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Agency Costs of Vertical Integration - the Case of Family Firms, Investor-Owned Firms and Cooperatives in the French Wine Industry

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Abstract

Vertical integration theory has long suggested internal costs related to changes in incentives due to vertical integration, which means that vertical integration may lead to agency costs. In this work, we specify the notion of agency costs of vertical integration and extend Ang, Cole and Lin (2000)'s measurement of agency costs to provide an empirical assessment of these costs in the French wine industry. Our econometric analysis finds that the agency costs of vertical integration may reach 2% to 3% of sales. It also displayed an unexpected result: vertical integration implies less costs for cooperatives than for other firms, but provides a lower performance. This result deserves further investigations.

Key-words: agency costs, vertical integration, ownership structure, cooperatives, wine industry

JEL Codes: G320, D230, Q130

A key-issue in the wine industry is differentiation through vertical integration (Bijman et al, 2012). However, vertical integration implies agency problems which should differ according to the different ownership structures of firms, i.e. family firms, firms with outside equity or cooperatives. To tackle this issue, we use the concept of agency costs of vertical integration and provide a methodology to assess these costs in the French wine industry.

The organizational economics literature has long established the relationship between differentiation and vertical coordination (Barry et al. 1992; Sexton and Lavoie 2001; Hendrikse and Bijman 2002). Vertical integration is the internal organization of vertical relationships involving suppliers of intermediate goods and services (upstream) and the purchasers of those goods and services (downstream) (Joskow 2001). Internal organization appears as one form of organization that solves many ex ante coordination problems between two firms for which coordination and collaboration may lead to improved efficiency. However, internal organization creates ex post problems of control and coordination (Barry et al. 1992; D'Aveni and Ravenscraft 1994; Williamson 2002; Gibbons 2005; Joskow 2005; Lajji and Mahoney 2006). And Joskow (2005) emphasizes the lack of research on the costs of internal organization. Our research focuses on one particular cost of internal organization, the agency costs between the firms' owners and the managers.

Among the costs of vertical integration, some are independent of the managers' efforts but the major concern is incentive distortions related to integration (Grossman and Hart, 1986; Williamson, 1985; D'Aveni and Ravenscraft, 1994). In this perspective, vertical integration may amplify agency problems between the manager and the firm's owner(s)¹ and hence imply agency costs. In our view, the positive agency theory² provides an understanding of the agency costs within firms through the concept of managerial entrenchment which occurs when, by making manager-specific investments, managers can reduce the probability of being replaced, extract higher wages and larger perquisites from shareholders, and obtain more latitude in determining corporate strategy (Shleifer and Vishny 1989). In conducting differentiation strategy, managers make the firms more dependent on their know-how and complex processes, which may imply an increase of managerial discretion.

The agency problems of vertical integration may be even more critical for cooperatives which can be considered as an organization with vaguely defined property rights (Cook 1995; Bontems and Fulton 2009). In this article, we tackle this issue by measuring the agency costs of vertical integration. To this aim, we follow Ang, Cole and Lin (2000) (ACL) who provide a measure both in relative and absolute terms by highlighting the effect of ownership structures on operating expenses. We propose to extend their methodology to focus on agency costs of vertical integration, which, to our knowledge, has never been done (see Lafontaine and Slade (2007) for a review of empirical research on vertical integration).

This requires the coexistence of firms with different ownership structures involved in similar contracting activities and with vertical integration as a possible choice. In this respect, the

¹ 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 *ex post*, when vertical integration is the coordination mode chosen by the vertical coordinator, whose *raison d'être* disappears when vertical integration is achieved.

² The theory of vertical integration explains the costs of non-integration rather than the costs of integration (Joskow 2005; Hart 2009).

diversity of organizational forms in agribusiness (Sykuta and Cook 2001; Boland et al. 2008) make this sector ideal ground for research on the agency costs of vertical integration. This is especially true in the case of the French wine industry (Bijman et al, 2012; Couderc et al, 2010). From an experimental point of view, to select the French wine industry makes it possible to focus on internal firm specific factors (such as agency costs), as it operates in a fairly homogeneous environment.

