the respondents' perceptions and analyzed using the Structural Equation Model (SEM) method, applied in the software Smart PLS 3.2.8. The structural model used in this approach is formative. On a global scale, the choice of Indonesia as an investment location is influenced by (i) aspects of physical, social, and economic advantages related to cross-border trade and (ii) aspects of the supply chain related to the impact of climate change.

Keywords: Foreign Direct Investment, Trading Across Borders, Supply Chain, Investment Location Choice, Investment Location Selection

Citation: Sitawati, A., Taki, H., Wiranegara, H.W., Supriatna, Y., dan Andajani, R.D. (2024). Global Supply Chain Operations for Investment Locations Selection in Climate Change Variation. *Jurnal Ilmu Lingkungan*, 22(4), 933-940, doi:10.14710/jil.22.4.933-940

1. INTRODUCTION

A livable city is a city where people can live comfortably and peacefully. The concept of a livable city is often associated with the quality of a city that offers a comfortable and healthy environment. This

means the city environment is safe, attractive, socially cohesive, inclusive, and environmentally sustainable. The neighborhood of a livable city has affordable and diverse housing, is connected by convenient public transport, has walking and cycling infrastructure to

work, educational facilities, public open spaces, local shops, health and community services, and recreational and cultural opportunities (Lowe et al., 2020).

According to the Asian Development Bank (ADB) (2019), cities are the engines of economic growth and prosperity, offering prospects for productive investment. Business friendliness at the city level has been the subject of interest and concern for over three decades. The importance of urban investment awareness has been growing due to its well-known social and economic impacts at different societal levels. These effects resonate at the macro-level, impacting not only the specific urban areas where venture capital is invested but also influencing the surrounding region and country (Correia et al., 2020). Currently, competition to attract investors is experienced by countries and cities (Bruneckienė, Zykienė, & Stankevičius, 2016). An investment-friendly city will be the preferred location for investment by multinational companies.

IAP (2018) outlined six principles of livable cities, focusing on the availability of the following factors, namely (1) basic necessities (e.g., housing, water, electricity), (2) public facilities (e.g., transportation, city parks, worship facilities, health, education), (3) public spaces for interaction, (4) security, (5) support for economic, social and cultural functions, and (6) sanitation. A livable city should improve on these factors to become an investment-friendly environment in meeting its economic objectives.

Multinational companies operating businesses across geographic boundaries are known as Foreign Direct Investment (FDI). The relocation of investment location outside the business territory is a phenomenon that occurs in the era of globalization. In this era, the world seems to function as an expansive area without distinct boundaries. The recent progress in information technology has significantly increased the flow of both knowledge and capital across borders (Wheelen et al., 2018).

Geographical cross-border activities involve two countries, namely the country of origin of investment (home country) and the country of destination of investment (host country). The presence of FDI in the host countries are particularly crucial for developing nations with limited economies. FDI not only signifies the inflow of foreign investments but also impacts employment opportunities, increases exports, enhances information flow, and introduces new technology (Sitawati, 2021). Consequently, urban planners, designers, and city managers should formulate urban development strategies capable of attracting FDI.

On the other hand, the main factor of FDI's success is the accuracy of managerial decisions in selecting the investment location (Sitawati, 2020). Numerous studies have focused on the factors influencing the choice of investment location, considering both regional economic and business perspectives. For instance, physical, social, and economic advantages

are known to be important factors influencing the selection of investment location (Hoover & Giarratani, 2020; Luthans, & Doh, 2018). Similar view considers the investment climate as an important factor motivating foreign companies to invest in the destinations (World Bank, 2011).

The location advantage of the host country is the factor that affects FDI in investment location choice (Sitawati, 2020). For the host country to be advantageous, the nation should possess abundant natural resources, inexpensive labor, efficient transportation, a sizable market, and high-quality industrial areas. These factors epitomize the potential and opportunities of the host country to attract more investors.

Another critical factor influencing the investment location choice for FDI is the investment climate of the host country (Sitawati, 2020). The investment climate reflects the attractiveness of the host country to investors (Sitawati, 2020). World Bank assesses the investment climate using the "Ease of Doing Business (EoDB)" framework (The World Bank, 2013). This institution evaluates the "Ease of Doing Business" through 10 indicators, namely: (1) starting a business, (2) dealing with construction permits, (3) registering property, (4) paying taxes, (5) accessing credit, (6) enforcing contracts, (7) obtaining electricity, (8) trading across borders, (9) resolving insolvency, and (10) protecting minority investors. Based on that review, the Trading across Borders indicator is one of the indicators used to assess the "Ease of Doing Business."

