Dominant business models and sustainable long-term growth. A System Dynamics-based analysis of the Prosecco wine industry

Carmine Garzia*, Francesco Gentile**, Edoardo Slerca*

*SUPSI - University of Applied Sciences and Arts of Southern Switzerland, DEASS - Department of Business Economics, Health and Social Care, Manno Switzerland
**UNISG University of Gastronomic Science, Pollenzo Bra, Italy

1. Introduction

The emergence of dominant business models inside an industry has encountered an increasing interest among strategic management scholars (Osterwalder et al., 2005; Zott & Amit, 2007; Zott et al.,2011; Schiavi & Behr, 2018). The process is particularly relevant in fast-growing industries where the structure of the offer tends to be organized around a few dominant business models, which are progressively adopted by most incumbents, reducing the level of heterogeneity (Teece, 2010). Particularly fertile empirical ground for the analysis of these phenomena is constituted by sectors such as wine, in particular Denomination of Origins (DOC)[1] wines (Gilinsky et al., 2018; Dressler & Paunović, 2019; Giacomarra and others, 2021) because it is possible to observe how, within a set of companies producing the same product, different business model configurations are adopted, it is also possible to observe how business models evolve over time and whether dominant models establish themselves over others. The process can be facilitated by the existence of private or public entities, for example, consortia, business associations, and competition regulatory agencies that can play a strategic role in coordinating the supply and growth process (Valette & Amadieu, 2018).

The Prosecco industry represents an ideal empirical ground for the analysis of the phenomenon described above. In fact, the current structure of the Prosecco DOC is the result of the Italian Ministerial Decree of July 17, 2009, which modified the Prosecco growing area, significantly expanding the boundaries of the production area (originally confined in a very small part of the Treviso area, just a few kilometers north of Venice) and identifying a large DOC area and two small DOCG areas.[2] (Figure 1). Since the reorganization of the appellation and production area, Prosecco has become one of the most successful wines internationally, with 627 million bottles produced in 2021 compared to 140 million bottles produced in 2010 (Prosecco DOC Consortium, 2021) (Figure 2). The spread of the product is due to a rapid growth in production capacity that has allowed a large amount of product to be placed on the market at very competitive prices (Pomarici and others, 2019). The growth of the sector has led to a radical change in the characteristics of supply with the emergence of companies with a business model based on trading, not integrated with wine production, focused on bottling and selling the product. The so-called "traders" become the real force behind Prosecco's growth.

Figure 1. Prosecco production area (source: Prosecco DOC Consortium).

[1] DOC stands for “Denominazione di Origine Controllata," in English: “Denomination of Origins Controlled," which means that wines that adopt that denomination are produced according to certain rules, using specific grapes produced in specific territories. In the DOCG denomination, the "G" stands for "guaranteed") adopt more restrictive rules with respect to the DOC regulation regarding the origin of the grapes.
[2] Source: MIPAAF, Italian Ministry of Agriculture.

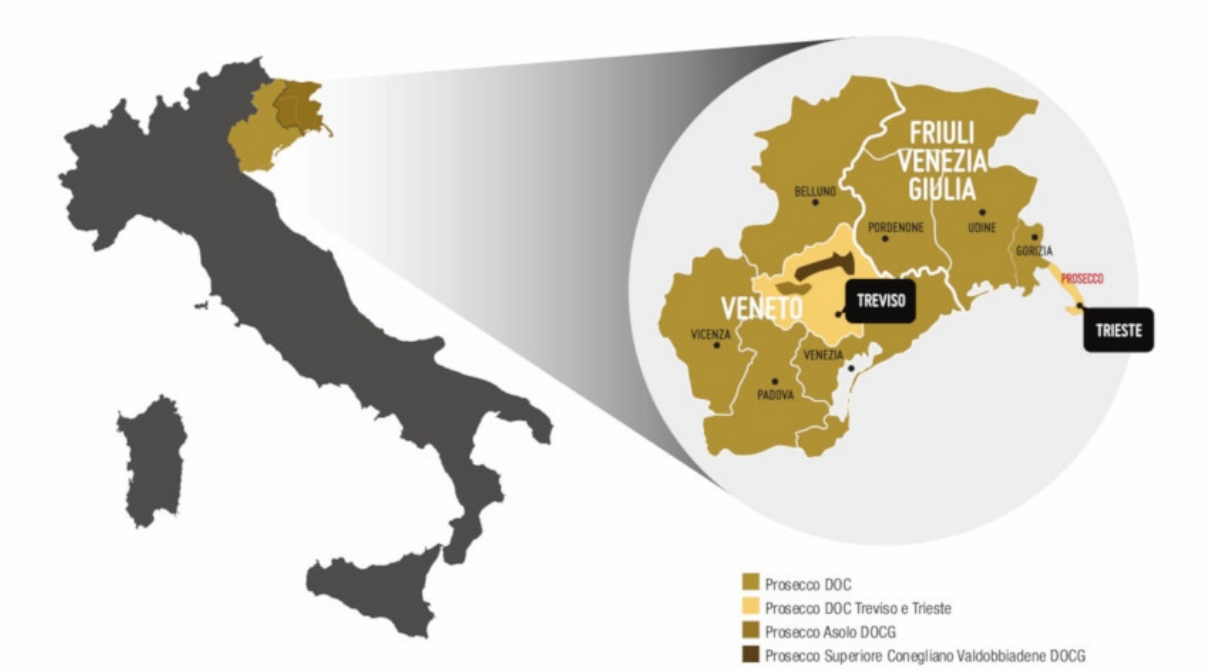


Figure 2. Evolution of bottles produced by Prosecco DOC (source: Prosecco DOC Consortium)

