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Solvency and Performance of French Wineries in Times of Declining Sales: Co-operatives and Corporations

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ABSTRACT

The paper assesses the ability of French wineries to prevail over the crisis of French wine in the years 2000. Corporations are distinguished from co-operatives:

Over the 2000-2006 period in spite of sales fluctuations, French wineries did not increase their financial debt level substantially. Such result supports the traditional static trade-off theory (TOT). Co-operatives were able to absorb part of the impact of the wine crisis at the expense of their members, in increasing account payables to member. Corporations have not increased trade account payables to vine growers.

In the mid-2000s, the French wine crisis has not been strong enough to shake the financial structure of co-operatives and corporations. But co-operatives look more affected. However, sales of French wines dropped a lot more in 2009 and financial data are not yet available to observe the consequences.

Keywords: winery, co-operative, strategy, debt, leverage, performance, wine, crisis

1 Introduction

The sales of French wines have plummeted during the year 2000s on the domestic and exportation markets. From the first cooperative winery established in Languedoc in 1901 to overcome overproduction and declining price of wine, nowadays 870 cooperative wineries produce 51% of French wines. The industry is very fragmented. Marketing investments and strategies differ among corporations and co-operatives.

The objective of the research is to assess the ability of French wineries to prevail over the crisis of wine in the current decade. More specifically the capacity of wine companies to preserve optimal structure of financing during a crisis is investigated. Wine companies are relatively small familial firms with relatively little access to capital markets. Moreover, for governance reasons (the will of the family to keep the control) they are reluctant to ask for external financing. A crisis, by reducing internal source of funds, could badly hurt their capacity to finance investments. Under investment will deteriorate their competitive position amercing a vicious circle. Corporations will be distinguished from co-operatives. In the literature financing is often seen as the "Achilles heel" of cooperatives in an increasingly concentrated, tightly coordinated and capital-intensive food system (Vitaliano, 1983; Cook, 1995). This financial weakness of cooperatives is probably even more present in crisis periods.

The paper is organized as follows. First theoretical foundations in the financial and governance theories are presented. Second, empirical observations in the wine industry are reported. Third, the procedures are shown: methodology and data. Fourth, results are given. Finally conclusions are drawn with managerial implications.

2 Theoretical Foundations

Research work is based on financial theory (optimal financial structure: effect of leverage and default risk) and principles of management in cooperatives (the maximization of the price of grapes brought by co-op members and not the maximization of coo-op profit). First, the paper presents the classical capital structure theories and emphasis on the main determinants of capital structure. Then, the paper investigates the theoretical foundation and empirical findings on the specific impact of companies' status (corporations or cooperatives) on capital structure. Finally the impact of crisis on capital structure is studied.

2.1 Capital Structure theory

Optimal leverage ratio

The most important financial decision is choosing the level of financial leverage, that is, the debt to equity ratio. Assuming the absence of income tax, financial market imperfections (like transaction costs) and bankruptcy costs, Modigliani and Miller (1958) show (1) that the cost of capital for a firm does not depend on its capital structure in terms of debt or equity and (2) that the value of a firm is therefore unaffected by its financial leverage. So, the impact of financial structure on the value of a firm is irrelevant.

However income tax and bankruptcy costs exist. Financial leverage affects firm value in two ways: (1) interest expenses are deductible from income tax, generating tax savings; and (2) financial leverage increases bankruptcy costs because of the risks of default on interest payments and/or debt capital repayment. Corporations will increase their financial debt as long as bankruptcy costs remain low (Modigliani and Miller, 1958).

Since 1958, the literature on capital structure has expanded with many theoretical and empirical contributions mainly focused on three major theories to explain corporate leverage and its evolution.

The first theory is the traditional static trade-off theory (TOT). It states that firms choose an optimal capital structure in comparing the tax benefits of debt, the costs of bankruptcy and the costs of agency of debt and equity. Financial debt plays a disciplinary role and is less costly than equity capital. Optimal leverage minimizes the cost of capital and maximizes the value of a firm (Modigliani and Miller, 1963; Stiglitz, 1972; Jensen and Meckling, 1976; Myers, 1977; Titman, 1984).

The second theory is the pecking order theory (POT) (Donaldson, 1961; Myers and Majluf, 1984; Myers, 1984). Due to information asymmetries between insiders and outsiders, companies prefer to be financed first by internal resources, then by debt and finally by stockholders' equity. The debt to equity ratio depends on the degree of information asymmetry, on the capacity for self-financing and on the other constraints related to sources of financing. So, the level of leverage reflects past profitability and investment opportunities of firms.

Empirical determinants of capital structure

Theory suggests that the major determinants of capital structure are size, asset structure, profitability, risk and growth. Most of these variables may have contradictory effects on capital structure as explained below.

Size

Relative bankruptcy costs and probability of bankruptcy are negatively related to firm size because larger firms have more assets as collaterals and are more diversified, so they can divest some division in case of distress. Hence, they are likely to borrow from banks on better terms. (Warner, 1977; Ang *et al.*, 1982; Pettit and Singer, 1985; Titman and Wessels, 1988). In contrast smaller enterprises may find it more costly in relative terms to resolve informational asymmetries with lenders and financiers, which discourage the use of outside financing (Chung, 1993; Grinblatt and Titman, 1998). And they are more likely to be liquidated when they are in financial distress (Ozkan, 1996). So, large firms may be higher leveraged than small enterprises… and then take more risks. Consequently, size may be not so clear.

Asset structure

Bank financing is enhanced in pledging assets (particularly tangible assets) as collateral (Storey, 1994; Berger and Udell, 1998) because it reduces adverse selection and moral hazard costs (Long and Malitz, 1992). However, tangible assets may lead to increasing risk due to in higher operating leverage (which is fixed costs divided by total costs) and then have a negative impact on financial leverage (Hutchinson and Hunter, 1995). Some intangible assets, such as reputation, are also viewed as a guarantee by debt holders (Balakrishnan and Fox, 1993).

Companies with higher liquidity ratios might be able to stand a relatively higher debt ratio due to greater ability to meet short-term obligations (TOT). On the other hand, firms with greater liquidities may use them to finance their investments (POT). Therefore a company's liquidities should have a negative impact on its leverage ratio (Ozkan, 2001). So, Liquidity ratios may have a mixed impact on the capital structure decision.

