

# Identification and analysis of enterprise risks associated with the value environment of the Cargill cocoa business

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## Abstract

This article seeks to identify and analyze the enterprise risks associated with the value environment of Cargill's cocoa business. It is a qualitative study using the case study method. To obtain a systemic perspective of the phenomenon, the data was collected by interviewing executives from different areas of the company, submitting their narrative to content analysis. Thus, from the perspective of enterprise risk management, it was identified that the main internal risks arise from cocoa processing, due to the high degree of complexity of the operations, and high added value of the products involved in the system. As for the external risks, the emphasis is on the relations with suppliers, as a result of the dependence of middlemen on the process of buying the raw material. It was also observed that political, legal and social aspects appear as points of attention and important sources of risk in this value system. These results contribute, therefore, to the advancement of the enterprise risk literature in business environments associated with the agribusiness context, while presenting the applicability of scientific models for the identification and classification of these risks. Future studies of a longitudinal nature and contemplating the risks of the chocolate value chain in its completeness are recommended.

**Keywords:** Risks. Risk management. Value chain. Value environment. Cocoa.

## *Identificação e análise dos riscos corporativos associados ao ambiente de valor do negócio de cacau da Cargill*

### Resumo

Este artigo identifica e analisa os riscos corporativos associados ao ambiente de valor do negócio de cacau da Cargill. Para isso, adota-se a abordagem qualitativa e o método de estudo de caso. Para a coleta de dados, de modo a obter uma perspectiva sistêmica do fenômeno, executivos de diferentes áreas da empresa foram entrevistados e seus discursos foram submetidos à técnica de análise de conteúdo. Assim, sob a perspectiva da gestão de riscos corporativos (GRC), identificou-se que os principais riscos internos se originam a partir dos processos de beneficiamento de cacau, devido ao elevado grau de complexidade das operações e do alto valor agregado dos produtos desse sistema e os externos a partir das relações com seus fornecedores, tendo em vista a dependência de atravessadores no processo de compra da matéria-prima. Observou-se, ainda, que aspectos políticos, legais e sociais se apresentam como pontos de atenção e importantes fontes de risco nesse sistema de valor. Tais resultados contribuem, portanto, para o avanço da literatura de riscos corporativos em ambientes de negócio associados ao contexto do agronegócio, ao mesmo tempo que apresentam a aplicabilidade de modelos científicos para a identificação e classificação desses riscos. São recomendáveis futuros estudos de natureza longitudinal e que contemplem os riscos da cadeia de valor do chocolate em sua completude.

**Palavras-chave:** Riscos. Gestão de riscos. Cadeia de valor. Ambiente de valor. Cacau.

## *Identificación y análisis de los riesgos corporativos asociados al entorno de valor del negocio de cacao de Cargill*

### Resumen

Este artículo identifica y analiza los riesgos corporativos asociados al ambiente de valor del negocio de cacao de Cargill. Para ello, se adopta el enfoque cualitativo y el método de estudio de caso. Para la obtención de datos, los efectos obtener una perspectiva sistémica del fenómeno, se entrevistó a ejecutivos de diferentes áreas de la empresa y sus discursos se sometieron a la técnica de análisis de contenido. Así, bajo la perspectiva de la gestión de riesgos corporativos, se identificó que los principales riesgos internos se originan a partir de los procesos de beneficiado del cacao, debido al alto grado de complejidad de las operaciones y al alto valor agregado de los productos de ese sistema y los externos, a partir de las relaciones con sus proveedores, considerando la dependencia con los intermediarios en el proceso de compra de la materia prima. Se observó, además, que aspectos políticos, legales y sociales se presentan como puntos de atención e importantes fuentes de riesgo en este sistema de valor. Estos resultados contribuyen, por lo tanto, al avance de la literatura de riesgos corporativos en ambientes de negocio asociados al contexto del agronegocio, al mismo tiempo que presentan la aplicabilidad de modelos científicos para identificación y clasificación de esos riesgos. Se recomiendan estudios futuros de naturaleza longitudinal, y que contemplem los riesgos de la cadena de valor del chocolate en su totalidad.

**Palabras clave:** Riesgos. Gestión de riesgos. Cadena de valor. Entorno de valor. Cacao.

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## INTRODUCTION

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Organizations operate to achieve planned goals and, for this, establish direct and indirect relationships with a range of agents. In recent years, these relationships have become increasingly complex, given the increasing uncertainty in business environments, which has increased the risks associated with reaching these goals (WU, KEFAN, HUA et al., 2010; OLSON and WU, 2017).

Named enterprise risks, these risks, therefore, constitute a set of events capable of compromising the company's objectives (ISO, 2009; COSO, 2013), as well as reducing the capacity to deliver value to the agents involved in the environment (DARLINGTON, SIMON and WITHWORTH, 2001). They can be originated from different sources as a consequence of the environmental context in which the organizations are located, of the established organizational objectives (IBGC, 2007; ZONATTO and BEUREN, 2010; COSO, 2013) and of the relationships they establish with their value environment (OLIVA, 2015).

Therefore, in order to ensure the achievement of their objectives, organizations have developed enterprise risk management (ERM) techniques, which, in order to be effective, require the implementation of measures to identify, analyze, evaluate, treat and monitor enterprise risks in an integrated way (ISO, 2009).

Thus, different proposals to order and systematize the ERM were presented by different institutions, such as IBGC (2007), ISO (2009) and COSO (2013). However, these models have still been unable to achieve effective levels of risk management by analyzing them from individual companies. Therefore, it is important that ERM models go beyond organizational boundaries in isolation and reach other agents with which the organization relates to a business environment (OLIVA, 2015).

In this sense, agroindustrial value chains become relevant as an object of study on enterprise risks, since presenting a significant level of complexity and interrelations (SOUZA and PEREIRA, 2006; SCHOUCHANA, SHENG and DECOTELLI, 2013) may contribute for the development of ERM techniques and systems more adapted to the management needs of that specific environment.

