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Selection Criteria for Sustainable Suppliers in the Supply Chain of Copper Mining in Chile

Criterios de selección de proveedores sostenibles en la cadena de suministro de la minería del cobre en Chile

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ABSTRACT

The objective of this research is to identify the criteria for the selection of sustainable suppliers in the supply chain of copper mining located in the Antofagasta region in Chile, through the information obtained from the application of a survey to executives of all mining companies in the Antofagasta region in 2018. The research results show that mining companies use economic, environmental and social criteria in the selection of sustainable suppliers, which are consistent with the research carried out by Dickson (1966) and Zimmer, Frohling and Schultmann (2016). However, the group of mining companies represented in this study differ from others regarding the criteria applied to suppliers of goods compare to service providers. In the case of suppliers of goods, economic criteria are valued more preferably, such as: quality, delivery on time, price, historical performance and previous sales. On the other hand, when it comes to service providers, environmental and social criteria, such as: occupational health and safety management and environmental management, are valued with greater importance.

Keywords: supply chain, selection criteria, sustainable suppliers, mining, copper, Chile

RESUMEN

El objetivo de esta investigación es identificar los criterios de selección de proveedores sostenibles en la cadena de suministro de la minería del Cobre localizada en la región de Antofagasta en Chile, a través de la información obtenida en la aplicación de una encuesta a directivos de todas las compañías mineras de la región de Antofagasta en el año 2018. Los resultados de la investigación evidencian que las mineras utilizan los criterios económicos, ambientales y sociales en la selección de proveedores sostenibles, los cuales son consistentes con las investigaciones realizadas por Dickson (1966) y Zimmer, Frohling y Schultmann (2016). No obstante, se destaca como un hallazgo importante la diferenciación que hacen las mineras en la valoración de los criterios cuando se trata de proveedores de bienes o proveedores de servicios. En el caso de proveedores de bienes se valoran con mayor preferencia los criterios económicos, tales como: calidad, entrega a tiempo, precio, desempeño histórico y ventas anteriores. En cambio, cuando se trata de proveedores de servicios se valoran con mayor importancia los criterios ambientales y sociales, tales como: gestión en seguridad y salud ocupacional, y gestión medioambiental.

Palabras clave: cadena de suministro, criterios de selección, proveedores sostenibles, minería, cobre, Chile

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Introduction

The copper mining is the most relevant economic activity for Chile. Directly, it represents more than 10% of GDP, more than 50% of exports, and it is the main recipient of foreign direct investment, representing one of every three dollars that enters the country (Bustos-Gallardo and Prieto, 2019). The presence of new foreign capital has strongly boosted the development of the mining industry, transforming the Antofagasta region into the world capital of copper mining (Bustos-Gallardo and Prieto, 2019). Therefore, it is not surprising the incidence that this activity has on all the activities of this area. According to Bustos-Gallardo and Prieto (2019), the region contributed about 3.2 million tons of copper to national production, that is, about 57%. Currently, supply chain management has become an aspect that contributes to productivity and competitiveness in different mining industries, such as in the case of copper, gold, coal, nickel, among others; Because logistics manages the flows of information, materials, minerals and money from the supply of inputs and supplies, through storage,use in exploration, exploitation and benefit activities, to transportation in order to meet the customer requirements (Pedrosa, Blazevic and Jasmand, 2015). Vendor selection is one of the critical decisions for any organization, due to its direct impact on profitability and maintaining the company's competitive position. Historically, sourcing decisions were made based on economic aspects. However, due to the growing trends in outsourcing of services, the increasingly

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demanding environmental policies and the social demands of the territories where they carry out their operations are forcing companies to integrate the triple bottom line criteria, which are economic criteria. environmental and social issues in their supply chain activities (Ghayebloo, Tarokh, Venkatadri, Diallo, 2015). Sustainable supplier selection is a complicated decision, due to the permanent conflict between the regulation and legal regulation of sustainability and the organizational objectives of companies (Zimmer, Frohling and Schultmann, 2016).