Profitability

There are conflicting theoretical predictions on the effects of profitability on leverage. With POT, profitable firms can use their earnings for self-financing instead of borrowing money. But from the TOT point of view, more profitable firms are exposed to lower risks of bankruptcy and have greater incentive to use debt to exploit interest tax shields. Jensen (1986) views debt service as a discipline tool to increase profits and cash-flows in order to be able to meet financial commitments. So, he predicts a positive relationship between profitability and financial leverage.

Risk

Since higher variability in earnings indicates that the probability of bankruptcy increases. The TOT theory infers that firms with higher income variability have lower leverage (Bradley *et al.*, 1984; Kester, 1986; Titman and Wessels, 1988) to lower the volatility of their profit. From a POT perspective, firms with high volatility of results try to accumulate cash during good years, to avoid under-investment issues in the future so a negative relation between operating risk and leverage is also expected.

Growth

Growth opportunities can be analyzed as an intangible asset (Myers, 1984; Williamson, 1988; Harris and Raviv, 1990), in case of bankruptcy, their value will be close to zero. As bankruptcy costs increase, following TOT, the level of debt must decrease. Firms with less growth prospects have more free cash flows and should use debt for its disciplinary role (Jensen, 1986; Stulz, 1990). Firms with growth opportunities may invest sub-optimally, and therefore creditors will be more reluctant to lend for long horizons. The conflict between shareholders and debt holders due to growth opportunities can be solved by short-term financing (Titman and Wessels, 1988) or by convertible bonds (Jensen and Meckling, 1976; Smith and Warner, 1979).

Growth necessitates important financing that can not always be fulfilled by internal financing. If pecking order arguments are applied, firms with relatively high growth will tend to issue securities less subject to information asymmetries, i.e. short-term debt. This should have the result that firms with relatively higher growth have more leverage.

Non-debt tax shields

The tax advantage of leverage decreases if the company has other mean to reduce taxes (DeAngelo and Masulis, 1980). So companies with no debt tax shields, such as tax deductions for depreciation and investment tax credits, should be less levered.

Implications for the present research

For shareholders, financial debt leads to an increase in the rate of return on equity (ROE) when the rate of return on operating assets (ROA) is greater than the interest rate required by lenders (see the appendix for detailed explanations). Financial leverage offers greater potential returns for the investor than would be available otherwise. However, debt involves risk, which is borne by shareholders. The loan principal and all accrued interest must be repaid, even if the operating income from the investment is lower than expected and the cash flows generated are insufficient to meet debt capital repayment and interest expenses. Uncertainty about lower future income increases bankruptcy costs. Thus, financial leverage lowers income tax payments but increases bankruptcy costs and therefore shareholders' ROE requirements. A higher debt to equity ratio leads to a higher required ROE, because of the higher risk involved for equity-holders in a company with debt (Modigliani and Miller, 1963). The optimal capital structure depends on the debt interest rate, the income tax rate and the cost of equity in order to maximize corporate value.

Financial indicators were selected to examine the behavior of the model: total sales, operating income (also named Earnings Before Interest and Taxation (EBIT)), operating margin as EBIT to sales.

2.2 Governance and principles of management: corporations versus co-operatives

Deshayes (1998) used the agency theory to analyze the governance and economic logics of corporations and co-operatives. Corporations maximize profit for their equity shareholders and profit is the residual income. Cooperatives maximize the price of agricultural products (here grapes) brought by co-op members. The return on equity capital is not risky, but limited by law to the rate of returns of corporate bonds published every semester by the French Ministry of Economics. So the price paid for co-op members' agricultural products is the variable to adjust results (Pérez, 2003; Coelho and Rastoin, 2004). The price paid by co-ops for agricultural products provided by co-op members depends on decision of the board of directors. As a result, the value of total sales, EBITDA and EBIT depends on internal policy decisions made by farmers and may not fully reflect cost efficiency and output market price. As a result, the values of total sales, EBITDA and EBIT in co-ops and corporations are not fully comparable.

Cooperatives capital structure is largely related to the incentive system in the vaguely defined property rights of cooperatives (Cook, 1995). Equity capital acquisition is limited by the number, the wealth, and the risk-bearing capacity of its current members. Moreover, cooperatives members lack incentives to invest because of free rider, horizon and portfolio constraints (Knoeber and Baumer, 1983; Cook and Iliopoulos, 2000). Finally, cooperatives have limited access to outside sources of equity capital because of restrictions on residual claims (Hart and Moore, 1996). Therefore, everything being equal, cooperative should rely more in debt than in equity capital (Lerman and Parliament, 1990, 1993). Lerman and Parliament (1990) show that median leverage ratios are not significantly different for cooperatives and comparable corporations in food-processing industries. Lerman and Parliament (1993) find that, contrary to theoretical expectations agricultural cooperatives equity capital is not statistically different from the national average (in the USA) of non-financial corporations.

2.3 Capital Structure and Business cycle

It is widely acknowledge that firms' capital structure and financial performance evolve with the business cycle, Oliveira Martins and Scarpetta (2002) give a brief survey of the theoretical and empirical literature on this subject. Companies financially fragile are more subject to a flight to quality in the access to external finance at the onset of an economic downturn (Bernanke, Gertler, and Gilchrist, 1996). A vicious circle dynamic arises: insufficient financing leads to insufficient investments and poor future financial performance leading to the fall of internal funds and thus in available finance etc.

3 Empirical Observation in the French Wine Consumption

The consumption of French wine has declined from 2001 to 2008, in volume and value. In volume, both domestic and exportation market declined both by 14% over the 2001-2009 period. The paroxysm was reached in 2003 and 2004 and further in 2009. In value, the export market declined strongly (by 4.5%) in 2004 and even more dramatically by 18.8% in 2009.

