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Exploring the Manufacturing Reshoring Decision-Making Process Using System Dynamics

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Abstract. Reshoring manufacturing is a strategic decision because of its cost, implications, and complexity. Existing models have largely focused on cost aspects in reshoring decisions and are considered limited in assisting practitioners in the reshoring decision-making process. Variables like cost and quality have been the most important, whereas environment and sustainability seem not a priority, arguing for the myopic nature of these decisions. Therefore, this study employs system dynamics (SD) to expand practitioners' mental models for the reshoring decisionmaking process. To do so, first, variables and heuristics are retrieved from the literature. Next, an industry expert is interviewed to have a practitioner's input. Finally, a descriptive SD model is built by connecting variables and heuristics. The findings indicate that the behavior of the variables in reshoring decisions is dynamic over time. Furthermore, the variables are inter-linked, resulting in non-linear, multicaused reshoring decisions. The presented SD model allows incorporating the variables that are sometimes difficult to quantify and provides a holistic view of the variables, their relationships, complexities, and the dynamics involved in the reshoring decision-making process. This study contributes to reshoring literature by using SD perspective in the reshoring decision-making process and proposing an SD model for reshoring decision-making. This study assists practitioners in expanding their mental models regarding the reshoring decision-making process. It is further argued that the proposed SD model may work as a generic steppingstone to further develop company-specific feedback-oriented models to support in their reshoring decision-making processes and to support future research on the topic.

Keywords. reshoring, backshoring, decision-making, modeling, system dynamics

1. Introduction

The reshoring phenomenon has gained momentum as several manufacturing companies are relocating back their activities from former low-cost countries [1, 2]. This phenomenon has been observed across various types of industries, company sizes and home or host countries [3, 4]. Furthermore, contemporary events such as the Covid-19 pandemic, the Suez Canal blockade or the shipping container shortage have exposed the risks of too long supply chains, leading practitioners to contemplate reshoring of their manufacturing activities [5]. Moreover, the most recent report on climate change has raised urgency to consider sustainability in business decisions [6], leading to even larger

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incentives for reshoring. Reshoring is a costly, complex, and strategic decision for companies [7-9], as it involves the assessment of capabilities and investments in production resources [10]. Therefore, these decisions demand a long-term perspective and a thorough analysis [1]. Acknowledging the newness of the topic, there is a need to develop theories to explain reshoring in high-cost countries and to explore the reshoring decision-making process [7].

Modeling methods and decision support models have received limited attention in reshoring literature [7, 8], as most studies on reshoring have employed case studies, surveys, conceptualization, and literature reviews as research methods [11]. Some models have employed fuzzy logic in a reshoring decision-making process [12-14], while others have employed mathematical modeling [7]. Yet, there are limitations in understanding the complexity and dynamics between the variables in the reshoring decision-making process. The advantage of modeling methods lies in the exploration of a certain phenomenon [15], therefore, explored herein.

The challenge to modeling the reshoring decision-making process is that the decision-makers seldom follow a systematic and structured process [16]. Moreover, decision-makers are limited in their mental models [17], resulting in that often, reshoring decisions are based on the decision-makers' experiences or preferences which is limited, and not considering the complete picture. This means that a behavioral style of making decisions (or heuristics) needs to be accounted for in the modeling of the decision-making process. One way to incorporate these heuristics into reshoring is to employ system dynamics (SD) [16]. Therefore, the purpose of this study is to explore the reshoring decision-making process using SD.

2. Research Design

The research design comprised a literature review, an interview, and modeling. During the literature review, the search was limited to journal articles in the English language between 2009-2021 in Scopus and Web of Science. The final sample considered 18 articles. From these articles, central ideas, case study descriptions, and theories were extracted to identify variables and heuristics for the model. Thereafter, an interview was carried out with an industry expert to contrast the findings from the literature and to get practical insights into the reshoring decision-making process. The expert was chosen based on contextualized expertise [18] in offshoring and reshoring decision-making processes. The interview was conducted following an interview guide comprising questions about the company, the expert, variables, heuristics, and relationships that the expert considered in the reshoring decision-making process. The interview was audiorecorded and transcribed. Next, variables, heuristics, and relationships were retrieved from the interview, which were then mapped with those found during the literature review. Finally, a descriptive SD model of the reshoring decision-making process was developed using the inputs from the previous two parts. Applying SD modeling had the following main motivations. First, the reshoring problem cannot be explained by a single variable [8] and many of the variables are interconnected [19]. Second, to approach an understanding of the problem under study, which has a dynamic nature, and the purpose is to explore different interconnections between the various parts involved, SD is considered an appropriate tool [20]. As well as dynamics and complex business decisions with real-world characteristics can be represented and explained by SD models [21-23].

