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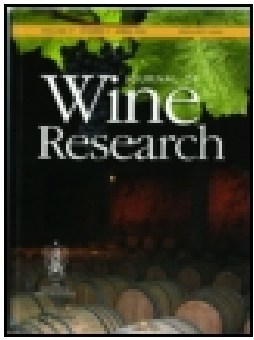
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A new balanced scorecard approximation to enhance performance management systems of Chilean wineries

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ABSTRACT

The Chilean wine industry faces a growing challenge in terms of the increasing global competition, along with other difficult challenges such as exchange rate fluctuations, higher labor and energy costs and climate change. In light of this, the present paper proposes a new approach to increase competitiveness of Chilean wineries based on findings of the current performance management systems practice in the industry. The methodology encompasses a thorough survey of the industry's management systems, with special emphasis on the balanced scorecard (BSC) and its derivatives. The study finds, upon examining the results, that the ISO 9001 norm and the national code of sustainability of the Chilean wine industry are the two most commonly used and that only 14% of the companies have designed a BSC of some type, offering a unique opportunity to introduce this novel approach focusing on performance and sustainability, incorporating the spatial and temporal dimensions of the industry today.

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1. Introduction

Although the global wine industry has sustained modest growth in the last few years, based on the world's wine consumption (registered in 2012), with a total of 245 million hectoliters (Mhl), an increasing growth in demand is expected for the years ahead with a greater competition within the industry as a whole. Hence, wine global consumption is expected to increase by 5.3% between 2012 and 2016 (Salon Vinexpo in Bordeaux, January, 2013). Given this favorable scenario, Chile stands out as a relevant player, with a diversified production represented by 351 wine companies. Thus, the country became the sixth largest wine producer and the fifth exporter worldwide during 2013 (International Organisation of Vine and Wine [OIV], 2014). Nevertheless, at the same time, it is possible to foresee a more difficult and complex competitive scenario lying ahead, as a result of various factors such as several free trade agreements between Chile and other nations that are active industry players, along with new regulatory barriers, and industry norms and trends linked to sustainability performance measurement, green production and social responsibility. Also, customers everywhere are increasingly demanding that

the wine industry as a whole subscribes to and adopts environmental and social guidelines and practices among its standard management and strategic performance measurement systems (SPMS), not just economic ones. Additionally, it is found, upon closer scrutiny of the vineyards and wine distributors and retailers in Chile, that there are internal problems that companies have which delay the delivery of information to key players of the industry, which reduces their competitiveness. In fact, to date, there is still a gap of 90 days in information pertaining to wine stocks, which by law must be collected by Chile's Livestock & Agriculture Service (SAG) (Wine Chilean Corporation, 2007). This piece of information is reported once a year, in circumstances that the information is to be provided monthly by the wine companies. These and other issues are affecting the industry's competitiveness, yet somehow issues like these are not being accounted for in the industry's current strategic performance management practices and measurement systems, reducing its sustainability.

Upon examining the literature, we found no technical and/or scientific studies that address the industry's management systems and their linkage to wineries' competitiveness. It is therefore important to know what companies are doing to address these problems and to find the opportunities and challenges they pose. An example of such management systems is the Balanced Scorecard (BSC), one of the most well-known and utilized management systems today in the world (Rigby & Bilodeau, 2011). In light of the above, the present study aims to find out first which management systems are being utilized in the Chilean wine industry today, particularly the BSC, and second, the extent of their application to characterize these more specifically. To reach this goal, the paper sets a general objective that is to be achieved by means of the following two specific objectives: Review the concepts that underlie performance measurements systems, strategic performance measurements and the BSC management system. Then elaborate a diagnosis and analysis of the current management systems in use in the Chilean wine industry and of the BSC in particular. Thereafter, results are discussed before introducing the new approach based on the industry's findings.

The paper is comprised of four sections: section two presents a literature review on SPMS and the BSC. Section three presents the research methodology and section four offers the results and analysis therein. Finally, conclusions and recommendations are presented for future research on the subject.

2. Review of the literature

The next section will explore SPMS, and the use of BSC linked to agricultural industry and the wine sector in particular.

2.1. Performance measurement systems

Performance measurement systems (PMS) – understood as those belonging to the so-called management control systems – are key to support organizations in their decision-making processes, allowing them to take effective actions whenever and wherever necessary, to assess whether or not the company is aligned with its business strategy (Frolick & Ariyachandra, 2006). Securing the business strategy and its congruence with every other aspect of the enterprise system is a vital role of management systems in

every company (Neely, 2005). However, while there is clarity of mission, to date, there is no consensus on establishing a common ground for PMS despite having been abundantly discussed for decades in various knowledge areas, such as management accounting, operations management and performance measurement (Franco-Santos et al., 2007). In fact, one could say that the role of PMS is to help establish consistency between the individual wishes of the different players or groups of players and the collective responsibilities of the organization. Lately, the purpose of management control systems has been the improvement of the company's overall performance rather than concentrating on particular aspects of the firm, helping it to achieve and secure its strategic objectives (Dewille, Ferrier, & Leleu, 2014). This statement coincides with what Zu, Robbins, and Fredendall (2010) mentioned about the integrative function of the PMS in the framework of strategic management systems operation.