Table 1.
Consumption of French wine in volume, 2001-2008 (in million hectoliters)

Year	2001	2002	2003	2004	2005	2006	2007	2008
Domestic market	33	32	31	30	29	29	29	28
% annual change		*-2,2%*	*-4,3%*	*-2,2%*	*-3,7%*	*1,7%*	*-1,2%*	*-3,1%*
Exportation market	16	15	15	14	14	14	15	13
% annual change		*-3,2%*	*-2,4%*	*-5,8%*	*-1,9%*	*5,8%*	*3,0%*	*-9,8%*
Total market	48	47	45	44	42	44	44	41
% annual change		*-2,5%*	*-3,7%*	*-3,3%*	*-3,2%*	*3,0%*	*0,2%*	*-5,3%*

Source: Data directly provided to authors by Fédération française des vins et spiritueux and Fédération des exportateurs de vins et spiritueux de France, 2001-2010

Table 2.
Exportations of French wines in value, without VAT (in million euros)

Year	2001	2002	2003	2004	2005	2006	2007	2008	2009
Exports (in million euros)	5 285	5 628	5 736	5 481	5 519	6 160	6 674	6 737	5 473
yearly change in %		*6,5%*	*1,9%*	*-4,5%*	*0,7%*	*11,6%*	*8,3%*	*0,9%*	*-18,8%*

Source: Data directly provided to authors by Fédération française des vins et spiritueux , 2001-2010

So, it is hypothesized that such a decreasing demand may have affected the financial structure and profitability of wineries. Did wineries react differently according to their mode of governance due to their legal status, i.e. co-operatives versus corporations?

4 Variables and Data

In this section we present and justify the variables we selected in the empirical study and give the characteristics of the sample.

4.1 Variables

The financial characteristics of wineries, in distinguishing cooperatives from corporations, is analysed with reference to three complementary aspects:

1/ Commercial features are measured by sales and growth of sales.

Total sales indicate business size in order to control for size effect.

Growth of sales analysed over several year is relevant to compare co-ops and corporations that are in competition. The criterion shows the ability to expand business overtime.

2/ Capital structure is very relevant to compare the solvency of co-ops and corporations. It is measured by the following ratios: financial leverage, measured as the financial debt to equity, long term to total assets, short-term debt to total assets, and trade account payables to suppliers divided by total assets.

Financial leverage is measured by financial debt capital to equity capital. It is usually used to assess the independence of a company with regard to bankers. Banks should not take more risks than shareholders. In most companies without large inventories, the ratio is inferior to 1. However the wine making process requires time, so the industry must finance investments and heavy stocks of barrils and/or bottles that are easy to sell in the forthcoming months. So, the ratio is expected to be superior to 1, even though the lower the better to avoid risk.

The ratio “long term debt to total assets” provides an insight about sustainable financing of business. Long term debt refers to debt maturing within more than one year.

The ratio “short-term debt to total assets” shows how fragile is the source of financing of business, since short-term debt matures within less than one year. Rolling over is uncertain if bankers do not agree to lend money. So, short-term debt is riskier than long-term debt.

The ratio “trade account payables to suppliers divided by total assets” is very important to compare co-ops and corporations according to their different mode of governance explained above. In co_ops, co-op members are the main suppliers. They elect the board of directors which may ask for longer terms of payments or may be more sensitive to requests for shorter delays. Even for corporations, financing by suppliers can become a substitute to rarefying banks financing in period of crisis.

3/ Economic and operating performance indicators are difficult to choose. Financial measures of performance such as profit margin and return on equity (ROE) are not relevant for co-operatives. As mentioned above in the literature, the objective of a co-op is not to maximize members’ equity capital, but to maximize the price of grapes paid to members. Vine growers provide both equity capital and grapes.

Again as mentioned above in the literature, output prices in cooperative depend on decisions made by board of directors; it is not easy to compare co-ops with corporations in terms of sales. However, despite their imperfection some criterions may be used:

growth of sales,
EBIT growth rate, (EBIT stands for earnings before interest and taxation),
average operating margin, which is EBIT to sales, that indicates the commercial performance of the company (profit generated by 1 € of sales),
and rate of return on operating assets, i.e. EBIT divided by fixed assets and required working capital that measure the economic performance of the company (profit generated by economic assets),

Heyder et al. (2011) used return on sales as EBIT to sales to assess the performance of both agricultural co-ops. Analyzing their evolution is more relevant than discussing their level at a point of time.

4.2 Data

All variables are measured using book values because the data come from financial statements only. The Diane (Bureau van Dijk) data bank is one of the most comprehensive financial data bank with 850,000 French firms. Data over the period 2000-2006 were available for a sample of 806 French wineries including 94 co-ops, which is 12% of the sample. Public limited companies and limited liability companies are corporations gathering 86% of the wineries in the sample.

Table 3.
Legal forms of French wineries in the sample

Legal form of French wineries in the sample	Number of wineries	Proportion of total wineries
Public limited company (SA, SAS)	518	64%
Limited liability company (SARL), non-trading company (SNC)	176	22%
Co-operative	94	12%
Other legal forms	18	2%
Total	100	100%

5 Empirical Findings

Our empirical investigation is divided in two parts. In the first part the impact of business cycle on the three complementary aspects presented above (commercial, capital structure, financial performance) are analyzed essentially through descriptive statistics. The objective is to check if during the studied period (2000-2006) companies in the French wine industry have known important variations of the three components and to detect the time period of the crisis. Moreover we want to know if the period of crisis and the impact of crisis on commercial aspects, financial structure measures and financial performances are similar for corporations and for cooperatives. In the second part, an econometric study is conducted to determinate the impact of traditional determinant of capital structure and therefore test the pertinence of capital structure theory during this period and for the wine industry. This study complements the one of Viviani (2008) on capital structure determinants in the French wine industry. Compared to this study, original contributions of our paper in this part are first, to add two non-often tested determinants of capital structure; the status of companies (corporation or cooperative) and the impact of business cycle indicators and second to take into account the panel data structure of the sample.

5.1 Financial impact of French wine industry crisis

Tables 4 and 5 , as well as figures 1 and 2, show that the French wine crisis was at its paroxysm in 2004 and 2005 with the lowest operating margin level of about 5% while it reached about 9% in 2000.

The findings are similar, whatever the legal status of wineries is. However, the gearing ratio (as financial debt to equity ratio) remained at 1.23 for co-ops over the period while for corporations it slightly increased from 1.67 in 2000 to 1.87 in 2004. Co-ops have increased their account payables to suppliers (mainly co-op members who provide grapes) while corporations have not. Hence, co-ops were able to absorb part of the impact of the wine crisis at the expense of their members.

In conclusion, the crisis was not strong enough to shake the financial structure of co-ops and corporations.