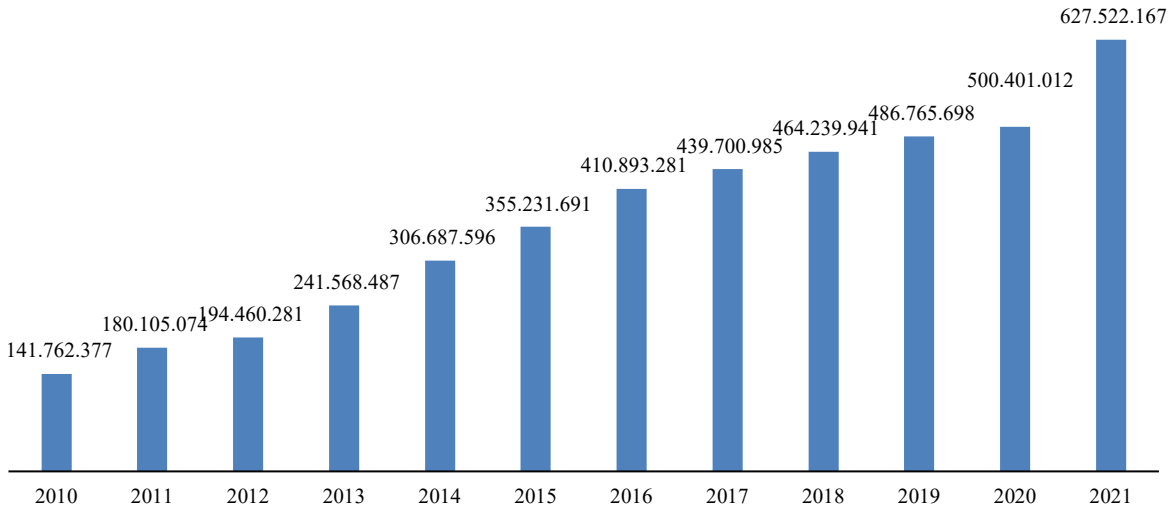


Figure 3. Evolution of Prosecco export

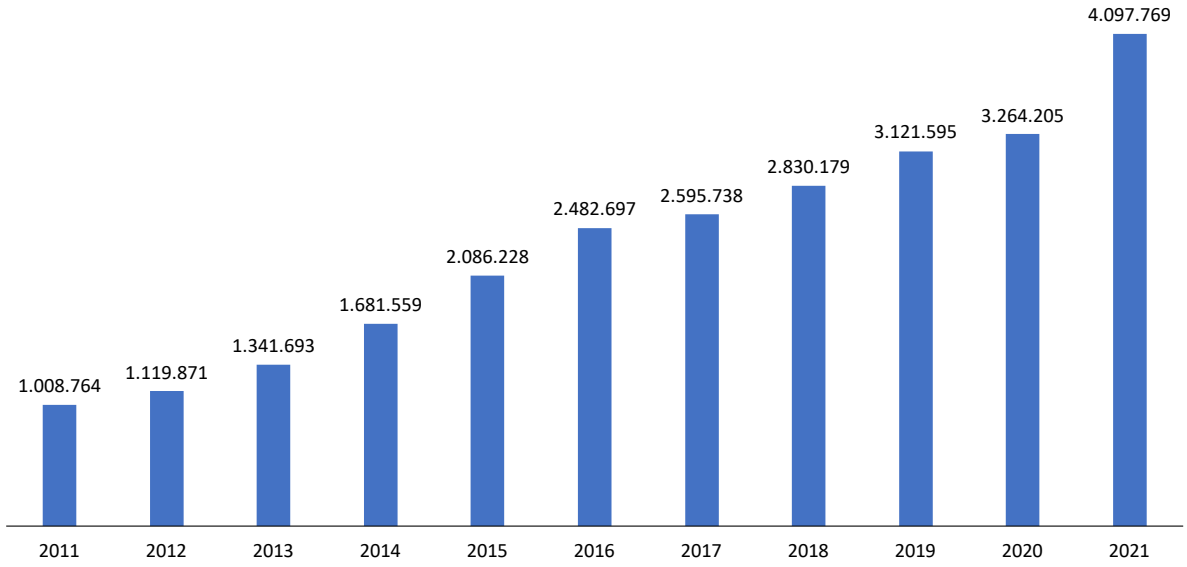
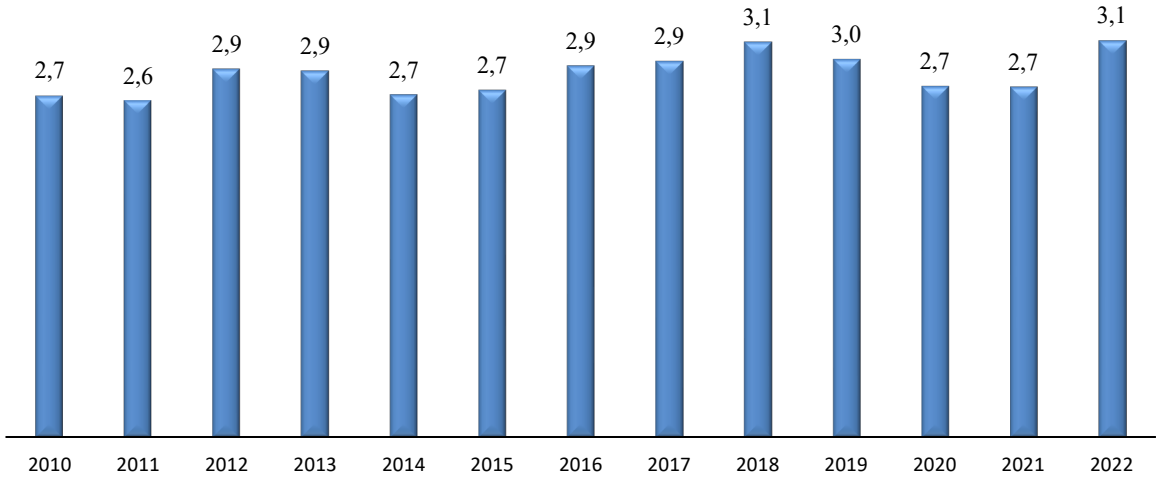


Figure 4. Evolution of Prosecco prices (euros per bottle, ex cellar) (source: Prosecco DOC Consortium)



The research question animating the present study is exploratory and seeks to investigate, using the System Dynamics approach (Täuscher, 2018), the dominant business model diffusion dynamics. The processes of diffusion of a dominant business model can be effective in guaranteeing the success of a denomination on the international market. However, what happens to the long-term sustainability of the dominant business model remains unclear (Franceschelli et al., 2018). We want to analyze this issue assuming a resource-based perspective, exploring the impact of the dominant business model diffusion on a firm's strategic resources dynamic (Da Silva & Trkman, 2014). In particular, we want to reflect on the internal consistency of the Integrated Prosecco producers' business model to verify if this model can be economically sustainable in the long run.

The paper is structured into five sections: the first section is devoted to the methodology and description of the sample analyzed, the second part is dedicated to a comparative analysis of business performance and structural characteristics of the two business models, the third part is devoted to the analysis of the dynamics of the dominant business model emergence, the fourth section is dedicated to the analysis of the impact on strategic resources of the processes of dominant business model diffusion, in the conclusions we focus on managerial implications and we present an agenda for future researches.

2. Methodology and data

Following the path identified by other studies on business models (Ferrer-Lorenzo et al., 2019; Faria and others, 2020; Broccardo & Zicari, 2020), the methodological approach involves comparative performance analysis at the level of clusters of companies in the sector adopting different business models.

To analyze the evolution of the sector, a representative sample of producers was considered consisting of 117 companies, of which 16 are integrated companies that produce grapes by growing the land, sparkling wine and selling the products. The companies adopting the "trader" model are 101 and are focused on the winemaking, sparkling wine transformation process and distribution. We analyzed the performance of the companies over 12 years from 2011 to 2021, specifically looking at the evolution of production and revenue growth, profitability, financial structure, and the evolution of tangible and intangible investments. The type of business model of the companies was assigned based on the analysis of tangible assets to see whether the company-owned vineyards and facilities produce wine and make it sparkling. Tangible assets analysis has been performed according to the official financial reports of the companies included in the sample. For all companies analyzed, Prosecco DOC production data were collected from the Prosecco DOC Consortium, which certifies all production data of companies included in the denomination of origin.

In order to have an objective performance assessment term, the companies were compared with a sample of wine companies that represent about 70 percent of Italian wine production, based on the Food Industry Monitor data.[3] (Garzia, 2022). The sample consists of 110 Italian wine companies.

The analysis of industry development dynamics was carried out using the tools of System Dynamics analysis (Sterman, 2000). The use of modeling and simulation in the field of strategic analysis has been on a positive trend of diffusion (Perlow et al., 2002; Repenning & Sterman, 2002; Rudolph & Repenning, 2002; Zott, 2003). System dynamics analysis has been used extensively in the study of business models, particularly for the analysis of change processes of innovation processes (Rebs, Brandenburg, and Seuring 2019; Torres and others 2021; Varia

[3] Food Industry Monitor data are available online at www.foodindustrymonitor.com.

and others 2021) and in particular strategic change processes (Moellers and others 2019). System Dynamics allows for the investigation of the link between strategic positioning choices and firm resource dynamics (Casadesus-Masanell et al., 2017; Ammirato et al., 2022).