The Brazilian cocoa chain, for example, which, unlike the other national agribusiness chains, is characterized by high aggregate value since its initial stage of cultivation and preparation of the almond (VEGRO, ASSUMPTION and SILVA, 2014) is benefited by studies of this nature, since this particular aspect associated with it is sufficient to generate considerable risks still in its incipient processes. However, the framework of studies on ERM practices in this particular chain is still limited. Searches in the national literature based on the keywords "enterprise risks", "enterprise risk management" and "cocoa value chain", carried out in the databases of the Coordination Portal for the Improvement of Higher Education Personnel (CAPES) and of the Scientific Periodicals Electronic Library (SPELL) from 01/01/2000 to 04/20/2017, did not identify studies on risks in the value chain of cocoa in the Brazilian context, for example, evidencing that it is a topic still unexplored in Brazil.

Given this context, this study sought to answer the following question:

- What enterprise risks are associated with the value environment of the cocoa business?

To reach an understanding of this problem, the objective of this study was to identify and analyze the risks associated with the value environment of the Cargill cocoa business, from the perspective of the initial stages of ERM programs and the characterization and understanding of the business value environment studied.

## THEORETICAL FRAMEWORK

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### Enterprise risks: definition, sources and types

The risks stem from the uncertainty that the future (WALTERS, 2007) and the business environment may entail (WALKER, 2013), causing companies to use indicators of the volatility levels of the risks to which they are exposed (IBGC, 2007). The determination of a enterprise risk is based on the opportunity and occurrence of the event *versus* the impact of that event (WALKER, 2013; AQLAN and ALI, 2014).

Thus, enterprise risks can be understood as a measure of uncertainty (IFAC, 2001; ISO, 2009) regarding the possibility of occurrence of an event (COSO, 2013) that is capable of compromising the achievement of a company's objectives (ISO, 2009),

adversely affecting the organization's ability to maximize value to its agents (DARLINGTON, SIMON and WITHWORTH, 2001). The sources of origin of risks are varied and result from the context of each organization, its objectives (IBGC, 2007; ZONATTO and BEUREN, 2010, COSO, 2013) and the relationships that the organization establishes with the value environment (OLIVA, 2015).

Usually, the risks come from internal and external sources (IBGC, 2007), however, other classification criteria can be used. Ghoshal (1987) argues that enterprise risks can have four classifications: a) macroeconomic; b) politic; c) competitive; and d) resources. Jorion (1998), in turn, classifies them into 3 categories: a) operational; b) strategic; and c) financial. Zonatto and Beuren (2010) propose new typologies of risks, such as legal, environmental and image.

Therefore, despite the multiple types and sources of identified risks, some traditional categories are most often adopted by the authors, such as strategic, operational and financial risks. However, other risks associated with more recent phenomena, such as image and ethical risks, have also appeared more frequently in risk assessment studies (OLIVA, 2015), due to the increasing complexity of organizational relationships and increasing uncertainty in business environments (WU, KEFAN, HUA et al., 2010; OLIVA, 2015; OLSON and WU, 2017).

Studies on agribusiness have also sought to analyze and classify existing risks to define mitigation strategies (USDA, 1999; MOREIRA, PROTIL and DA SILVA, 2010; SCHOUCHANA, SHENG and DECOTELLI, 2013). The US Department of Agriculture (USDA, 1999), for example, classified institutional, price or market, and production risks as the main risks related to agribusiness. However, in spite of being identified, a more detailed analysis of these risks shows that, in general, there are recurrent and traditional risks in the literature related to the agribusiness context.

## Enterprise risk management

The ERM has been understood as a coordinated process of management activities, procedures and practices (ISO, 2009), which, in line with the organizational objectives (COSO, 2013), aims to identify events with potential to affect the organization's performance (MILLER and WALLER, 2003), as well as to suggest the ideal path for risk management (CHOI, YE, ZHAO et al., 2016).

In this sense, organizations need to develop coordinated activities that allow, in a holistic way, to identify, analyze, evaluate, treat and monitor the risks inherent to their processes (ISO, 2009; BROMILEY, MCSHANE, NAIR et al., 2015), as well as managing the impacts of those risks by managing the interrelationships between them (RIMS, 2011). Thus, although the ERM implementation programs are not universal (IBGC, 2007), there is some consensus about the existence of basic steps for their implementation, including risks identification, analysis, evaluation, treatment, monitoring and communication (LABBI, 2005; IBGC, 2007; ISO, 2009; DIONNE, 2013; WALKER, 2013).

In a succinct way, the first phase is focused on the identification of risks and involves the process of searching, understanding and describing all the risks to which the organization is exposed, regardless of whether or not its sources are under the control of the company (IBGC, 2007; ISO, 2009). The next stage, of analysis, occurs so that the organization can interpret and understand the causes of risks, as well as their consequences (BAIRD and THOMAS, 1985; ISO, 2009). Subsequently, the stage of risk assessment involves the moment when the organization decides on the risks it will be willing to take or not (BAIRD and THOMAS, 1985). In the treatment stage, one identifies what risks are treated and the priority of treatment (ISO, 2009). After this step is the monitoring of the risks, involving the activities of monitoring the changes in the expected performance of the components of the ERM during the treatment of risks (ISO, 2009). Finally, in the communication stage, internal mechanisms are established to encourage accountability, ownership and learning of risks (ISO, 2009; WALTERS, 2007), as well as external mechanisms of transparency, consultation and exchange of information between the company and its stakeholders (ISO, 2009; COSO, 2013).

## Value chains and systems

The dynamics of today's markets have changed the relationship between suppliers, customers and competitors, contributing to new business models being created at an increasingly fast pace, requiring rapid responses and flexibility on the part of companies in the face of changes in business environments (WALTERS, 2004).

To meet this new context, organizations have redefined their capabilities and processes, creating structures called "value chains", which are characterized by the formation of business networks that emerge from traditional corporations (DRUCKER, 2001). Value chains start from the consideration that the value a company adds to its product or service results from performing

several interdependent value activities along the chain, so that the cost and effectiveness of an activity affect and are affected by cost and effectiveness of the others (PORTER and MILLAR, 1985).

In this way, the value chain is based on the adequate coordination of activities and optimization of performance changes between the different parts of the production process, which allows differentiation and competitive advantage to be created in the face of competitors who are not adequately resolving the ideal equilibrium of its productive process (PORTER and MILLAR, 1985). This is because the value chain allows a more efficient management of what is important in the various processes, identifying what adds value to increase the returns to the participants (NORMANN, 2001; WALTERS, 2004).