In the globalization era, the impact of climate change is significantly increasing. Wheelen (2018) stated that over half of global executives acknowledge environmental issues, including climate change, as the most crucial challenges organizations will face in the next five years. Accordingly, the study focuses on the impact of climate change aspects on investment location choice.

The continuity of the supply chain is one of the risks of climate change impacts affecting business decisions (Wheelen et al., 2018). These pressures introduce uncertainty to supply chain networks, especially for global networks operating across continents. The selection of investment location is a critical consideration in supply chain management (Barcelona Field Studies Centre, 2022; Hoover & Giarratani, 2020; Luthans & Doh, 2018; Ireland, Hoskisson, & Hitt, 2017; Stevenson, 2012), where the determination is at a strategic level (Dasaklis & Pappis, 2013).

Choice of investment location for supply chain operation is significant for multinational corporations (Lu, 2011). The investment locations are not all suitable for supply chain operations. Tesla Motors (a manufacturer of electric motors) encountered a notable example of a miscalculation in selecting the location for investment. Tesla Motors' objective of moving production process to Bangkok was to lower labor costs but the impact of sea storms led to

increased travel time and fuel consumption in the region. The initially low labor wages in Bangkok had to be balanced against the rising shipping costs of shipping across the Pacific Ocean (Wheelen et al., 2018). Based on this statement, travel routes become a crucial consideration in investment location selection.

Another impact of climate change on supply chain operations is the rising sea level due to the melting ice in polar regions, leading to storm flooding in the seaports. The severity of the floods in ports depends on the seaport locations. According to Becker, Mcevoy, and Mullett (2018), one-third of the world's ports are situated in areas prone to tropical storms. This vulnerability becomes crucial as FDI selecting Vanuatu, South Korea, and India as investment locations committed errors in deciding the investment locations related to port disturbances. These ports were critically damaged by Cyclone Pam (2015) and Typhoon Maemi (2013), with Chennai seaport suffering severe damage due to flooding in 2015. Therefore, the location of ports can significantly affect supply chain operations.

The other impact of climate change that has implications for global supply chains is the existence of international regulations regarding emission limits emitted by ships. (Wright, 2013). These international regulations result in only certain ships that emit low emissions that can cross the ocean. The ship size is related to the level of harbor water depth. Additionally, the ship size is related to the level of harbor water depth, making the sea depth in the host country's port waters a crucial consideration in investment location choice.

Based on the reviews above, this study aims to elaborate on the factors influencing FDI in selecting Indonesia as an investment location. In a relatively unique approach, the research formulates regional development policies based on a demand-side perspective. This includes the identification of investors' viewpoints during the investment location selection process. The findings provide information for urban planners, designers, and managers in developing regional development strategies for the city.

The evaluation of the city's attractiveness for investment serves as a method to establish close connections between specific factors, providing recommendations and suggestions for improving and maintaining sustainability as well as for positioning the city as attractive for investment (Snieska, & Zykiene, 2015). Essentially, urban planners should understand the factors that mostly influence investment in deciding the best policies to implement.

2. METHODS

2.1. Data Collections

The study was conducted within JABABEKA Cikarang Industrial Area, located approximately 35 kilometers east of Jakarta, along Bekasi-Cikampek corridor. The industry was administratively situated

within North Cikarang District, Bekasi Regency, West Java Province. The analysis focused on the electronics and automotive manufacturing industry with foreign investment (PMA) status, comprising a sample size of 80 companies. The minimum sample size was determined using the Slovin formula (Sugiyono, 2010). Considering that the population was dispersed across 19 locations in JABABEKA Industrial Area, a cluster proportional random sampling approach was applied during the sampling process.

Exogenous variables included physical, social, and economic advantages related to trading across borders (representing X1), and supply chain related to the impact of climate change (denoting X2). The indicators for X1 consisted of (1) availability of infrastructure for trading across borders and (2) investment climate connected to trading across borders (X1.2). However, indicators for X2 included (1) the travel routes, (2) the geographic position of ports, and (3) the sea depth of port waters.

The endogenous variable in the study model was investment location selection (Y1). This variable was represented by two indicators, namely Indonesia as the primary decision of investment location (Y1.1) and Indonesia's potential support to become an investment location (Y1.2).