On the other hand, Franco-Santos et al. (2007) define PMS functions of the business as the ability to measure performance, while continuing with the management of a given strategy, and also to facilitate communication, learning and improvement within the organization. As such, PMS is an integrative management system that connects and inter-relates the various business performance dimensions with functional strategies, for example, operations, human resources, technology and innovation, marketing and finance. The following are features of PMS, according to the vision of different authors. For example, Franco-Santos et al. (2007):

- Characteristics (properties or elements): performance measures and supporting infrastructure that can vary from manual to automated mechanisms, in order to acquire, compare, classify, analyze, interpret and deliver the information to decision-makers.
- Roles (purposes or functions): (i) performance measurement, (ii) strategic management, (iii) communication, (iv) influence on behaviors and (v) learning and improvement.
- Processes (series of actions that constitute a PMS): processes are grouped into five categories: (i) selection and design measures, (ii) collection and data manipulation, (iii) information management, (iv) evaluation of performance and rewards and (v) systems review.

Grosswiele, Röglinger, and Friedl (2013) established seven requirements for PMS to ensure that they would be useful to the organization. These are divided into two categories: product design and process design:

PMS as product design:

- Coverage of information requirements for those who make the decisions.
- Alignment with corporate objectives.
- Adequate complexity of information processing.
- Appropriate costs of operation and maintenance of the supporting infrastructure.

Design process of the PMS:

- Consideration of the interdependence amongst measurements.
- Consideration of the existing measures.
- Systematic involvement of decision makers and experts in the field on the decisions.

In addition to making PMS a concrete tool, which supports the business management, it should also address the four key processes of business management: design, implementation, use and review/update (Franco-Santos et al., 2007; Nudurupati, Bititci, Kumar, & Chan, 2011).

According to Grosswiele et al. (2013), there is a widespread perception that PMS employ a tree topology or pyramid whereby a specific measure, for example, return on investment or economic value added, is broken down by means of the mathematical transformation into a hierarchy of objectives with the corresponding performance measures situated at the lower level.

Otheitis and Kunc (2015) evaluated the adoption of PMS in the shipping industry, whereby they present revealing information. One of their main findings is that the use of PMS is directly related to the type of business where most sophisticated/complex business tends to adopt PMS earlier than other firms in the same industry. Another important finding is that the early adopters of PMSs are today among the leaders in the industry. Finally, the study by Otheitis and Kunc (2015) recognizes a heterogeneous adoption of PMSs, which helped to explore the relation between PMSs and performance.

2.2. Strategic performance measurement systems

Over the past decade, a large number of companies have significantly transformed their performance measurement and management systems to embrace a more strategic outlook. An important component of this transformation has been the adoption of SPMS (Franco-Santos, Lucianetti, & Bourne, 2012; Micheli & Manzoni, 2010; Rigby, 2009). Based on these widespread adoption processes, it has been argued that the SPMS have a beneficial impact on performance (Bisbe & Malagueño, 2012; Crabtree & DeBusk, 2008; Davis & Albright, 2004; De Geuser, Mooraj, & Oyon, 2009; Hoque & James, 2000). Such an impact is to be achieved mainly through SPMS' successful implementation of the proposed strategies, for example, better communication at all levels, a good execution plan, plus more effective monitoring (Kaplan & Norton, 2000, 2004; Murby & Gould, 2005). In fact, SPMS can be understood as a subset of the PMS. Thus, Bisbe and Malagueño (2012) propose that SPMS be defined as those interfaces that have distinctive features such as:

- Integration of the operational long-term strategic objectives.
- Provision of performance measures in multiple perspectives.
- Provision of a series of goals/indicators/objectives/action plans for each perspective.
- Presence of explicit causal relationships among the goals or performance measures.

Furthermore, Franco-Santos et al. (2012) more specifically define the distinctive features of the SPMS as those intended to support the achievement of the company's strategic objectives, which are to be measured through financial and non-financial metrics. These relatively well-established characteristics of SPMS have been challenged by recent research. An emerging stream in the literature suggests that the SPMS can be used not only to ensure the implementation of the planned strategies, but also to better define and establish the formulation process of such strategies (Bourne, Mills, Wilcox, Neely, & Platts, 2000; Gimbert, Bisbe, & Mendoza, 2010; Kaplan & Norton, 2008).