However, the concept of the value chain expands in the sense that a product, until reaching the final consumer, goes through several value chains, becoming the result not only of a chain but of a value chain system, from the chains of the main producer to the chains of its suppliers (PORTER and MILLAR, 1985). This perspective is corroborated by Vesco, Tarifa, Pacheco et al. (2014) by reinforcing that value chains are not independent activities but a system of interdependent activities so that a producer can achieve a greater competitive advantage by appropriately coordinating other value chains outside the boundaries of their organization (PORTER and MILLAR, 1985).

In this article we adopt the concept of value environment proposed by Oliva (2015) as an extension of the concept of value systems, since it presents the possibility of mapping the main agents that relate among themselves and which generate value for the company.

## The ERM and the value environment

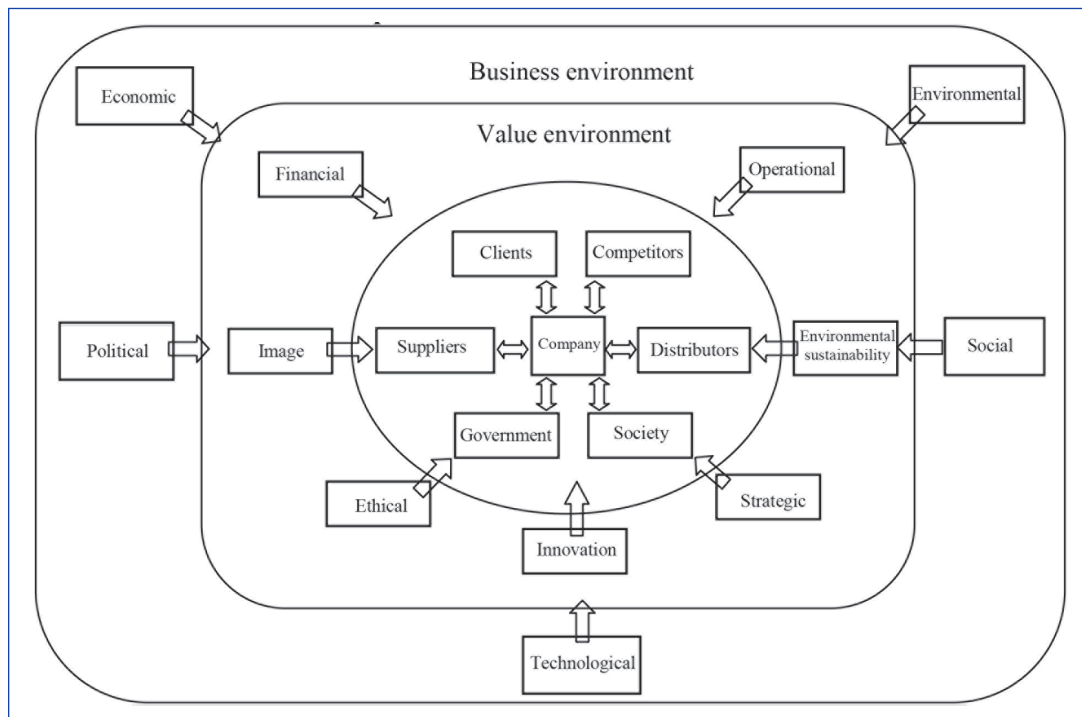
Due to the multiple relationships established by the organization with the other agents of its business environment (OLIVA, 2015), the variables arising from its connection to the other participating companies (NORMANN, 2001; WALTERS, 2004) can cause enterprise risks to arise at any point in the value chain (GRAY and SHI, 2005), either because of the company's internal relations or the relationships it maintains with its value environment (OLIVA, 2015).

It is also important for organizations to identify and manage external risks resulting from relationships with other members of their value chain (LEE, 2004; NORMANN and JANSSEN 2004; HULT, CRAIGHEAD and KETCHEN JUNIOR, 2010; DELOITTE, 2013; MANUJ, ESPER and STANK, 2014).

In other words, in order for this management to be efficient, one must consider the business environment as a whole (OLIVA, 2015), since environmental forces may significantly affect the organizations' objectives (GAULTIER-GAILLARD, LOUISOT and RAYNER, 2009; HITT, IRELAND and HOSKISSON, 2014).

Among the environments to be considered are, yet, the macroenvironment – where the economic, social, political and environmental forces act – and the microenvironment – where the acting forces are clients, suppliers, distributors, society, government and competitors (Figure 1).

**Figure 1**  
**Enterprise risks in the value environment**



Source: Oliva (2015, p. 70).

However, the practice of observing the environment as a whole is not yet predominant and, in most cases, the ERM still only prioritizes the organizational level, harming the assessment and management of risks across business boundaries in the face of disregarding the potential interactions among risk factors. This causes managers to have a limited understanding and management of the risks to which organizations are exposed (GRAY and SHI, 2005). To avoid such limitation, this study adopted the risk analysis proposed by Oliva (2015).

## METHODOLOGICAL PROCEDURES

### Research design

The qualitative approach was adopted, suggested for situations in which one seeks to identify, analyze and prioritize potential events and their impacts (AQLAN and ALI, 2014). Therefore, given the proposed objective, the use of this approach is justified in view of the phenomenon investigated.

As for the method, the case study was adopted, since it is the method that is increasingly used in social research for the exploration of real-life situations, whose limits are not clearly delimited, allowing to describe the context in which the events are occurring (GIL, 2008).

Finally, as for the nature, this article is classified as exploratory-descriptive. Exploratory, because it seeks to develop a better understanding of a topic where there is little theory available to guide predictions; and descriptive, because it details a new situation, in order to identify an event or activity (HAIR, BABIN, MONEY et al., 2005).

## Conceptual basis

In order to adopt the proposed conceptual basis, the models considered apt included the concepts and the fundamental approaches to research, such as holistic management of enterprise risks, business environment and value environment, as well as the perspective of multiple sources of risk in the value chain (GRAY and SHI, 2005) and considering risk as an event of relational origin (OLIVA, 2015).

Thus, the conceptual models adopted were also evaluated for the ability to meet the delimited macro and micro-objectives, so called to facilitate the construction of the research design based on the literature on planning and implementation of ERM programs (Box 1).