The measurement of both the exogenous and endogenous variables relied on perception, assessed through a questionnaire using a Likert scale. The Likert scale comprised five selections, ranging from 1= strongly disagree to 5= strongly agree.

2.2. Data Analysis

The study used inferential statistics for data analysis, using the Structural Equation Model (SEM) approach. Smart PLS 3.2.8 served as the software for the SEM approach, implementing a formative structural model. Contrary to the reflective approach where indicators were influenced by factors, the Formative model determined latent variables through indicators (Hair, Hult, Ringle, & Sarstedt, 2017).

The hypotheses proposed in this study are as follows:

- H1: Physical, social, and economic advantages related to trading across borders (X1) have a significant effect on investment location choice (Y1).
- H2: The supply chain related to the impact of climate change (X2) has a significant effect on the investment location choice (Y1).

Figure 1 shows the SME's structural model.

The comprehensive data analysis process included two stages, namely: (1) measurement model analysis (outer model) and (2) structural model analysis (inner model). Figure 2 visually presented the data analysis steps.

The outer model measures how each indicator relates to its latent variables. There are two stages in measuring the outer model, namely 1) Collinearity Issues and 2) Significance and Relevance of the Formative Indicators. Furthermore, the measurement

of the inner model describes the relationship between latent variables, which are formulated based on theories. There are five stages in the measurement of the inner model, namely 1) Collinearity Assessment; 2) Structural Model Path Coefficients; 3) Coefficient of Determination (R² Value); 4) Effect Size f²; and 5) Blindfolding and Predictive Relevance Q².

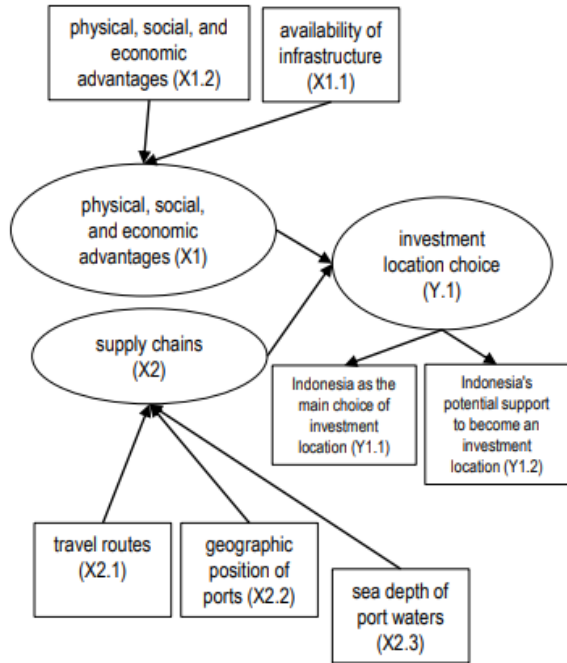


Figure 1. Structural Model

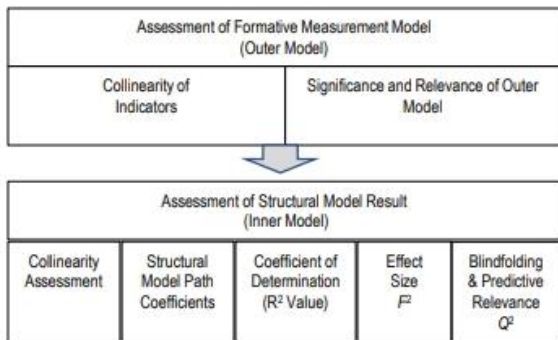


Figure 2. Data Analysis Steps

3. RESULT AND DISCUSSION

3.1. Result

3.1.1. Measurement Model Analysis (Outer Model) Analysis of the Collinearity of Indicator

The initial step of evaluating the outer model was to calculate the Variance Inflation Factor (VIF) value to detect the potential existence of multicollinearity among indicators within latent variables. Collinearity was a high correlation between two formative indicators and can impact estimated weights as well as statistical significance (Hair et al., 2017). VIF values > 5 indicated potential collinearity (Hair et al., 2017), and the outcomes of the calculations were presented in Table 1.