In the following, we use SD feedback concepts to identify, based on empirical data on performance and investment structure, the key drivers behind the development of the Prosecco sector and the affirmation of a dominant business model.

3. Comparing business models in the Prosecco industry

The Prosecco sector has experienced significant growth due to an aggressive strategy of penetration into international markets, a product positioning with affordable pricing and an aggressive marketing policy (Rossetto & Galletto, 2019). The demand for the product was also supported by a marketing policy aimed at giving brand visibility in the international market. A further element that has stimulated the product's success is related to the consumption trend of light wines with relatively low alcohol content and the consumption of cocktails mixed with other spirits, such as the so-called "Italian Spritz."

Prosecco's success in international markets has occurred by taking market share from other sparking products (like the Spanish wine Cava). It has also occurred by penetrating consumer groups that are typically non-consumers of sparkling wine (Onofri et al., 2015; Dal Bianco and others, 2018).

The model of the integrated producer of Prosecco has its historical roots in wine production in Italy and originated as an evolution of a family farm that produces and markets wine. A relatively high fixed capital structure characterizes the model due to investment in the land and in facilities to cultivate it (Pomarici and others, 2021). Typically, farms with an integrated model sell the wine they produce and only minimally bottle wine produced by others. This model is very rigid because it does not allow to manage fluctuations in demand (positive or negative). Furthermore, the model does not allow companies to push on volume to achieve economies of scale and on price policies to penetrate supermarket channel. In the case of Prosecco production, integrated producers usually adopt a middle-price to premium-price position and tend to differentiate from budget wine producers (Pomarici and others, 2019).

The trader model (sometimes referred to as "bottlers" or as “bottling companies”) is a strongly business development-oriented model; companies either buy grapes and turn them into sparkling wine or buy bulk wine directly and bottle it. The model leverages economies of scale in sourcing, bottling and logistics. The model has strong elasticity that allows for effective response to fluctuations in demand and enables companies to use price leverage to enter distribution. The trader model involves investments in production capacity to increase plant size and achieve economies of scale, which allows the use of price leverage to enter markets and also to offer large quantities of product by occupying distribution channels, especially internationally. Traders, as is the case in commercially oriented business models (Bresciani and others, 2016; Frigon et al., 2020), also have high intangible investments in marketing to communicate the product and support the penetration in the supermarket channel.

Grapes and/or bulk wine are sourced from independent grape farmers who are focusing on grape production and, in certain cases, bulk wine production; the latter is transformed into sparkling wine by traders and bottled with their brands.

Prosecco has grown at a higher rate than the wine sector and has done so by accepting structurally lower commercial profitability than those in the wine sector and leveraging on the emergence of a specialized business model based on trading companies (Garzia, 2022). Prosecco has achieved significantly higher growth performance than the Italian wine sector,

with a structurally lower commercial margin (ROS) but a higher ROIC, Return on Invested Capital (Figures 5, 6, 7, 8).

Figure 5. Revenues growth, Prosecco vs. Italian Wine Industry (source: foodindustrymonitor.com)

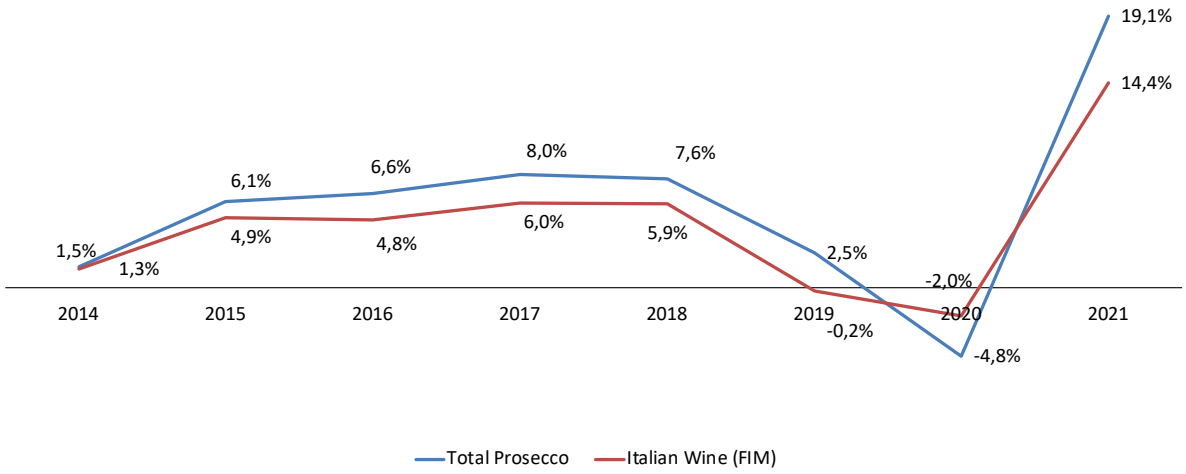


Figure 6. ROS-Return on Sales, Prosecco vs. Italian Wine Industry (source: foodindustrymonitor.com)

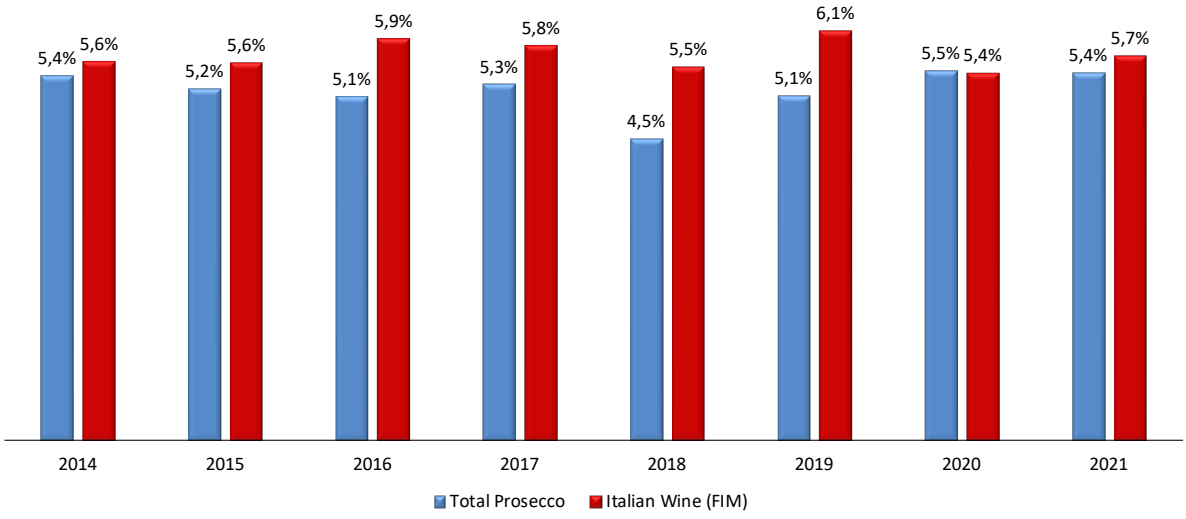


Figure 7. ROIC-Return on Invested Capital, Prosecco vs. Italian Wine Industry (source: foodindustrymonitor.com)