### Box 1

#### Conceptual models adopted by the research

Macro-goals (Macro categories)	Micro-goals (Micro categories)	Conceptual models
Identify	Risk environment	IBGC (2007)
	Origin of internal risk	
	Origin of external risk	
	Type of risk	Oliva (2015)
	Relation agent	
Analyze	Impact category classification	Grey and Shi (2005)

Source: Elaborated by the authors.

## Data gathering

Data collection was performed through interviews, as these allow respondents to speak more freely about the subject and, consequently, respond to the exploratory nature of the research (GIL, 2008). The interview script was structured in three blocks: a) preparatory questions; b) exploratory questions; and (c) resolution questions, comprising a total of 9 questions.

The selection of the units of analysis for the case study was defined by accessibility, and individuals with considerable knowledge on the subject under analysis and representing the universe surveyed (GIL, 2008) were selected. To ensure this representativeness, it was established as a criterion for choosing the units of analysis to interview individuals who were directly related to each of the agents of the value environment identified in the Oliva (2015) model. Thus, 10 employees of the Cargill cocoa business were selected, namely: 1 director, 3 managers, 5 supervisors and 1 analyst, belonging to the following areas: top management, human resources, controlling, patrimonial security, labor safety, environment, logistics and origination of cocoa.

The interviews were conducted between May 8<sup>th</sup> and 10<sup>th</sup>, 2017, using Skype® audio conferencing, with an average duration of 45 minutes. The contents of the interviews were recorded in digital recording or by handwritten notes, according to the way authorized by the interviewees (one interviewee did not authorize audio recording). At the end, the records were stored for access in the analysis phase of the content.

## ANALYSIS AND PRESENTATION OF RESULTS

For the analysis of the results, we used the content analysis method proposed by Bardin (2010), which involves a set of communication analysis techniques through systematic and objective procedures, which allows the identification and description of the main contents of the messages under analysis. Thus, the first step of the method was the transcription of the interviews conducted. Then, the three stages defined by Bardin (2010) were developed: a) pre-analysis; b) exploration of the material; and c) inference and interpretation from the treatment of the results.

In the first stage of pre-analysis, a floating reading of the transcribed messages was performed, consisting of the first contact oriented with the contents, in which it was sought to verify the fulfillment of the messages to the scope of the research objectives, in order to exclude the contents outside of the scope.



In the next stage of material exploration, the remaining content of the floating reading was coded and decomposed, as recommended by Bardin (2010). For the content coding of the interviews, a spreadsheet with the macro and micro categories defined in Box 1 was elaborated. Thus, for each micro category were associated words and key expressions that allowed to infer and to identify the enterprise risks present in the speeches, as well as measure the frequencies of citation of the identified risks.

These frequencies, in turn, allowed the identification and selection of the 10 main internal and external risks associated to the environment of value in analysis (most cited). In addition, the number of times a given risk is cited contributes to its classification as to its degree of impact and possibility of occurrence.

The inference and interpretation phase of the results was developed from the elaboration of a spreadsheet with the organization and codification of the content, as well as the determination of the frequency of citations of enterprise risks.

Finally, to present the results, the synthesis tables were elaborated to facilitate reading and comparison of the main aspects analyzed. The presentation of these resources used as basis the conceptual models adopted in this study, sometimes adapted to the context of the research.

## RESULTS AND ANALYSES

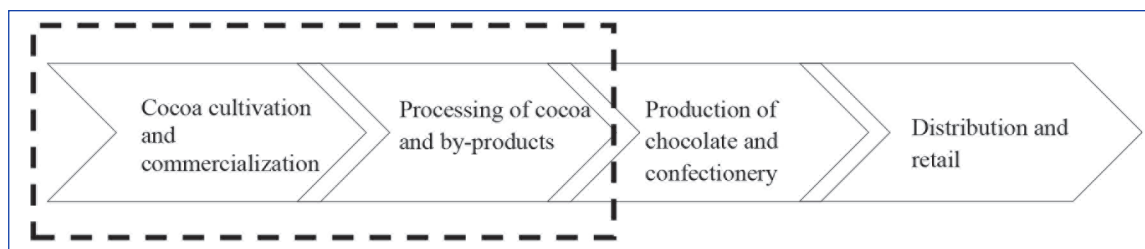
### Case identification: Cargill and the value environment of the cocoa business

Production volume and GDP related to the cocoa and chocolate value chain are relevant for the country. Approximately R\$11, 5 billion is traded annually (CEPEA, 2013), which makes Brazil the third largest market among consumers in the world.

Cacao activity involves approximately 50,000 producers in Brazil, according to data from the Executive Committee of the Cocoa Plan (CEPLAC, 2012), and operate a value system that brings together more than 335,000 people, according to IBGE's Agricultural Census (IBGE, 2006), acting as producers, partners and employees of the industry, distributed in the segments of: a) cultivation and commercialization of cocoa; b) processing of cocoa and derivatives; c) production of chocolate and confectionery; and d) distribution and retail (Figure 2).

Figure 2

#### Cocoa and chocolate value system



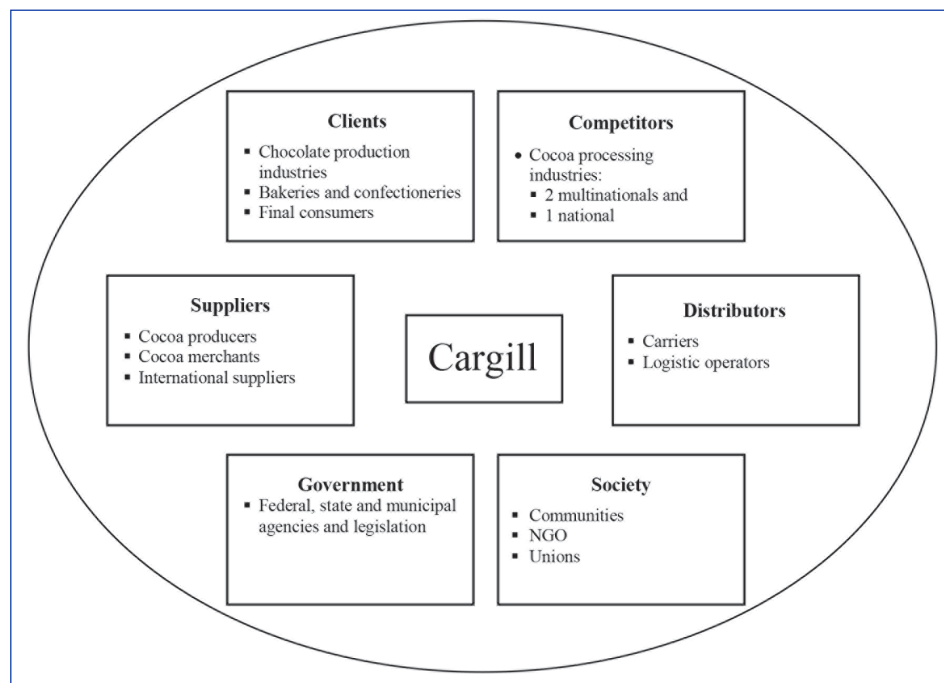
Source: Adapted from AIPC (2015).