The objective of this research is to generate knowledge on the selection criteria of suppliers in the supply chain of copper mining

located in the Antofagasta region in Chile, through the information obtained from the application of a survey to managers of the mining companies in 2018 and deliver recommendations that allow obtaining higher levels of productivity and efficiency in that industry. The research results show that mining companies use economic, environmental and social criteria in the pre-selection and selection processes of sustainable suppliers, which are consistent with the research carried out by Dickson (1966) and Zimmer, Frohling and Schultmann (2016). Notwithstanding the foregoing, the differentiation that mining companies make in evaluating criteria when it comes to suppliers of goods or service providers stands out as an important finding since they differ. In the case of suppliers of goods, economic criteria are valued more preferably, such as: quality, delivery on time, price, historical performance and previous sales. On the other hand, when it comes to service providers, environmental and social criteria, such as: occupational health and safety management and environmental management, are valued with greater importance.

Currently, to the best of my knowledge, there are no scientific studies or research on the criteria for selecting sustainable suppliers in the mining supply chain, and especially in the copper mining industry of the Antofagasta region in Chile.

The study is organized into four sections: the first section presents the importance of this research in the context of the existing literature. After that it is presented the methodology that is supported as a case study. In the third section the results obtained and their discussion are shown. The last section presents the conclusions which include recommendations and limitations of this study.

Literature review

The supply chain is "a set of three or more entities that directly participate in the flow of products, services, finances and/or information from a source to a customer" (Mentzer, Dewitt, Keebler and Zacharia, 2016). According to Marques, Paiva, Beheregarai and Teixeira (2012), the supply chain is a phenomenon that always occurs when companies establish relationships, regardless of the level of existing management. The supply chain concept is applicable to mining because it is made up of a group of companies that have facilities, functional activities and distribution systems that seek to deliver minerals to different customers. Additionally, it should be pointed out that in the Chilean case, the production chains resemble the concept of the supply chain because they are made up of supply, exploration, exploitation, profit, marketing and consumer companies, which generate different relationships between they, such as: productive chains or agglomerations of companies among others, which focus on increasing productivity and the use of mineral resources (Arias, Atienza and Cademartori, 2014). The Copper mining is the most relevant economic activity for Chile since it represents more than 10% of GDP, more than 50% of exports, it is the main recipient of direct foreign investment, with 30% of total production and It maintains a third of the known reserves, the largest globally (Bustos-Gallardo and Prieto, 2019). In the case of Chilean mining, the importance of the supply chain is crucial, since mining companies have outsourced a large number of functions to their suppliers, concentrating their efforts on the core of the business, that is; the ownership, operation and management of the deposits. Therefore, an important part of the past and future success of Chilean mining depends directly on the productivity and competitiveness of suppliers (Korinek, 2013). The Antofagasta region is closely linked to the history and development of Chile's copper mining. Therefore, it is not surprising the incidence that this activity has on all the activities of this area. According to Bustos-Gallardo and Prieto (2019), this region contributed 3.2 million tons of copper to national production, that is, about 57%. Purchases play a strategic role and require adequate management in organizations, since they can represent between 40% and 60% of final product sales, and for these reasons, a small reduction in these costs can lead to an increase in the efficiency and profitability of the company (Grzybowska and Gajdzik, 2014). For this reason, identifying the relevant supplier selection criteria is a key activity in the management of the supply chain, which guarantees having reliable and competent suppliers that provide inputs, cost and adequate quality (Hanlin and Hanlin, 2012). Dickson (1966) was a pioneer in investigating the relevant criteria in the supplier selection process. This author identified and analyzed 23 criteria and concluded that quality was the highest priority criterion, followed by on-time deliveries and the good historical performance of the organization (Table 1).

The vendor selection is one of the critical decisions for any organization due to its direct impact on profitability and maintaining the organization's competitive position. Historically, sourcing decisions were made based on economic aspects. However, growing service outsourcing trends, environmental policies and social concerns are now forcing companies to integrate triple bottom line criteria, which encompass economic, environmental and social criteria in their supply chain activities (Ghayebloo, Tarokh, Venkatadri, Diallo, 2015). Sustainable supplier selection is a complicated decision, due to the permanent conflict between the regulation and legal regulation of sustainability and the organizational objectives of companies (Zimmer, Frohling and Schultmann, 2016). Consequently, the problem of selecting sustainable suppliers is commonly considered