Within the SPMS, the following stand out:

- The framework of control levers (Simons, 1995) which identifies four processes: belief systems, systems limits, control and diagnostics systems, and interactive control systems. These are used to analyze how the company leverages its management control system so as to be able to implement its business strategy.
- The BSC or scorecard (Kaplan & Norton, 1992, 1996, 2000, 2001, 2004, 2005, 2008) proposes a system that allows to communicate the strategy, measure the employees' performance, and aligns the efforts of all players in the pursuit of a common direction: the mission of the business.
- The performance Prism (Neely, Adams, & Kennerley, 2002) proposes a PMS defined as second-generation SPMS, because unlike the BSC, it incorporates all stakeholders, especially investors, clients and intermediaries, employees, suppliers, regulators and communities.

2.3. The Balanced Scorecard (BSC)

The BSC is one of the most used management systems today; in 2011, 63% of 1230 companies surveyed in the study of Rigby and Bilodeau (2011) and 60% of Fortune 500 companies employed it (<http://www.leadershiprising.com>). The authors of the BSC, Kaplan and Norton (1992), propose that the strategic targets of the firm be grouped into four distinct perspectives: financial, customer, internal processes and learning and development (Kaplan & Norton, 1996). They provide a four-stage framework for the BSC implementation:

- Translating the vision into concrete actions, wherein management seeks to diffuse and obtain a consensus on the strategic vision of the company that is to be applied at all the levels of the organization, from top to bottom
- Communicate and link the process by which managers communicate the strategy from top to bottom in the organization, tying departmental and individual objectives to the core strategy.
- Enterprise Planning, wherein the firm's financial budget is linked to the strategic targets.
- Feedback and learning, wherein the company develops the capacity of strategic learning drawn from work experience within the organization, thus being able to verify the strategic effectiveness at all levels.

Today, the BSC is defined as a set of accurate performance measures at the strategic as well as at the operational level and it is also recognized as a key management tool involving every phase of strategy implementation including budget and control. De Geuser et al. (2009) verified an increase in performance of the companies that use it, reflected in the integration of processes and on the empowerment of the people. On the other hand, Kunc (2008) proposes to use Systems Thinking as a way of supporting the design and implementation of the BSC, through improvements in the process of design and understanding of the interrelationship among the different performance measures in the BSC.

Likewise, it is possible to recognize a great variety of management control systems that use the BSC as a base ground, looking to measure performance on various fronts, among them, sustainability. For example, Sustainable BSC (Hubbard, 2009); Sustainability BSC for Environmental Services (Dias-Sardinha, Reijnders, & Antunes, 2007); Eco-BSC (Sidiropoulos,

Mouzakitis, Adamides, & Goutsos, 2004); to name a few. On the other hand, if the intention were to measure the inter-organizational performance, the following pieces of work stand out: Generic BSC framework for third-party logistics service provider (Rajesh, Pugazhendhi, Ganesh, Ducq, & Lenny Koh, 2012) and Balanced Supply Chain Scorecard (Park Lee, & Yoo, 2005).

Nevertheless, there is a void in the literature when it comes to finding a management system that can encompass strategic and operational measures simultaneously linking the temporal and spatial dimensions of such performance measures at every node of the supply chain involving the different players acting in it, such as suppliers and distributors. Therefore, based on this need to address such issues, the present paper proposes to close an existing gap and at the same time integrate and elaborate on aspects that were already being treated separately by the BSC, such as sustainability and supply chain management. For example, sustainability, which is addressed within the internal process perspective of the BSC, already considers social and environmental aspects (Kaplan & Norton, 2004). However, the model proposed here considers two additional perspectives to the previous social and environmental ones, calling the financial perspective an economic perspective that encompasses more than just financial indicators. The classic BSC model is redefined to reflect in a more explicit way the three fundamentals dimensions of sustainability working in a coordinated manner with all supply chain actors since a single mistake in the one of these three dimensions could trigger unwanted scenarios that can harm the company as seen in cases like Nike, Disney, Levi Strauss, Benetton y Adidas (Seuring & Müller, 2008). Likewise, even though the original BSC proposes an internal process perspective in operations, touching specifically on the company's relation with its suppliers and distributors (Kaplan & Norton, 2004), the proposed model will build upon this construct considering an extended vision of the supply chain to incorporate the spatial dimension of the same. This extended vision perspective of the company's supply chain considers evaluating not only the logistic performance but also the sustainability of suppliers, distributors and of the company itself.