For the purposes of this study, the risks of the value environment of the first 2 value chains presented in Figure 2 were analyzed, using the perspective of one of the large companies operating in this segment in the country – Cargill Agrícola S.A.

Cargill is a company founded 153 years ago that has been in Brazil for 53 years, working in the agricultural, food, financial and industrial areas. It is present in 17 states and has more than 10,000 employees. It is one of the largest agribusiness companies in the country. In the cocoa segment, Cargill is the second largest processor in the country, producing cocoa liquor, cocoa butter and cocoa powder, which are sold to the industries producing chocolate derivatives. For this, it has a factory in Ilhéus-BA, where it receives and processes cocoa beans produced in the states of Bahia and Pará, as well as another chocolate factory in Porto Ferreira-SP.

Based on the value environment approach proposed by Oliva (2015), the value environment of the cocoa business in which Cargill operates was structured to operationalize a reading of the business value environment (Figure 3).

**Figure 3**  
**Relationship agents in Cargill's value environment**



Source: Adapted from Oliva (2015).

In Figure 3 one can see the various interrelationships established among the agents that compose this value environment as they develop their activities, with a view to creating value and seeking to achieve their organizational goals (PORTER and MILLAR, 1985; DRUCKER, 2001; SUTTON, 2006; OLIVA, 2015).

Thus, through this structuring of Cargill's business environment, it was also possible to observe that three other cocoa processing companies act as direct competitors, two multinational companies and one Brazilian company. Together, these 4 companies account for 95% of the cocoa processed in Brazil (AIPC, 2015), which demonstrates the economic importance of this environment of value for the sector in question.

In relation to the supply of cocoa, Cargill acquires almonds basically of 3 main groups: a) cocoa merchants; b) agricultural producers; and (c) international suppliers. Most of the cocoa purchased comes from traders who buy cocoa directly from the farmers and act as concentrators of large volumes of the raw material. In addition, the company acquires smaller quantities directly from agricultural producers and, lastly, as domestic production is insufficient to meet demand, Cargill also imports cocoa from other countries.

As for the distributors, it was possible to observe a common element to this business environment: the contracting of local transporter and logistics operators. At Cargill, they transport the products from the processing unit to the chocolate producing units, mostly located in the Southeast of the country.

In relation to the society, the agents considered were the communities in the locality where the cocoa processing plant is installed and the localities where the company maintains stores for the purchase of cocoa, the social organizations inherent to these communities (non-governmental organizations (NGO), unions and other similar organizations) and the government, represented by municipal, state and federal administration bodies (inspection, collection and standardization bodies).



From the observation of the value environment, it was possible to understand the dynamics between the agents and the need for the organization to establish business strategies that allow the best value-added balance to be achieved by each of those involved in the environment, in order to ensure the creation and delivery of expected value across the chain as a whole (PORTER and MILLAR, 1985; DRUCKER, 2001).

In addition, due to the complexity of the agribusiness value chains (SOUZA and PEREIRA, 2006; SCHOUCHANA, SHENG and DECOTELLI, 2013), characterized by considerable quantity and diversity of agents, which, although interdependent, carry differences of an ethnic, cultural, technological and land use character, it can be inferred that this results in the incorporation of a significant amount of risks into this value environment (SCHOUCHANA, SHENG and DECOTELLI, 2013).

Therefore, these results empirically demonstrate the importance of the value chain management perspective and, consequently, of the value environment in which a company is inserted, since the resources managed are not only those internal to the company, but also the external ones, associated to agents of the environment, which requires more attention to relationships that occur beyond the boundaries of the traditional corporation (NORMANN, 2001; WALTERS, 2004; OLIVA, 2015). In this way, the understanding of the value environment allows to identify not only the relations that add value, but also those that can generate risks (LEE 2004; NORMAN and JANSSON, 2004; HULT, CRAIGHEAD and KETCHEN JUNIOR, 2010; DELOITTE, 2013; MANUJ, ESPER and STANK, 2014; OLIVA, 2015).

## Enterprise risks associated with the value environment

Based on the assumption that enterprise risks can be identified through internal processes and the relationships between the organization and the value environment agents, the enterprise risks of the cocoa business present in the discourses could be categorized as set out in Box 2.

### Box 2

#### Identification of enterprise risks associated with the value environment of the Cargill cocoa business

Macro category	Micro category	Conceptual models adopted for analysis
Risk environment	Internal; external	IBGC (2007)
Origin of internal risk	Processes; people; technology	
Origin of external risk	Economic; environmental; social; technologic; political	Oliva (2015)
Type of risk	Image; financial; operational; ethical; innovation; strategic; environmental sustainability	
Relationship agent	Supplier, client, competitor, distributor, society, government	

Source: Elaborated by the authors.

Thus, based on the conceptual models adopted, it was possible to identify the main enterprise risks, classifying them as risks from the internal environment (Box 3) and risks from the external environment (Figure 4 and Box 4).

### Box 3

#### Main internal risks

Risk environment	Origin of the risk	Risk	Frequency of citations
Internal	Processes	Losses in sorting, transport and storage	18
		Inherent in the participation of third parties in the process	10
		Non-compliance with specific legislation	6
		Work accident	5
		Deviation of cocoa wastes	5
		Others	15
	People	Internal Control Fraud	4
		Opposition to the importation of raw material	4
		Internal thefts	2
	Technology	Exposure for information	2
		Lack of support from research agencies	2

Fonte: Elaborated by the authors.

