

**Agency Costs of Vertical Integration - the Case of Wine Business in France**

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**Abstract:** In this research, we breed the theory of vertical integration and the positive agency theory to define the concept of agency costs of vertical integration. Then, we extend the Ang, Cole and Lin (2000)’s methodology to provide a measure of the agency costs of vertical integration. If the theory does not leave doubt about the relevance of the concept, our empirical results fail to provide a robust assessment of these costs. Our results let us think that the agency costs of vertical integration can be close to 2 or 3% of the sales. To conduct this preliminary research, we use an original database encompassing two hundreds wine processing firms. In our view, this question deserves further empirical investigations, maybe with more extensive data. Because of the variety of organizational forms of agrifood firms, agribusiness provides an ideal ground to handle this issue.

**Key-words:** agency costs, vertical integration, governance, cooperatives, wine industry

**JEL Codes:** G320, D230, Q130

In a broad study on European farmers’ cooperative, Bijman et al (2012) showed that differentiation is seen as a key competitive advantage by cooperatives in the wine and dairy sectors when cereals and pig sectors emphasize the product costs. However, “a growth and marketing strategy of the cooperative may not only require a professionalization of the management, it may also require strengthening the control capacity of the board of directors and supervisory board” (p.118). In other words, vertical integration implies agency problems that cooperatives need to manage if they want to experience success in their differentiation strategies. As there is no reason that agency costs of vertical integration concerns only cooperative firms, and as the analysis of manager/owners agency problems needs to compare different ownership structures, we propose to assess the agency costs of vertical integration in the whole wine processing sector in France.

Differentiation generally requires vertical coordination (Barry et al 1992, Hendrikse and Bijman 2002). However, vertical integration creates complex problems of control and coordination among highly interdependent activities (D’Aveni and Ilinitich 1992) and internal organization can be considered as the organization form of last resort (Williamson, 2002). As a consequence, the equilibrium degree of vertical integration reflects a balance of the benefits against the costs (Barry et al 1992, D’Aveni and Ravenscraft 1994, Williamson 2002, Gibbons 2005 and Lajiji and Mahoney 2006).

Among the costs of vertical integration, some are independent on the manager efforts but the major concern is the incentive distortions related to integration. Indeed, Grossman and Hart (1986) consider the control of a firm by another as desirable only if overinvestment by the acquiring firm is a less severe problem than underinvestment in the non integrated solution. Williamson (1985) considers that the loss of high-powered market incentives can make internal organization more costly than the market mechanism and D’Aveni and Ravenscraft (1994) point out the loss of market pressure related to integration. In other words, vertical integration may stress agency problems between the manager and the firm’s owner(s)<sup>1</sup>. Hart (2009) considers that the theory of vertical integration explains more the costs of nonintegration than the costs of integration. Here we consider that the agency theory can help to understand them through the concept of managerial entrenchment, in the sense of Shleifer and Vishny (1989)<sup>2</sup>. Indeed, vertical integration is likely to occur when high asset specificity is combined to high nonseparability (difficulty in separating and measuring individual effort in the total output or production) (Mahoney, 1992), two ingredients raising managerial entrenchment and, thus, agency costs between managers and firms’ owners. The agency problems of vertical integration must be even more critical for cooperatives as they display “vaguely defined property rights” (Cook 1995, Bontems and Fulton 2009).

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<sup>1</sup> Vertical integration can be considered as involving two principals, the vertical coordinator and the investor (“the lender” in Barry et al 1992), and one agent, the manager (Barry et al, 1992). Our focus is on the agency cost between the investor and the manager when he is the vertical coordinator.

<sup>2</sup> An alternative explanation can be the influence costs related to multi-unit organization (Meyer et al, 1992) but this does not seem relevant in the case of the French wine industry where firms are small and cannot be considered as multi-unit organization.

In this paper, we aim to assess the agency costs of vertical integration which, to the extent of our knowledge, has never been done (see Lafontaine and Slade 2007 for a review of empirical research on vertical integration). To fulfill this goal, we adapt the methodology set up by Ang, Cole and Lin (2000) (ACL) to measure agency costs both in relative and absolute terms.