2.4. The BSC and its application in wine companies

Some researchers have proposed a generic BSC in various industries, such as in the case of the generic BSC framework for third-party logistics service provider (Rajesh et al., 2012), and the possibility of implementing the BSC in public sector agencies: An experience in municipal sport services (Rodríguez, López, & Ortiz, 2010). Notwithstanding the latter, research on the application of the BSC in wine companies could only find a single publication that makes an analysis of its potential development in small Australian wineries. The result of the study, based on in-depth interviews with the management of nine wineries was daunting, and this was so because there was no real possibility of making this kind of design for the amount of requested resources, strategic planning, the design of the system itself and its maintenance in time (Demediuk, 2004). In addition, Kunc (2007) investigated the managerial practices of the small and medium-sized vineyards of Chile, where favorable conditions were identified for the development of PMS, as is the BSC. The study found that such conditions were made possible by the good level of development of the Chilean wineries' technological capabilities in production and viticulture.

However, all the above does not explain why such a successful management system that is being used by so many companies of various industries all over the world apparently still has not been implemented in wine companies. Therefore, pertinent questions emerge at this point that motivate the current study, aimed at answering these questions, such as, do wine companies use management systems? Is there any case where a BSC was designed for wine companies of Chile? Are strategic issues and competitiveness linked to performance sustainability? How do existing management systems, if any, correlate with the traditional BSC?

3. Research methodology

In order to achieve the objectives of the present research effort, fieldwork was planned, developed and supported by in-depth surveys, designed to assess the reality of the Chilean wine industry. A sample of wine companies was selected, and a survey was specifically designed to subsequently establish contact with each vineyard and gather information through interviews with the administration of each selected company. Afterwards, the data were thoroughly analyzed using a statistical framework, and the results were contrasted with the studies discussed in the first part of the research, evidencing a series of conceptual and technical findings, which are presented later in the paper and cited in the conclusions. Below are the main initial stages of the methodological application: sample selection and survey design for fieldwork. The above was done to find out the reality the Chilean wine industry today in regard to performance measurement and management systems being used in the industry, making special emphasis on the BSC, with the purpose of recognizing if there is a real ground base for the management system that is being proposed.

Sample selection

In order to choose a representative sample of the industry, we selected 99 exporting vineyards which comprise the Wine Association of Chile in 2012, mainly for two reasons: they represent 28% of the 351 wine companies in the country; and more importantly, they are present in international markets, thus making them clearly more competitive than those which are only local players. Those selected were also good prospects for further technological and management systems development.

3.1. Construction of the survey

The instrument designed to carry out exploratory research was a survey that initially had 26 questions, which, after three months of successive evaluations by a panel of experts comprising professionals of the business sector and the academic world, resulted in a survey consisting of 36 open-type questions, multiple choice, dichotomous and psychometric scale (see [Table 1](#)).

3.2. Fieldwork

In order to generate contacts with the 99 wine companies selected, a search was conducted through websites, e-mail or phone enabling us to contact the general manager or area manager of each company. Thus, 94 effective contacts were made. Thereafter, the executives of said companies were invited to take part in the research by means of

Table 1. Distribution of survey questions.

Type of question	Quantity
Open	5
Multiple selection	12
Dichotomous	5
Scale psychometric	14
Total	36

Source: Own elaboration.

an e-mail. Finally, 44 interviews were realized, representing 44% of the 100 firms first approached, and 12.5% of the vineyards in the country, respectively. Of the 50 remaining vines, just two decided not to participate in the study, while the others, in an indirect manner, also decided not to participate in the study since after four emails sent to them, no reply was received. Finally, the meetings were supported via audio and on-site interviews with an average duration of 40 minutes.

4. Results

The results generated by the tables and tabulations of the 44 surveys were then classified into two sections: characterization of the sample and main findings. This division is for the structure of the survey, where the first part focused on the characterization of each company according to its employees, type of products, supply of inputs, among others, and the second part evaluates the types of strategic planning and management systems and control, which account for the main objective of the study. Of 44 people surveyed, 18% of participants were CEOs, 43% were line or area managers, 9% were middle management and 30% were area chief/head; 54% of the sample corresponds to large companies with an annual turnover of more than \$ 4.5 million, while 32% corresponds to medium-sized companies, with a billing range between ||US\$ 1,050,000 and US\$ 4,500,000. Finally, the remaining 14% of firms correspond to small companies with an annual turnover of between US\$ 100,787 and ||US\$ 1,050,000. With respect to the distribution of the labor force, as is common in companies in the agricultural industry, 82% of the employees are technical or non-professionals, while 11% consists of engineers. The remaining 7% are other professionals.

Finally, as one can see in [Table 2](#), most of the activities carried out by these companies are executed internally. Especially significant amongst these are the processes of palletizing and of labeling, as well as the mixture of wines. The cultivation processes tend to be less executed internally.

Table 2. Characterization of the business activities developed by the companies themselves.