3. Identifying Reshoring Variables and Heuristics

The variables and heuristics that need to be incorporated in the SD model are identified using a literature review and an expert interview, as outlined below.

3.1. Literature Review

Reshoring decisions involve both qualitative and quantitative variables [17]. In many cases, managers are limited in their decision-making capacity and resort to myopic decisions based purely on costs [24, 25]. The variables are commonly addressed as barriers and drivers in the reshoring literature [7, 16, 26-28]. The main drivers of reshoring decisions are various types of costs, especially increasing labor costs in offshore locations [7, 29]. The next main driver is the poor quality of products manufactured in the offshore location [7]. In fact, quality is the leading single driver for reshoring decisions in the USA and Western Europe [3, 29, 30]. Nevertheless, there are some areas lacking attention in the reshoring decision-making process. For example, environment and sustainability are seldom considered as drivers for reshoring decisions [17], and they have the least priority for the industry among other variables [12, 13], despite being aware of the environmental problems and new regulations [17]. Only four variables were identified in the literature related to environment and sustainability in the reshoring decision-making process. The variables were increased awareness of the environmental impact, stricter environmental legislation, increased focus on sustainability [8], and firm's aims in terms of environmental and social sustainability [7].

The literature review identified that classifying variables as drivers or barriers can be misleading because it depends on whether the home country or the host country is being analyzed. For example, access to qualified personnel, flexibility/ability to deliver quickly, and lack of capacity can be either a driver or barrier depending on the standpoint [8, 31]. This is observed for most drivers and barriers identified in the literature. Hence, one needs to be careful when applying the notion of driver or barriers, and it's important to address them rather as 'variables' in the decision. Variables' names considered in the modeling are capitalized and italicized throughout the text from this point on.

Variables frequently considered by different authors emerged from the study of the literature; for instance, *Operational Cost* [7, 27, 29], *Quality of Products* [1, 26, 29, 32], *Difference in Labor Costs* [26, 27, 29, 33]. The cost-related variables are the most influential [29] ones in the reshoring decision-making process. Among the cost variables, *Difference in Labor Costs* is most important for reshoring decisions [26, 27, 29, 33]. The next influential variable is related to the *Quality of Products* [29].

Variables and quotes from the literature review were used to define the heuristics that support explaining the cause-effect relationship between the *Reshoring Decision* and its causes (Table 1). The tendency of *Reshoring Decision* is the dependent variable, and it represents companies' inclination to make a reshoring decision. This decision is an effect caused by independent variables like *Development of Competences, Quality of Products, Cost of Poor-Quality, Difference in Labor Costs,* etc. In total, eight independent variables were considered for modeling the reshoring decision-making process. Moreover, for each independent variable, one heuristic was defined and at least one supporting quote identified in the literature review was included in the table. The home country was the standpoint used to consider the changes in the independent variables and to develop the heuristics.