To conduct our research, we used an original database set up by the UMR MOISA³ research team, the survey on the determinants of French wine firms' performance (*enquête sur les déterminants de la performance des entreprises viti-vinicoles françaises*) that includes information on strategy, marketing, and finance, as well as financial data on 210 French wine firms. The data were collected in a series of one hour face-to-face interviews during a survey of the managers of the firms in 2005. This information was merged with a financial database⁴ which covers the years 1996 to 2005.

We follow ACL in assessing agency costs through a comparison of operating expenses according to ownership structures. The differences between French and US accounting principles require some adaptations that are explained in the section 2. Thanks to the survey, we are able to distinguish (i) family firms (taken as the zero-agency cost case) when the manager's family owns more than 98%⁵ of the firm and when members of the founding family are still employed by the firm⁶, (ii) outsider-managed firms when the ownership is open and no members of the founding family are involved in the management of the firm and (iii) cooperatives.

We consider two proxies of vertical integration. The first proxy refers to the firm's use of their own brand. If the firms use their own brand to sell their product, they are considered as vertically integrated⁷. In research based on five case studies, Beverland (2007) showed that long-term brand positioning requires a supportive governance structure but did not quantify the agency costs of inefficiency. The second proxy refers to the volume of bottled wine. If a firm bottles more than 85% of the wine they sell, they are considered vertically integrated⁸. We are also able to control for marketing expenses, innovation efforts, and the size and the role of localization.

In the following section we explain the notion of agency costs of vertical integration and the principles of our methodology. We present the data and the variables in section II, our results in section III, and our conclusions in section IV.

³ UMR MOISA is a research team composed of researchers from INRA, SUP'AGRO Montpellier, CIRAD and CIHEAMM-IAM, which deals with a wide array of agrifood economics and management topics.

⁴ The survey uses the "Diane" database, which aggregates financial data of French firms.

⁵ Owner-managers may benefit from opening a fraction of their equity to external shareholders for legal and tax reasons. For example, the "Société Anonyme" status requires at least seven shareholders. Another reason may be legal obligations regarding managerial compensation.

⁶ Fama and Jensen (1983) reported that "family members have many dimensions of exchange with one another over a long horizon and therefore have advantages in monitoring and disciplining related decision agents"

⁷ One third of French wine cooperatives use their own brand against two thirds of "negociants" (Couderc et al, 2010).

⁸ This threshold enables us to distinguish the "negociants (traders)" who use the bulk wine markets as a way to manage the market risks from those who secure their markets through differentiation (40% of "negociants" who bottle less than 85% of their wines use their own brand versus 80% for the others). 25% of "negociants" bottle less than 85% of their wines, versus 81% of cooperatives. The 85% bottling threshold is appropriate for the comparison of vertical integration by cooperatives and non-cooperative firms in the French wine sector: less would exclude too many "negociants" and more would not distinguish vertical integration from dependence on intermediary markets.

Agency costs of vertical integration

According to a literal interpretation of Jensen and Meckling's (1976) agency theory, there should be no agency costs for firms that are 100% owned by the manager. As a result, if we follow Ang, Cole and Lin (2000), owner-managed firms can serve as a reference for assessing agency costs, whatever the firm's activity or organizational form. Starting from this idea, we compare agency costs for firms which decided to internalize downstream activity and those which did not. The difference should correspond to the agency costs of vertical integration.

A first implication of this view is that ownership structure is the leading factor of agency costs as it determines the misalignment between the interests of the firm's owner and those of the firm's manager. Vertical integration may exacerbate agency problems rooted in the ownership structure but cannot, by itself, induce agency problems: there is no agency costs for 100% owner-managed firms, whatever the degree of vertical integration. A simple way to capture this idea is to consider that the agency costs of vertical integration and of the ownership structure are multiplicative rather than additional, given that one part of agency costs related to ownership structure is not related to vertical integration. We formalize this concept in a simple way by considering that agency costs of the different organizational structure is

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

where a_{ij} represents the total agency costs,

α_i represents the agency costs related to ownership structure i ,

β_j^i represents the multiplier of agency costs related to the internalization of the downstream processing stage j . The subscript i indicates that the multiplier of agency costs depends on the ownership structure.

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

Let us apply this approach to the case in which the owner-managed firm is the zero-agency costs case and when focusing 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 requires the assessment of four values, the agency costs related to the two ownership structures, α_1 and α_2 , and the agency costs of vertical integration for the two ownership structures $\alpha_1\beta^1$ and $\alpha_2\beta^2$ given that these values are relative to one reference point.

