

Two-sided Moral Hazard and Monetary Vertical Restraints: Evidence from European Franchising Data

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Abstract

This paper investigates the choice of the two profit-sharing vertical restraints within franchising networks: the royalty rate and the up-front fee. It is based on the theoretical and empirical literature concerning share contracts in the context of a double-sided moral hazard. We use a three countries European dataset, regarding a wide range of sectors, in order to test several assumptions concerning the choice of the monetary provisions within franchise contracts. The estimations are partly consistent with the analytical context.

Keywords: Vertical restraints, Royalty rate, Up-front fee, Contract Econometrics.

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I. INTRODUCTION

Vertical restraints are contractual provisions binding a producer to one or several retailers. In this way the upstream firm constrains the action of its distributors. Generally franchise contracts enclose a set of vertical restraints. Monetary terms sharing the profit generated by the decentralized vertical structure are at the heart of the agreement. Within franchise systems, two main provisions determine the share arrangement: the up-front fee and the royalty rate.

The relevance of the agency framework to study vertical restraints is now commonly admitted, since the main theoretical contributions of Mathewson and Winter¹, Rey and Tirole². In addition, the empirical literature emphasizes the role of the agency arguments in explaining the organizational choices of the upstream firm concerning its network of retailers³.

This paper is based on the theoretical and empirical results concerning share contracts in franchising, in the context of a double-sided moral hazard.

The bilateral moral hazard model explaining profit-sharing vertical restraints in franchising was formalized by Lal (1990), and Bhattacharyya and Lafontaine (1995). In this framework, the share arrangement is a result of both parties need for incentives. This model finds support in the empirical literature. Comparing several agency models (risk-sharing, one-sided and two-sided moral hazard models), Lafontaine (1992) shows that the data are most consistent with incentives issues on both sides. Agrawal and Lal (1995) take the predictions from the theoretical model presented in Lal (1990) to data. They find empirical support to the incentive-based explanation for the use of royalty-rate in franchise contracts. Brickley (2002) proxies the franchisor's side moral hazard and highlights its impact on the monetary provisions. Lastly, Vazquez (2005) takes into account risk sharing and bilateral moral hazard issue, as Lafontaine (1992). His empirical results are consistent with the agency framework.

In this field, we investigate the choice of the two profit-sharing vertical restraints. When as most of agency econometric studies on franchising use US data, this paper is based on European franchising data.

Europe appears yet to be the continent of franchise. In its 2006 survey, the European Franchise Federation (C. Chopra, 2006) reveals indeed that in 2005, 1500 distinct franchised

¹ 1983, 1984 , 1985 a, 1985 b, 1986.

² 1986 a and b.

brands are operating in the United States, whereas 6437 are in Europe. The number of franchised brands in the United States is 23 percent of the total number of distinct brands in the European Union. Moreover, most franchised brands operating in Europe (close to 80%) are domestic ones, native to Europe. The countries concerned are: Austria, Belgium, the Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Italy, the Netherlands, Portugal, Slovenia, Spain, Sweden, Switzerland, Poland and Russia. Our empirical study compiles data of three leading countries for franchising: France, Germany and Spain. Another feature of the franchising sector in Europe is its diversity. Our unique collected dataset takes into account a wide range of activities, grouped together into 8 main sectors.

The paper is organized as follows. Section 2 discusses the analytical framework. Section 3 sets out the testable qualitative predictions. Section 4 describes the data and the empirical specifications. Section 5 contains the estimations. Our results are partly consistent with the hypothesis provided by the analytical framework. Concluding comments are offered in section 6.

II. ANALYTICAL FRAMEWORK

1. Franchise as an Agency Relationship

We focus on a bilateral contracting between a franchisor and a franchisee. This is an agency relationship as the upstream firm mandates the downstream party to distribute its products. The principal (the franchisor) designs the contract. His proposition specifies the payments he will pass on to the agent (the franchisee). The franchisee decision consists in accepting or rejecting the contract.

A franchisee moral hazard emerges since i) the retailing effort affects the profit function of the principal, and that ii) the principal cannot observe this effort. The only observable variable is the result, in other words the quantity sold on the retail market.

³ J. Brickley and F. Dark (1987), S. Norton (1988), A. Minkler (1990), J. Brickley, F. Dark and M. Weisbach (1991), F. Lafontaine (1992), J. Brickley (1999), B. Arrunada and al. (2001), F. Lafontaine and K. Shaw (2005), L. Vazquez (2005).

2. Residual Claimancy

In this situation, the principal can choose to grant the distributor the status of residual claimant. Then the share contract includes an up front fee and no royalties. This arrangement suppresses the moral hazard because in that case, the franchisors' reward is independent of the result, and so of the franchisee's effort. In addition, that kind of arrangement is the most incentive mechanism for the downstream firm: once the entry fee is paid, the franchisee captures the totality of the results from its sale effort.