Table 1. VIF in the Outer Model

Indicators	VIF
X1.1	1.002
X1.2	1.002
X2.1	1.244
X2.2	1.691
X2.3	1.568
Y1.1	1.564
Y1.2	1.564

Table 1 showed that all indicators had VIF values less than 5, indicating the absence of multicollinearity between the Availability of Infrastructure Related to Trading across Borders (X1.1), Investment Climate Related to Trading across Borders (X1.2), Travel Routes (X2.1), Geographical Position of Ports (X2.2), Sea Depth of Port Waters (X2.3), Indonesia as the Main Choice of Investment Location (Y1.1), and Indonesia's Potential Supports to become an Investment Location (Y1.2). Following the measurement of this model, the framework progressed to an evaluation of the significance and pertinence of the outer model.

Analysis of the Significance and Relevance of the Formative Indicators

The second step of evaluating the outer model is calculating the Outer weight value with a P-value of 0.05. The Outer weight value is important for assessing the contribution of formative indicators and their relationships (Hair et al., 2017). P-value above 0.05 suggests that the indicator may not be appropriate for assessing the latent variable. Table 2 showed the outcomes of the outer weight value measurements.

Table 2. Outer Weight Value

Formative Indicators Latent Variable	Outer Weight	P-Value
X1.1→X1	0.729	0.000
X1.2→X1	0.650	0.000
X2.1→X2	-0.123	0.292
X2.2→X2	0.476	0.068
X2.3→X2	0.690	0.008
Y1.1→Y1	0.573	0.001
Y1.2→Y1	0.545	0.001

Table 2 showed that indicators X2.1 and X2.2 had P-values above 0.05, rendering the outer weight value insignificant. According to Hair, Ringle, and Sarstedt (2017), when the value of outer weight is not significant, but the outer loading value is high (above 0.50), the indicators can be interpreted as "really important but not relatively important". In these circumstances, the indicators are typically retained.

Another consideration was when an indicator had an insignificant outer weight value and an outer loading value below 0.50. In this case, the experts should decide when to maintain or delete the indicator based on theoretical relevance (Hair et al., 2017). Table 3 showed the Outer Loading Value.

Table 3 showed that X2.2 exhibited a robust outer loading value of 0.833, surpassing the 0.50 threshold, leading to the decision to retain indicator X2.2 for measuring latent variables. The Outer loading

value of X2.1 was below 0.50, but based on theoretical considerations, both indicators were retained to measure the latent variables. In a formative model, the indicators collectively influenced the latent variable, therefore, removing the indicator could alter the fundamental nature of the construct.

Table 3. Outer Loading Value

Formative Indicators Latent Variable	Outer Loading	P-Value
X1.1→X1	0.760	0.000
X1.2→X1	0.685	0.000
X2.1→X2	0.319	0.067
X2.2→X2	0.833	0.000
X2.3→X2	0.930	0.000
Y1.1→Y1	0.900	0.000
Y1.2→Y1	0.889	0.000

3.1.2 Structural Model Analysis (Inner Model) Collinearity Assessment

Measuring collinearity in the inner model used the same method as in the outer model, as Table 4 presented the VIF value.

Table 4. Variance Inflation Factor (VIF) in the Inner Model

	Y1
X1	1,154
X2	1,154

Table 4 showed that all VIF values were below 5, implying no multicollinearity between the physical, social, and economic advantages related to trading across borders (X1) and supply chains related to the impact of climate change (X2). Therefore, the measurement of this model continued by assessing the path coefficient.

Structural Model Path Coefficients

Structural Model Relationships or Path Coefficients showed hypothesized relationships among constructs (Hair et al., 2017), with a default value between -1 and +1. The study used a significant level of 5% indicating that the P value should be less than 0.05 for the relationship to be considered significant. Conversely, a P-value value above 0.05 showed an insignificant relationship, and the structural model path coefficients were presented in Table 5.

Table 5. Structural Model Path Coefficient

	Coefficient
X1 -> Y	0.513
X2 -> Y	0.320

Table 5 showed that X1 was found to have a significant and positive effect on Y1, with a coefficient value of 0.513. Supply Chains Related to the Impact of Climate Change (X2) also had a significant and positive effect on Investment Location Choice (Y1), with a coefficient value of 0.320. The measurement results indicated that the influence of X1 on Y1 was greater than the effect of X2 on Y1.

Coefficients of Determination (R² Value)

Model accuracy in predicting constructs was measured by the coefficient of determination (R²) (Hair, Ringle, & Sarstedt, 2017). Acceptable R² values depended on the model complexity and the discipline of study (Hair, Ringle, & Sarstedt, 2017).