Growth of sales

Table 4 and figure 1 enable to compare co-ops and corporations. Co-ops faced crisis over a longer period and at a deeper degree with negative growth sales from 2004 to 2006.

Table 4.
Growth rates of sales of French wineries: corporations and co-operatives, 2000 - 2006

Growth rate of sales	01/00	02/01	03/02	04/03	05/04	06/05
Corporations	1.9 %	6.9 %	1.2 %	4.2 %	-0.4 %	2.5 %
Co-operatives	5.0 %	2.2 %	3.3 %	-1.3 %	-0.8 %	-1.5 %
Corporations and co-ops	2.2 %	6.6 %	1.4 %	3.8 %	-0.4 %	2.2 %

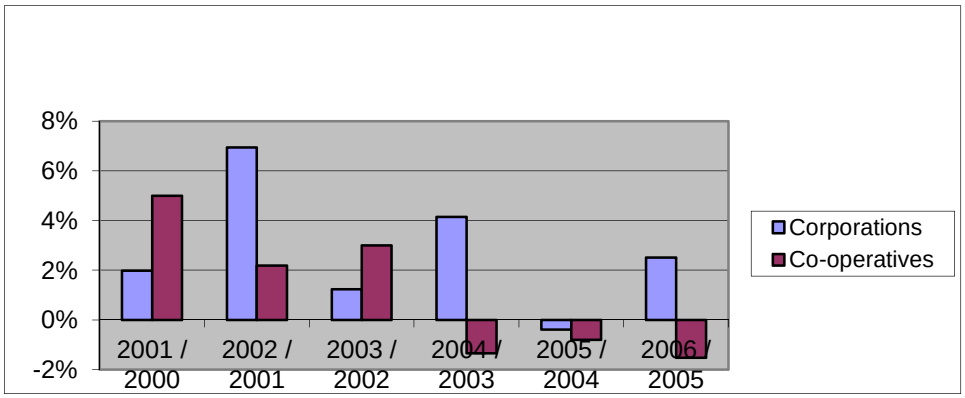

Figure 1. Growth rate of sales for corporations and co-operatives

Financial structure

As expected and exhibited on table 5, the financial structure of French wineries evolves towards less equity and more debt as the crisis expands from 2000 to 2004 and stabilization in 2005. The gearing goes down form 2000 to 2006 for both corporations and co-operatives.

Long term debt to sales goes up slowly while short term debt to sales increases up to 2004 and then decreases. Does it mean that crisis leads first to a rise in short term debt with some slow trade-off with long term debt? Corporations are more leveraged than co-ops. Co-ops hold more long term debts than corporations while it is the opposite for short term debts.

Corporations were not able to transfer their difficulties to their suppliers since the trade account payables to sales ratio slightly decreases along the period. In contrast, co-operatives could increase their trade account payables to sales ratio. Co-op' board of directors succeeded in increasing debt to co-op members (who provide grapes), since they account for a large part of suppliers' debt.

Globally from 2000 to 2006, the crisis was not strong enough to shake the financial structure of the French wineries. But co-ops were able to increase their debts to their suppliers (members) expressing the importance of the mode of governance. Corporations were not able to do so.

Table 5.
Financial structure of French wineries, 2000 – 2006

Gearing as financial debt to equity ratio	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**
Corporations	1.67	1.75	1.78	1.77	1.87	1.80	1.29
Co-operatives	1.23	1.10	1.27	1.18	1.23	1.18	1.23
Corporations and co-ops	1.63	1.68	1.72	1.70	1.79	1.73	1.28

Long-term debt / total assets	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**
Corporations	17.9 %	17.6 %	18.1 %	18.6 %	18.7 %	19.0 %	20.7 %
Co-operatives	21.6 %	24.1 %	20.7 %	22.0 %	22.1 %	24.1 %	25.0 %
Corporations and co-ops	18.2 %	18.7 %	18.4 %	19.0 %	19.0 %	19.6 %	21.2 %

Short-term debt / total assets	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**
Corporations	6.2 %	6.3 %	6.8 %	6.7 %	6.6 %	5.9 %	6.1 %
Co-operatives	2.0 %	3.3 %	2.9 %	3.9 %	3.6 %	4.0 %	3.4 %
Corporations and co-ops	5.8 %	6.0 %	6.3 %	6.4 %	6.3 %	5.7 %	5.8 %

Trade account payables to suppliers / total assets	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**
Corporations	31.0 %	301.0 %	29.8 %	29.6 %	28.9 %	28.9 %	28.7 %
Co-operatives	24.0 %	24.7 %	26.2 %	24.8 %	26.4 %	26.6 %	28.6 %
Corporations and co-ops	30.4 %	32.1 %	29.3 %	29.0 %	28.6 %	28.6 %	28.7 %