Activity	Internalized (%)	Outsourced (%)	Mixed (internal and external) (%)
Grape harvest	43	2	55
Wine fermentation	77	0	23
Control of the wine in barrels or tanks	84	0	16
Mixing of wine	89	0	11
Bottling process	84	11	5
Labeling process	89	7	5
Palletizing process	90	5	5

Source: Own elaboration.

4.1. Main findings and opportunities ahead

With regard to the evaluation of the strategic analysis of the companies constituting the study sample, 82% of companies were said to have a formally established strategic plan that was formulated in almost 56% of the cases in a participative manner, that is, involving employees at different hierarchical levels of the company: line management, middle managers and area chiefs/heads. The more strategic elements of the plan are in the 89% of cases the 'Mission' and in 81% of the companies the 'Vision' and/or strategic objectives; 18% of companies that do not possess a formally defined strategic plan justified themselves by saying that:

- The company is still in stage of development, so it does not have time to define a strategic plan.
- The company is too small and, at the same time, has an organizational structure so flat that it deems unnecessary to have a formalized strategic plan.
- There is a lack of management commitment and knowledge to plan strategically.

In light of the findings, it is possible to confirm that the vast majority of Chilean wineries have a strategic plan in place, something which is vital in order to introduce the PMS model being proposed, since it is a prerequisite to have the vision, mission and strategic objectives well defined prior to any further work. The BSC, being a type of PMS, is compared with other PMS in line with the work by Otheitis and Kunc (2015). Next, we present a table that summarizes the distribution of the different PMSs currently being used in the Chilean wine industry. This distribution spreads from the classic financial controls, quality control/quality assurance down to the most current systems such as the use of annual performance commitments, various control boards and KPI. In order to have an overview of the use of such systems, following table 3 presents a factual picture of PMSs in use today as they are distributed by size of vineyard.

As can be seen, in general terms, the PMS that is most present is the classic Financial Control (77%), followed by quality control/quality assurance systems (57%). In third place comes the commitment to annual performance system with a 43%. However, following closely behind is the use of KPI (41%), while the control boards come in last with 23% of the cases. The last two systems, which are more modern in terms of their design and broader scope, provide hope that more complex and elaborate systems such as the BSC are likely to continue to be developed in the near future, particularly in the wine industry. It is interesting to note that when accounting for the 6 vineyards that have already been using the BSC as a SPMS, half of them also used the five PMS identified in the above table, and 67% of these vineyards used the following four PMS: Financial control, control boards, commitment to annual performance and QC/QA (Table 3).

It was identified that only 14% of the vineyards are using the BSC. This figure falls sharply below the 60% of companies belonging to the Fortune 500 (2012) or the 63% of the sample studied by Rigby and Bilodeau (2011). All this comes to confirm that it is a very small set of firms, making evident the many opportunities are present in the industry at present when it comes to strategic management systems. The findings show the lack of formally established strategic planning and management systems affecting the majority of wine companies. The reasons that in part explain the current situation are two: the first

Table 3. Performance measurement systems in Chilean Vineyards.

Type of vineyard	Financial control (%)	Control Board (%)	Use of KPI (%)	Annual performance commitment (%)	Quality control/quality assurance (QC/QA) (%)
Large	88	29	54	50	71
Medium	69	23	31	46	46
Small	67	0	17	17	33
Total	77	23	41	43	57

Source: Own elaboration.

is that the wine companies in general are family-owned enterprises, which are more reluctant to share the strategy with the members of the company; the second reason is associated with the size of the company, which does not make for a sustainable design in its current stage of development, much less for the implementation and management of the BSC. Of the companies that do have a BSC in place, 83% correspond to large companies, and small and medium enterprises (SMEs) represent only 17% of the total. With regard to the former, the average number of employees is 97, where 84% of them correspond to technical or non-professional. Likewise, when considering their exports, 61% of this group's production has targeted international markets, while in the other group, the SMEs, the average number of employees is 89, where 93% correspond to non-professionals or technicians. Finally, with respect to exports, 75% of its production has targeted international markets.

Analyzing the design of the BSC being used in the Chilean wine company, the model employed was the classic one of the well-known four perspectives by Kaplan and Norton. The interesting thing here is that of the enterprises that designed a BSC, only half ended up implementing it, taking them between six months to a year to do so, a period which coincides with the time period suggested by authors like Göran Olve et al. (1999), and Kaplan and Norton (2009).

4.2 Discussion

The main function of the BSC is to support companies in such areas as: change management, performance measurement, strategic alignment, communication strategy and strategic thinking (See Figure 1).

This finding confirms what was presented by Kaplan and Norton (2000, 2004); and Murby and Gould (2005), all of whom identify the favorable impact that SPMS have on a successful implementation of the strategy, through better communication and execution and more effective follow-up actions.

