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Dominant business model consolidation processes: A System Dynamics-based analysis of the Prosecco wine industry

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ABSTRACT

Prosecco wine has become one of the widest diffused sparkling wine with 627 million bottles produced in 2021 compared to 140 million bottles produced in 2010. 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. 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 in wine production, focused on bottling and selling the product. The paper analyzes, using a System Dynamics approach, the process that determined the affirmation of the trading business model by identifying the critical variables and the relevant feedback loops structures. Resource dynamic analysis allowed us to evaluate the long-term sustainability of the dominant business model.

***Keywords**: Wine industry; business model; competitive dynamics*.

1 Introduction

Dominant business models emerge in fast-growing industries when first-movers establish a market leadership forcing incumbents to adopt similar strategies, reducing the level of heterogeneity among competing firms (Teece, 2010). An increasing number of scholars has been investigating the process through which a dominant business model emerges and defines industry competitive dynamics (Osterwalder et al., 2005; Zott and Amit, 2007; Zott et al.,2011; Schiavi and Behr, 2018). Particularly fertile empirical ground for the analysis of these processes is constituted by sectors such as wine, in particular Denomination of Origins (DOC)[1] wines (Gilinsky et al., 2018; Dressler and Paunović, 2019; Giacomarra and others, 2021), because in this industry is possible to observe how companies producing the same product adopt different business model configurations, 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 et al., 2018).

The Prosecco industry represents an ideal empirical ground for the analysis of the phenomenon described above. The current structure of the Prosecco DOC is the result of a new legislation, introduced in 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). The DOC regulation allows for a very high vineyard productivity, furthermore grapes can be sourced from other Italian regions in case of exceptional demand or of poor harvest. 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 180 million bottles produced in 2011 (Prosecco DOC Consortium, 2021) (Figure 2). The product diffusion 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), with minimum fluctuation in prices through the years. 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.

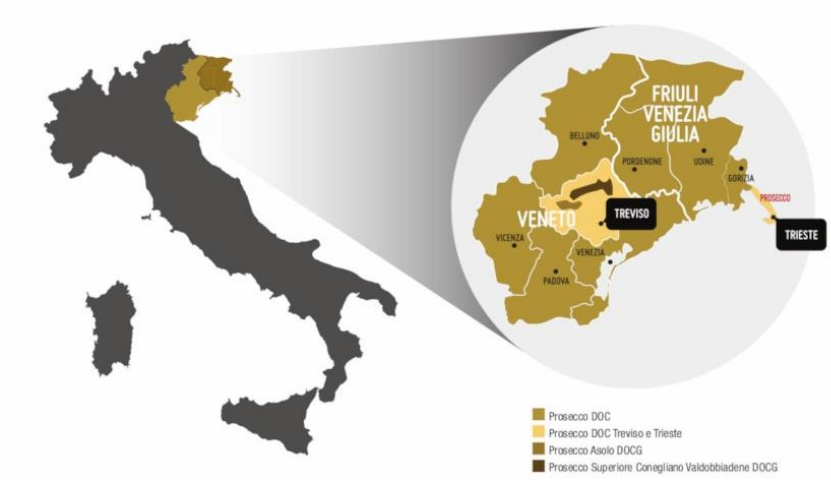

Figure 1. Prosecco production area (source: Prosecco DOC Consortium)

[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 (the so called “Disciplinare”or “Wine regulation”), using specific grapes produced in specific territories. The DOCG denomination (the ‘G’ stands for ‘guaranteed’) adopts more restrictive rules with respect to the DOC regulation regarding the origin of grapes.

[2] Source: MIPAAF, Italian Ministry of Agriculture.

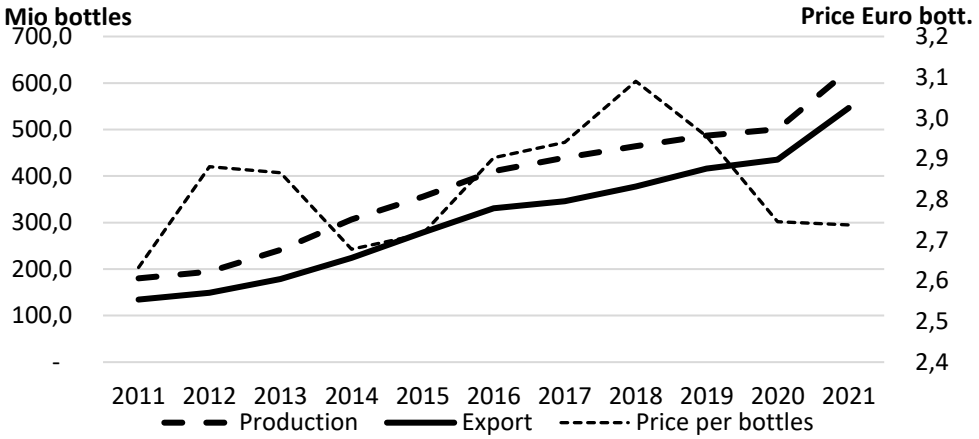

Figure 2: Evolution of Prosecco production, export and price. Production and export in million bottles on the left axes, price per bottle in euros on the right axes (source: Prosecco DOC Consortium, selling price from the producer).