One key-point of the ACL’s methodology is to consider a reference point, the “zero-agency cost firm”, where, in the Jensen and Meckling (1976)’s perspective, the manager is the firm’s sole shareholder. To measure agency costs of vertical integration requires zero-agency cost base cases for both firms which choose vertical integration and those which do not. In this respect, agribusiness appears as an ideal ground for research as few industries, if any, outside of agriculture have the breadth of distinctly different organizational forms involved in similar contracting activities (Sykuta and Cook 2001, Boland et al 2008). This is especially true in the case of French wine business. Regarding the ownership structure, our data shows that in the French wine processing sector, 56% of firms are cooperatives, 22% are entirely owned by the managers’ family and 22% display outside equity. Regarding vertical integration features, Couderc (2004) provided a detailed overview of the French wine supply chain which gives prominence to the complexity of the supply chain: farmers, cooperatives and *negociants* can be involved in all level of the supply chain. He showed that *negociants* (non cooperative wine processing firms) sell 7 billion euro of wine to other wine processing firms (for a whole turnover of 20 billion euro) instead of distributors. Moreover, 64% of *negociants* and 28% of cooperatives use their own brand to sell their wines (Couderc et al, 2010)). These figures show that *negociants* and cooperatives can adopt different behavior regarding their investments in the downstream stage of the supply chain. Bijman et al (2012) show that two types of cooperatives coexist in the European wine sector: a group of dynamic market oriented cooperatives that have managed to deal with market changes and strong branding and marketing activities and many cooperatives that are dedicated to production and collecting/bargaining products.

To sum up, we extend the ACL’s methodology and use the organizational diversity of wine business to obtain a zero-agency cost reference point for vertically integrated firms as well as for firms specialized on their processing stage. The two reference points serve to disentangle agency costs of vertical integration from other costs. In doing so, we provide a unique methodology to assess owner-manager agency costs of different organizational forms.

In this aim, we use an original database set up by the UMR MOISA<sup>3</sup> research team, the “*Enquête sur les déterminants de la performance des entreprises viti-vinicoles françaises*” (Survey on the determinants of French wine firms’ performance) including information on strategy, marketing, finance as well as financial data on 210 French wine firms. The data had been collected through a survey completed by the managers of the firms in a series of one hour face-to-face interview. This information has been merged with a financial database (Diane) which covers the years 1996 to 2005. We obtain 1120 observations. We follow ACL in considering the operating expenses as a proxy of agency costs and

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<sup>3</sup> UMR MOISA is a research team composed by researchers from INRA, SUP’AGRO Montpellier, CIRAD and CIHEAMM-IAM, who deal with a wide array of agrifood economics and management topics.

slightly differs from the Ang, Cole and Lin’s approach to adapt the analysis to French accounting. Our ownership structure variable distinguishes the family-controlled firm, when the family manager owns more than 98% of the firm, from the firms with outside equity. We propose another proxy based on the number of the founding family’s members in the management of the firm to distinguish family firms from outside-managed firms. We propose two proxies of vertical integration. The first proxy is base on the use of their own brands by the firms. The second proxy is based on the proportion of bulk wine production on total production. We control marketing expenses, innovation efforts, size, localization, years and fixed effects in clustering observations for each firm.

The next section explains the methodology. We present the data in the second section and the results in the third section. Then we conclude.

### **I. Agency costs of vertical integration**

According to a literal interpretation of the Jensen and Meckling’s agency theory, there should be no agency costs for firms owned at 100% by the manager. As a result, owner-managed firms can serve as a reference point for the assessment of agency costs, whatever the firm’s type or strategic choice. Here we starts from this idea to compare agency costs for firms differently involved in the downstream of the supply chain, i.e. to assess agency costs of vertical integration.

A first implication of this view is that ownership structure is the first factor of agency costs as it determines the misalignment between the interests of the firm’s owner and those of the firm’s manager. Then, vertical integration may exacerbate the agency problems rooted in the ownership structure. A simple way to capture this idea is to consider that vertical integration’s and ownership structure’s agency costs are multiplicative rather than additive. If the effect of vertical integration is necessary related to ownership structure, it remains that one part of agency costs related to ownership structure is not related to vertical integration. We formalize that in a simple way in considering that agency costs of the different organizational structure is

$$a_{ij} = \alpha_i(1 + \beta_j)$$

With  $a_{ij}$  the total agency costs,

$\alpha_i$  the agency costs related to the ownership structure  $i$ ,

$\beta_j$  the multiplier of agency costs related to the integration stage  $j$ .