Regarding the design of the BSC, the classical model of four perspectives was used by the BSC adopters: financial, internal processes, customers, and learning and development. Of this pool of companies, 83% of the vineyards generated a single model for all of their enterprise-wide requirements, while the remaining 17% developed a BSC to be used by high-level management and also developed another BSC to be used by other area managers and staff, hence establishing two distinct performance management systems (PMS) hierarchies. With regard to the implementation of BSC, only half of the companies which designed the model ended up implementing it, and are currently using it on a daily basis. This is reinforced by the fact that all of them have, at some point, modified performance

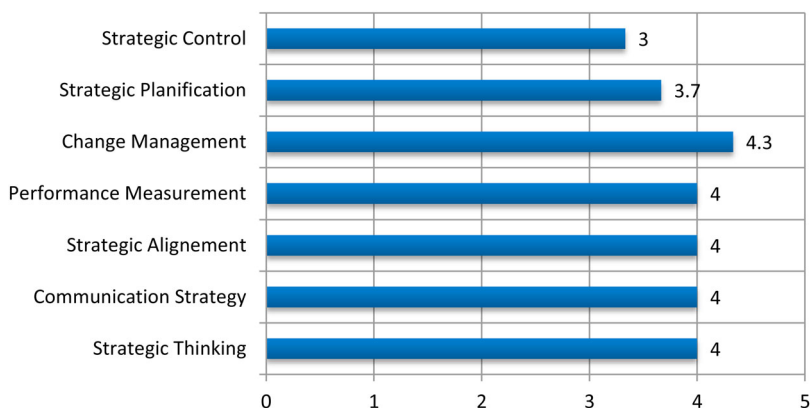


Figure 1. Main functions that support the BSC implementation*.
Source: Own elaboration. (*: Likert Rank, where 1= Not important and 5=Extremely important)

indicators and have also incorporated new indicators. On the other hand, only 33% of these have gone further, wherein they have also modified existing strategic objectives and added new ones as well. On the other hand, when checking for the support that the general management had in the process of implementation, it was widely recognized that he/she had excellent level of support from all ranks. Finally, the vineyards that implemented the BSC acknowledged that the benefits realized are far greater than the costs incurred in its implementation. It is possible to identify the benefits perceived by wine companies as a result of the implementation of the BSC. The main improvements are realized in the planning and management control processes, as shown in the Figure 2. These results show the applicability of the BSC as a base ground model so that a more adequate and effective model can be proposed for the wine industry to help wine companies not only to connect strategic and operational performance measures but also to measure sustainability of the business at the inter-organizational level.

Regardless of the BSC implementation cases already studied, there were a total of 15 other management systems identified as being in use today within the Chilean vineyards, in such areas as quality, environment, sustainability and safety (see Table 4).

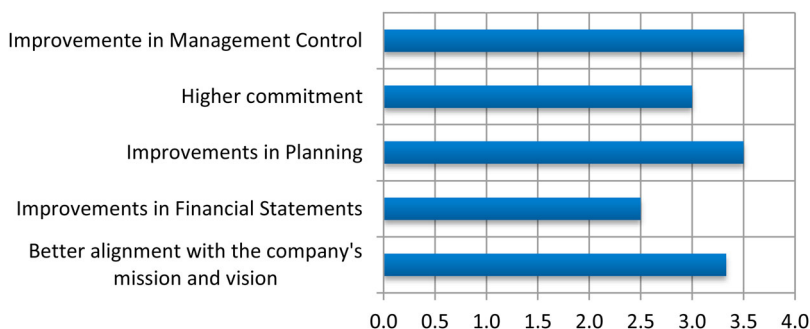


Figure 2. Main results that support the BSC implementation*.
Source: Own elaboration (*: Likert Rank, where 1=Not important and 5= Extremely important)

Table 4. Management systems in Chilean Vineyards.