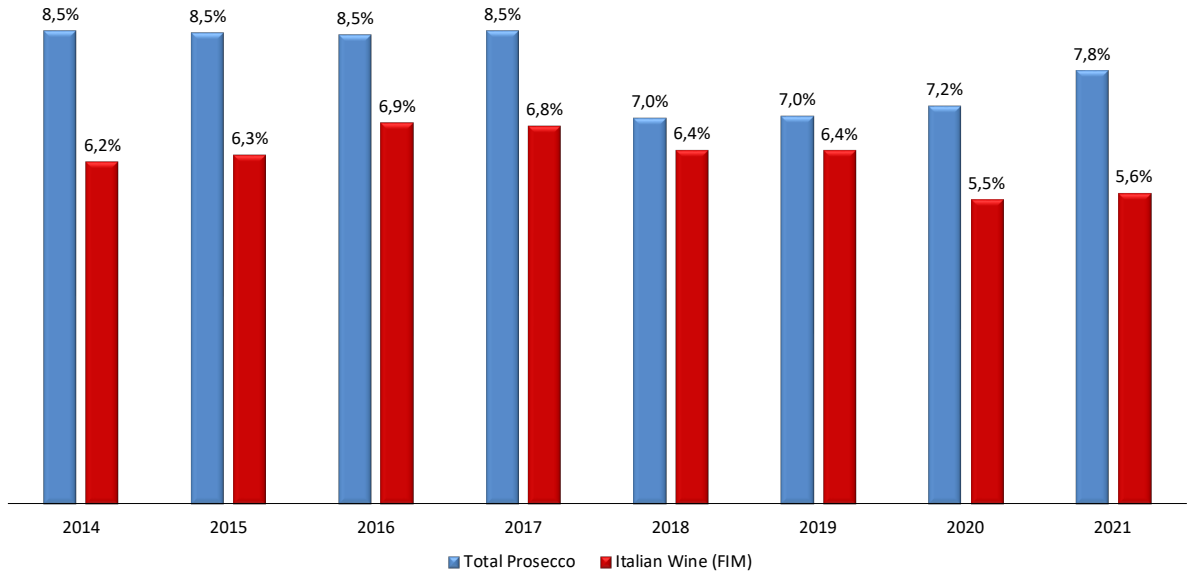
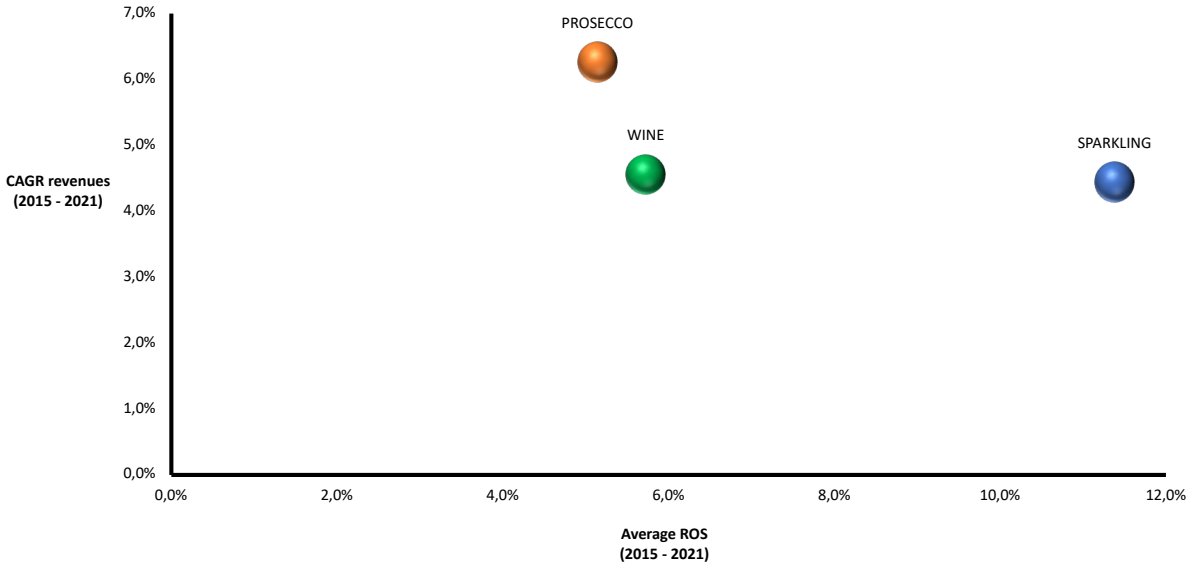


Figure 8. Long-term growth vs. profitability Prosecco vs. Italian Wine Industry (source: foodindustrymonitor.com)



While supply chain specialization is optimal for sustaining a process of rapid growth in the industry (Mitchell & Coles, 2004; Markides & Oyon, 2010), the effects on the profitability and sustainability of competing firms' business models are quite controversial (Figures 10, 11). Traders should avoid fluctuations in profitability generated by aggressive price policies. Because they have implemented strong investments to increase production capacity, they need a stable market situation to repay debts. Otherwise, they will gradually reduce future investments. On the other side, integrated producer profitability is very critical and can stimulate companies to abandon the industry and become pure bulk wine suppliers.

Figure 9. Traders vs. Integrated producers – sales breakdown (source: foodindustrymonitor.com)

Figure 10. ROS-Return on Sales, Prosecco producers with different business models (source: foodindustrymonitor.com)

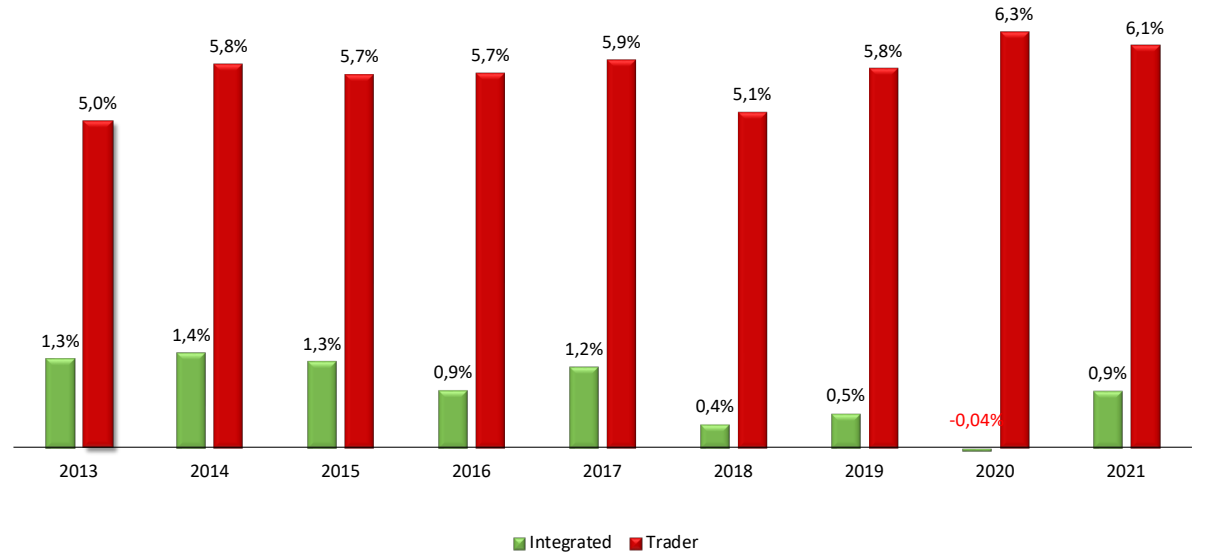
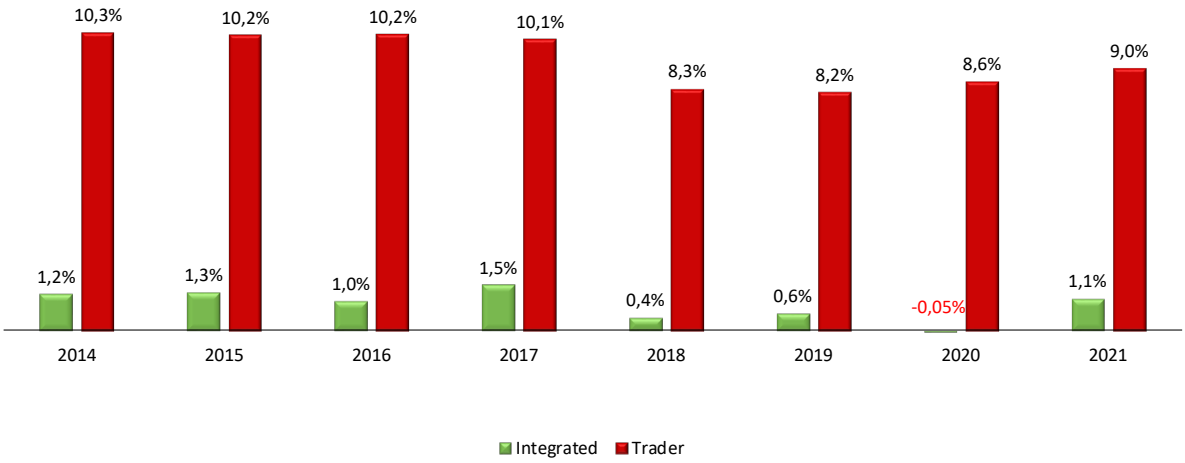