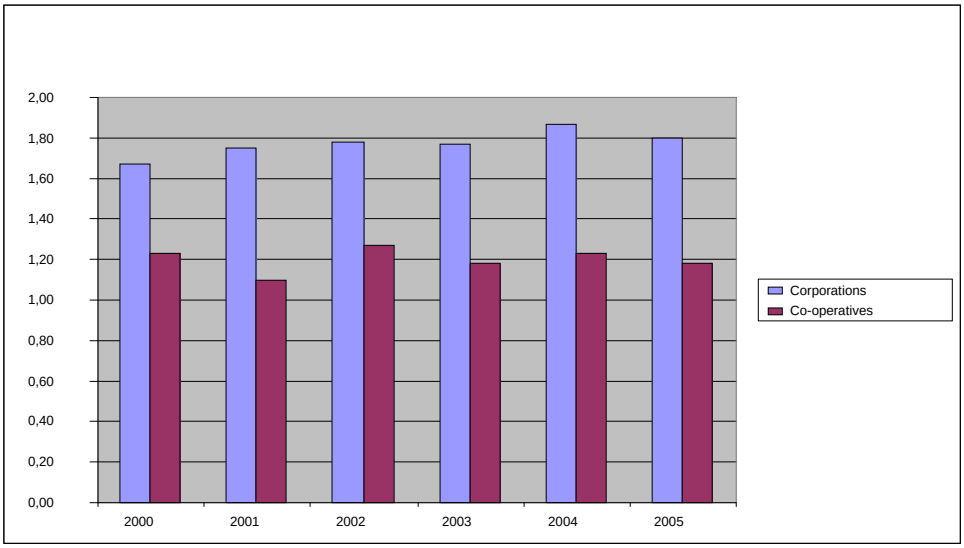

Figure 2. Financial Debt to Equity Capital, for corporations and co-operatives

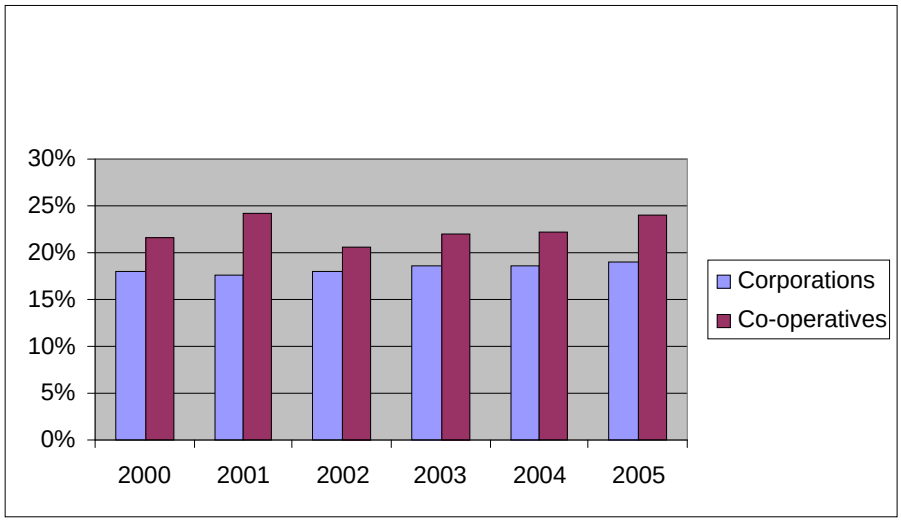

Figure 3. Long-term Debt/Total Assets, for corporations and co-operatives

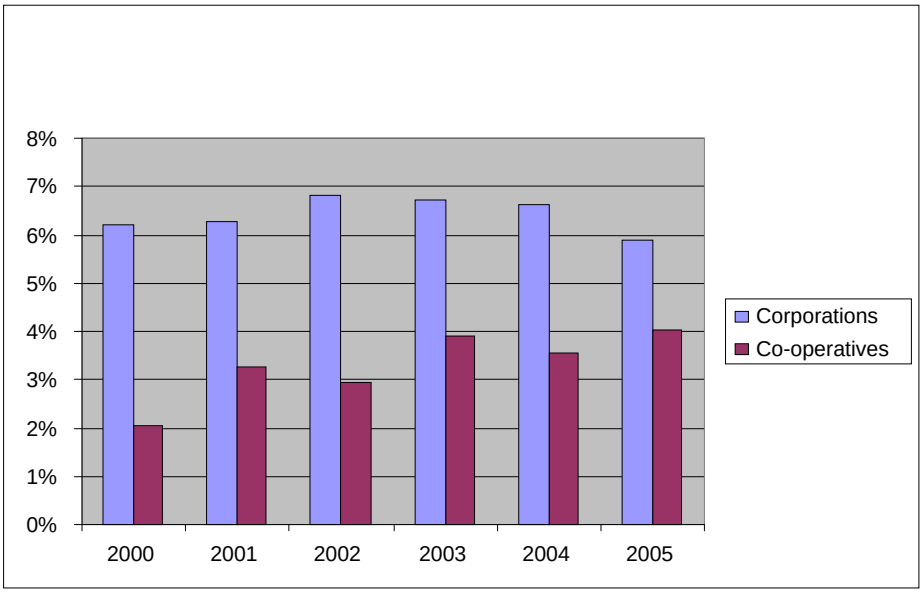

Figure 4. Short-term Debt/Total Assets, for corporations and co-operatives

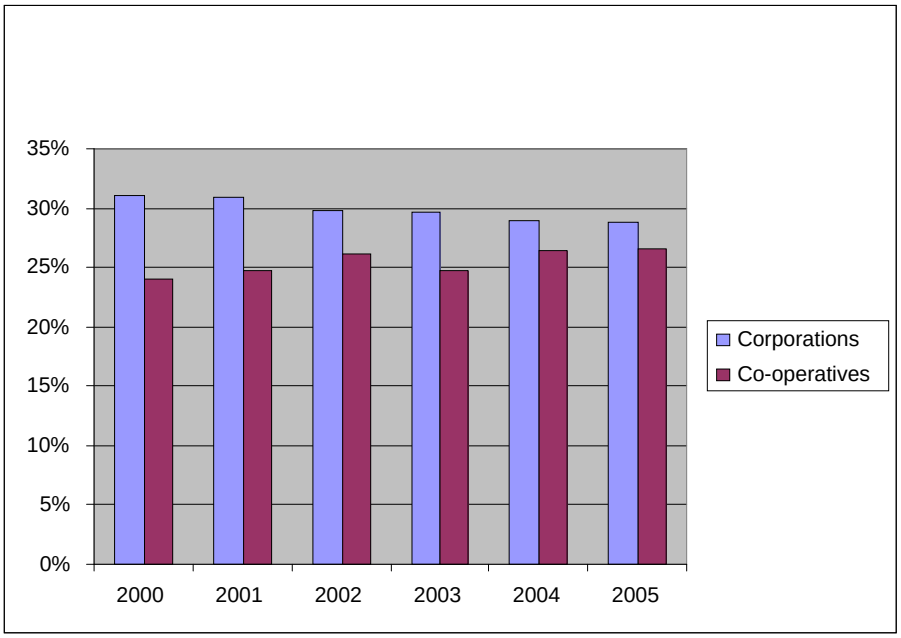

Figure 5. Trade account payables to suppliers**/** Total Assets, for corporations and co-operatives

Economic profitability

Notice, that part of vine growers' payoffs is included in operating costs, i.e. grape costs. So, the interpretation of performance results is not easy for co-ops.

The economic profitability of French wineries – corporations as well as co-operatives - plummeted to reach a low point in 2004. However, not only co-ops faced crisis over a longer period, but also at a deeper degree with lower profitability from 2004 to 2006 as shown on table 6 and figures 6, 7 and 8.