The research question animating the present study is exploratory, we investigate, using System Dynamics approach the dominant business model diffusion dynamics (Täuscher, 2018). The processes of diffusion of a dominant business model can be effective in guaranteeing the success of a wine 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 and Trkman, 2014).

The paper is structured into five sections: the first section is dedicated 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 the Original Data Set

Following the path identified by other studies on business models (Ferrer-Lorenzo et al., 2019; Faria and others, 2020; Broccardo and Zicari, 2020), the methodological approach involves comparative performance analysis at the level of clusters of Prosecco companies with 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 so called “Integrated” companies that produce grapes by growing the land, sparkling wine and selling the products. The companies adopting the so called "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 that 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 “Prosecco”. In order to have an objective performance assessment term, the companies were compared with a sample of 110 Italian wine companies producing wine other than Prosecco based on the Food Industry Monitor data[3] (Garzia, 2022).

The analysis of industry development dynamics was carried out using System Dynamics principles (Forrester, 1969), in particular we use feedback loops to represent dynamic relations between certain variables that describe business model. System Dynamics has always been widely used as an explanatory medium to address the logic and the nature of dynamic behaviour of social systems (Sterman, 2000). The use of modelling and simulation is well established in the management field (Perlow et al., 2002; Repenning and Sterman, 2002; Rudolph and Repenning, 2002; Zott, 2003).

[3] The wine company sample has been extracted from the Food Industry Monitor, the largest economic observatory on the performance of Italian food companies at the University of Gastronomic Science (UNISG), based in Pollenzo, Italy, encompassing 75% of overall Italian joint-stock food and beverage industry companies with in particular the 70% the entire Italian wine production by value.

System Dynamics analysis has been used extensively in the study of business models, particularly for the analysis of strategy renewal and innovation processes (Rebs, Brandenburg, and Seuring 2019; Torres et al., 2021; Varia et al., 2021) and to investigate strategic change processes (Moellers et al., 2019) and the link between strategic positioning and firm resource dynamics (Casadesus-Masanell et al., 2017; Ammirato et al., 2022).

The purpose of our conceptual SD model is to identify, based on empirical data on performance and investment structure, the key drivers behind the affirmation of a dominant business model in the Prosecco industry and to evaluate the effect of exogenous factors as well as of internal dynamics on the resilience of the model in the long run.

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 and 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 et al., 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 et al., 2021). Typically, farms with an Integrated model sell the wine they produce and only minimally bottle wine produced by others. The model is very rigid because it does not allow to manage fluctuations in demand and does not allow companies to push on volume to achieve economies of scale to reduce costs and prices. Integrated Prosecco producers adopt a middle to premium-price position and tend to differentiate from budget wine producers (Pomarici et al., 2019).

The Trader model (sometimes referred to as "bottlers" or as “bottling companies”) is a strongly growth-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 production 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 on international market. Traders make significant intangible investments in marketing to support the penetration of the product (Bresciani and others, 2016; Frigon et al., 2020), usually they don’t invest in land and in vineyards

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

Traders control the largest part of Prosecco production both in volumes and value and apparently, they are the real driver of the exceptional growth experienced by the denomination. Considering the average market shares (in value) from the 2013 to 2021, calculated on our original sample, Integrated producers control 87,5% of the Prosecco production, while Integrated producers contribute for the 12,5%.

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 (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 (Table 1).

While supply chain specialization is effective for sustaining a process of rapid growth in the industry (Mitchell and Coles, 2004; Markides and Oyon, 2010), the effects on the profitability and sustainability of competing firms' business models are quite controversial (Table 2). 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 grapes and/or bulk wine suppliers.