Figure 11. ROIC-Return on Invested Capital, Prosecco producers with different business models (source: foodindustrymonitor.com)

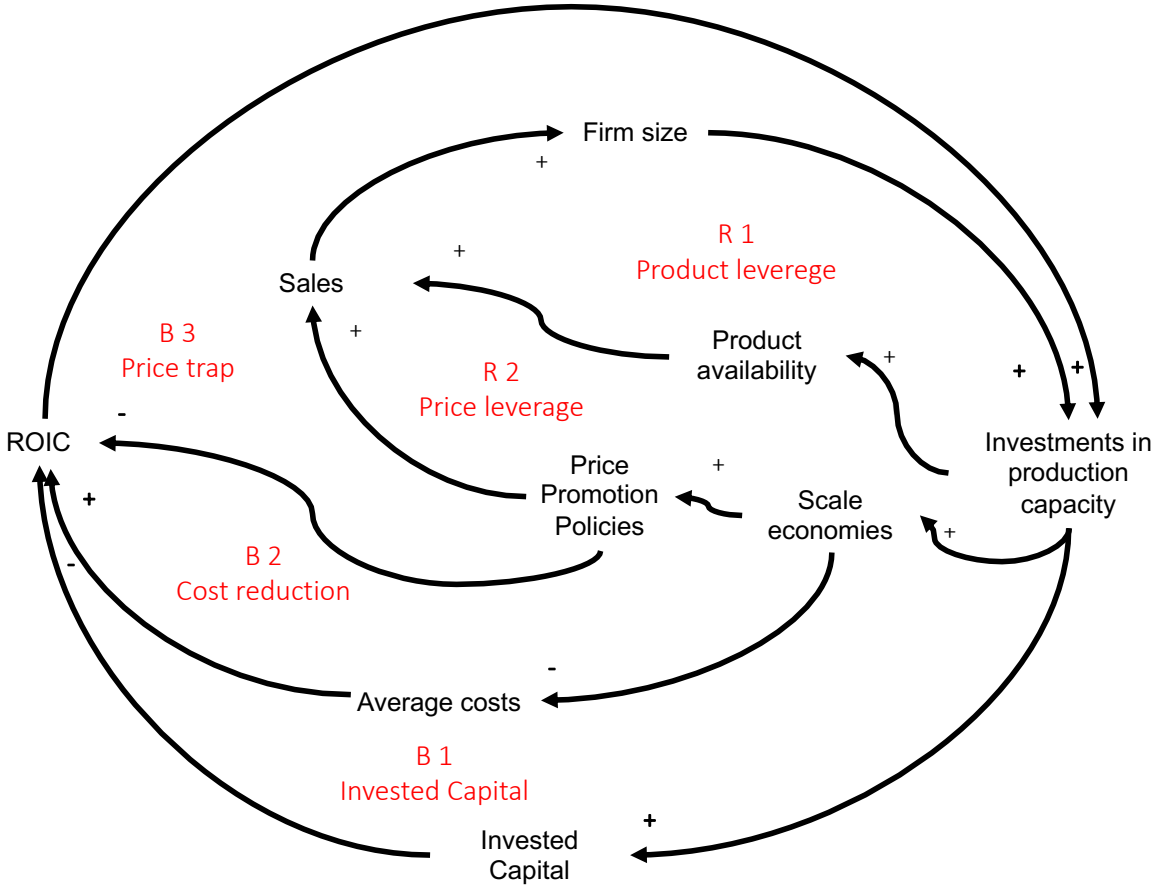


A system dynamics representation of the dominant business model

The operating model of Prosecco companies that have adopted the trading business model can be effectively illustrated using the data that emerged from the analysis of performance and investment structure, using the System Dynamics tools for representing the relationships between variables. The goal is to identify the critical, positive and negative causal loop diagrams that describe the dynamics of the growth process and the effects on the return on investment (Figure 12).

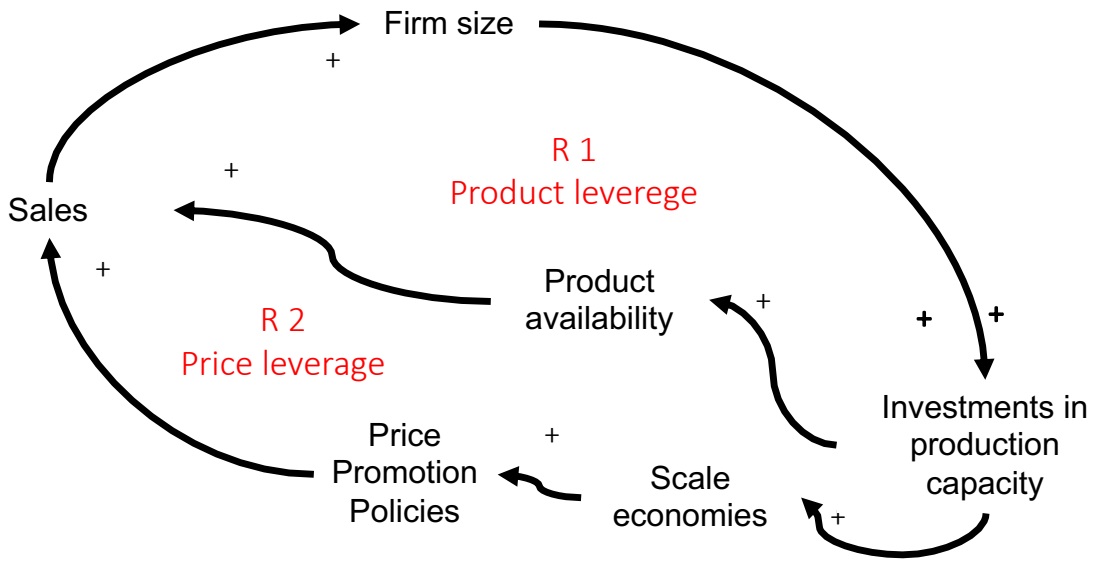
The main driver of growth is the strong availability of the final product, which depends both on the availability of area planted with vines and, therefore, raw material and on the production capacity of traders, which, in turn, depends on investment in facilities. Product availability makes it possible to interact with large importers and enter supermarket distribution chains (feedback loop R1 “Product leverage”), guaranteeing growth in sales and thus promoting growth in company size. The causal loop diagram representing product availability is supported by another reinforcing causal loop diagram (R2 “Price leverage”), which affects the price promotion policies. Prosecco companies can leverage price reduction to enter and remain in distribution channels because of their ability to achieve economies of scale, which then leads to a reduction in average unit costs. This allows to reduce price and to implement aggressive price discount policies to preserve volumes. The R2 causal loop diagram is one in which economies of scale, in turn, are influenced by firm size. The larger the firm, in terms of bottling volume size, the greater will be the effect of economies of scale.