Table 1. Supplier selection criteria

Selection criteria	Dickson research
Quality	1
Delivery	2
Performance history	3
Warranties and claims	4
Production facilities and capacity	5
Price	6
Technical capacity	7
Financial position	8
Conflict resolution	9
Communication system	10
Reputation and position in industry	11
Relationship closeness	12
Management and organisation	13
Operational controls	14
After sales services	15
Attitude	16
Impression	17
Packaging ability	18
Labour relations	19
Geographical location	20
Amount of past business	21
Training aids	22
Reciprocal arrangements	23

Source: Dickson (1966)

as a multi-criteria decision-making problem. There is a comprehensive systematic review dedicated to different criteria of environmental sustainability in the area of selection of sustainable and ecological suppliers (Govindan, Rajendram, Sarkis, Murugesan, 2015); (Zimmer, Frohling, Schultmann, 2016); (Awashi, Chauhan, Gokal, 2010). Recently, Zimmer, Frohling, and Schultmann (2016) examined 143 articles published between 1997 and 2014, and based on their research results, the top 10 economic, environmental, and social criteria are listed below in Table 2.

Among the environmental sustainability criteria are subcriteria:

a) Environmental efficiency: it shows the way in which a supplier is carrying out external environmental policies together with internal policies (Govindan, Rajendram, Sarkis, Murugesan, 2015); (Amindoust, Ahmed, Saghafinia, Bahraininjad, 2012); (Bai and Sarkis, 2010). It includes ecological process planning, environmental protection, regulatory compliance and continuous monitoring, the internal control process, environmental protection policies and certifications related to the environment, such as ISO 14001. Shen, Olfat, Govindan, Khodaverdi, Diabat (2013) highlighted the increasing attention of consumers regarding the economy and the environment. They also noted the critical role associated with environmental management systems, as well as environmental protection policies.

Table 2. Sustainable supplier selection criteria

Economic criteria	Environmental criteria	Social criteria
Quality	Environmental management system	Stakeholder engagement
Flexibility	Resource consumption	Staff training
Price	Ecological design	Commitment in social management
Delivery term	Recycling	Commitment to health and safety management
Relationship	Ecological impact control	Stakeholder relations
Cost	Sewage water	Code of social conduct
Technical capacity	Energy consumption	Donations for sustainable projects
Logistical costs	Reuse	Rights of interested parties
Reverse logistics	Air emissions	Safety practices
Rejection rate	Environmental code of conduct	Annual number of accidents

Source: Zimmer, Frohling and Schultmann (2016)

b) Green image: try to establish a supplier image in the market as a green company that is capable of producing green items. The green image consists of market reputation, customer retention, stakeholder relationships, environmental staff training, and market share (Awashi, Chauhan, and Gokal, 2010); (Mafakheri, Breton and Ghoniem, 2011); (Kannan, Govindan and Rajendran, 2015).

c) Pollution reduction: this is related to reducing the amount of greenhouse gas emissions from a supplier to be in line with regional and international green policies subject to the type of business. The subcriteria included in the reduction of pollution are the consumption of resources, wastewater, emissions to the atmosphere, the carbon footprint, solid waste and the use of harmful materials (Bai and Sarkis, 2010); (Cifci and Buyukozkan, 2011); (Dou, Zhu and Sarkis, 2014).

d) Green competencies: measures suppliers' ability to reduce environmental influences from their operations through the use of different green technologies, for example, green recycling and packaging, recycling capacity, use of green materials, flexibility and green technology, and the capacity of response are the subcriteria associated with green skills (Mafakheri, Breton and Ghoniem, 2011); (Cifci and Buyukozkan, 2011); (Ghadimi, Dargi and Heavey, 2017); (Azimifard, Moosavirad and Ariafar, 2018).

Among social sustainability criteria are subcriteria:

a) Safety and health: describes the potential of a provider with respect to the offer of programs to protect its personnel, prevent occupational accidents that affect the health and safety of workers, OHSAS 18001 certification that allows standardized conditions and

health and safety practices (Govindan, Rajendram, Sarkis and Murugesan, 2015); (Bai and Sarkis, 2010); (Ghadimi, Dargi and Heavey, 2017); (Wittstruck and Teuteberg, 2012); (Vahidi, Torabi, and Ramezankhani, 2018).

b) Employment practices: ensures that the current and future needs of company employees are met. This criteria includes subcriteria such as disciplinary and safety practices, employee contracts, discrimination, child labor, job opportunities, fair job sources, flexible work arrangements, professional development, workers compensation, research and development, employee interests and rights, employee well-being and diversity (Govindan, Rajendram, Sarkis and Murugesan, 2015); (Buyukozhan, 2012); (Thornton, Autry, Gligor and Brik, 2013).