Providing general guidelines for acceptable R² values proved challenging as the figure varied depending on the model (Hair, Ringle, & Sarstedt, 2017). According to Hair, Ringle, and Sarstedt (2017), an R² value of 0.20 is considered high in a discipline such as consumer behavior, customer satisfaction or loyalty.

Table 6. Coefficient of Determination

Variable	R Square (R ²)
Y1 (Investment Location Choice)	0.485

Table 6 showed that the value of R² was 0.485. As reviewed above, determining an acceptable R² value depended on the complexity of the model and the discipline of study. This research focused on consumer perceptions of investment location choice using a Likert Scale. Therefore, this assessment was equated with the evaluation of social and behavioral sciences (e.g., consumer behavior), where the value of R² ~0.20 was considered high (Hair, Ringle, & Sarstedt, 2017; Braga, 2019). Significantly, the R² value in this study exceeded 0.20, signifying a higher level of predictive accuracy for the model.

The Effect Size (f²)

Effect size (f²) was used to evaluate the coefficient of determination of all endogenous variables. The difference between f² and R² was that f² was more specific for each exogenous variable (Sitawati et al., 2021). An f² value of 0.02, 0.15, and 0.35 represented small, medium, and large effects, respectively (Hair, Ringle, & Sarstedt, 2017), while an effect size value of less than 0.02 suggested no effect.

Table 7. The Effect Size (f²)

	Y1 (Investment Location Choice)
X1 (Physical, Social, Economic Advantages Related to Trading Across Borders)	0.442
X2 (The Supply Chains Related to The Impact of Climate Change)	0.172

Table 7 showed that the f² value of physical, social, and economic advantages related to trading across borders (X1) was 0.442, implying a high effect (Hair, Ringle, & Sarstedt, 2017). The f² value of the supply chains related to the impact of climate change (X2) was 0.172, suggesting a moderate effect. Consequently, variable X1 had a high effect on Y1, and indicator X2 had a moderate impact on Y1.

Blindfolding and Predictive Relevance Q²

The Stone-Geisser Q² value was used to evaluate the accuracy of the predictions, where a value greater than 0.0 showed a predictively relevant model (Hair, Ringle, & Sarstedt, 2017). Q² values below 0.05 had small predictive relevance, while figures between 0.05 and 0.30 suggested moderate predictive relevance and values exceeding 0.30 indicated strong predictive relevance (Sitawati et al., 2021).

Table 8. Predictive Relevance

Variabel	SSO	SSE	Q ² = (1-SSE/SSO)
Y1 (Investment Location Choice)	160.000	108.749	0.320

As depicted in Table 8, the Q² value was 0.320, signifying that the model had great predictive relevance.

3.2. Discussion

The SEM-PLS results indicate that the two variables, namely X1 and X2, have a significant and positive effect on variable Y1. Consequently, both hypotheses proposed in this study are accepted. Specifically, the influence of the Physical, Social, and Economic Advantages Related to Trading across Borders (X1) on Investment Location Choice (Y1) is greater than the impact of the Supply Chains Related to the Impact of Climate Change (X2) on Investment Location Choice (Y1).

The largest number of respondents are from Japan and Korea, with the majority originating from Asian countries (around 82.50%). This distribution indicates that foreign companies investing in Indonesia are primarily from the Asian continent. Ships from Korea and Japan to Indonesia do not cross the Pacific Ocean, which is known for experiencing the deadliest superstorms. Due to this downside, travel route of supplies from Japan and Korea to Indonesia is relatively safe. Despite the Supply Chains Related to the Impact of Climate Change (X2) are considered important by foreign investors, the level of importance is comparatively lower than the aspects of Physical, Social, and Economic Advantages Related to Trading Across Borders (X1).

The research model also shows predictive accuracy, as evident by the R² value of 0.485 (refer to Table 6). Additionally, the results of the effect size measurement (f²) suggest that Physical, Social, and Economic Advantages related to Trading Across Borders (X1) have a substantial effect on Investment Location Choice (Y1) (refer to Table 7). Supply Chains related to the Impact of Climate Change (X2) exhibit a moderate effect on Investment Location Choice (Y1) (see also Table 7). These effect size measurements align with the path coefficient measurements of the structural model (Table 5). Furthermore, the results of Q² predictive relevance measurement indicate that the research model possesses significant predictive relevance (Table 8).