Now, let us consider the costs of vertical integration that are not agency costs and that are hard to distinguish from agency costs by the observer, γ_j . As a result, the only variables we can observe are agency costs plus the non-agency costs of vertical integration:

In this case, to isolate the agency costs of vertical integration requires a differential approach in which we compute the difference between the vertical integration costs of the vertically integrated firms less those of the non-integrated firms with the same ownership structure less the zero-agency cost vertically integrated firms, i.e.

$$\alpha_i \beta^i = [\alpha_i(1 + \beta^i) + \gamma] - \alpha_i - \gamma \quad (2)$$

Given the ownership structures observed in the French wine industry, we compare the agency costs of open-ownership firms and cooperative firms to those of family firms. If we consider family firms as a reference point, the open-ownership firms as type 1 firms, and cooperatives as type 2 firms, our objective is to assess $\alpha_1 \beta^1$ and $\alpha_2 \beta^2$, the vertical-integration agency costs for open-ownership firms and cooperative firms respectively.

Data

We use the *Survey on the determinants of French wine firms' performance* which aimed to collect strategic data on a representative sample of firms belonging to the French wine industry (1018 firms and revenue of 17.5 billion euros in 2006). The sample included 210 wine firms. Our final sample comprised 183 firms, of which 86 were cooperatives, for which all the data concerning the variables under study were available.

The database provides a clear view of key organizational variables: (i) the ownership structure, with a distinction made between cooperatives and non-cooperatives, and, among the non-cooperative firms, a direct question was asked concerning the ownership structure: does the manager's family own more than 98% of the firm?; (ii) the number of members of the founding family employed in the firm; (iii) the branding strategy, with a question related to the use of their own brands by the firms versus the brands of a distributor or other firm; (iv) the proportion of wine sold in bulk and in bottles.

Ownership structure is thus characterized by a qualitative variable with three items: owner managed firms, open-ownership firms, and cooperatives. To characterize the case of zero-agency cost, we added firms that employ at least one member of the founding family and firms where the manager's family own 98% of the firm. In so doing, we included some firms whose founding family (generally the main shareholder) continues to control the firm even though the ownership is open. We assume that the agency costs are almost null when managers are members of the owning family, but that agency costs appear when the firms are managed by an outsider, and are higher for cooperatives⁹.

⁹ This last assumption is in line with the idea that the "vaguely defined property rights structure" of cooperatives should imply high agency costs (Cook 1995; Chaddad et al. 2005) but this contradicts Hansmann (2012) who states that farmers are good monitors of the cooperatives of which they are members.

We limit our vertical integration approach to the internalization of marketing decisions by the processing firms. As a result, vertical integration is a dummy variable that distinguishes firms that focus on wine processing from firms involved further downstream. We consider two proxies of vertical integration. The first is related to the branding strategy. We consider firms to be vertically integrated when they state that they sell their products under their own brands (29% of cooperatives and 72% of *negociants*). The second proxy is related to the volume of wine sold in bulk: we consider as integrated firms that sell more than 85% of their wine in bottles (24% of cooperatives and 80% of *negociants*). We expect that operating expenses increase with vertical integration, that agency costs of vertical integration appear with outside ownership and management, and that they are higher for cooperatives as interest alignment in cooperatives are related to the fact that they generally confine themselves to relatively simple, homogeneous commodities (Hansmann 1988).

We followed ACL's methodology by considering operating expenses as dependent variables. ACL's methodology is based on US financial statements, which oblige firms to define operating expenses as total expense less the cost of goods sold, interest expense, and managerial compensation. French financial statements do not enable us to compute the cost of goods sold. However, in the French income statement, there is an item that is very close to operating expenses: *autres achats et charges externes*, which includes expenses other than raw materials, wages, amortization, and taxes. The main drawback of this item is that it includes marketing expenses even if they are attributed to the final product. In US financial statements, marketing expenses would be considered in the costs of goods sold. To correct this possible bias, we control the marketing expenses in the *autres achats et charges externes* with a control variable of the marketing effort.