According to Zimmer, Frohling, and Schultmann (2016), the buyer's price, delivery, and quality goals, along with the vendors' capabilities to meet all of those goals, are generally selected as important criteria. It should be noted that, in practice, the criteria for the selection of suppliers can be chosen in relation to the configuration of the company. There is also evidence from a study by Amindoust, Ahmed, Saghafinia, Bahraininjad (2012) that showed that the decision on the indicators for the selection of suppliers depends on the conditions of the organization and each company can think further about their own criteria for choosing the best providers. Due to the above presentation of the literature in this area, the motivations to develop this research are mainly two:

a) Determine if the findings provided by Dickson (1966) and Zimmer, Frohling and Schultmann (2016), hold in the case of copper mining producers in Antofagasta, most important mining region in Chile.

b) Identify the criteria for selecting sustainable suppliers in the copper mining supply chain located in the Antofagasta region of Chile. This is done for goods and services.

Materials and methods

The research was carried out in the Antofagasta region in Chile, where the main mining districts that concentrate about 57% of copper production in Chile are located (Bustos-Gallardo and Prieto, 2019). The approach is supported as a case study, which is framed as a descriptive investigation, based on the search for information, with the purpose of identifying the criteria for the selection of suppliers in the supply chain of copper mining in Chile and It was carried out during 2018. For this purpose, a survey was prepared that was applied to 41 managers of all the copper-producing mining companies in the Antofagasta region, according to the database provided by the Chilean Copper Corporation (COCHILCO). A questionnaire with semi-structured questions was developed, based on the supplier selection criteria obtained by Dickson (1966) and Zimmer, Frohling and Schultmann (2016). The questionnaire is organized into four sections: the first section is about the location of the mining companies and the objective is to know their geographical location in the Antofagasta region. The second section is about the characterization of the managers who answered the survey with the aim of knowing which organizational area they belong to, seniority in the company and in their managerial position. The third section aims to know whether mining companies apply asynchronous and synchronous preselection methods, and what criteria they consider at each stage. The fourth and last section aim to know what are the criteria that mining companies apply to select suppliers of goods and service providers.

Results and discussion

Location of mining companies.

The mining companies in the Antofagasta region are 83% concentrated in the municipalities of Calama, Antofagasta and Sierra Gorda (Table 3). This is because the largest copper ore deposits are concentrated in these territories, and these communes are known as mining districts.

Table 3. Location of mining companies

Antofagasta	Mejillones	Sierra Gorda	Taltal	Calama	Tocopilla
24%	6%	24%	6%	35%	6%

Source: Author

Characterization of the managers of the mining companies that answered the survey.

This information was very relevant, since it allowed us to conclude that those who answered the survey know well how the internal organization of the mining company works, possess the necessary knowledge and have sufficient experience both in the company and in the position, to be considered as informants. valid in quality, relevance and relevance (Table 4).

Table 4. Characterization of managers

How long have you worked in the Company?			
1-3 years	4-5 years	6-10 years	Over 10 years
7%	27%	27%	39%
To which organizational area does your position belong?			
Supply and contracts	Human Resources	Safety and environment	Operations and maintenance
51%	3%	7%	39%
What is your position?			
Superintendent	Department head	Engineer and Analyst	Other
46%	27%	27%	0%
How long are you in that position?			
1-3 years	4-5 years	6-10 years	Over 10 years
19%	54%	27%	0%

Source: Author

Supplier pre-selection criteria

The pre-selection is the process of selecting candidates to participate in the formal purchase process, which is generally associated with new purchases or modified repurchases of services. They are based on the information that mining companies have, especially at the user level, but other types of actors also participate.