Empirically, the impact of physical, social, and economic advantages related to trading across borders (X1) on investment location choice (Y1) aligns with the actual conditions. Indonesia boasts a high-quality transportation infrastructure that supports the export-import process. Furthermore, the country features an industrial estate that excels at facilitating industrial activities. For instance, there is convenient access to macro infrastructure to and from Jababeka, such as the Cikampek toll road and the double-double track route. These factors render the Jababeka industrial area an attractive choice for investors seeking an investment location in Indonesia. Additionally, the industrial area offers a dry port, ensuring the smooth operation of export-import activities. Currently, infrastructure development is prioritized to increase Indonesia's attractiveness as a host country.

Foreign Direct Investment (FDI) companies situated in industrial areas are equipped with various essential facilities to facilitate industrial operations. These facilities are categorized into two types, namely (i) industrial infrastructure facilities and (ii) supporting infrastructure facilities. Industrial infrastructure facilities include energy and electricity networks, telecommunications networks, water resource networks, assured raw water supplies, sanitation networks, and transportation networks. Supporting infrastructure facilities comprise employee housing, education and training facilities, research and development facilities, healthcare facilities, fire safety infrastructure, and waste disposal sites.

Industrial estates also offer essential basic infrastructure, including raw water treatment plants, wastewater treatment facilities, drainage channels, street lighting installations, and a well-developed road network. Furthermore, industrial estates provide various additional facilities to companies located within the vicinity. These include tax incentives, streamlined development, and electricity management for specific needs and industrial activities within the estates, such as one-stop integrated service facilities in compliance with statutory regulations. Consequently, FDI companies located in industrial areas benefit from significant convenience and a sense of security while conducting their operations.

Indonesia is increasingly conducive as a host country with the issuance of Law of the Republic Indonesia Number 11 of 2020 concerning Job Creation. One of the urgent of the Job Creation Law is to encourage increased investment. The background to the issuance of a work copyright law is: (1) increasing the ease of doing business from 73rd place (2020) to 53rd in the world, (2) the existence of policy conflict, (3) Indonesia's regulatory index is still low, (4) there is a phenomenon of excessive regulation, (v) inefficient policies, and (vi) laws are sectoral, often out of sync and there is no legal certainty. This law improves the investment climate and creates legal

certainty, with aims to overcome overlapping regulatory issues, harmonize central and regional policies, provide ease of doing business, and accelerate economic transformation. Significantly, the Job Creation Law simplifies the requirements for investment, contributing to a more attractive and conducive environment for both domestic and foreign investors.

The significance of the impact of supply chains related to the impact of climate change (X2) on investment location choice (Y1) is further corroborated by real-world conditions. This is evident when considering the geographical location of the Indonesian state. Indonesia's position, shielded from the open sea, ensures that travel routes are relatively safe from sea storms, which are frequent in open waters. The security of travel routes promotes the smooth operation of global supply chain activities.

The equatorial location of Indonesia contributes to the attractiveness, providing safety from storms (Sitepu, 2017) because storms only revolve in northern and southern hemispheres but not in the equatorial zone. Therefore, Indonesia will relatively not be hit by tropical storms (Sitepu, 2017). Ports in Indonesia also tend to be safe from flood and storm attacks, ensuring the relatively smooth continuity of the supply chain. This safety factor attracts FDI companies to select Indonesia as an investment location.

The impact of climate change having implications on global supply chains is influenced by international regulations governing ship emission limits (Wright, 2013). These regulations restrict ocean-crossing to ships emitting low emissions, a criteria more easily met by large ships. Therefore, only large ships could cross the ocean. The Port of Tanjung Priok can accommodate large ships, with a capacity of 400,000 TEUs, indicating that supplies transportation to Indonesia can meet international requirements for sea travel emission limits. This phenomenon makes Indonesia highly attractive as an investment location.

The country's attractiveness as an investment location is also supported by the availability of complete intermodal facilities at the Tanjung Priok port. This intermodal facility can connect Tanjung Priok Port with all other ports in Indonesia. Equipped with modern technology and facilities, Tanjung Priok Port accommodates the latest generation of ships, allowing direct access to various ports in international trade centers through direct calls.

Based on the demand-driven approach in identifying investors' perspectives in the process of selecting an investment location, the regional development strategies that the government of Indonesia should enhance to have high attractiveness are.

