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# **Inventories in the wine industry:**

## **From sector and financial determinants to strategic behaviors**

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### **Key issues of wine inventories study**

Wine inventories constitute a central issue in the wine industry (Koulayom and Chopov, 2007). To our knowledge, no previous study focused on the inventories in the wine industry; no research study presented inventory policies, inventory behavior and inventory performance in this specific industry. This is why we propose in this exploratory study based on qualitative approach, an overview of this question in wine specific sector where inventories play a central role. In this context, this paper aims at providing insight into the determinants of wine inventories, inventory behaviors and wine business strategies', and their impacts on enterprises performance.

### **Context of the study and wine inventories highlights**

The level of inventories is a central issue in wine companies. The characteristics of companies having larger inventories, identified by Rumyantsev and Netessine (2007), i.e. uncertain demand, smaller companies, longer lead times, seems to match with the characteristics of wine companies: According to a study carried out by the French bank Crédit Agricole<sup>1</sup>, inventories in the French wine industry represented 256 days of sales in 2016, against 71 in the whole agro-food industry. This weight increases and is higher than the average level of 2011-2015 (238 days). The wine industry experiences low inventory turnover: making wine needs from six months to several years (at least three in Champagne).

Moreover, according to the same study, the average rate of EBITDA is 9.2% in 2015, and this industry is composed of a lot of SMEs. Debt in small wine businesses is mainly composed of the financing of inventories (Estrade and Koulayom, 2009). In inventory management, companies face a *"compromise between limiting of risk by having a greater inventory level and limiting a cost of inventory"* (Michalsky, 2008, p. 187): wine companies have to find the right level of inventories to hold in order to face demand and make vats be empty and wine warehouses be available for the new harvest.

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<sup>1</sup> Observatoire financier des EAA, special filière vin Crédit Agricole. [http://etudes-economiques.credit-agricole.com/medias/Observatoire7\\_20161118.pdf](http://etudes-economiques.credit-agricole.com/medias/Observatoire7_20161118.pdf)

Finally, in the wine industry the issue of inventories is related to the limited volumes available because of the size of the vineyard, the specifications of the appellations, the yield and the impact of climatic conditions such as drought, hail or frost, weakening the performance and sustainability of these companies. Actually, the change in wine inventories reflects the impact of climatic change (Bukenya and Labys, 2007). This last factor becomes increasingly important for agriculture and the sustainability of wine companies.

### **Conceptual framework and theoretical background: inventories in wine business**

The literature identifies several kinds of inventories: raw materials, finished goods, and work in progress. In wine companies more specifically, inventories are composed of (1) wine in bottles and bag in box, bulk wine (either purchased from wine growers or produced by the company itself), (2) bottles, corks, boxes, and (3) other supplies, including those related to the vineyards. In this study, we focus in wine inventories (bottles, bag in box and bulk wine). The wine industry is composed of several kinds of wine companies, namely cooperatives, wine-growers, wineries, merchants, but nowadays each of these families can grow vines, produce and sell wine.

The high concentration of the industry results in wine groups, even family ones, composed of one or several entities growing vines, making wine and selling it: the integration of the value chain is often complete within the same group. A wine grower can either sell his harvest to another company or produce his own wine, a merchant or a cooperative. Similarly, a merchant can either produce its own wine, or just buy wine to resell it. The nature of inventories and the strategies associated to “who holds inventories” impacts all the management of the firm, and consequently inevitably its performance. In this article, we will focus on wine growers producing their own wines, but possibly selling a part of their bulk wine to merchants.

**1. Literature about inventories:** Inventory management is part of operations management and cost accounting fields. According to Qian (2018), the literature on inventory management either studies optimal inventory policies, or inventory behavior, and inventory performance. Several models have been developed in order to minimize all the costs related to inventories and their financing; one of the most famous and simple being the economic order quantity, i.e. the optimal quantity to order (Choi *et al.*, 2018). Several costs are related to inventories, i.e. purchasing costs, ordering costs, carrying costs, stockout costs, cost of quality, and shrinkage costs (Choi *et al.*, 2018).