Asynchronous preselection represents the best instance to identify requirements, but it is also necessary that attractive offers derive from them, which must have the characteristics of being particular, original and difficult to replicate. In this way, its penetration in the purchase process can be greater because it represents a more complete, specialized offer and, therefore, less disposable. Respondents reported using asynchronous preselection (Table 5), which allows reducing the high administrative costs of receiving, managing and evaluating the number of proposals and quotes that would be received if the entire registry of suppliers were invited, and also allows reducing the uncertainty about the supplier's final performance when there is no historical performance or previous sales. The criteria used by mining companies to preselect a supplier in the asynchronous phase with 41 citations, are to meet the quality parameters and solve an unrecognized problem or suggest improvements; with 34 appointments, to be recommended by a professional of the company; and finally with 31 appointments, to be recommended by another mining company. The other phase that makes up the preselection of suppliers is the synchronous phase that is in tune with a specific purchasing process. It represents the earliest stage of a formal process where users recognize a need and raise a requirement. Respondents reported using synchronous preselection (Table 5), which corroborates the aforementioned in the sense that it allows deciding which supplier will be selected to participate in an established purchasing process. The criteria used in the synchronous phase with 41 citations are; positive evaluation of their technical skills, ISO 9001 certification, ISO 14001 certification and OSHAS 18001 certification. With 40 appointments, positive evaluation of their technical skills. With 28 appointments, the positive evaluation of your financial situation; and lastly, with 20 appointments, enrollment in external supplier qualification records. These results are consistent with the research by Dickson (1966), and especially with the research by Zimmer, Frohling and Schultmann (2016) on the environmental and social criteria for the selection of sustainable suppliers.

Supplier selection criteria

Once the suppliers and their offers have gone through the pre-selection processes, a small group of suppliers between 3 and 5 moves on to the next stage, where the decision criteria are considered within an evaluation and administrative process that takes the form of a tender. or contest. As previously stated, the supplier selection criteria presented to the respondents is based on the supplier selection criteria obtained by Dickson (1966) and Zimmer, Frohling and Schultmann (2016). In the survey of mining company managers on the criteria for selecting goods suppliers, they are asked to select from the list of criteria those they consider relevant according to their knowledge and experience. Then, they must perform a forced ranking where the first they choose is the most important and the last they choose the least important. The aforementioned forced ranking is expressed through the simple average of the accumulated scores assigned by each of the respondents, considering the n = 41 that corresponds to the number of managers of the mining companies surveyed. The results obtained allow us to appreciate in the first instance that all the respondents chose the selection criteria mentioned in the Dickson (1966) study, in addition to the criteria of occupational safety management, occupational health management and environmental management mentioned in Zimmer's research., Frohling and Schultmann (2016) (Table 6). The results show that the selection criteria for goods suppliers most valued by the respondents are quality first, delivery on time second, price third, historical performance fourth, fifth place previous sales and sixth technical capacity, and the rest of the evaluation criteria indicated in Dickson's research (1966). These results are consistent with the existing literature, since they correspond to the economic criteria for the selection of sustainable suppliers from the research of Zimmer, Frohling and Schultmann (2016).

Table 5. Supplier pre-selection criteria

Does your company use asynchronous pre-selection of suppliers?			
Yes	Not		
100%	0%		
What are the criteria to be considered a supplier in the asynchronous preselection?			
Meet the quality parameters	Recommended by a professional of the company	Recommended by another mining company	Troubleshoots
41 quotes	34 quotes	31 quotes	41 quotes
Does your company use synchronous pre-selection of suppliers?			
Yes	Not		
100%	0%		
What are the criteria to be considered a supplier in synchronous preselection?			
Registration in external supplier qualification records			
20 quotes			
Positive evaluation of your financial situation			
28 quotes			
Positive evaluation of your technical skills			
41 quotes			
Positive assessment of your business skills			
40 quotes			
ISO 9001 certification			
41 quotes			
ISO 14001 certification			
41 quotes			
OHSAS 18001 certification			
41 quotes			

Source: Author

Table 6. Selection criteria for goods suppliers

N°	Selection criteria	Average
1	Quality	1,0
2	Delivery	2,85
3	Price	2,93
4	Performance history	4,78
5	Amount of past business	5,83
6	Technical capacity	7,98
7	Geographical location	8,83
8	Operational controls	10,66
9	Production facilities and capacity	10,68
10	Reputation and position in industry	11,37
11	Financial position	11,46
12	Occupational safety management	12,15
13	Warranties and claims	12,22
14	Occupational health management	13,15
15	Environmental management	14,15
16	Impression	14,61
17	Management and organisation	16,34
18	Relationship closeness	18,22
19	Attitude	18,68
20	Labour relations	18,85
21	After sales services	19,39
22	Conflict resolution	20,24
23	Training aids	22,37
24	Reciprocal arrangements	23,27
25	Packaging ability	24,22
26	Communication system	25,12