N.o	Variable	Docouintion	University	Cumodine curdes	Connoo
.0V	v ariable	Description	neurisuc	Supporting quotes	Source
-	Development of Commetences	Access to new skills, knowledge, technological advances	If the <i>Development of</i> <i>Competences</i> increases in the home country then the	" development competences, including access to skills and knowledge, are the key incentive for backshoring." "[Dnivers of reshuring]. A cross to skills and knowledge"	[34], p. 43 [35] n 57
	in the second second	and availability of	Reshoring Decision	"[Drivers of reshoring]. Production technology availability in locations	[26] n 504
		production technology in	tendency increases.	(production automation). Disruptive technological advances (e.g., 3D printing)"	100 . J. [07]
		the nonce country.		"The most prominent reasons for backshoring to NZ were issues surrounding flexibility/ability to deliver quickly"	[31] p. 286
2	Quality of Products	Fewer quality problems, seran rate and product	If the Quality of Products increases in the home	" the quality issue is the primary single factor for reshoring of American manufacturing commanies"	[29], p. 69
		defects in the home country. Greater design	country, then the Reshoring Decision tendency	"A number of benefits are also associated with backshoring, including higher quality."	[34], p. 39
		and quality compliance in the home country.	increases.	"This decision [reshoring] was made because of the dramatic decline in sales resulting from unforeseen product quality problems"	[26], p. 499
ς,	Cost of Poor- Quality	The cost associated with rework, extra material used, extra utilities in the home country.	If the <i>Cost of Poor-Quality</i> decreases in the home country, then the Reshoring Decision tendency increases.	"At SME D, reshoring decisions followed repeated deliveries of poor-quality products from its Chinese steel item (D-2) supplier"	[17], p. 39
4	Difference in Labor Costs	The Difference in Labor Costs associated with wages, salaries, and	If the <i>Difference in Labor</i> <i>Costs</i> between the home and the host countries	"Wages increase at the Chinese factory slash China's labor cost advantage over states in the US, which makes the companies relocate their business operations back home."	[29], p. 66
		employment benefits between the home	decreases, then the Reshoring Decision	" the efficiency seeking offshoring by utilizing the lower labor cost is more likely to reshore."	[29], p. 64
		country and the host country.	tendency increases.	"General Electric's reshoring decision due to: "the faster than expected increase in Chinese"	[26], p. 499
				"The investigation underlines that increasing labor costs in the technological- laggard country reduces its attractiveness and may spark a reshoring process."	[27], p. 4

Table 1. Heuristics for modeling the reshoring decision-making process.

S	Operational Cost	Involves multiple costs, e.g., shipping, warehousing, raw	If the <i>Operational Cost</i> decreases in the home country, then the <i>Reshoring</i>	"The location decisions of Multinational Enterprises are updated at discrete-time periods and are based on comparative production-cost advantages in the two countries that depend on () extra <i>Operational Costs.</i> "	[27], p. 3
		material, labor, and poor quality in the home country.	Decision tendency increases.	" cost was the most relevant [reshoring driver category] in terms of both number of drivers and total citations."	[7], p. 92
9	Gap between Desired and Observed Performance	Difference between the desired performance and <i>Observed Performance</i> in the home country [17].	If the Gap between Desired and Observed Performance decreases in the home country, then the Reshoring Decision tendency increases.	"Given the assumption that reshored production results in better responsiveness and fewer unanticipated problems than offshore production, the realization of a <i>Gap between Desired and Observed Performance</i> would encourage reshoring (i.e., a decrease in Offshoring)."	[17], p. 41
7	Influence of Brand Image	The influence of the brand image and country	If the Influence of Brand Image and Country of	"resources/strategic assets considerations (), brand image, () have been called to explain firms' decisions to relocate closer to their headquarters."	[36], p. 141
	and Country of Origin	of origin over customers' emotions, perceptions of	Origin increases in the home country, then the	" consumers feel emotions toward specific elements connected with a product (as the country of origin) "	[9], p. 89
	(country of origin effect)	product quality, and buying decisions for	Keshoring Decision tendency increases.	"Traditionally, the country of origin has strongly influenced consumers' buying decisions for certain products."	[36], p. 152
		certain products (i.e., "made-in" or country-of-		"Recently, many firms have reshored manufacturing activities back to their home countries to increase customer perceptions of product quality."	[37], p. 1099
		ongin effect) in the home country.		" the "made-in effect" () is the fourth most important motivation of reshoring decisions in our sample."	[38], p. 115
8	Labor Intensity of	The physical effort required in the	If the Labor Intensity of Manufacturing Process	" the labor-intensive manufacturing processes of apparel have made reshoring financially infeasible."	[39], p. 1
	Manufacturin	manufacturing process	increases in the home		
	g Process	(e.g., machine and worker) in the home country.	country, then the <i>Reshoring</i> <i>Decision</i> tendency decreases.	"Labour-intensive products are sometimes manufactured in neighbouring lower- cost countries in a practice known as nearshoring."	[40], p. 552

3.2. Expert Interview

To contrast the evidence found in the literature review, an interview was conducted with an expert (Expert A) from a Swedish manufacturing company (Company A). Expert A belongs to the middle-management level of the organization with experience in several relocation projects including offshoring and reshoring decision-making processes. Company A offshored some of its manufacturing processes from Sweden between 2015-2020. Besides, it made reshoring decisions more recently, bringing back manufacturing operations from its offshore suppliers.