3. Why Royalties?

3.1. *Two-sided moral hazard*

Despite the advantages of residual claimancy, descriptive statistics show that royalties are usual in franchise contracts⁴. Theoretically, this is explained by two arguments: i) the importance of the risk bearing on the franchisee⁵, ii) a two-sided moral hazard. Our empirical work focuses on the second point.

A moral hazard emerges on the franchisor's side because the sales on the retail market are also dependent on its effort. In business-format franchising, the brand name, in other words the reputation of the network, represents the main contribution of the franchisor. A strong brand name capital favors the sales on the final market. Building and supporting the chain reputation is the task devoted to the franchisor.

In that case the contract has to contain an incentive mechanism for the franchisor too. The share contract results from the necessity to incite both the franchisee (which tends towards diminishing the royalty rate) and the franchisor (which on the contrary tends towards increasing the royalty rate).

Finally, the double-sided moral hazard (and so the share contract) is also related to the monitoring costs for the franchisor and the franchisee. The more these costs are high (which means that monitoring is difficult), the more the hazard is important.

⁴ See Lafontaine and Shaw (1999), Blair and Lafontaine (2005).

⁵ Risk related to the hazard concerning the level of the demand on the retail market.

3.2. *Bhattacharyya & Lafontaine (1995)'s model for profit sharing contracts in franchising*

In order to focus on the impact of the bilateral moral hazard on the monetary provisions, Bhattacharyya & Lafontaine (1995) do not take into account the issues relating to risk-sharing. Their model is a main reference for our study because it demonstrates that, in a context of a double-sided moral hazard, royalties are required even with risk neutral parties.

$$X = f(e, r) + \mu \quad (1)$$

where X is the total monetary return produced; this is the only contractible variable. e denotes the franchisee's effort, r the franchisor's effort and μ is a random term with mean zero and variance σ^2 . We assume that the realization of μ is unobservable to both parties, and that the effort levels are unverifiable. For this reason any enforceable contract has to be based on the output level. Both parties are assumed to be risk neutral.

f is a standard neoclassical production function. f_e and f_r denote the partial derivatives.

$$f_e \text{ and } f_r > 0$$

$$f_{ee} \text{ and } f_{rr} < 0$$

$$f_{er} > 0 \text{ and } f(0, r) = 0 \text{ and } f(e, 0) = 0$$

This last assumption involves a team production: both inputs are required for any production to occur.

The utility functions are increasing and convex in effort:

$$U'(r) > 0 \text{ and } U''(r) < 0$$

$$V'(e) > 0 \text{ and } V''(e) < 0$$

The maximization program for the franchisor is then written as:

$$\max_{\beta, F, e, r} \{F + \beta \cdot f(e, r) - U(r)\} \quad (2)$$

Subject to:

- (i) $\beta f_r(e, r) = U'(r)$
- (ii) $(1 - \beta) f_e(e, r) = V'(e)$
- (iii) $(1 - \beta) f(e, r) - F - V(e) \geq k$

Where F is the up-front fee, β denotes the royalty rate on the output and k stands for the franchisee's reservation utility level. Constraints (i) and (ii) represent respectively the franchisor's and franchisee's incentive constraints, and (iii) is the franchisee's participation constraint, with k the franchisee's reservation utility.

From the participation constraint we know that $f(e, r)$ must be positive, otherwise F would have to be negative. But then the franchisor earns negative profits and is better off not contracting with the franchisee. For $f(e, r) > 0$, it must be from the team production assumption that both e and r are positive. Hence $U'(r)$ and $V'(e)$ have also to be both positive. Then if β were either 0 or 1, one of the incentive conditions would not be satisfied. As a result β must be strictly between 0 and 1.

$$\beta = \frac{U'(r) / f_r(e, r)}{V'(e) / f_e(e, r) + U'(r) / f_r(e, r)} \quad (3)$$

For a given level of β , the effort levels adjust so that the franchisor's contribution to the sum of marginal disutility weighted by respective productivities is equal to the royalty rate. So the optimal royalty rate is increasing in the relative importance of the franchisor's effort.

We can note that the franchisor and the franchisee share the output equally ($\beta=1/2$) when they have equal marginal productivities ($f_r(e, r) = f_e(e, r)$) and equal disutility of effort ($U'(r) = V'(e)$).

We can also mention that F , the up-front fee, is not present any more in (3). This observation is coherent with the idea that this fee affects neither the choice of effort, nor total surplus. More general, it is consistent with the proposal that the franchise fee is chosen to meet the franchisee's

reservation utility (F is included in franchisee's participation constraint), whereas the royalty rate allows the surplus repartition. In the same time, the franchisor uses F to extract rents left downstream by the royalty rate.