Figure 12. Dominant business model diffusion dynamics. Reinforcing and balancing loops



Positive causal loop diagrams, which explain the development of the industry, are confronted with balancing causal loop diagrams (Figure 13) in which the combination of the variables involved exerts a balancing function on growth. Financial dynamics play an important role in business model deployment through time. In particular, we focus on the causal loop structure that determines the ROIC (Return on Invested Capital) (Annex 1):

Figure 13. Dominant business model diffusion dynamics. Reinforcing loops



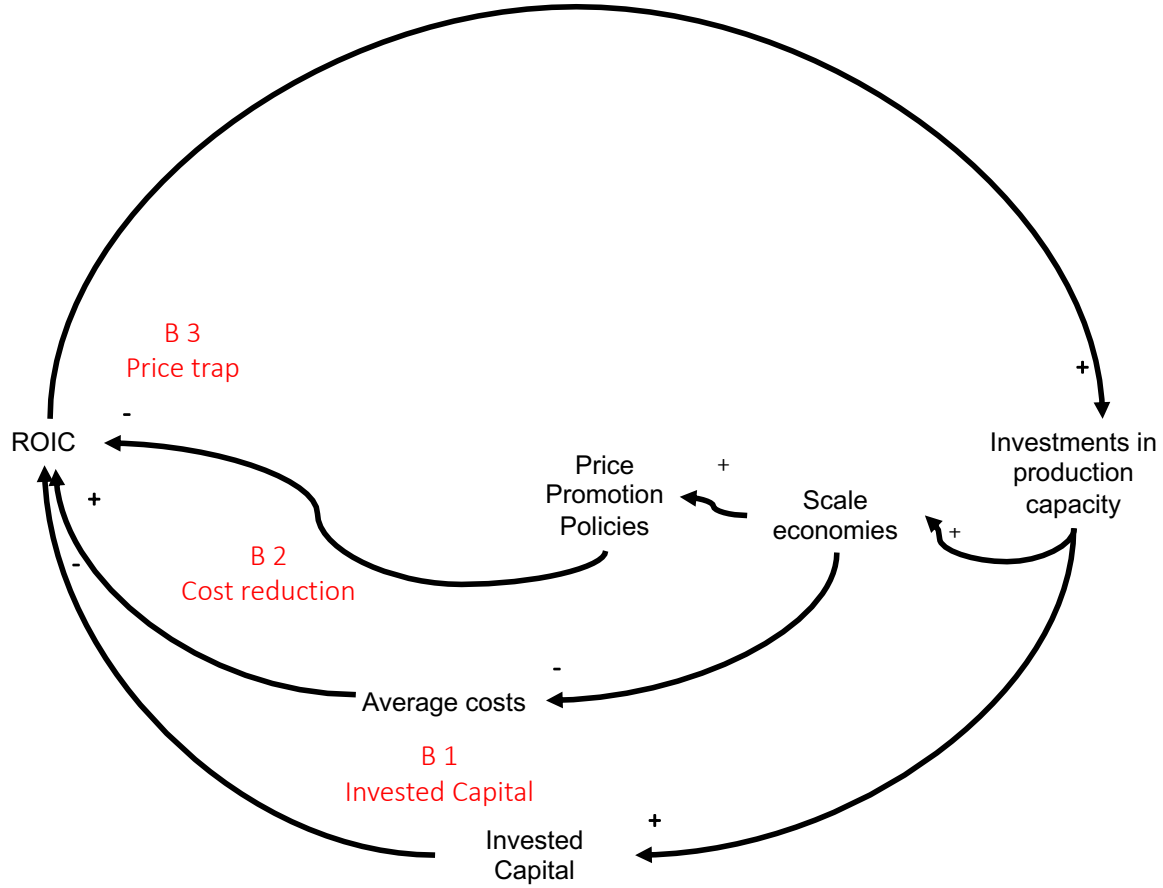
The first balancing causal loop diagram (Figure 14, B1 "Invested Capital") takes its cue from capacity investment, which tends to reduce ROIC by acting on the denominator of the ratio (the Capital Invested IC), so while capacity investment, due to economies of scale allows for better EBIT and thus increases ROIC, the stock of capital employed pushes to reduce ROIC and thus acts as a balancing factor with respect to the strain on capacity investment and thus growth.

The causal loop diagram (B2 "Cost reduction") identifies the link between economies of scale and return on invested capital. In fact, economies of scale determine a reduction of unit costs, thus an improvement in the EBIT. ROIC growth is positively related to EBIT, in particular, due to the reduction in unit variable costs that allow for a better return on investment. Thus, this influences investment decisions and also allows the firm to rely on leverage to continue to invest in productive capacity.

The third balancing causal loop diagram (B3, "Price trap") also affects ROIC. It implies the use of price promotion leverage, which is important to ensure product penetration in the market. However, it can result in a significant reduction in ROIC because it affects EBIT. Price leverage must be used with great caution, taking care to ensure that any price cut is offset by a significant cost reduction (due to the scale effect) that allows for a positive net effect on EBIT and does not depress ROIC.

The negative causal loop diagram B 2 ("Cost reduction") neutralizes the effect of balancing loop B3, which tends to reduce ROIC. However, it is likely to prevail to the extent that economies of scale are fully realized, which still implies a strong growth tension that allows plants to operate at full utilization to make possible the achievement of economies of scale.

Figure 14. Dominant business model diffusion dynamics. Balancing loops



Analyzing with System Dynamics tools, the traders' business model highlights its complexity and potential vulnerability. The business model, in order to express profitable growth, must leverage firm size and increase investment in productive capacity. However, the sustainability of the model also depends on variables exogenous to the firms.

The first important element relates to marketing policies to protect the brand and support the commercial penetration strategy of Prosecco that allows the optimal price level to be maintained; these policies depend on both the companies and the Prosecco DOC Consortium. The ability of the Prosecco DOC Consortium to make investments depends indirectly on the number of bottles produced (for the Italian Consortium regulation, each DOC bottle produced determines a small royalty payment to the Prosecco DOC Consortium), so the more Prosecco will be produced, the greater will be the revenues for the Prosecco DOC Consortium and therefore the budget dedicated to communication. The communication investments made by the Prosecco DOC Consortium can be partly substituted by direct investments of the companies, especially the larger companies with the trader's business model.