Expert A mentioned that the reshoring decision-making process is dynamic and time-consuming. The entire process can take 1-2 years, from the start of the process until implementing the reshoring. During this period, the context is dynamic, and variables can change, leading them to modify or terminate the decision-making process. For example, changes in the top management team, the regulations, and the home country context could disrupt the decision-making process. According to the expert, the cost is the most important variable in the reshoring decision-making process, followed by quality. Moreover, the expert selected four out of the eight variables included in Table 1 as relevant to the reshoring decision-making process. The *Difference in Labor Costs* and *Operational Cost* is classified as directly related to cost, while *Quality of Products* and *Labor Intensity of Manufacturing Process* are indirectly related. Thereafter, the expert added that the cost of the components, availability of components, and the amount of support required are relevant variables for reshoring. According to the expert, the cost is not only influenced by the activities directly related to the production, but also by supporting activities.

The expert suggested that some variables and heuristics were not relevant for reshoring. The reason for this was that these variables could not be quantified in terms of cost. For example, the variables *Development of Competences, Influence of Brand Image and Country of Origin* are difficult to quantify. The expert suggested that heuristics 1 and 8 may be relevant depending on the cost. On the other hand, the expert suggested that heuristic 7 is not observed in Company A but might be relevant in the future. During the reshoring decision-making process, environmental or sustainability variables were not considered at the company. The decision-makers know their *Reshoring Decision* has indirect implications on the environment and sustainability. For example, Expert A stated: "... we know that these decisions indirectly affect the environment in logistics aspects like transportation...".

4. Descriptive SD Model for Reshoring Decision-making Process

The eight variables found during the literature review, together with the heuristics defined in Table 1 were the base for modeling the reshoring decision-making process. Causal Loop Diagramming (CLD), a method to develop qualitative models using SD methodology was applied using Vensim software (see Figure 1). Developing the model resulted in identifying several causal loops formed by the variables and the heuristics, known as causal links. Additionally, two more variables were created during the modeling (e.g., *Desired Performance* and *Observed Performance*) to add coherence to the variable *Gap between Desired and Observed Performance*.



Figure 1. SD model representing the identified variables and heuristics for reshoring decision-making.

The modeling process resulted in additional heuristics in the form of cause-effect relationships among the independent variables presented in Table 2. These relationships were not present in the literature and are the result of the modeling process to represent a coherent whole from the identified variables in Table 1. Consequently, applying feedback thinking in the modeling process had the impact that most of the variables became dependent on another variable, previously stated independent based on literature. Thus, most of the relationships between the variables became bidirectional. Furthermore, it also became evident, during the modeling, that the relationship between *Reshoring Decision* could cause an effect on some variables, and not only be the affected. These relationships were represented with two heuristics in the model: If *Reshoring Decision* tendency increases, then an increase in *Quality of Products* is expected; and, if *Reshoring Decision* tendency increases, it results in an increase of *Difference in Labor Costs*. The resulting model, in Figure 1, is formed by 20 causal links. The presented model comprises five reinforcing loops (R-loops) and two balancing loops (B-loops).

R-a is a reinforcing feedback loop formed by the causal links between the two variables, *Quality of Products* and Reshoring Decision. Meaning, if the *Quality of Products* increases after reshoring, it introduces a positive cycle towards an increasing *Reshoring Decision* tendency, possibly leading to even further improved quality. Yet, it also means this will not be the case if products are reshored and produced with poor quality, having the opposite effect instead. R-b connects the three variables *Quality of* Products, Cost of Poor-Quality, and Reshoring Decision. This loop describes that when the *Quality of Products* increases after reshoring, this leads to reducing the *Cost of Poor*-Quality, which further reinforces the Reshoring Decision tendency. R-c connects the four variables *Ouality of Products*, Cost of Poor-Ouality, Operational Cost, and Reshoring Decision. Hence, when a Reshoring Decision is taken which leads to increased Quality of Products, it reduces the Cost of Poor-Quality as stated before, which also will decrease the Operational Cost. Reducing the Operational Cost will then further reinforce the Reshoring Decision tendency. R-d connects the four variables Quality of Products, Observed Performance, Gap between Desired and Observed Performance, and Reshoring Decision. This loop describes the connection between increasing the *Quality* of Products leading to increased Observed Performance and then reducing the Gap between Desired and Observed Performance. Also leading to a reinforced dynamic, increasing the *Reshoring Decision* tendency. R-e connects the six variables. The first part of this loop is like the loop R-c, and its last part is like the loop R-d. Where the

consequence of reducing the *Operational Cost* from increased quality performance leads to reducing the *Gap between Desired and Observed Performance* which supports closing the *Gap between Desired and Observed Performance* and even further reinforces the *Reshoring Decision* tendency.