Table 1.
Comparison between Prosecco and Italian wine industry profitability (sources: Italian wine data are proved by the Food Industry Monitor observatory; Prosecco data are elaborated by the authors on the original sample)

Sales growth %	2014	2015	2016	2017	2018	2019	2020	2021	CAGR Sales 2015-2021
Total Prosecco	1,5%	6,1%	6,6%	8,0%	7,6%	2,5%	-4,8%	19,1%	6,3%
Italian wine	1,3%	4,9%	4,8%	6,0%	5,9%	-0,2%	-2,0%	14,4%	4,6%
ROS %									Average ROS 2014-2021
Total Prosecco	5,4%	5,2%	5,1%	5,3%	4,5%	5,1%	5,5%	5,4%	5,2%
Italian wine	5,6%	5,6%	5,9%	5,8%	5,5%	6,1%	5,4%	5,7%	5,7%
ROIC %									Average ROIC 2014-2021
Total Prosecco	8,5%	8,5%	8,5%	8,5%	7,0%	7,0%	7,2%	7,8%	7,9%
Italian wine	6,2%	6,3%	6,9%	6,8%	6,4%	6,4%	5,5%	5,6%	6,3%

Table 2.
Profitability of Prosecco producers with different business models
(sources; Prosecco data are elaborated by the authors on the original sample)

ROS %	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**
Integrated	1,4%	1,3%	0,9%	1,2%	0,4%	0,5%	-0,0%	0,9%
Trader	5,8%	5,7%	5,7%	5,9%	5,1%	5,8%	6,3%	6,1%
ROIC %								
Integrated	1,2%	1,3%	1,0%	1,5%	0,4%	0,6%	-0,0%	1,1%
Trader	10,3%	10,2%	10,2%	10,1%	8,3%	8,2%	8,6%	9,0%

4 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 data that emerged from the analysis of performance and investment structure, applying System Dynamics feedback loop concept to represent relationships between variables. The conceptual model boundaries can be defined as follow: the model represents the internal dynamic of the trader business model, the goal is to identify the relevant positive and negative causal loop diagrams that describe the dynamics of the growth process and the effects on the return on investments (Figure 3).

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 supermarkets feedback loop R1 “Product leverage” (Figure 3), guaranteeing growth in sales and thus promoting growth in company size. The causal loop diagram representing product availability is supported by the reinforcing feedback loop R2 “Price leverage” (Figure 3), 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. Economies of scale 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.

Positive feedback loops, which explain the development of the industry, are confronted with balancing feedback loops (Figure 3) 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).

The first balancing loop, B1 “Invested Capital” (Figure 3) 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 acts as a balancing factor with respect to the strain on capacity investment and growth.

The feedback loop (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. This influences investment decisions and also allows the firm to rely on leverage to continue to invest in productive capacity.

The third balancing loop B3, “Price trap” (Figure 3) 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” (Figure 3) 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.

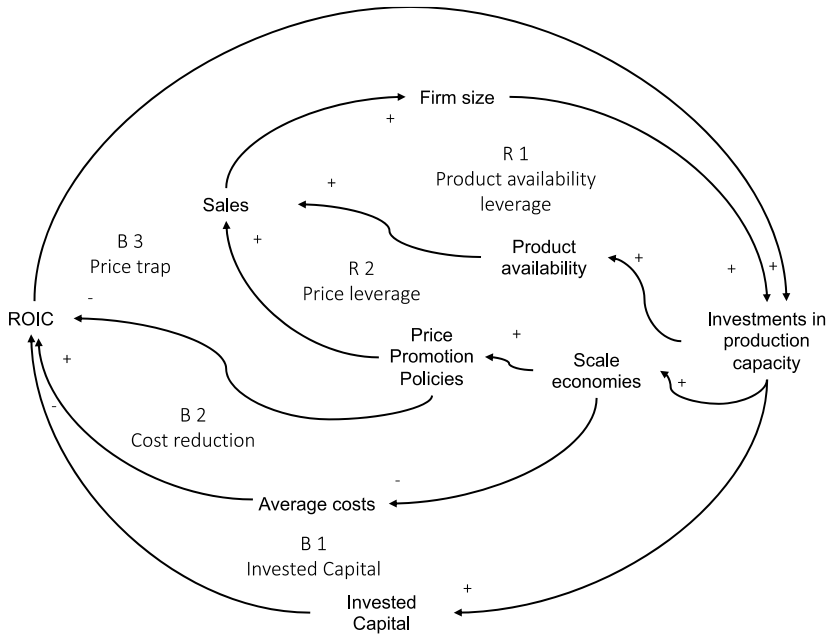

Figure 3. Dominant business model diffusion dynamics. Reinforcing and balancing loops

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.