Name	Abbreviation	Explanation
ISO 9001 (International Organization for Standardization)	ISO 9001	International standard applied to management systems for quality (QMS) focused on all elements of quality management.
ISO 14001 (International Organization for Standardization)	ISO 14001	International standard that expresses how to establish an effective system of environmental management (EMS) to achieve the sustainability of the organization.
ISO 22000 (International Organization for Standardization)	ISO 22000	International standard for food safety management, defines and specifies the requirements for developing and implementing a food safety management system.
Hazard Analysis and Critical Control Points (Pillsbury) Corporate Social responsibility	HACCP CSR	Assurance of the food safety management system. Management systems which invite companies to develop active and voluntary social improvement of economic and environmental conditions in the community, usually with the aim of improving their competitive value situation and their added value perception, ensuring their sustainability.
International Food Standard (Federation commercial German – Hauptverband des Deutschen Einzelhandels (HDE) – Fédération des entreprises du Commerce et de la distribution (FCD) – COOP, CONAD, Federdistribuzione)	IFS	Standard that supports uniform and standard quality control in food safety throughout the supply chain, except for the agricultural producer.
NCH 2861 (Chile)	NCH 2861	Certified food safety system which encompasses aspects such as establishments of programs prerequisites, analysis and determination of safety hazards.
National code of sustainability of the Chilean wine industry. (University of Talca/vines Errazuriz and Caliterra Viñas de Colchagua.)	CS	Code to promote the benefits of a sustainable production of grapes and wines of high quality and encourage grape growers and winemakers to improve their operations management through compliance with the requirements of the standard.
Global Reporting Initiative	GRI	A framework that guides the construction of sustainability reports, establishing the principles and indicators that businesses can use to measure and to publicize their economic, environmental and social performance in the pursuit of sustainability.
Clean production agreement (Chile)	APL	Management tool that allows to improve productive conditions environmental, hygiene and safety, energy efficiency, efficiency in water use, and other matters addressed by the agreement of a particular production sector companies that have subscribed to it, seeking to generate synergies and economies of scale in the achievement of the agreed objectives of.
The water footprint (UNESCO-IHE)	HA	The water footprint is defined as the total volume of freshwater used to produce the goods and services produced by a company.
Carbon footprint	HC	These are emissions of greenhouse gases which have an impact on climate change, directly and indirectly, either by a person, organization, event or product.
Certified Carbon Neutral	CCN	A system that guarantees that emissions have been accounted for and that total carbon footprint or greenhouse gas emissions associated with the production, transport and distribution of the product have been neutralized.
Demeter international (Germany)	Demeter	Biodynamic agriculture certification system of, it is one of the three most important organic certifications worldwide.

(Continued)

Table 4. Continued.

Name	Abbreviation	Explanation
BRC Global standards (United Kingdom)	BRC	Management system that ensures the standardization of criteria employed for quality, safety and operational standards, ensuring therein that the products comply with the legal obligations and provide protection for the final consumer of the good or service.

Source: Own elaboration.

Table 5. Most common management systems and the reason why it was implemented.

Management system	Percentage (%)	Reason	
		Market demand (%)	Strategy (%)
ISO 9001	43	42	58
CS	41	39	67
HACCP	39	53	59
HC	31	46	46
APL	31	23	69
ISO 14001	26	9	82
GRI	24	20	70

Source: Own elaboration.

Table 6. Management systems per company type.

Management system	Participation of companies		
	Large (%)	Medium (%)	Small (%)
ISO 9001	54	38	17
CS	54	23	33
HACCP	50	23	33
HC	46	23	0
GRI	38	8	17
APL	33	23	50
ISO 14001	20	2	2

Source: Own elaboration.

The management system most widely used by companies is the ISO 9001 with 43%, followed by the CS with 41% and HACCP with 39%. The main reason why the companies implemented these management systems is that it is part of their business strategy (see Table 5). Only one among the companies analyzed in the study deemed using some of these management systems to ascribe to a trend within the industry.

Upon analyzing how management systems are applied, according to the distribution of whether the company is small, medium or large, significant differences appeared, as shown in Table 6. In accordance with what was expected, big wine companies develop to a greater extent different management systems such as ISO 9001, CS and HACCP, albeit not in the same proportion as shown in the overall analysis, and they also retain the same order. Similar situation occurs with medium-sized companies, where ISO 9001 emerges as the main system being used, noting a significant decrease in the percentage of companies that use the others systems. Analyzing the small vineyards, one would expect the use of these types of systems to be minimal; however, the results of the analysis say the opposite. In fact, the study finds that CS, HACCP and GRI management systems are used even more when it comes to medium-sized companies. The case of APL draws even

Table 7. Pearson matrix management systems used in the Chilean vineyards.

	CMI	ISO 9001	ISO 14001	ISO 22000	HACCP	RSE	IFS	NCH 2861	CS	GRI	APL	HA	HC	CCN	Demeter	BRC
CMI	1.000															
ISO 9001	0.208	1.000														
ISO 14001	−0.076	0.267	1.000													
ISO 22000	0.189	0.270	−0.108	1.000												
HACCP	0.229	0.289	−0.135	−0.090	1.000											
RSE	−0.037	0.495	0.358	0.088	−0.055	1.000										
IFS	0.151	0.148	−0.145	−0.124	0.336	0.124	1.000									
NCH 2861	0.370	0.017	−0.251	0.320	0.038	−0.221	−0.124	1.000								
CS	0.036	0.262	0.211	0.102	0.213	0.442	0.320	0.102	1.000							
GRI	0.203	0.321	0.118	0.152	−0.067	0.449	0.045	−0.127	0.466	1.000						
APL	0.155	0.226	0.282	−0.030	0.260	0.258	0.214	−0.030	0.258	0.129	1.000					
HA	−0.154	0.093	−0.030	−0.004	−0.068	0.319	0.146	−0.188	0.352	0.408	0.189	1.000				
HC	0.013	0.325	0.282	−0.164	0.360	0.258	0.214	−0.164	0.356	0.239	0.476	0.217	1.000			
CCN	−0.119	0.063	0.226	−0.145	0.063	0.028	0.221	0.073	0.211	−0.009	0.309	0.096	0.333	1.000		
Demeter	0.066	−0.007	−0.041	0.432	−0.137	−0.004	−0.102	0.040	−0.183	−0.058	−0.245	−0.154	−0.245	0.131	1.000	
BRC	0.066	−0.007	−0.041	−0.156	0.157	0.173	0.855	−0.156	0.248	−0.058	0.063	0.057	0.063	0.131	−0.128	1