We consider  $b_{ij} = \alpha_i\beta_j$  as the agency costs of vertical integration for a given ownership structure  $i$ .

Let apply this approach to the case where the owner-managed firm is the zero-agency costs case and when the specialization on one processing stage can be considered as the case of non vertical integration. To focus on the agency costs of vertical integration for two types of ownership structure is equivalent to assess four values, the agency costs related to the two

ownership structures,  $\alpha_1$  and  $\alpha_2$ , and the agency costs of vertical integration for the two ownership structures (see table 1)  $b_1 = \alpha_1\beta$  and  $b_2 = \alpha_2\beta$ .

**Table 1. Agency Costs and Agency Costs of Vertical Integration**

<b>Agency costs</b>	<i>Vertical Integration</i>	
<i>Ownership structure</i>	Reference	Integration
Reference	$a_{(0;0)} = 0$	$a_{(0;1)} = 0$
Type 1	$a_{(1;0)} = \alpha_1$	$a_{(1;1)} = \alpha_1(1 + \beta)$
Type 2	$a_{(2;0)} = \alpha_2$	$a_{(2;1)} = \alpha_2(1 + \beta)$

Now, let consider the costs of vertical integration which are not agency costs and which are hardly disentangled from agency costs when we try to observe them,  $\gamma_j$ . As a result, the only variables we can observe are agency costs plus non agency costs of vertical integration:

**Table 2. Agency Costs and Costs of Vertical Integration**

<b>Agency costs</b>	<i>Vertical Integration</i>	
<i>Ownership structure</i>	Reference	Integration
Reference	$o_{(0;0)} = a_{(0;0)} = 0$	$o_{(0;1)} = a_{(0;1)} + \gamma_1 = \gamma_1$
Type 1	$o_{(1;0)} = a_{(1;0)} = \alpha_1$	$o_{(1;1)} = a_{(1;1)} + \gamma_1 = \alpha_1(1 + \beta) + \gamma_1$
Type 2	$o_{(2;0)} = a_{(2;0)} = \alpha_2$	$o_{(2;1)} = a_{(2;1)} + \gamma_1 = \alpha_2(1 + \beta) + \gamma_1$

In this case, to isolate the agency costs of vertical integration requires a differential approach where we compute

$$b_i = o_{(i;1)} - o_{(i;0)} - (o_{(0;1)} - o_{(0;0)}) = \alpha_i\beta$$

Given the ownership structures we can observe in the French wine industry, we propose to compare the agency costs of open-ownership firms and cooperative firms to those of owner-managed firms. If we refer to the last as the reference point, the open-ownership firms as type 1 firms and cooperatives as type 2 firms, our objective is to assess  $b_1$  and  $b_2$ , the agency costs of vertical integration for open-ownership firms and cooperative firms respectively. One other contribution of our research is also to assess  $\alpha_1$  and  $\alpha_2$  the agency costs due to the opening of ownership and those related to the cooperative ownership structure in the French wine business.

## II. Data and methodology

### a. Sample

The *Survey on the determinants of French wine firms’ performance* is an attempt to capture strategic data on a sample representative of the French wine agribusiness (firms which process wine with sales superior to 3 millions of Euros), composed by about 850 firms. The sample encompasses 210 wine firms. We obtain a final sample of 180 firms which provides full data on the variables considered in our research.

### b. Variables

The database provides us with a clear view of key organizational variables which are:

- the ownership structure, with the distinction between cooperatives and non-cooperatives, and, among the non-cooperative firms, a direct question on the capital structure, “does the manager’s family own more 98% of the firm?”
- the proportion of wine sold in bulk or in bottle;
- the branding strategy, with a question related on the use of their own brands by the firms (the firms can sell their products under the brands of another firms, often the distributor);
- the marketing effort by a question on the marketing expenses in percentage of sales for the main products.