5 The Diffusion Process of the Dominant Business Model and its Effects on the Company's Strategic Resource Dynamic

In this section we extend the model boundaries and we explore the interaction of Trader business model with the Integrated producer business model, focusing on resource dynamics. A System Dynamics archetype, the so-called "limit to growth" (Figure 4), determined by a combination of a negative loop and a reinforcing loop (Sterman, 2000) can help us to address a relevant critical issue. 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 4, feedback loop B1 "scale economies"). Indeed, Integrated producers need higher prices to generate higher margins and sustain investments in product differentiation as depicted in feedback loop R1 "Differentiation"(Figure 4). 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. Lower profitability resulting from low average prices (due to the actions of Traders) prevents Integrated producers from making these kinds of investments and, thus, from developing premium products. One effect of this dynamic is that Integrated companies have no incentive to continue bottling and selling premium products but are driven to produce grapes and/or bulk wine that can be sold to Traders or to sell directly grapes to Traders, reinforcing the process of spreading the dominant business model.

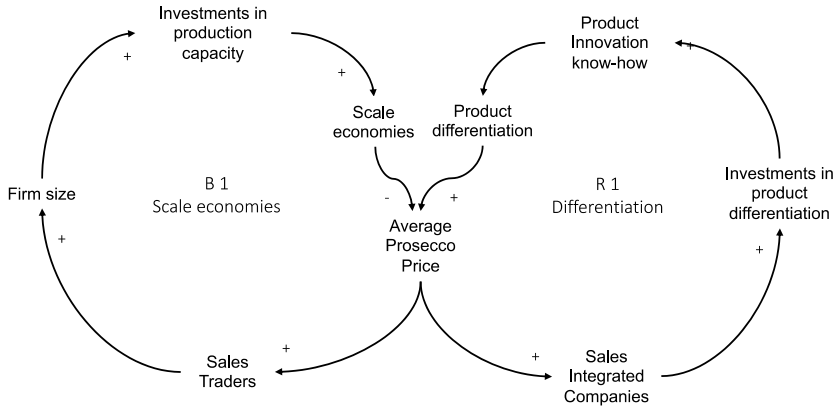

Figure 4. The limit to price growth generated by the interaction between the two business models

The interaction between the two business models affects business resource development processes (Figure 5). Resources are essential components of the business model and determine the possibility for a firm to sustain strategic positioning (Casadesus-Masanell et al., 2017). The market leadership of the Traders implies a continuous increase of their market share thanks to aggressive price policies sustained by investments in production capacity (tangible assets) as depicted in the feedback loop R1 "Traders production capacity". The proportional decrease of Integrated producers market share will determine a significant reduction of product innovation know-how, aimed at differentiation which is important to sell the product with a premium price (Figure 5, feedback loops R2 "Integrated producers innovation know-how").

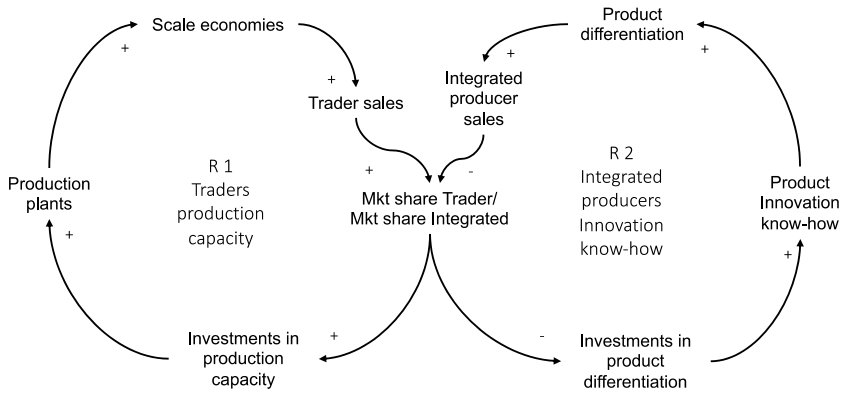

Figure 5. Tangible and intangible resource dynamics

The trader's business model is production-oriented; it is focused on managing winemaking process and logistics. This makes product innovation-know-how less relevant, as selling is done mainly by leveraging price. The gradual reduction of know-how in product innovation leads to a change in the industry entry barrier. Entry barriers related to intangible resources tend to decrease, while barriers related to production capacity increase. Production capacity become the dominant resource around which is built the trader model, while product innovation know-how decreases because of the marginal role of Integrated producers. It's important to point out that tangible barriers based on widely used and accessible technologies, such as those for sparkling wine production, can be more easily imitated (Grant, 2006).

6 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 growth trap that is a situation in which the demand is driven by product availability and low price and companies continue to invest in production capacity to leverage on economies of scale and reduce cost and price. This process reduces the incentives 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: 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. 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 will be economically sustainable, in the long run, if certain 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.

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Annex

Table
ROIC, Return on Invested Capital calculation

ROIC: Return on invested capital
ROIC=$\mathbf{EBIT/IC}$
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