Source: Own elaboration.

more attention, since it not only surpasses the medium-sized enterprises in proportion, but also the large companies in its usage. This finding can be explained by the fact that through these systems, small businesses look to differentiate themselves in order to penetrate the niche market that has been selected, for example, companies that implement APL would seek to be recognized as a green wine producer.

In order to identify the level of correlation amongst the different management systems used by wine companies, a Pearson matrix was built (see [Table 7](#)), highlighting for each column in bold, the stronger positive correlation and in red the strongest negative correlation. In general terms, one can highlight the positive correlation between CSR with the ISO 9001, ISO 14001 and GRI, which makes sense because of the objective being pursued by each of them. A similar situation is also identified among the GRI, with CSR, CS and HA, which was also expected. On the opposite side, the largest negative correlation occurs between NCH 2861 and ISO 14001, a possible explanation for this being that the first is focused on a quality standard, whereas the second focuses on environmental issues. Now, if we analyze the BSC, it has a greater positive correlation with the NCH 2861, ISO 9001, HACCP and ISO 22000. This is explained by the fact that these management systems pave the way for the design and implementation of the BSC. This makes sense since ISO 9001, for example, is a quality management system that requires, among other things, that companies define their strategic plan, quality policy and identify processes and possess management indicators, all of which are the basis for the BSC. Nevertheless, the lower correlation is with the CCN and the more negative correlation is with HA.

5. Conclusions

The Latin American wine industry, as well as the global industry in general, is facing major challenges and opportunities that companies must address and consequently exploit. In this sense, the present study demonstrates that Chilean wine companies use different management systems that allow them to cope with this scenario, one of them being the BSC. According to the study, it was found that 14% of the vineyards have designed a classic BSC, with the original four perspectives, which in 83% of cases correspond to large companies. Of these companies, only half got to the point of implementing it. The two main reasons why they did not implement it are that it is a family business, not willing to share its strategy, and the high level of resource expenditures that this could mean for them. The study also acknowledged the BSC's contribution from the point of view of the functions involved in the system, some of which are change management and performance measurement. Additionally, we highlight two concrete contributions of the model: improvements in strategic planning and management control. The study also established that the management systems most used by the researched vineyards correspond to ISO 9001, CS and HACCP. However, upon analyzing the situation of these businesses, the study shows that large companies tend to develop to a greater extent various management systems. Upon analyzing the small Chilean wineries, one would expect the use of these types of systems to be minimal; however, CS, HACCP and GRI systems in use within this group of companies exceed the medium-type enterprise group. The case of APL called the attention even more, since it surpasses not only the medium-sized enterprises in proportion, but also large companies.

Upon analyzing how the management systems correlate in a comprehensive manner as a whole, it is possible to identify that there is positive correlation between CSR and ISO 9001, ISO 14001, GRI, CS and HA. This is explained by the fact that CSR management system seeks to actively improve the economic, social and environmental conditions of the community, and it is positively supported by other management systems identified being the systems with greater correlation: ISO 9001 (0.495), GRI (0.449) and CS (0.442). This last system was developed especially for the Chilean wine industry. Likewise, the existence of a positive correlation of NCH 2861, ISO 22000, ISO 9001, HACCP, ISO 22000, GRI and CS management systems with the BSC is also identified, and it is explained by the fact that the identified management systems support the design and implementation of the BSC. Finally, one can begin to configure an optimal model for this type of industry sectors, focusing on the BSC by the particular way that companies in Chile organize themselves wherein the strategic organizational structure and management style are strongly influenced by the direct owner or by the family group controlling the company, rather than by non-industry investors. The fundamental characteristics of the model being proposed here would be a PMS based on the BSC that is designed to suit the particular way that these companies operate, encompassing all the aspects and dynamics of the industry operations. The new model has sustainability as the central focus of the business as well as a direct driver and enabler of the business successful performance, given the interest identified in the companies that have designed a BSC. In addition, the proposed system would measure the performance of all players who are part of the industry's value chain, employing both temporal and spatial dimensions of the same.

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