**2. Determinants of inventories:** Mathuva (2013) identifies firm, time, industry and economy-level determinants of inventory holdings. According to the classical inventory theory, inventories are determined by technological and managerial factors (Lieberman *et al.*, 1999). In the wine industry, and more specifically in France, the level and the management of inventories is influenced by a set of institutional rules and practices.

- Actually, the system is organized according to the geographical indications of origins (GIO). There exist specifications for each of these designations, which constraint the length of storage before selling the wine. Actually, the specifications can decrees companies not to sell their wine before a given date. This implies an additional need of short term resources during this period of storage.

- Another system impacting wine inventory management exists and regards wine under geographical indications of origins. Wine companies can constitute an individual complementary volume. In times of good harvests, they are allowed to store 20% (instead of 10% until then) of their harvest each year to half a year of harvest along three years. This system has been developed in order to limit the effect of climatic changes, which can seriously compromise the sustainability of wine businesses. This appears to be an interesting and cheap kind of insurance against climatic hazards; actually the only constraint is to purchase vats to store this excess of wine. In Champagne, this system of reserve is institutionalized and each company must constitute it.

- The French system also includes the principle of “en primeur” wines. This looks like futures, i.e. derivatives allowing buying wines before they are bottled, and at a cheaper price, two to three years before wine is released. While wine is still in barrels, it can be purchased in advance. Even if it means that the winemaker has to support the storage of wine, he benefits from direct cash, aimed at financing working capital because one part of the price is paid in advance and the other part (VAT, delivery costs) when delivery is effective.

**3. Financial implications of inventories:** Inventories and payables are one key for business success. Globally speaking, the literature agrees to say that more aggressive (vs. conservative) working capital policy impact negatively the profitability of firms (Aminu, 2012). The results of studies about the relationship between inventories and profitability are mitigated (Mathuva, 2013). Capkun *et al.* (2009) found a positive correlation between inventory performance (average between inventories beginning and end of year divided by sales) and financial performance and firm valuation in US manufacturing firms. Aytac *et al.* (2016) studied the impact of working capital management (WCM) on firm profitability in the French wine industry. They found that the delay in converting inventories to cash does not significantly impact profitability, while the theory expects a negative impact. Dimson *et al.* (2015) found that the return of wine depends on the quality and the number of years of maturing. The most profitable wines are “*young maturing – high quality vintages*”. According to Esteban *et al.* (2018), inventories play a different role for profitability, depending on the kind of market targeted for the wine (generic or specific wine).

### **Empirical methodology**

In October and November 2018, we carried out an exploratory study on French wine companies, and more precisely SMEs. We interviewed ten companies (by telephone) but also one bank (face-to-face), and two chartered accountants (face-to-face), with one hour and half at least for each interview.

The interviews aimed to confront the approach of the different stakeholders, identifying the key issues related to inventories in the wine industry, and identifying the practices in terms of inventories' valuation, financing and management. Each interview of companies was composed of several parts: description of inventories, inventories' management, inventories' valuation, inventories' financing and main problems related to wine inventories.

The interviews of banks and chartered accountants aimed to provide complementary information about the way wine companies manage their inventories. With a qualitative approach, we compared the answers of the respondents in order to identify inventory behaviors and the determinants of wine inventories.

## Main findings

This exploratory survey made possible the identification of several features in inventory behavior for wine companies.

**-Wine inventories determinants':** inventories seems to be a problem more for smaller companies in producing regions where land is not valued at a high level, and for companies specializing in long-ageing wines. Companies selling both bulk wines and wine in bottles have to make a trade-off on the volume of bulk wine to sell according to market prices, demand, and the need for cash. There exists a cyclical management of inventories before and after harvest.

**-Financial and strategic implications of wine inventories behaviors':** Inventories are financed with equity and/or permanent short term financial debts (overdraft, commercial paper). The level of debt lent by banks depends on the producing cycle of wine. The valuation of inventories by banks is based on market price instead of production cost and financial statements. The security relies on land (price and availability) which depend on the region.

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