For instance in 2004, the EBIT of co-ops decreased by 36.9% while the EBIT of corporations increased by 2.8% as described on table 4 and figure 6.

The average operating margin of co-operatives went down to 3.0% in 2004 and 2.0% in 2005 as on table 6 and figure 7. In contrast for corporations, the average operating margin amounted to 5.7% in 2004 and 2005.

Similarly, co-ops experienced low rates of return on operating assets of 3.0% in 2004 and 2005 while corporations obtained higher performance with 9.9% in 2004 and 2005. This is mentioned on table 6 and exhibited on figure 8.

The fact that co-operatives perform less than corporations may be due to higher price paid for grapes to their members. The board of directors of co-ops may be pressured by co-op members to increase grape price. The results may also reflect that co-operatives often invest less in intangible assets, such as brands and other marketing tools.

Table 6.

Economic performance of French wineries: corporations and co-operatives, 2000 - 2006

Growth rate of operating income (EBIT)	**01/00**	**02/01**	**03/02**	**04/03**	**05/04**	**06/05**
Corporations	-4.5 %	8.8 %	-10.9 %	2.8 %	7.1 %	17.0 %
Co-operatives	-4.0 %	26.1 %	-2.8 %	-36.9 %	12.7 %	-19.2 %
Corporations and co-ops	-4.23 %	9.32 %	-10.59 %	1.34 %	7.25 %	16.12 %

Average operating margin (EBIT to sales)	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**
Corporations	9.4 %	7.0%	7.4 %	6.5 %	5.7 %	5.7 %	6.8 %
Co-operatives	3.4%	3.7%	4.8 %	4.1 %	3.0 %	2.2 %	5.0 %
Corporations and co-ops	8.7 %	6.6%	7.1 %	6.2 %	5.4 %	5.3 %	6.0 %

Rate of return of operating assets (EBIT / operating assets)	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**
Corporations	12.1 %	14.5 %	13.0 %	15.1 %	9.9 %	9.9 %	11.5 %
Co-operatives	4.2 %	3.0 %	4.4 %	6.9 %	4.6 %	3.0 %	1.5 %
Corporations and co-ops	11.4 %	13.3 %	12.0 %	14.1 %	9.4 %	9.1 %	10.4 %