Our sample showed that family firms are smaller than outsider-managed firms, family firms' sales ranged between 12 and 19 million euros while outsider-managed firms' sales ranged between 12 and 45 million euros. Cooperatives' sales fell between the two, from 10 to 36 million euros. Cooperatives that used their own brand were almost twice as big as firms focused on processing. Based on the use of their own brand, there was a difference, although not significant, between outsider-managed firms, whereas there was no difference between family firms.

Table 3. Average sales by ownership structure and vertical integration, in thousand euros

Ownership structure	Vertical Integration		
	Proxy	No	Yes
Family firms	Brand	18,157 (5,533)	16,365 (3,525)
	Bottling	15,511 (4,419)	17,197 (10,170)
Outsider-managed firms	Brand	23,029 (5,791)	31,269 (10,619)
	Bottling	15,818 (5,583)	35,860 (11,331)
Cooperatives	Brand	11,930 (1,755)	23,517 (6,351)
	Bottling	12,474 (7,291)	29,834 (7,436)

Note: N: 198 firms; 1226 observations; standard errors adjusted for 198 clusters in N firms are in the brackets

In table 4, we compute the operating expense to sales. Operating expenses clearly increase with vertical integration but not in the same order of magnitude depending on the governance of firms. This increase reaches 7% for family firms, almost 10% for outsider-managed firms

but, surprisingly, is insignificant for cooperatives. This first insight suggests that the agency costs of vertical integration explain the 3% difference between family firms and outsider-managed firms. However, the absence of difference for cooperatives is unexpected.

Table 4. Average operating expense to sales by ownership structure and vertical integration, in percentages

Ownership structure	Vertical Integration		
	Proxy	No	Yes
Family firms	Brand	10.67 (1.39)	17.71 (1.37)
	Bottling	10.02 (1.19)	17.27 (1.32)
Outsider-managed firms	Brand	6.43 (1.09)	16.93 (1.09)
	Bottling	6.77 (1.24)	16.81(1.92)
Cooperatives	Brand	10.52 (1.63)	12.61 (1.39)
	Bottling	10.79 (1.35)	13.14 (1.83)

Note: N: 198 firms; 1215 observations; standard errors adjusted for 198 clusters in N firms are in the brackets

Our analysis needs a certain number of control variables. One important point is to avoid confusing the intangible expenses needed for market access and the 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 taking part in trade fairs, etc. We deal with this problem by introducing a variable on the marketing effort (the marketing expenses for the main product, expressed as a percentage of sales).

One determinant point of wine firms is the area from which they operate. Although a certain number of *negociants* deal in wines from different *appellations*, most wine firms are SMEs (the 90th percentile of sales is €45 million¹⁰) embedded in their local community with regional specialization. Moreover, the reputation of *appellations* differs considerably from one region to another. For example, let us compare Bourgogne or Bordeaux both of which have a very strong reputation worldwide, and Languedoc which, despite major efforts to improve quality, still has a reputation for low-quality mass production. This may impact the marketing effort of individual firms. Moreover, supply chains present regional specificities related to the effect of natural conditions on the wine quality, their proximity with consumer markets and path dependency. This is even truer for cooperatives. As a result, we include the region of origin of the firms (*bassin viticole*) as a control variable.

The need for control variables (*CV*) as well as the need to isolate the effect of vertical integration (*VI*) and ownership structure (*OS*) called for multivariate analysis. In addition, the measure of agency costs of vertical integration means the interaction of ownership structure and vertical integration variables (*OS × VI*) have to be included.

The regression model, with operating expenses (*OE*) as the explanatory variable, is such that:

$$OE = \beta_1 OS + \beta_2 VI + \beta_3 (OS \times VI) + \beta_4 CV + \alpha \quad (3)$$

¹⁰ According to the European Commission definition, SMEs are firms with an annual turnover below €50 million (EU recommendation 2003/361).

In this model, $(\beta_1 + \beta_3 VI)$ corresponds to the full agency costs of ownership structures (the ACL measurement, considering the zero-agency cost case as a reference) and β_3 corresponds to the agency costs of vertical integration as formalized in section 1.

We apply a feasible generalized least square approach adjusting for heteroskedasticity and autocorrelation.