Ownership structure is a qualitative variable with three items, owner managed firms, open-ownership firms and cooperatives. In the analysis, we use another item of the questionnaire on the number of members from the family who owns the firm. We consider as the zero-agency cost case the firms which employ at least one member of the owner-family and the others as outsider-managed firms. We aim to encompass the firms with a strong control from the founding family expected to reduce agency costs, even when it does not correspond to a 100% ownership of firm’s equity.

Vertical integration is a qualitative variable with two items, firms involved in the downstream stage (marketing) and firms specialized on the processing stage. We consider three proxies of vertical integration. The first is related to the branding strategy. We consider as vertically integrated the firms which declare to sell their products under their own brands. The second is related to the distribution channel. We consider as non integrated the firms selling more than 85% of their wine to intermediaries between them and the consumers’ market such as trading groups, wholesalers, *negociants* and internal sales. The third proxy is related to the volume of wine sold in bulk: we consider as integrated the firms selling more than 85% of their wine in bottles.

Following the ACL’s methodology, these variables are the explanatory variable and the main dependent variable is operating expenses, a quantitative variable. However, ACL’s methodology is based on US financial statements which make them define operating expenses as total expense less cost of goods sold, interest expense and managerial compensation. French financial statements do not enable us to compute cost of goods sold. However, we can

observe an item very close to operating expenses in the French income statement, the “*autres achats et charges externes*”, which encompasses expenses other than raw materials, wages, amortization and taxes. To make it simple, we consider it as operating expenses, scale them by sales and correct the difference related to the presence of marketing expenses in the “*autres achats et charges externes*” with a control variable of the marketing effort.

c. Descriptive analysis

A descriptive analysis of our sample shows that owner-managed firms are smaller than non-(fully) owner managed firms, as sales are of about 11 millions of Euros for bottling firms while they reach 35 and 45 millions of Euros for partially and fully bottling firms respectively in the case of non-owner managed firms. Cooperatives display different figures. If the less downstream involved cooperatives are smaller than owner-managed firms, the bottling cooperatives are much higher with average sales equal to about 1.5 times the sales of owner-managed firms for partially bottling firms and twice for fully bottling firms.

**Table 1. Ownership structure, vertical integration (own brand) and sales**

Governance	Vertical Integration (own brand)	Sales 2004		
		Mean	St Dv.	N
Owner- manager	No brand	16118	7291	11
	Own brand	11311	2011	37
Outside ownership	No brand	27997	7822	15
	Own brand	44129	15183	31
Cooperative	No brand	12049	1789	61
	Own brand	15779	3329	28

N = 183 firms

**Table 2. Governance, vertical integration (own brand) and sales**

Governance	Vertical Integration (bulk wine < 15%)	Sales 2004		
		Mean	St Dv.	N
Family firm	No brand	20433	6674	17
	Own brand	16852	3253	47
Non family firm	No brand	23650	8528	11
	Own brand	47223	20888	22
Cooperative	No brand	12284	1842	59
	Own brand	14717	3274	27

N=183 firms

In the tables 3 and 4, we compute the operating expenditures for each ownership structure and vertical integration feature. This shows that operating expenditures increase with vertical integration. Moreover it seems that operating expenditures are lower for non-owner managed firms than for owner managed firms.



**Table 3. Ownership structure, vertical integration and operating expenditure**

Governance	Vertical Integration (own brand)	Operating expenditures (scaled by sales) 2004		
		Mean	St Dv.	N
Owner- manager	No brand	0,12	0,02	11
	Own brand	0,18	0,01	37
Outside ownership	No brand	0,08	0,01	15
	Own brand	0,18	0,02	31
Cooperative	No brand	0,10	0,02	61
	Own brand	0,14	0,01	28

N = 183 firms

**Table 4. Governance, vertical integration and operating expenditure**

Governance	Vertical Integration (bulk wine < 15%)	Sales 2004		
		Mean	St Dv.	N
Family firm	No brand	0,12	0,02	17
	Own brand	0,19	0,01	47
Non family firm	No brand	0,07	0,01	11
	Own brand	0,16	0,02	22
Cooperative	No brand	0,10	0,02	59
	Own brand	0,14	0,01	27

N= 183 firms

#### d. Control variables

Our analysis needs a certain number of control variables. One important point is to avoid considering intangible expenses necessary to market access and agency costs of vertical integration. This is one disadvantage of using the “French” income statement: the item “*autres achats et charges externes*” includes advertising, fees for participating to trade fairs... To tackle this problem, we use the proportion of advertising and promotion costs expenses (scaled by sales) in the multivariate regression.