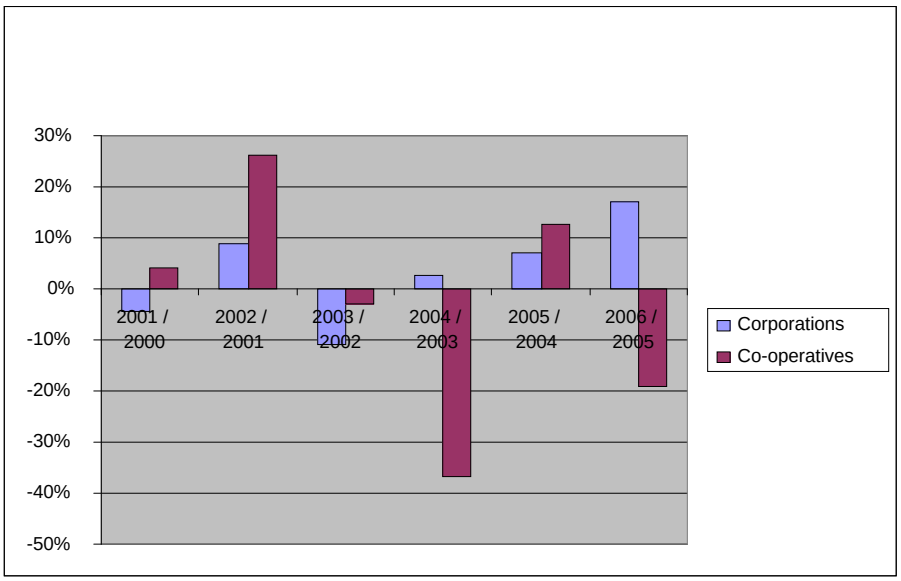

Figure 6. EBIT growth rate for corporations and co-operatives

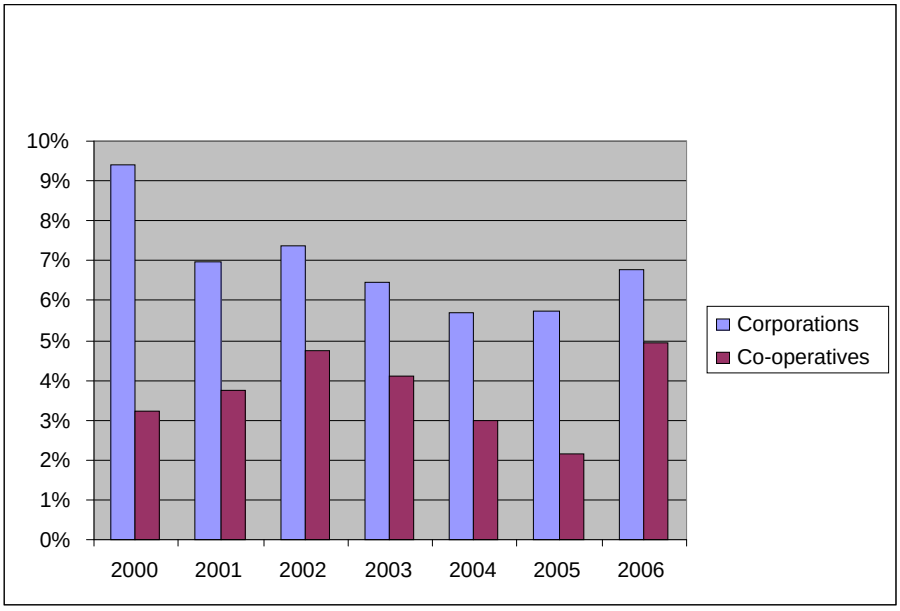

Figure 7. Average operating margin for corporations and co-operatives

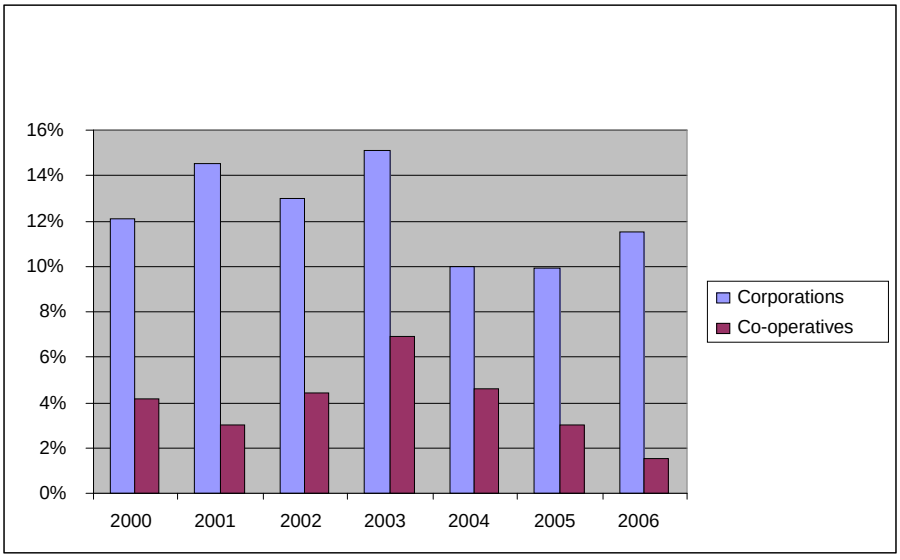

Figure 8. Rate of return on operating assets for corporations and co-operatives

5.2 Capital structure determinants in period of crisis

We implement 3 different models. All models have for objective to test the theory of capital determinants but add new independent variable to the classical ones presented in the theoretical section (size, profitability, non-debt tax shield and tangibility). In the first model we want to investigate if the status of the company (corporation or cooperative) has an impact on capital structure (controlling for classical determinants). The two other models aim to capture the impact the impact of the crisis in the French wine industry on the various aspects of the capital structure of companies. Two proxies are used to measure the crisis: the first one is the aggregated level of sales (we sum the sales of all companies in the sample, knowing that the sample is representative of the wine industry), the second one the aggregated level of profits (sum the profits (EBIT) of all companies in the sample).

To cope with the panel structure of the data, we use Generalized Least Squares regression (GLS) with random effect methodology. We construct two different indexes of the business cycle in the wine industry: the aggregate sales and the aggregate profits of all the companies in our sample. This choice seems to us justified by the fact that our sample is representative of the whole wine industry.

Table 7.
Impact on long-term debt / total assets

The long-term debt to total assets ratio is the dependant variable
Stars *, **, ***, indicate significance at 10%, 5%, 1%, respectively, p- values are given in parenthesis.

Independent variable	Model 1 Corp./Coop.	Model 2 Aggregated sale	Model 3 Aggregated profit
Size (turnover)	$-1.7\ 10^{-7}$ * (0.084)	$-1.84\ 10^{-7}$ * (0.064)	$-1.78\ 10^{-7}$ * (0.073)
Profitability (EBIT / Sales)	-0.034 ** (0.011)	-0.035 ** (0.011)	-0.035 ** (0.010)
Non debt tax shield (Depreciation and amortization / Sales)	-.000757 ** (0.04)	-.00076 ** (0.038)	-.00076 ** (0.04)
Tangibility (Net tangible assets / Total assets)	$7.84\ 10^{-6}$ ** (0.03)	$-1.42\ 10^{-6}$ (0.996)	$-1.42\ 10^{-4}$ (0.957)
Dummy (1. Corporations 2. Cooperatives)	0.04125 ** (0.03)		
Aggregated Sales		$8.25\ 10^{-10}$ (0.695)	
Aggregated Profit			$-1.33\ 10^{-8}$ (0.47)
Constant	0.149 *** (0.000)	0.184 *** (0.000)	0.088 *** (0.000)
Wald chi2	18.76 *** (0.0021)	14.16 ** (0.0146)	14.53** (0.0126)

In Table 7 we investigate the determinants of the long-term to total assets ratio. Concerning the classical determinants (models 1) we observe a negative significant (at 10% level) size effect which is contrary to the results found in the literature and not in line with POT because we expect larger companies to have lower information asymmetry and thus higher debt. A negative significant (at 5% level) economic profitability effect is consistent with financial theory: a company may take advantage of the effect of leverage when its profit is high (TOT). The negative significant (at 5% level) effect of non debt tax shield (Depreciation and amortization / Sales) is also in line with the trade off theory: when a company has other ways to reduce tax, it uses less debt. A positive significant (at 5% level) effect of tangible assets is also consistent with TOT: higher tangible assets lead to higher collateral to secure debt (less bankruptcy costs).

As expected by theory, cooperatives have significant (at 5% level) higher long-term debt ratio than corporations even when controlling for traditional capital structure determinants (model 1). Crisis indicators have no significant impact on long term debt ratio; this ratio seems not sensible to conjuncture fluctuations models 2 and 3). The crisis seems to be perceived as temporary by a majority of wine companies in consequence they don't adjust their optimal long term capital structure ratio.

Table 8.
Impact on short-term debt / total assets

The short-term debt to total assets ratio is the dependant variable
Stars *, **, ***, indicate significance at 10%, 5%, 1%, respectively, p- values are given in parenthesis.

Independent variable	Model 1 Corp./Coop.	Model 2 Aggregated sale	Model 3 Aggregated profit
Size (turnover)	$-3.8\ 10^{-9}$ (0.95)	$3.66\ 10^{-9}$ (0.95)	$8.98\ 10^{-9}$ (0.87)
Profitability (EBIT / Sales)	-0.022 *** (0.006)	-0.021 *** (0.006)	-0.021 *** (0.008)
Non debt tax shield (Depreciation and amortization / Sales)	.000044 (0.84)	.000049 (0.82)	.000058 (0.79)
Tangibility (Net tangible assets / Total assets)	-0.00045 *** (0.004)	-0.00045 *** (0.004)	-0.00043 *** (0.006)
Dummy (1. Corporations 2. Cooperatives)	-0.0306 *** (0.003)		
Aggregated Sales		$1.49\ 10^{-10}$ (0.90)	
Aggregated Profit			$-2.27\ 10^{-8}$** (0.036)
Constant	0.096 *** (0.000)	0.060 *** (0.000)	0.088 *** (0.000)
Wald chi2	24.20 *** (0.002)	15.22 *** (0.0095)	19.60 *** (0.0015)

Table 8 on the determinants of short term debt ratio enables to get the following findings. First note that size has no significant effect of short term debt contradicting theory that explains that small companies (with higher information asymmetry) should have higher short term debt ratio. A negative significant (at 1% level) economic profitability effect is consistent with financial theory: higher profit means higher internal funds and lower need of external financing (coherent with POT), moreover a company may take advantage of the effect of leverage when its EBIT is high according to the TOT. The negative significant (at 1% level) effect of non-debt tax shield and tangibility are in line with the tradeoff theory as explained for long term debt determinants.