A second important element concerns the availability of raw materials, which must be ensured at affordable prices thanks to the careful planning of production that is the responsibility of the Prosecco DOC Consortium with the Veneto region. Any shortage of raw materials would drive up production costs, leading to a worsening of EBIT and thus bringing to an abrupt halt the development of causal loop diagrams that fuel the sector's growth. The role of the Prosecco DOC Consortium, in this case, is to coordinate production planning. Any lower availability of raw materials as grape prices rise would undermine the return on investment and, thus, the entire development model. On the other hand, prices that are too low in supplies would push

companies to reduce vineyard areas, leading to a dangerous shortage of raw materials in the medium term.

4. The diffusion process of the dominant business model and its effects on the company's strategic resource dynamic

The diffusion of the dominant trader model allows us to discuss a System Dynamics archetype, the so-called limit to growth (Figure 15), determined by a combination of a negative loop and a reinforcing loop (Sterman, 2000). The price-based competition implemented by traders pushes down the average reference price and makes differentiation policies implemented by integrated producers difficult to achieve (Figure 15, feedback loop B1 “Traders production capacity”). Indeed, integrated producers need higher prices to generate higher margins and sustain investments in product differentiation (Figure 15, feedback loops R1 “Marketing” and R2 “Differentiation”). Integrated producers offer higher quality Prosecco DOC that can have a more expensive production process due to limited quantities, handmade production process and production systems. Furthermore, the traders need to make investments in marketing and communication that support premium positioning. Lower profitability resulting from low average prices (due to the actions of traders) prevents them from making these kinds of investments and, thus, from applying premium prices. One effect of this dynamic is that integrated companies have no incentive to continue bottling and selling premium products under their own brand name but are driven to produce bulk wine to sell to traders or to sell grapes directly to traders, reinforcing the process of spreading the dominant business model.

The interaction between the two business models affects business resource development processes (Figure 17). Resources are an essential component of the business model and determine the possibility for a firm to sustain a specific strategic positioning (Casadesus-Masanell et al., 2017). The emergence of the trader-based development model implies a reduction in innovation-related know-how, particularly in product innovation aimed at differentiation and in marketing know-how that is important to sell the product with a premium price and thus to support positioning strategies (Figure 17, feedback loops R2 “Production know-how” and R3 “Product differentiation know-how”). The trader's business model is production-oriented; it is focused on managing the winemaking process and the logistics. This makes product innovation and marketing know-how less relevant, as selling is done mainly by leveraging price. The gradual reduction of know-how in product innovation and marketing, and communication leads to a change in the industry entry barrier (Figure 17). Entry barriers related to intangible resources tend to decrease, while barriers related to productive capacity remain very high. Tangible barriers based on widely used and accessible technologies, such as those for sparkling wine production, can be more easily imitated than intangible barriers, such as product innovation know-how, especially when it is unique and can be protected by patents, or that represented by registered trademarks (Grant, 2006).

Figure 15. The limit to price growth generated by the interaction between the two business models.

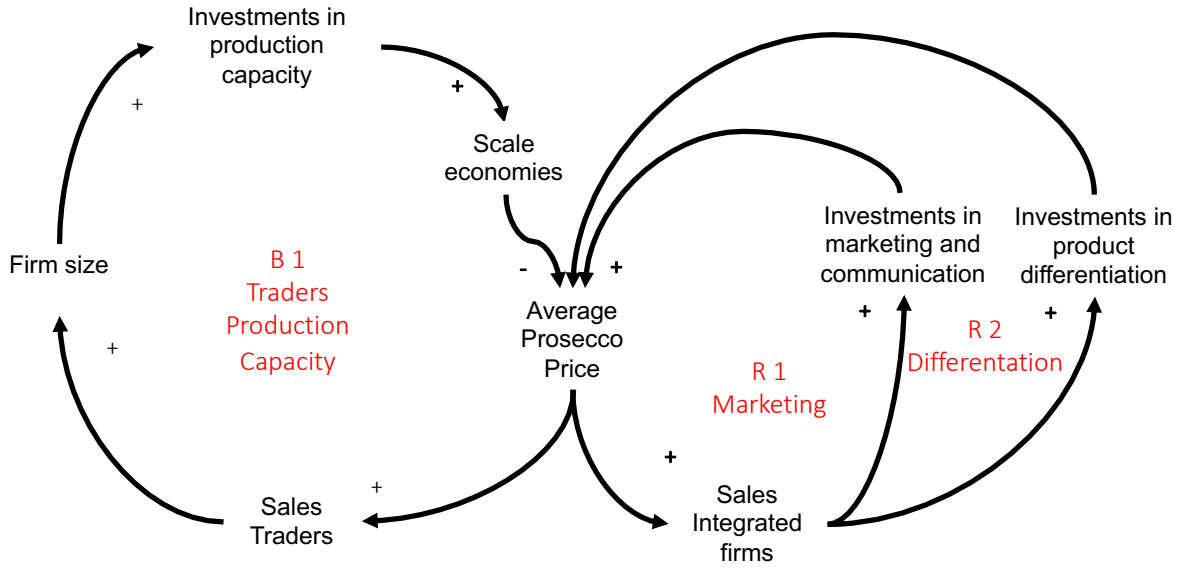


Figure 16. Average price long-term expected behavior

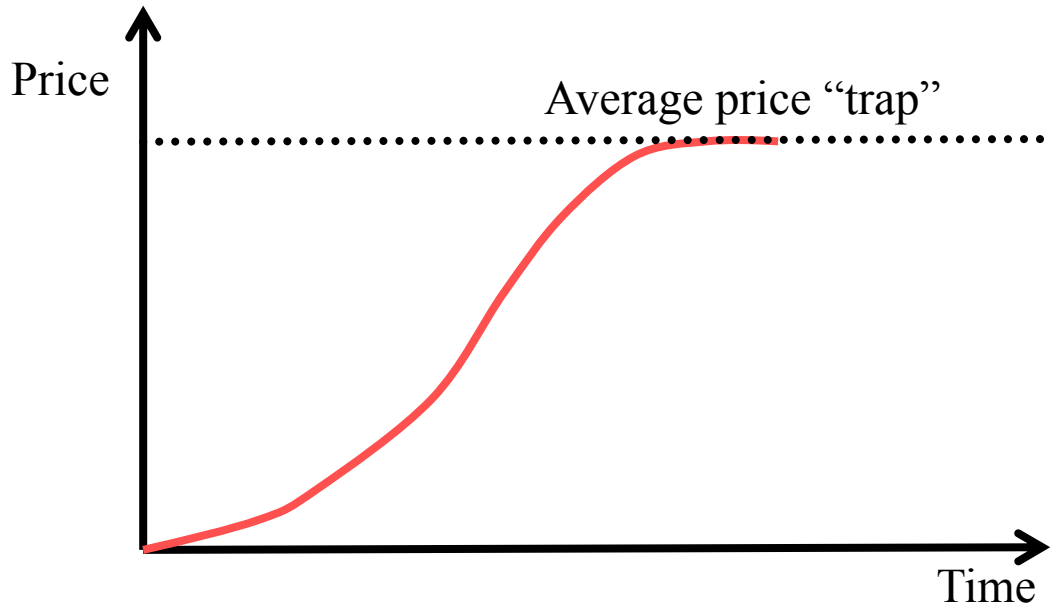


Figure 17. Resource dynamics in the Prosecco industry business models.