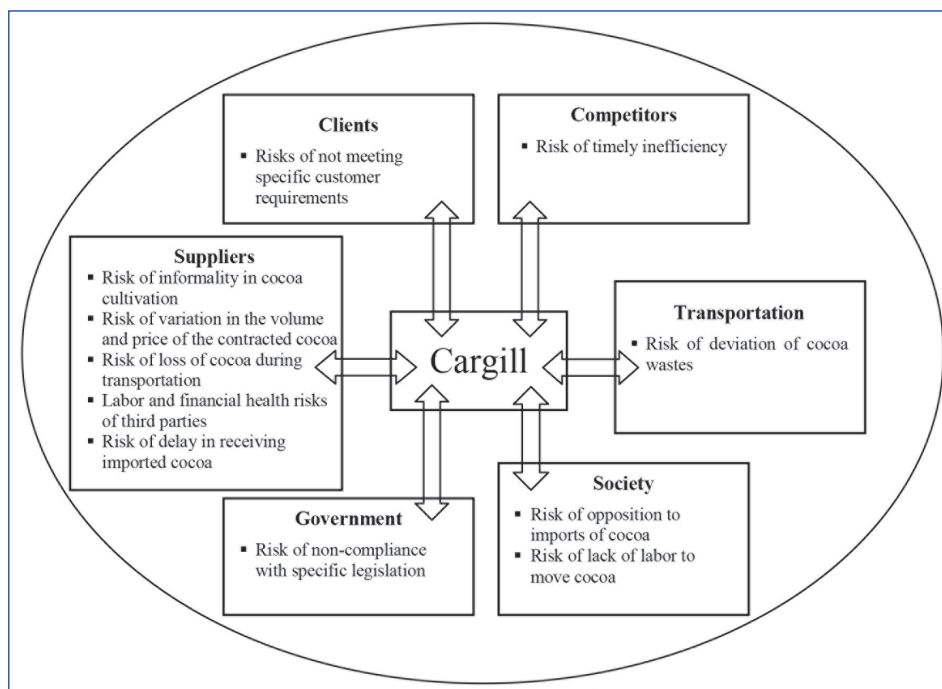
As shown in Box 3, it was observed that the internal risks originate mainly from the processes of cocoa processing. In terms of relative frequency, they accounted for 63% of the internal risks mentioned by the interviewees. This is due mainly to the relationship between the high degree of complexity of operations associated with agribusiness value chains (SOUZA and PEREIRA, 2006; SCHOUCHANA, SHENG and DECOTELLI, 2013) and, probably, the high value added of the products of this system.

In addition, the risks related to human actions in the process, which totaled 11% of the internal risks, were highlighted, possibly resulting from the contradictory relationship between the high value added of the product and the low level of socioeconomic development of the environment in which cocoa is produced and stored.

Regarding the external risks, the results evidenced these events as results of the relationships with the agents of the value environment of the cocoa business (Figure 4). Despite the identification of 22 types of external risk, in this study we opted to analyze only the 10 main risks associated with value environment agents, since they represented approximately 74% of the frequency of citations collected.

Figure 4

**Main external risks from the perspective of relational risk**



Source: Elaborated by the authors.

Among the risks identified in the relationship between Cargill and its suppliers, the risks inherent to production (cultivation), indirect purchase and transportation of the product (42% of external risks) are highlighted, which, despite transferring risks from these activities to other agents, establish a relationship of dependence that intensifies the risks capable of compromising the delivery of value by Cargill.

Box 4 presents the typology, source and representativeness of risks. The results are in line with those of other recent surveys, where strategic and operational risks stand out regardless of the relational agent. This type of risk is increasingly present in the agendas of large corporations (AON RISK MANAGEMENT, 2012; OLIVA, 2015).

The risks related to the environment and to changes in the economy have also been identified. Thus, the observed results show that the risks related to the political, legal and social context also affect agriculture and related activities (GAULTIER-GAILLARD, LOUISOT and RAYNER, 2009).