Cooperatives have significant (at 1% level) lower short-term debt ratio than corporations (Model 1). That could be explained by the lower reactivity of cooperatives' financial manager to evolutions of companies' characteristics or by the reluctance of banks to finance cooperatives with short term debt.

Aggregated sales (Model 2) have no significant effect on short term debt ratio but aggregated profits have a significant negative effect. This result shows an interesting substitution effect between short-term debt and profit. If profit decreases due to conjuncture fluctuations, internal funding is more difficult and is replaced by short term debt.

Table 9.
Impact on trade accounts payables to suppliers / total assets

Trade account payables to suppliers / total assets is the dependant variable
Stars *, **, ***, indicate significance at 10, 5, 1%, respectively, p- values are given in parenthesis.

Independent variable	Model 1 Corp./Coop.	Model 2 Aggregated sale	Model 3 Aggregated profit
Size (turnover)	$3.82\ 10^{-7}$ *** (0.010)	$4\ 10^{-7}$ *** (0.005)	$3.88\ 10^{-7}$ *** (0.008)
Profitability (EBIT / Sales)	-0.115 *** (0.000)	-0.121 *** (0.000)	-0.115 *** (0.000)
Non debt tax shield (Depreciation and amortization / Sales)	-.0001126 (0.127)	-.0001125 (0.126)	-.001125 (0.130)
Tangibility (Net tangible assets / Total assets)	.0000796 (0.120)	.00086 * (0.092)	.00081 (0.112)
Dummy (1. Corporations 2. Cooperatives	-0.1338 (0.587)		
Aggregated Sales		$-1.43\ 10^{-8}$ *** (0.001)	
Aggregated Profit			$-2.28\ 10^{-8}$ *** (0.547)
Constant	0.31 *** (0.000)	0.50 *** (0.000)	0.32 *** (0.000)
Wald chi2	30.55 *** (0.0000)	41.37 *** (0.0000)	30.77 *** (0.0000)

Table 9 presents results on the determinant of trade account payable to suppliers. In presence of information asymmetry, this source of funding could replace debt financing because suppliers are more aware of their customer financial situation and economic conditions (being in the same industry). Moreover they could also be more flexible in period of crisis. We observe a positive significant (at 1% level) size effect, confirming that bigger companies can impose their financial conditions to suppliers. As already explained, negative significant (at 1% level) economic profitability, negative (non-significant) effect of non-debt tax shield (Depreciation and amortization / Sales) and positive non significant effect of tangible assets are in line with financial theory.

Cooperatives have lower (but non-significant) supplier debt ratio than corporations, but they do not require their member to accept trade accounts beyond usual commercial habits: is it due to some contractual guidelines? If aggregated sales decreased, account payable to suppliers increase (coefficient is negative and significant), the relation is also negative with aggregated profit but non-significant.

In short, cooperatives, due to their different governance structure, have higher long term debt, lower short term debt and no significant differences in their account payable to suppliers even when controlling for traditional capital structure determinants (model 1). These results are globally in line with financial theory.

We observe that aggregated sales and profits have a different impact that their company level counterpart (size and profitability) meaning that there is a specific effect of the industry business cycle on capital structure. The fact that the crisis in the French wine industry has an impact only on short term debt and suppliers' debt is an indication that this crisis is perceived as temporary by most of the companies in the industry. Adjustment of capital structure is mostly done by short term debt if crisis has an impact on the global profit of the industry and by account payable to suppliers if crisis has an impact on global the global volume of sales.

6 Conclusion

The wine crisis was at its paroxysm in 2004 and 2005 when French wineries experienced an EBIT margin of 5% instead of 9% in 2000. However, the 2009 decline in sales was stronger than previous ones. But no financial data are available for the year 2009 yet.

From 2000 to 2006, the gearing – debt to equity ratio – remained at 1.23 for co-operatives. However for corporations, it increased from 1.67 in 2000 to 1.87 in 2004. As a consequence, the results are more

consistent with the trade-off theory because the gearing has remained quite stable in spite of sales fluctuations. The increase in corporate debt level in crisis time may be explained by the family ownership of most wineries. They are not able to increase equity capital and do not want to go public. So, self-financing is the only way to get financial resources. Afterward, short-term debt may be used. Finally if the crisis takes more time than expected, long-term debt may be considered.

Co-operatives were able to absorb part of the impact of the wine crisis at the expense of their members, in increasing account payables to member. Corporations have not increased trade account payables to vine growers. So, cooperatives, due to their different governance structure, have higher long term debt, lower short term debt and no significant differences in their account payable to suppliers even when controlling for traditional capital structure determinants (model 1). The results are globally in line with trade-off theory.

Even though figures show that EBIT margin is higher for corporations, it is not clear that they perform better than co-operatives. The fact that co-operatives perform less than corporations may be due to higher price paid for grapes to their members. The board of directors of co-ops may be pressured by co-op members to increase grape price. The results may also reflect that co-operatives often invest less in intangible assets, such as brands and other marketing tools.

The French wine crisis has not been strong enough to shake the financial structure of co-operatives and corporations. But co-operatives look more affected. However, the stronger decline in sales of French wine in 2009 should lead to stronger financial shock on the French wineries.

In terms of managerial implications, economic profits have lowered. So, French wineries are facing further shock in 2010 after new diminishing sales in 2009. And they will have to recover. Since the French wine sector is very fragmented, manager may achieve economies of scale, may be through mergers and acquisitions in order to decreasing operating costs, gather their supply and enhance some global brands so that they may stabilize or increase the price of wine on the French domestic market which is mainly in the hand of 5 supermarket chains.

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