One determinant point of wine firms is the area from where they operate. Indeed, if a certain number of “negociants” operate wines from different “*appellation*”, most of wine firms are SMEs embedded in their local community and which keep a regional specialization. Moreover, the reputation of *appellations* is very different from one region to one other. Compare for example Bourgogne or Bordeaux, with a very strong reputation everywhere in the world, and Languedoc which keeps an image of low-quality mass producing region albeit strong qualitative efforts. This may impact the marketing effort of individual firms. Moreover, supply chains present regional specificities which are related to the characteristics of *terroir*, their proximity with consumer markets and path dependency. This is even truer for cooperative. As a result, we introduce the region of origin of the firms (*bassin viticole*) as a control variable.

Moreover, we control years’ effect in introducing dummies as well as the fixed effect in clustering the observations for each firm.

The need for controlling variables and isolating the effect of vertical integration and governance effects appeals to a multivariate analysis (GLM analysis). We present the results in the next section.

### III. Results

We display the results of our regression in the tables 5 and 6. In the table 5, we present the results with the ownership structure variable, based on the 100% ownership by the manager’s family. In the table 6, we present the results with the governance variable, based on the employment of owner-family’s members. The dependent variable is “operating expenditures scaled by sales”. The explanatory variables are ownership structure/governance. We propose two proxies of vertical integration, when the product is sold with the firm’s own brand and when the firms bottle more than 15% of the wine. For each proxy, we present a regression with governance and ownership structure without the interaction terms and a second regression where vertical integration is given according to the ownership/governance variable. We use a GLM regression. The analysis includes 1138 observations (firm-years).

As expected, control variables have highly significant effect. The *region of origin* plays a role in the operating expenditures as well as the marketing efforts.

Explanatory variables play a significant effect on operating expenditures. Ownership structure as well as vertical integration is determinants of operating expenditures. According to our methodology, the reference point should be the least- downstream-involved owner-managed firms. Vertical integration implies between 5 and 6% more operating expenses.

Let consider the interaction of vertical integration with the ownership structure. It appears that the increment operating expenses of vertical integration is about 6% for owner-managed (or family controlled) firms and 9% for open-equity (or outsider-managed) firms. A difference seems to be perceived, even if it is not significant. In other word, we can suppose that the agency costs of vertical integration may be close to 2 or 3% of sales in terms of operating expenses.

Let consider the ownership structure / governance variable. In contrast with ACL, the operating expenses decreases with the opening of equity. It is not surprising given that there can be a slight confusion between the firm’s operating expenses and the personal consumption of the manager in the first case. This confusion is certainly governed by a tax minimizing behavior. As the manager is the full owner of the firm, we can say that these added operating expenses do not correspond to agency costs.

Cooperatives display unexpected results. First of all, their operating expenses are not higher than operating expenses of owner-managed firms. Operating expenses of cooperatives appear very weakly lower than the operating expenses of owner-managed firms, which is not a good news given the confusion between operating expenses and managers’ personal consumptions for these firms. A more interesting point is that operating expenses of cooperatives do not seem to increase with vertical integration. At this stage of our research, we may interpret this result as a maladjustment of the organizational structure to the vertical integration. Some preliminary analyses show that open ownership (or outsider-managed) firms increase their performance with vertical integration of about 5% in terms of EBITDA/sales when this increase hardly reaches 2% for cooperatives. However, we have to keep in mind that

performance for cooperatives cannot be measured by traditional financial indicators. Indeed, the owners are also the users.