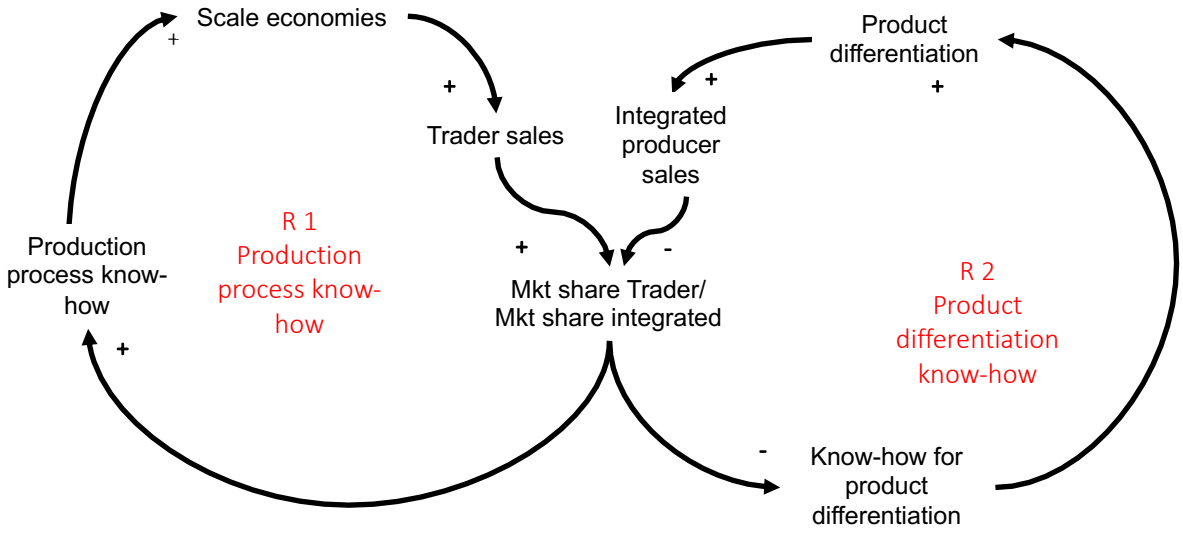
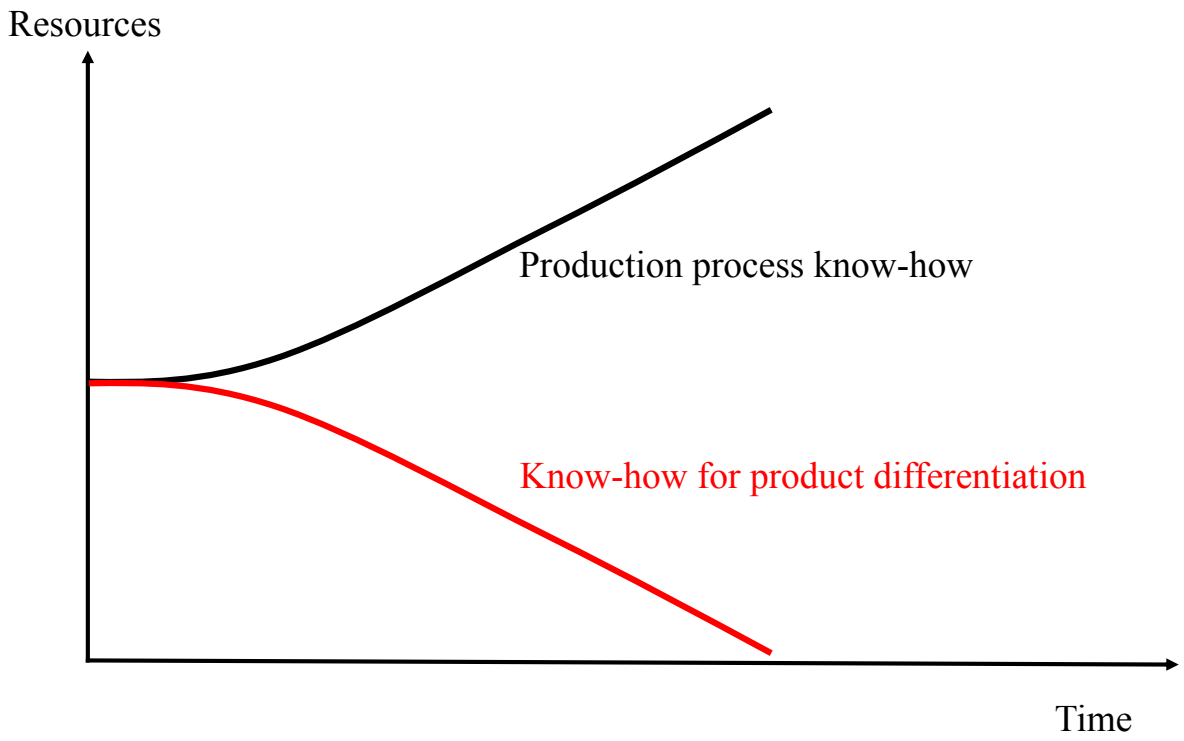


Figure 18. Resource dynamics long-term behavior.



5. Conclusions, managerial implications and future research

The strategy based on economies of scale and aggressive price policies is very effective in pursuing a wine denomination's rapid expansion (Pereira and others 2015) but can have a relevant downside.

Our paper points out how firms can become victims of the so-called “growth trap” that forces continuous investment in productivity to increase the level of efficiency while limiting investment in innovation and marketing. This reduces the ability to differentiate the product and exposes firms to the imitation process of other mass-produced sparkling wines, eventually operating in other parts of Italy or other countries.

The Prosecco industry's revenue growth, achieved mainly by increasing volumes, pushes traders to increase further production volumes, which, in order to be brought to market, are sold by further cutting unit prices. Companies with the trader business model, which focuses on increasing volumes, are driven to aggregate with other companies, further increasing in size to achieve production and distribution economies of scale. Traders are under pressure to cut costs and act on suppliers (grape producers) due to strong bargaining power to recover margins. The effect of these kinds of dynamics is that average profitability continues to fall. The relevant risk is that the concentration of volumes on a few players, which adopt the trader business model, may lead companies to further price reductions, further depressing profitability and prompting integrated companies to change their business model.

Integrated companies may have two alternatives to adopting the trader model: withdrawing from direct sales, specializing only in agricultural production or developing niche products for premium consumers, cutting production volumes. Companies with an integrated business model could become important actors in the product innovation and renovation process. Innovative integrated producers can generate know-how that could benefit the entire Prosecco industry. Therefore, if it were possible to preserve a certain level of heterogeneity in the Prosecco industry, it would reinforce the success of the product further. Integrated producers can make a relevant contribution to the development of premium product know-how that can be transferred to traders. Premium integrated producers can contribute to maintaining a higher position for the Prosecco DOC, generating positive spillover for the entire denomination. Preserving the level of heterogeneity would require investments to preserve the segmentation strategies implemented by companies with business models other than the dominant one.

The actual industry structure and the success of the dominant business model are sustainable if there are authorities, such as consortia, that can coordinate different actors involved in the industry value chain by acting on two critical variables: the availability of the raw material and investment in product differentiation, marketing and brand awareness.

Further research should be directed toward analyzing the possible evolutionary trajectories of the industry, focusing on the following elements: sustainability of the trader business models and the potential emergence and evolution of alternative business models.

Annex 1. ROIC, Return on Invested Capital calculation

ROIC: Return on invested capital
ROIC=EBIT/IC
EBIT: Earnings Before Interest Taxes and Depreciation
EBIT = Revenue - COGS - Operating Expenses
COGS: Cost of goods sold
IC: Invested Capital (operative approach formulation)
Current assets
- Non-interest-bearing current liabilities
= Net working capital
+ Net property, plant, equipment
+ Acquired intangibles
+ Goodwill
= Invested capital

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