B-a is a balancing feedback loop formed by the causal links of the three variables *Difference in Labor Costs, Operational Cost,* and Reshoring Decision. This loop shows the expected effect of increased *Difference in Labor Costs* as an effect from the Reshoring Decision, due to higher salaries in the home country, leading to higher *Operational Costs,* which have the opposite effect back on the *Reshoring Decision* tendency. This leads to a balancing effect to an increasing tendency of reshoring holding back a continuously reinforced reshoring trend. B-b is a balancing feedback loop that directly connects the variables *Difference in Labor Costs* and *Reshoring Decision* to each other. Similarly, as R-a, this loop shows how a *Reshoring Decision* tendency.

Some variables are not part of any feedback loop identified from the literature review to have significance for the reshoring decision-making process. The variable *Influence* of Brand Image and Country of Origin has been identified to directly affect the Reshoring Decision tendency, as well as the variable Development of Competences. The Development of Competences also improves and reduces the Labor Intensity of Manufacturing Process, leading to reduced Difference in Labor Costs.

No	Cause	Effect
•		
1	Quality of Products increases in the home country	Cost of Poor-Quality decreases
2	Cost of Poor-Quality decreases in the home country	Operational Cost decreases
3	Operational Cost decreases in the home country	Observed Performance increases
4	Quality of Products increases in the home country	Observed Performance increases
5	Observed Performance increases in the home country	Gap between Desired and Observed
	•	Performance decreases
6	<i>Difference in Labor Costs</i> between the home and the host countries increases	Operational Cost increases
7	Desired performance increases in the home country	Gap between Desired and Observed Performance increases
8	Development of Competences increases in the home country	Quality of Products increases
9	Labor Intensity of Manufacturing Process decreases in the home country	Difference in Labor Costs decreases
10	Development of Competences increases in the home country	Labor Intensity of Manufacturing Process decreases

 Table 2. Heuristics having an impact on reshoring dynamics as a result of modeling the causal relations between the variables.

5. Discussion

The reshoring decision-making process is non-trivial due to several variables involved, many of which are difficult to quantify, and their intertangled nature. As a result, decision-makers tend to rely on myopic decision rules focusing on costs and quality, and their previous experience, incorporated into their mental models. The most important variables for Expert A and the most common in the literature (i.e., cost and quality), were included in the model. The other variables suggested by Expert A were either too company-specific or already addressed in the model using the identified variables from the literature. Likewise, including all the specific variable names identified in the literature would have increased the model's size and complexity unnecessarily. Instead, aspects such as access to qualified personnel, flexibility/ability to deliver quickly, and lack of capacity, are represented by the arching variable *Development of Competences*. Further detailing and adding variables might be done in future research. Considering, insights from only one expert interview, as performed in this study, does not represent the entire industry. However, practical insights can be gained from individual experts and this study served as a pilot test in order to carry out further interviews in future research.

The literature and the expert interview revealed examples of variables lacking attention, some of which were included in the proposed model. Soft variables have been given limited attention in quantitative studies in the reshoring domain. Other groups of variables that are not in the limelight in reshoring research are environment and sustainability-related variables. Nevertheless, our findings reflect that environment and sustainability have not been key focuses for decision-makers, mainly due to lack of priority rather than being neglected. Instead, the decision-makers still prioritize cost and other performance-related variables.

The proposed descriptive model using CLD is an application of SD modeling and feedback thinking. It is shown, in this study, that applying CLD allows identifying new variables, inter-relationships, and dependencies that were previously neglected in the literature on the reshoring decision-making process. From a decision-maker perspective, the application of CLD and feedback thinking can provide additional support in the process. For example, Reshoring Decision was initially considered only as an effect, but after applying the SD approach it was also evident that the Reshoring Decision could cause an effect on some variables. Another benefit from applying the SD approach is the aspect of identifying unforeseen side effects from one decision. For example, the Reshoring Decision could reduce the Cost of Poor-Ouality, which reduces Operational Cost. However, a Reshoring Decision also increases the Difference in Labor Costs, thus the Operational Cost would in turn increase as well. Where one decision to reshore might have two opposite effects on the Operational Cost. Therefore, it can be argued that the power of CLD and feedback thinking applied in SD leads to a more holistic analysis and provide this type of insight, regarding the dependencies of variables and their relationships.