We set up three regression models. The first model shows the effect of vertical integration on operating expenses for each ownership structure. β_3 represents the total cost of the vertical integration for each ownership structure if $\beta_2 = 0$. In the second model, we focus on non-cooperative firms and use the regression model without constraining a coefficient. Ownership structure refers to ownership openness. In this case, β_3 represents the agency costs of vertical integration in the sense of ACL. In the third model, we also use the full regression model but focus on cooperatives as ownership structures. In this way, β_3 represents the agency costs of vertical integration of cooperatives. The results of the analysis are presented in the following section.

Results

Table 5 shows the results of the regression to estimate agency costs with the dependent variable as the ratio of operating expenses to annual sales. In models (1) and (3), we test the effect of ownership structure and vertical integration independently. We introduce the interaction terms in models (2) and (4). We quantify the vertical integration costs according to each ownership structure through an interaction variable. In models (1) and (2), we present the results with the branding strategy internalization as proxy for vertical integration. In models (3) and (4) we use the proportion of bottles versus bulk wine as a proxy for vertical integration.

Table 5. Ownership Structure, Vertical Integration and Agency Costs

	Operating expenses to sales			
	(1) VI proxied by brand	(2) VI proxied by brand	(3) VI proxied by bottling	(4) VI proxied by bottling
<i>Ownership structure</i>				
Family firms	Ref	Ref	Ref	Ref
Outsider-managed firms	-3.28*** (-6.16)	-3.47*** (-3.85)	-3.73*** (-5.35)	-5.44*** (-7.55)
Cooperative	-3.31*** (-7.59)	-1.51** (-2.01)	-2.96*** (-4.77)	-0.89 (-1.48)
Vertical integration	5.55*** (14.07)		5.32*** (9.07)	
<i>Ownership structure * Vertical integration</i>				
Family firms * Vertical integration		7.21*** (8.61)		7.13*** (11.42)

Outsider-managed firms * Vertical integration		8.20*** (7.42)		9.96*** (13.44)
Cooperative * Vertical integration		3.60*** (5.74)		1.39*** (2.37)
Marketing effort	0.36*** (7.05)	0.35*** (5.19)	0.45*** (7.42)	0.49*** (10.90)
Sales	-0.05*** (-7.48)	-0.05*** (-6.34)	-0.07*** (-7.50)	-0.08*** (-10.54)
Wine area	-0.28*** (-4.74)	-0.35*** (-4.39)	-0.22*** (-2.84)	-0.25*** (-4.16)
Intercept	12.62*** (23.26)	11.42*** (15.74)	11.95*** (16.31)	11.38*** (18.15)
N	1129	1129	1129	1129
Wald statistics	485.21***	296.30***	263.65***	546.28***

t statistics in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

First it should be noted that ownership structure has a significant effect on operating expenses. The ratio of operating expenses to sales by firms with open ownership is 3% lower than operating expenses to sales by family firms. This is in contradiction with the ACL assumption, but is nevertheless not surprising. Indeed, there may be confusion between a firm's income and the manager's compensation when the manager is a member of the founding family. The trade-off between the salary, and perks and dividends for a manager who is a member of the family who owns the firm might be subject to tax optimization. When the firm is managed by an outsider, there can no longer be any confusion, as shareholders may complain if the manager does not minimize operating expenses. This explains the lower operating expenses of outsider-managed firms. The fact that operating expenses to sales is not lower for cooperatives than those of family firms can be interpreted as agency costs, since managers do not minimize operating expenses as they should, given the separation of ownership and management.

Vertical integration (see models (1) and (2)) implies additional operating expenses that reach 5% of sales.

Now, let us consider the interaction terms ownership structure and vertical integration. The regression shows that vertical integration increases operating expenses for all firms: this increase is close to 7% for family firms, between 8 and 10% for outsider-managed firms and between 1.4 and 3.6% only for cooperatives. According to our methodology, the difference between family firms and outsider-managed firms reflects the agency costs of vertical integration.

Table 6 focuses on operating expenses in non-cooperative firms. In this regression, we keep the vertical integration variable, so that the interaction terms should be the direct calculation of the vertical integration agency costs for outsider-managed firms. The coefficient is not significant for this variable when vertical integration is proxied by brand. However, the

operating expenses related to bottling are 2.54% higher for outsider-managed firms, which means that vertical integration induces agency costs of economic significance.