1. Optimize the industrial estates and special economic zones (KEK). Augmenting these areas by incorporating facilities related to export-import activities, such as dry port facilities, direct access to seaports, customs incentives in the form of

import duty exemption on machinery, as well as goods and materials for industrial construction or development. This optimization not only expands investment opportunities but also stimulates international trade traffic activities.

2. Building Deep Seaport. Seaports that have deep waters can cause large ships to anchor at the ports. As larger ships emit lower emissions than small ships and can comply with international regulations on sea emission limits, the establishment of deep seaports expedites supply chain journey to Indonesia, contributing to the country's attractiveness as an investment location.

4. CONCLUSION

In conclusion, inferential analysis results showed that all hypotheses were significant in a positive direction. On a global scale, the selection of Indonesia as an investment location was influenced by (i) physical, social, and economic advantages related to trading across borders aspects and (ii) supply chain aspects related to the impact of climate change.

The variable of Physical, Social, and Economic Advantages Related to Trading Across Borders suggested high effect on investment locations selection. However, the variable of Supply Chains Related to The Impact of Climate Change showed moderate effect on investment locations selection. These two aspects included the availability of industrial areas, direct access from industrial estate to seaports, and the presence of dry ports as well as seaports capable of accommodating large ships. The research model showed high accuracy (R2 value = 0.485). Based on the results of the Q2 Predictive Relevance measurement, the research model possessed significant validity. To enhance Indonesia's investment attractiveness, the government needed to increase the availability of import-export facilities in industrial estates and special economic zones while building a deep seaport.

REFERENCES

- Asian Development Bank. 2019. *Creating Livable Cities – Regional Perspectives*. Manila, Philippines, <https://www.adb.org/sites/default/files/publication/531126/livable-cities-main-report.pdf>
- Barcelona Field Studies Centre. 2022. Locations of Industry Factors. <https://geographyfieldwork.com/IndustryLocationFactors.htm>, on April 24, 2023.
- Becker, A., Ng, A. K., Mcevoy, D., & Mullett, J. 2018. "Implication of Climate Change for Shipping: Ports and Supply Chains". *WIRE's Climate Change Journal*, 9 (2): 1-18.
- Braga Junior, Sergio., Martínez, Marta Pagán., Correa, Caroline Miranda., Moura-Leite, Rosamaria Cox., and Da Silva, Dirceu. 2019. Greenwashing effect, attitudes, and beliefs in green consumption. *RAUSP Management Journal*, Vol. 54 No. 2, 2019, <https://doi.org/10.1108/RAUSP-08-2018-0070>
- Bruneckienė, Jurgita., Zykienė, Ineta., Stankevičius, Vytautas. 2016. Critical analysis of city