**Table 5. Ownership structure, vertical integration and agency costs**

	Operating expenses (scaled by sales)			
	VI proxied by brand	VI proxied by brand	VI proxied by bottling	VI proxied by bottling
<i>Ownership structure</i>				
Owner-managed	Ref	Ref	Ref	Ref
Open ownership	-0.023 (-1.44)	-0.040* (-1.85)	-0,029* (-1,72)	-0.055*** (-3.55)
Cooperative	-0.036** (-2.18)	-0.016 (-0.67)	-0,021 (-1,42)	-0.010 (-0.57)
<i>Vertical Integration</i>	0.053*** (3.87)		0,062*** (4,68)	
<i>Ownership structure * Vertical integration</i>				
Owner-managed firms * Vertical integration		0.061** (2.30)		0.065*** (3.21)
Open ownership * Vertical integration		0.087*** (4.94)		0.100*** (5.93)
Cooperative * Vertical integration		0.016 (0.76)		0.019 (0.77)
Marketing effort	0.004*** (2.88)	0.003** (2.73)	0,004*** (3,53)	0.005*** (3.71)
Sales	0.000** (-2.62)	0.000** (-2.55)	0,000*** (-2,92)	-0.000*** (-3.31)
Wine Area	-0.001 (-0.54)	-0.002 (-1.05)	-0,001	-0.002 (-0.79)
Year	0.001 (-0.65)	0.000 (0.45)	0,001	0.001 (0.56)
Intercept	-2.476 (-0.62)	-1.716 (-0.42)	-2,264	-2.141 (-0.53)
Number of obs	1138	1138	1138	1138
F...	(7.186) 8.37	(9.186) 7.09	(7.186) 7.74	(9,186) 8.73
Prob > F	0.000	0.000	0.0000	0.0000
R-squared	0.0758	0.0839	0.0804	0.0890

**Table 6. Governance, vertical integration and agency costs**

	Operating expenses (scaled by sales)			
	VI proxied by brand	VI proxied by brand	VI proxied by bottling	VI proxied by bottling
<i>Governance</i>				
Family firms	Ref	Ref	Ref	Ref
Outsider-managed firms	-0,030** (-1,99)	-0,041** (-2,26)	-0,030** (-2,01)	-0,046*** (-2,86)
Cooperative	-0,034** (-2,29)	-0,010 (-0,45)	-0,018 (-1,28)	-0,002 (-0,12)
<i>Vertical integration</i>	0,053*** (3,87)		0,061**** (4,67)	

<i>Governance * Vertical integration</i>				
Family firms * Vertical integration		0,068*** (3.01)		0.069*** (3.88)
Outsider managed * Vertical integration		0,087*** (4.48)		0.094*** (5.09)
Cooperative * Vertical integration		0.017 (0.76)		0.019 0.76
Marketing effort	0,004*** (2,93)	0.003*** (2.71)	0.004*** (3.53)	0.005*** (3.74)
Sales	0,000*** (-2,82)	0.000*** (-2.64)	0.000*** (-3.14)	0.000*** (-3.35)
Wine Area	-0,001 (-0,60)	-0.003 (-1.03)	-0.001 (-0.60)	-0.001 (-0.72)
Years	0,001 (0,63)	0.000 (0.45)	0.001 (0.60)	0.001 (0.58)
Constant	-2,359 (-0,60)	-1.682 (-0.42)	-2.263 (-0.57)	-2.190 (-0.55)
Number of obs	1138	1138	1138	1138
F...	(7,186) 8.37	(9,186) 7.21	(7,186) 7.75	(9,186) 8.12
Prob > F	0.0000	0.0000	0.0000	0.0000
R-squared	0.0779	0.0855	0.0806	0.0877

#### IV. Conclusion

Our research is a first attempt to assess the agency costs of vertical integration. Based on the idea that vertical integration implies internal costs to organizations and, more specifically, that vertical integration may be related to managerial entrenchment, we extend the Ang, Cole and Lin (2000)’s methodology to provide a measure of the agency costs of vertical integration.

Our results show that the operating expenses of vertical integration depend on the ownership structure and governance of firms. These interactions may give prominence to agency costs of vertical integration. If the theory does not leave doubt about the relevance of the concept of agency costs of vertical integration, our empirical results fail to provide a robust assessment of these costs. This preliminary research let us think that the agency costs of vertical integration can be close to 2 or 3% of the sales. However, further empirical investigations, maybe with more extensive database, are necessary to prove it.

Agribusiness provides a unique field of research to assess these agency costs as no other industry displays so different organizational forms. Moreover, the question of agency costs of new organizational forms is critical for cooperatives as they display “vaguely defined ownership rights”. Remind that in France, cooperatives represent about one half of the agrifood industry...

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