Source: Author

Table 7. Selection criteria for service suppliers

N°	Selection criteria	Average
1	Occupational safety management	1,00
2	Occupational health management	2,07
3	Environmental management	2,98
4	Quality	4,29
5	Price	5,90
6	Delivery	7,12
7	Technical capacity	7,37
8	Performance history	9,24
9	Production facilities and capacity	10,66
10	Financial position	11,63
11	Amount of past business	11,95
12	Labour relations	12,85
13	Geographical location	13,98
14	Operational controls	15,95
15	Warranties and claims	16,10
16	Management and organisation	16,24
17	After sales services	16,44
18	Training aids	16,56
19	Reputation and position in industry	17,34
20	Attitude	17,83
21	Conflict resolution	18,12
22	Communication system	21,15
23	Relationship closeness	21,15
24	Reciprocal arrangements	22,49
25	Impression	25,10
26	Packaging ability	25,41

Source: Author

In the survey applied to the managers of mining companies on the criteria for selecting service providers, the same procedure is followed above. Respondents selected the criteria mentioned in the Dickson (1966) study, in addition to the criteria for occupational safety management, occupational health management and environmental management mentioned in the research by Zimmer, Frohling and Schultmann (2016) (Table 7).

The results show that the criteria for selecting service providers most valued by the respondents are first; management in occupational safety, in second place; management in occupational health, thirdly; environmental management, fourth; quality, in fifth place; the price, in sixth place; delivery on time, seventh; technical capacity; and later; the rest of the selection criteria indicated in Dickson's research (1966). These results are consistent with the existing literature, since they correspond to the environmental and social criteria for the selection of sustainable suppliers from the research of Zimmer, Frohling and Schultmann (2016) (Table 6). Already in the bidding process itself, the technical criteria evaluated may include: quality of services, the company's experience in the field, the profile of the staff, the equipment and tools to perform the service, and the work methodology. In addition, to include a safety evaluation that analyzes the accident rate and the operational risk matrix, an occupational health and hygiene evaluation that includes the analysis of occupational diseases and physical design of the work environment; and lastly, an environmental assessment that considers an assessment of the polluting agents and the degree of exposure of the workers.

Conclusions

The copper mining supply chain in Chile uses economic, environmental and social criteria in the pre-selection and selection processes of sustainable suppliers, which are consistent with the research carried out by Dickson (1966) and Zimmer, Frohling and Schultmann (2016). Notwithstanding the foregoing, the differentiation that mining companies make in evaluating criteria when it comes to suppliers of goods or service providers stands out as an important finding. In the case of suppliers of goods, economic criteria are valued more preferably, such as: quality, delivery on time, price, historical performance and previous sales. On the other hand, when it comes to service providers, environmental and social criteria, such as: occupational health and safety management and environmental management, are valued with greater importance. This differentiation made by mining companies is explained by the fact that the goods are inputs and finished products that are purchased for the production process and are manufactured in the supplier's facilities outside the mining

operation. Instead, the services are carried out inside the industrial premises, which implies that the suppliers must maintain their own personnel, machinery and equipment in the mining company's premises. Due to the above, the indicators of occupational safety management, occupational health management and environmental management of service providers, directly affect the management and productivity indicators of the company. In Chile, mining companies must report their indicators in occupational health and safety management, as well as environmental management at a consolidated level, that is; the company's own indicators plus the indicators of the service providers.

The first recommendation from the point of view of the sustainability of the mining business in the long term, is that mining companies implement the selection of sustainable suppliers through the standardization of selection criteria based on economic, environmental and social criteria. in their supply chains. The second recommendation from the point of view of the development of local suppliers is to encourage and support them to implement management systems and continuous improvement as it will allow them to be more productive and competitive, adding more value to the companies' supply chain. mining companies. This innovation will be a positive signal for investors, shareholders, the community and authorities because it demonstrates world-class business management, guaranteeing the delivery of quality products and services, in a sustainable way, taking care of the environment and protecting the integrity and health of its workers.

Chile being the third largest copper producer in the world, a limitation to the work carried out is knowing what are the criteria for selecting suppliers in the first two countries to contrast or to be able to generalized the conclusions reached in this study.

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