- attractiveness factors in Lithuania – Poland cross-border regions: the viewpoints of businessmen and youth. *Journal of Geography, Politics, and Society*, 2016, 6(2), 45-58, <https://doi.org/10.4467/24512249JG.16.012.5457>
- Correia, Joana S. R., Ferreira, Fernando A. F., Kavaliauskienė, Ieva Meidutė, Pereira, Leandro F., Zopounidis, Constantin, Correia, Ricardo J. C. 2020. Factors Influencing Urban Investment Attractiveness: An FCM-Sd Approach. *International Journal of Strategic Property Management*, 24(4), 237-250. <http://Dx.Doi.Org/10.3846/Ijspm.2020.12384>.
- Dasaklis, T. K., & Pappis, C. P. 2013. "Supply Chain Management Given2 Climate Change: An Overview of Possible Impacts and the Road Ahead". *Journal of Industrial Engineering and Management*, 6 (4): 1139-1161
- Hair J. F., Hult G. T. M., Ringle C. M., and Sarstedt M. A Primer on Partial Least Squares Structural Equation Modeling (PLS-SEM), 2nd ed, SAGE Publications, Thousand Oaks, California, 2017, p. 73.
- Hoover, E. M., & Giarratani, F. 2020. *An Introduction to Regional Economics*. McGraw-Hill College, New York.
- Ikatan Ahli Perencana Indonesia (IAP). 2018. Most Livable City Index. <https://iapindonesia.org/programs/5ee09b43140bc31fdd4630a2>
- Ireland, R. D., Hoskisson, R. E., & Hitt, M. A. 2017. *Strategic Management*. South-Western, Cengage Learning, Canada
- Lu, D. 2011. *Fundamentals of Supply Chain Management*. Dr Dawei Lu & Ventus Publishing ApS. Colorado, United States
- Luthans, F., & Doh, J. 2018. *International Management: Culture, Strategy, and Behavior*. McGraw-Hill. New York.
- Melanie, Lowe., Arundel, Jonathan., Hooper, Paula., Rozek, Julianna., Higgs, Carl Higgs., Roberts, Rebecca., and Billie Giles-Corti, 2020. Liveability Aspirations and Realities: Implementation of Urban Policies Designed to Create Healthy Cities in Australia. *Journal of Social Science and Medicine* (245): 2-3, <https://doi.org/10.1016/j.socscimed.2019.112713>.
- Snieska, Vytautas., and Zykiene, Ineta. 2015. City attractiveness for investment: characteristics and underlying factors. *Procedia - Social and Behavioral Sciences* (2015), 48-54. <https://core.ac.uk/download/pdf/82736329.pdf>
- Sitawati, A., Alhabsji, Taher., Kusumawati, Andriani., Abdillah, Yusri. 2020. Reorientation of Locational Investment Under Environmental Regulation Towards Improvement of Organizational Competitiveness. *International Journal of Advanced Science and Technology*, 29(5): 634-644, <http://sersc.org/journals/index.php/IJAST/article/view/9592>
- Sitawati, A., Alhabsji, Taher., Kusumawati, Andriani., Abdillah, Yusri. 2020. Determining Locational Choice of Organizational Decision System to Intensify Competitiveness. *Technology Reports of Kansai University*, 62(3), 499-510, <https://www.kansaiuniversityreports.com/article/determining-locational-choice-of-organizational-decision-system-to-intensify-of-competitiveness>
- Sitawati, A., Kusuma Dewi, D., Andajani, R. D., and Sihombing, P. R. 2021. The Strategy Preference of Multinational Entrepreneurs in Choosing Investment Locations. *Journal of Hunan University: Natural Sciences*. 48(3): 47-54, <http://jonuns.com/index.php/journal/article/view/534>
- Sitawati, A., Muhamad Taki, Herika., and Dewi Andajani, Rezkia. 2022. The Influence of Environmental Policies on Selecting Investment Locations. *Indonesian Journal of Urban and Environmental Technology*. 5 (3): 266-280. Doi: <https://doi.org/10.25105/urbanenvirotech.v5i3.14448>.
- Sitepu, M. Badai Pasti Tak Melalui Indonesia dan Beberapa Fakta Lainnya. Jakarta. <https://www.bbc.com/indonesia/majalah-41320695>, on September 20, 2017.
- Southworth, Michael. 2016. Learning to make liveable cities. *Journal of Urban Design*. 21 (5): 570-573. <https://doi.org/10.1080/13574809.2016.1220152>
- Stevenson, W. 2012. *Operations Management*. The McGraw-Hill Company. New York.
- Sugiyono. 2010. *Metode Penelitian Kuantitatif, Kualitatif, dan R&D*. Bandung: Alfabeta.
- Tennakoon, T.M.M.P, and Kulatunga. U. 2019. Understanding Liveability: Related Concepts and Definitions. *Proceedings of the 8th World Construction Symposium*. proceedings of the 8th World Construction Symposium, Colombo, Sri Lanka, 8 Colombo, Sri Lanka, pp. 578-587. <https://doi.org/10.31705/WCS.2019.57>.
- The World Bank. 2013. "Does Doing Business Matter for Foreign Direct Investment?", United States, The World Bank Group.
- The World Bank, 2011. *Attracting FDI*, New York, The World Bank Group.
- Wartaman, A.S., Kusumadewi, D., Ramadhani, A., andajani, R.D., 2021. Locational Choice Strategy: How FDI's Choice of Indonesia as An Investment Location Towards Competitiveness Advantage. *Proceedings of the 5th International Seminar on Sustainable Urban Development*, 737. <https://doi.org/10.1088/1755-1315/737/1/012031>
- Wheelen, T. L., Hunger, J. D., Noffman, A. M., & Bamford, C.E., 2018. *Strategic Management and Business Policy: Globalization, Innovation and Sustainability*. 15th. United States of America: Pearson Education, Inc
- Wright, P. 2013. "Impacts of Climate Change on Ports and Shipping". *Marine Climate Change Impacts Partnership: Science Review 2013*: 263-270