Cooperatives produce unexpected results. First of all, the operating expenses of cooperatives are lower than the operating expenses of owner-managed firms, which is expected as the owner-managers, certainly for tax reasons, tend to overweight operating expenses. A more interesting point is that cooperatives' operating expenses do not appear to increase with vertical integration. Table 7 shows that the costs of vertical integration are about 4% lower for cooperatives than family firms. This result contradicts our assumption of higher vertical integration agency costs for cooperatives. A focus on performance is necessary to understand this result.

Table 6. Vertical Integration and Agency Costs for Non-Cooperative Firms

	Operating expenses to sales			
	(1) VI proxied by brand	(2) VI proxied by brand	(3) VI proxied by bottling	(4) VI proxied by bottling
<i>Ownership structure</i>				
Family firms	Ref	Ref	Ref	Ref
Outsider-managed firms	-2.60*** (-4.61)	-3.01*** (-4.04)	-3.14*** (-5.44)	-4.62*** (-5.91)
Vertical integration	7.33*** (11.87)	7.07*** (9.79)	7.61*** (13.73)	6.72*** (10.26)
<i>Ownership structure*Vertical integration</i>				
Outsider-managed firms*Vertical integration		0.85 (0.80)		2.54*** (2.61)
Marketing effort	0.39*** (5.15)	0.37*** (4.84)	0.51*** (8.86)	0.51*** (9.34)
Sales	-0.05*** (-5.21)	-0.05*** (-5.12)	-0.07*** (-7.14)	-0.07*** (-7.56)
Wine area	-0.19 (-1.59)	-0.18 (-1.55)	0.08 (0.77)	0.05 (0.47)
Intercept	10.55*** (14.78)	10.70*** (14.42)	8.72*** (11.79)	9.62*** (12.09)
N	774	774	774	774
Wald statistics	305.32***	315.50***	359.85***	416.02***

Table 7. Vertical Integration and Operating Expenses to Sales for Cooperative Firms

	Operating expenses to sales			
	(1) VI proxied by brand	(2) VI proxied by brand	(3) VI proxied by bottling	(4) VI proxied by bottling
<i>Ownership structure</i>				
Family firms	Ref	Ref	Ref	Ref

Cooperative firms	-3.68*** (-8.72)	-1.44** (-2.23)	-3.43*** (-7.30)	-0.97* (-1.66)
Vertical integration	5.02*** (12.27)	7.41*** (10.58)	4.27*** (8.72)	6.95*** (11.19)
<i>Ownership structure*Vertical integration</i>				
Cooperative firms*Vertical integration		-3.74*** (-4.19)		-4.75*** (-6.00)
Marketing effort	0.28*** (4.54)	0.25*** (3.45)	0.31*** (4.57)	0.27*** (3.89)
Sales	-0.06*** (-6.49)	-0.06*** (-6.22)	-0.08*** (-7.98)	-0.08*** (-8.84)
Wine area	-0.21*** (-3.49)	-0.29*** (-3.95)	-0.19*** (-3.10)	-0.20** (-3.22)
Intercept	12.90*** (21.73)	11.59*** (18.74)	13.26*** (21.80)	11.65*** (18.34)
N	875	875	875	875
Wald statistics	398.76***	275.20***	322.50***	308.47***

t statistics in parentheses

* p<0.10, ** p<0.05, *** p<0.01

Table 8 shows that Earnings before Interests Taxes Depreciation and Amortization (EBITDA) increases with vertical integration. This means that the benefits of vertical integration outweigh the additional operating expenses listed in table 3 to table 7. One interesting point is that the performance related to branding is higher for outsider-managed firms. For cooperatives, branding increases performance but in a weaker and less significant way. For cooperatives, bottling more than 85% of their wine has no impact on performance, whereas for non-cooperative firms, it leads to a 3% increase in the ratio of EBITDA to sales.

Linking these results with the previous results leads us to conclude that, for non-cooperative firms, the increase in agency (and non-agency) costs due to vertical integration is much more than counterbalanced by the benefits. For cooperative firms, the absence of additional agency costs of vertical integration does not imply better performance than the non-cooperative firms. One possible explanation is that cooperatives do not make the same organizational changes as non-cooperative firms when they introduce a vertical integration policy. This would explain the absence of additive agency costs as well as the lower performance of vertical integration for these firms. From the managerial entrenchment theory perspective, one possible explanation is that cooperatives do not invest in human capital because of the agency costs this would imply (Lajiji et al. 2007). Indeed, learning is a specific asset and complexity management requires managerial discretion.