Box 4

**Types and origins of the external risks**

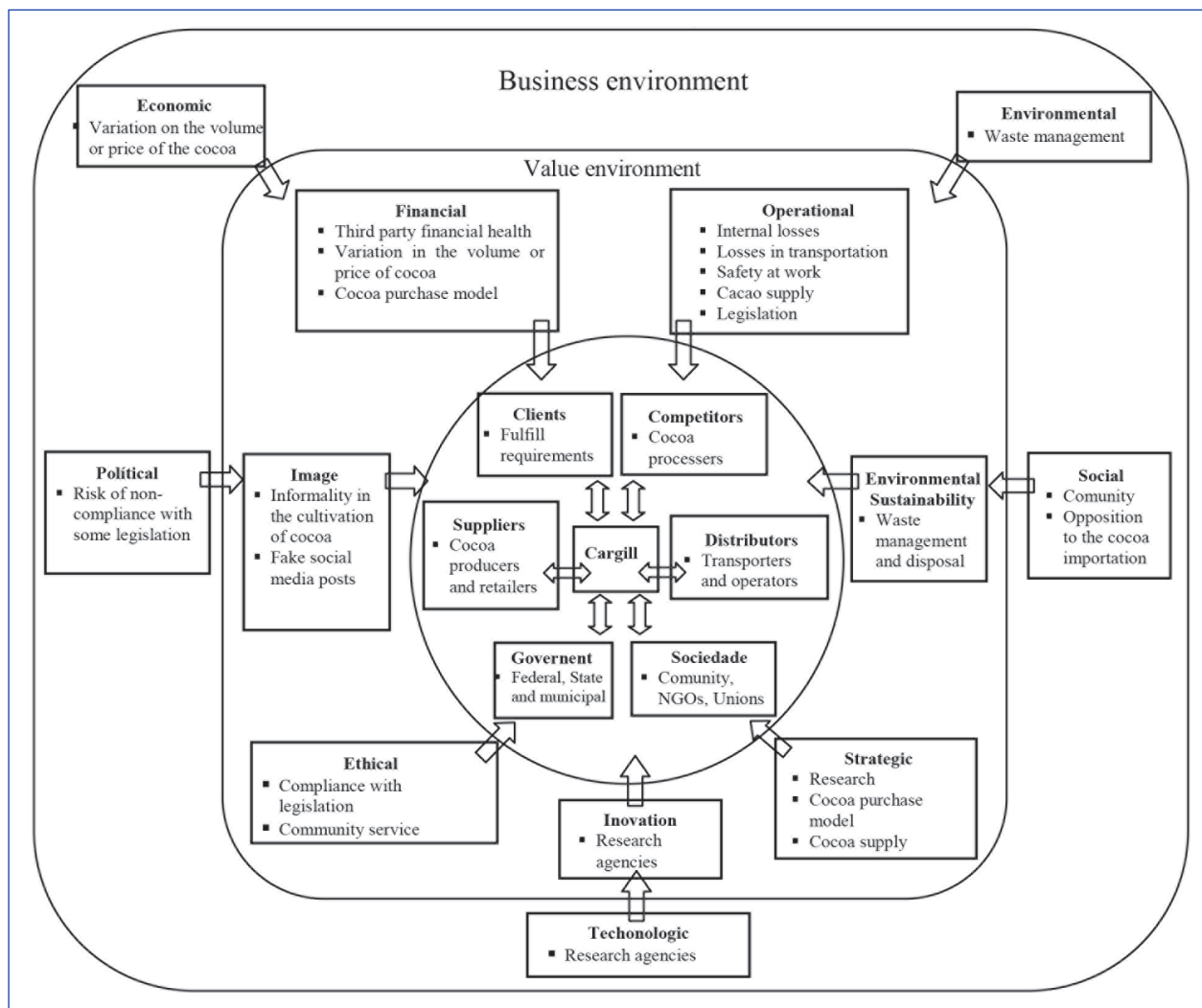
External risk	Freq. of citation	Type of risk (value environment)	Origin (business environment)
Loss of cocoa during transportation	7	Operational and financial	Economic
Labor and financial health of third parties	7	Strategic	Economic and environmental
Failure to meet specific customer requirements	5	Strategic and image	Economic and environmental
Variation in the volume and price of the contracted cocoa	5	Strategic and financial	Economic
Opposition to the import of cocoa	4	Operational	Social and political
Delayed receipt of imported cocoa	4	Operational	Economic and environmental
Non-compliance with specific legislation	4	Strategic and operational	Political
Lack of manpower for handling cocoa	3	Operational	Social
Deviation of cocoa wastes in transport	3	Operational and image	Economic
Informality in the cultivation of cocoa	3	Strategic and image	Economic

Source: Elaborated by the authors.

The results reinforce the importance of the existence of a structured (SOBEL and REDING, 2004) and holistic ERM system (ISO, 2009) to deal with the risks inherent in the complex chain of relationships between agents of the value environment, with a view to their management. Figure 5, elaborated under Oliva's conceptual model (2015), also demonstrates this finding when presenting in a schematic way the results identified in this study.

Figure 5

### Value environment of the Cargill cocoa business



Source: Elaborated by the authors.

## ANALYSIS OF ENTERPRISE RISK

For the categorization of enterprise risk in terms of impact, which considers its severity versus the possibility of occurrence, it was necessary to establish evaluation parameters that would allow to qualify and order the risks. Thus, we adopted a qualitative criterion of the main risks identified in the discourses that considered the severity of impact and the possibility of occurrence (Box 5). Thus, the greater the number of citations, agents involved and residual risks, the greater the severity of impact and the greater the possibility of occurrence.

## Box 5

### Parameters adopted for the classification of risks in terms of impact category

Classification	Parameters
Impact category	<ul style="list-style-type: none"> <li>• Relative frequency and intersection of citations</li> <li>• Number of agents involved</li> <li>• Association with residual risks</li> <li>• Denotative key words and expressions of ability to compromise organizational goals</li> </ul>

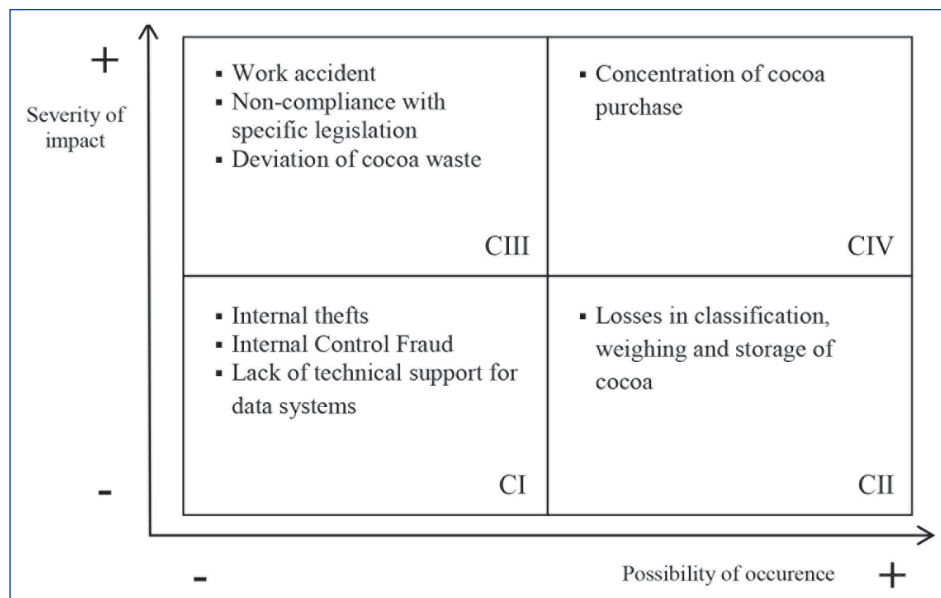
Source: Elaborated by the authors.

Based on Box 5, the risks were categorized according to the model proposed by Grey and Shi (2005) for the distribution of the classification quadrants of the main internal and external risks (Figures 6 and 7). However, it was chosen in this study to translate the term *likelihood* used by Grey and Shi (2005) to “possibility”, considering the practical association of the term probability to quantitative calculations, not performed in this qualitative research. This adaptation aligns with the one intended by the authors when using the term likelihood to the detriment of the term probability.