Heuristics were used for creating the SD model for the reshoring decision-making process. The accuracy of the heuristics depends on the information about the context that decision-makers have at that moment, and on the "simple rules" that they learn from their previous experiences [41]. On the same lines, reshoring decision-making is shown to depend on the preferences of the decision-makers, and it does not follow a systematic process [16, 17]. So, the heuristics used for creating the SD model follow the behavioral way of managers in reshoring decision-making.

Moreover, the CLD and feedback thinking in the presented model allows exploring different reshoring scenarios. For instance, an increase in the *Desired Performance* might increase the *Gap between Desired and Observed Performance*, even if *Observed Performance* in the home country increases. Nevertheless, the polarity of the causal links (i.e., positive, or negative) does not change regardless of the changes in the different variables. Despite models having qualitative variables that cannot be fully used to realize a decision, these need to be combined with quantitative models to strengthen the decision. Nevertheless, qualitative variables are important [23]. The usefulness of a descriptive model such as the proposed SD model lies in the capacity of representing a more complete picture of the variables affecting a reshoring decision. Such a model fills the function of expanding the decision-makers' mental models, improving their decision-making process.

Another reflection is the identified dynamism of reshoring decision-making, where a variable could change its value over time. For example, the variable *Influence of Brand Image and Country of Origin* could be a driver for reshoring today, however, the consumers' perspective might change in the future and this variable will become a barrier. Furthermore, the expert mentioned scenarios, for example, a change in the management team, or the regulations or home/host country context might modify or terminate the reshoring decision-making process. Such dynamism resulting from inter-relationships and dependencies of variables were visible through SD modeling.

Developing a formal model or decision support tool requires large amounts of data from real cases [12, 23]. Besides the qualitative and quantitative variables, it is important to know how empirical data in previous studies was interpreted and how the manufacturing reshoring decision-making process was executed [42], which is a challenge for further conducting quantitative studies in this field. Nevertheless, this study shows that qualitative modeling can provide valuable insights into the field as well. Despite the SD model can be considered useful for supporting the reshoring decision-making process, developing a single model to include all possible variables would result in a black-box model, and be challenging for decision-makers to interpret the model. Each company and *Reshoring Decision* may require more specific models, even though some variables and causal links are common. So, the proposed model herein is mainly to inspire future research and is believed to serve as a generic guideline for modeling future context-specific reshoring decision-making processes. Hence, the results presented here can be considered an initial step to improve understanding for considerations required to include in the reshoring decision-making process.

6. Conclusions

This study addresses that reshoring decisions are non-linear, multi-caused, and involve inter-related variables that are dynamic over time. The main variables for reshoring decision-making are related to cost and quality, partly because of limitations in the decision-makers' mental models. This research also shows that including soft variables, like the *Influence of Brand Image and Country of Origin*, are a good complement in the modeling of other so-called hard variables related to efficiency issues. This increases industry awareness and visibility of relationships and consequences previously ignored or underestimated. It has been identified that variables related to the environment and sustainability are not a priority for companies' reshoring decisions, even if they are not completely neglected by decision-makers.

Consequently, it can be considered that the presented SD model contributes to the research gap of modeling the reshoring phenomena. The model visualizes how the identified variables and heuristics can be connected, forming a whole to a larger extent than exposed from only studying the reshoring literature. Indicating the usefulness of feedback-oriented thinking in reshoring, and a tool to consider applying to contribute expanding the current mental models of the decision-making process beyond the cost-oriented thinking in reshoring an SD approach, considering this feedback-oriented thinking in reshoring, has scarcely been addressed previously in the literature.

The proposed SD model provides a holistic view of the variables, their relationships, dynamics, and the overall complexity of the reshoring decision-making process. However, given that reshoring decisions are different among industries, each company may require a tailormade model. This opens an avenue for future research, where different SD models could be developed for different contexts. And, even if there is no

unique SD model for all the reshoring decision-making possibilities, the model presented herein can inspire a generic model in the future.

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