Table 8. Ownership Structure, Vertical Integration and Performance

	EBITDA to sales			
	(1) VI proxied by brand	(2) VI proxied by brand	(3) VI proxied by bottling	(4) VI proxied by bottling
<i>Ownership structure</i>				
Family firms	Ref	Ref	Ref	Ref
Outsider-managed firms	-0.02 (-0.29)	-1.79** (-3.74)	-0.36 (-0.87)	-0.27 (-0.48)
Cooperative firms	0.52* (1.88)	0.39 (0.89)	1.30*** (4.29)	2.35*** (6.73)
Vertical Integration	1.73*** (6.28)		2.30*** (7.46)	
<i>Ownership structure*Vertical integration</i>				
Family firms*Vertical Integration		1.71*** (3.34)		3.31*** (8.10)
Outsider-managed firms*Vertical Integration		4.83*** (6.51)		2.91*** (4.05)
Cooperative firms*Vertical Integration		1.12*** (2.63)		-0.18 (-0.37)
Marketing effort	-0.09*** (-2.70)	-0.15*** (-3.95)	-0.06 (-1.54)	-0.06 (-1.62)
Sales	0.00 (0.64)	0.02*** (3.47)	-0.01 (-1.40)	-0.01 (-1.08)
Wine area	0.65*** (18.06)	0.58*** (14.26)	0.66*** (17.65)	0.67*** (19.13)

Intercept	1.51*** (4.95)	1.93*** (4.47)	1.07*** (3.30)	0.44 (1.28)
N	1129	1129	1129	1129
Wald statistics	444.85***	352.26***	526.78***	748.24***

t statistics in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Conclusion

Our results show that the internal costs of vertical integration depend on ownership structure, i.e. vertical integration can increase agency costs. Our results provide insights into the costs of internal organization and the way these costs are affected by different internal organizational and incentive structures, addressing a question neglected by research on vertical integration (Joskow 2005). Indeed, if the vertical integration theory has long suggested internal costs related to the change in incentive structures of vertical integration, there has been no clear identification of these costs as agency costs of vertical integration. Our econometric analysis on the French wine industry shows that agency costs of vertical integration are of economic significance when vertical integration is proxied by bottling. It reaches 2.5% of the firm's revenues. However, this result is not confirmed when vertical integration is proxied by branding.

An interesting point is that the firms that have the highest agency costs of vertical integration, i.e. outsider-managed firms, do not display lower performance. Conversely, cooperatives appear to have the lowest internal costs of vertical integration, but this does not result in improved performance. One possible explanation is that cooperatives do not make the same organizational changes as non-cooperative firms when they introduce a vertical integration policy. In doing so, they would avoid agency costs but compromise the success of their vertical integration strategy. These results and hypotheses need to be tested in further investigations.

Indeed, our research has certain limitations. Firstly, the assumption that vertical integration implies agency costs needs to be more documented. In our view, the entrenchment theory may explain why it may be true: vertical integration requires managers to have more specific knowledge and complexity leaves room for managerial discretion. This assumption fits the wine sector in France well, where contracting bulk wine sales with negociants (traders) or distributors who bottle and brand the wine is less complex than reaching the final distributors. Can this assumption be applied to other sectors?

Secondly, the measurement of agency costs of vertical integration would be more accurate in a fully dynamic setting, i.e., with longitudinal data on the decision of firms to move forward (or backward) along the supply chain, which would give an idea of the differential of performance of the same firms. In the very long term, it is even possible to envisage longitudinal data on ownership structure.

Thirdly, further investigations are needed to examine the effect of vertical integration on the performance of cooperatives. In the opinion of Couderc et al. (2010), cooperatives need

financial performance in the same way as non-cooperative firms, especially in the wine sector, where differentiation requires intangible expenses and hence, internal cash flows. These authors show that cooperatives' margins are similar to those of non-cooperative firms. From this point of view, it is not misleading to compare the financial performance of cooperative and non-cooperative firms. However, it is still true that the owners of the cooperatives are also users and are paid through the price of crushed grapes. One possible solution is to consider financial indicators specific to cooperatives (see Declerck (2013)) and to apply them to non-cooperative firms. However, our measurement of agency costs is not affected by this problem.

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