From the classification of internal risks by impact category, it was possible to evidence the dependence between cocoa merchants and the company under study, representing the main relational risk in terms of severity of impact and possibility of occurrence (Figure 6), since the potential inefficiency of cocoa traders may jeopardize Cargill’s supply.

Figure 6

### Classification of internal risks

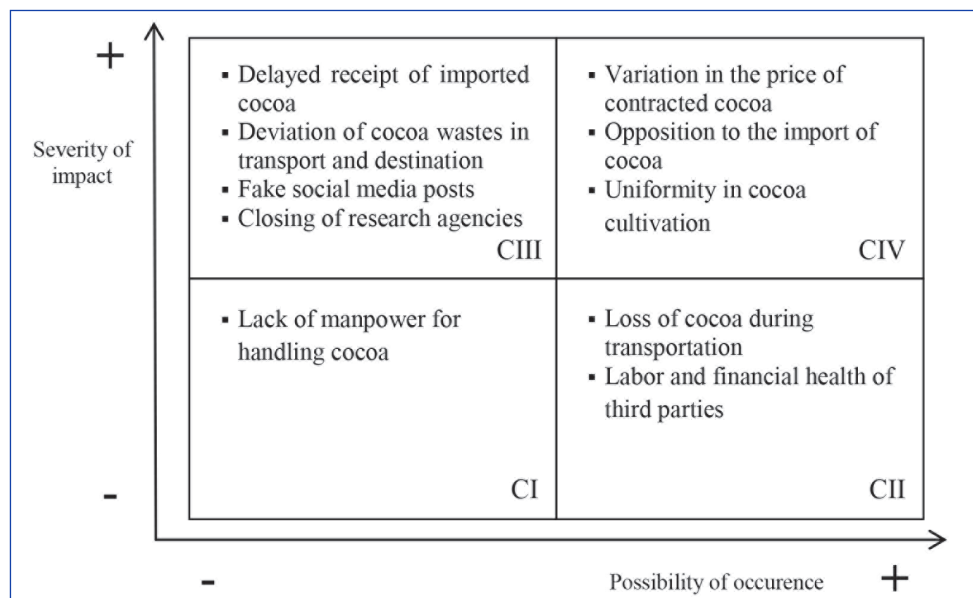


Source: Adapted from Grey and Shi (2005).

This type of risk, resulting from the purchase of raw materials from intermediaries, is also a common feature of other segments of agribusiness, such as the dairy segment, where the purchase model creates excessive dependence on companies in the process of supplying raw materials (VEGRO, ASSUMPÇÃO and SILVA, 2014).

Regarding the external risks, it was possible to verify the occurrence of 3 more significant risks regarding the possibility of occurrence and the level of severity (Figure 7). These items are related to the importance of the activities for the business and, consequently, to the capacity of Cargill to reach its objectives in this segment.

**Figure 7**  
**Classification of external risks**



Source: Adapted from Grey and Shi (2005).

The first risk is related to the variation in the volume and price of the contracted cocoa, constituting a purely market risk linked to the annual crop performance and the international demand for the product, but which, although little controlled by the company, requires constant monitoring by the company.

The second concerns the opposition to cocoa imports by local communities, due to the natural resistance and sense of protection of the domestic cocoa market. However, historical data on cocoa production account for the fact that in the last 10 years, only on one occasion the domestic crop surpassed the national demand (AIPC, 2015). In all other years it was necessary to import cocoa to meet the demand of the Brazilian market. Nevertheless, the risk of opposition to importation requires special attention from the company in order to clarify local and regional publics about the insufficiency of national production.

Lastly, the risk related to informality in the cultivation of cocoa refers to the culture dependent on basically family labor, carried out in small farms, which end up providing informal work and management practices, which may entail risks for the environment value.

## CONCLUSION

Faced with highly dynamic contexts such as today's business environments, enterprise risk management can give an organization greater security in its ability to achieve its goals and add value to its business environment. Consequently, ERM has become a key element in the strategy of any company and thus has undergone conceptual and practical developments.

In recent years, empirical studies that allow to identify and to assess the enterprise risks associated with various business environments have become relevant to the advancement of management practices insofar as they aid in the theoretical understanding of the subject and at the same time provide information for effective risk management, thus increasing the organizations' competitiveness and performance.

In this sense, the proposed case sought to explore the applicability of the initial practices of risk identification and analysis associated with ERM in the value environment of the Cargill cocoa business, based on the characterization and understanding of this value environment and its interrelationships. Thus, in addition to information specific to the cocoa value environment,



it is expected that this study will stimulate further analysis in other Brazilian agribusiness value environments, given its importance to the country's economy.

Based on the approaches and conceptual models adopted, we observed the variety of relationships that make up the value environment of the cocoa business, demonstrating the complexity of the risk sources and the level of exposure in this business environment and signaling the importance of adoption of integrated ERM systems.

Regarding the enterprise risks identified, it was concluded that, among the main internal risks, those associated with the cocoa processing processes, the high degree of complexity of the operations and the high added value of the products stand out. Regarding external risks, the dependence of traders on raw materials was highlighted, since, despite reducing the risks of direct access to cocoa producers, it increases the risks of negotiation and acquisition of the raw material for the industrial process including compromising the value delivery capability of the chain as a whole.

Based on the analyzes, it was also observed that, regardless of the agent of relation considered, the strategic, operational and image risks are significant in this context, which, along with the risks associated with the political, legal and social context, make up the set of important sources of risk in this value system.

Finally, the adoption of the conceptual models presented throughout the study allowed identifying, categorizing and analyzing the risks of the Cargill cocoa business environment, based on severity, impact and possibility of occurrence, demonstrating the applicability of the models considered for the risk management practice. Thus, this study contributes to the advancement of the enterprise risk literature in business environments associated with agribusiness and, at the same time, demonstrates the applicability of scientific models to identify and classify these risks.

Clearly, this study does not deplete the subject matter and opens the door to other studies that may deepen the theme of *risk in value environments*, whether in the other stages of ERM or in longitudinal researches. It is also recommended that this research be extended to the entire chocolate chain, encompassing the stages of *chocolate manufacturing and confectionery* until *distribution and retail*, so that the risks in the entire value environment of this important segment can be fully assessed of the national economy.

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