III. TESTABLE PREDICTIONS

The general qualitative prediction from this analytical framework is that the vertical restraints defining the share contract result from the necessity to provide sufficient incentives for the sales efforts of both franchisor and franchisee. On this basis, several testable predictions can be developed.

1. Franchisee's Side Moral Hazard

Moral hazard on the franchisee's side is related to its effort, and to the difficulty for the franchisor to monitor it. In this situation, we should find evidence that the share contract is closed to residual claimancy, the higher-powered incentive contract for the franchisee. Consequently, we assume that:

H₁: The royalty rate should decrease when the franchisee effort is larger.

H_{1a}: The royalty rate should decrease the harder it is to monitor the franchisee effort.

H₂: The up-front fee should increase when the franchisee effort is larger.

H_{2a}: The up-front fee should increase the harder it is to monitor the franchisee effort.

2. Franchisor's Side Moral Hazard

It is common for moral hazard models to be based on the hypothesis that only one party, the agent, provides effort in the selling process. Our analytical framework incorporates the possibility that the principal also offers some effort. We assume that the franchisor's effort and the difficulty for the franchisee to monitor it result in a moral hazard on the franchisor's side.

Royalties are a way to remunerate this effort, in other words an incentive mechanism for the franchisor. Therefore:

H₃: The royalty rate should increase when the franchisor effort is larger.

H_{3a}: The royalty rate should increase the harder it is to monitor the franchisor effort.

H₄: The up-front fee should decrease when the franchisor effort is larger.

H_{4a}: The up-front fee should decrease the harder it is to monitor the franchisor effort.

3. Underlying assumption

The explanations above rely on the underlying assumption that the profit-sharing provisions are substitute. For this reason we formulate a last hypothesis:

H₅: Each monetary provision (royalty rate, up-front fee) should have a negative impact on the other.

IV. DATA AND EMPIRICAL SPECIFICATIONS

Our sample consists of 1975 business format franchising networks, in three countries of the European Union. It includes a broad range of trade and service industries.

This is a unique dataset, extracted from a computerized version of the 2006 *Forby's Franchise Guide*⁶. The contract information contained in this reference source comes directly from the networks.

⁶ This data source has previously been used by Pfister and al. (2006) to construct a sample of 546 networks. Their study, in the field of the agency theory, relates to the issue “franchising versus owning”, which is one main issue of the empirical literature on franchising.

1. Explanatory Variables

1.1. Measuring the downstream moral hazard

The franchisee effort is taken into account by the amount of its personal capital contribution in the business (CONTRIB). In addition, the monitoring cost for the franchisor is estimated through the number of owned units, balanced by the size of the network, ie the total number of outlets (OWNED UNITS). The underlying explanation for the latest variable is that the upstream firm monitors the franchised units from its owned units. This assumption was previously used by Vazquez (2005).

We assume that a higher downstream moral hazard incites the franchisor to impose an upper contribution and a strict control on the franchisee. This is why the variables CONTRIB and OWNED UNITS should proxy the downstream moral hazard. When it is high the franchisor grants the status of residual claimant to the franchisee. For this reason we expect a negative links between the variables CONTRIB and the royalty rate, whereas a positive one between the variable OWNED UNITS and the royalty rate. Opposite signs are expected between each of these proxies and the up-front fee.

1.2. Measuring the upstream moral hazard

The age of the network (AGE) is a proxy for the franchisor's effort. This variable was previously used in the same way by Lafontaine (1992), Arrunada and al. (2001). It means that the franchisor is involved in its brand reputation. Royalties are the remuneration of this implication. Therefore a positive link is expected between AGE and ROYALTY and inversely in the FEE equation.

As Vazquez (2005), we measure the difficulty for the franchisees to monitor the franchisor effort taking into account the presence of a franchisees council in the network. Such councils gather elected franchisees and managers of the franchisor. They are a way for the franchisees to balance the decisional power of the upstream firm and to monitor it. We use a dummy variable

(COUNCIL) that equals 1 if there is a council in the network and 0 otherwise. A negative sign should link COUNCIL and ROYALTY, and a positive one with FEE.

1.3. Control variables

Finally, taking into account the characteristics of our international and multi-sectors data, we use two sets of variables in order to control i) the influence of the sector and ii) the impact of the institutional framework related to the country.

Using the NACE classification⁷, we distinguish eight sectors: services for individuals (SERVIND), services for businesses (SERVBUSINES), miscellaneous services for businesses and individuals (MISCEL), equipment for individuals (EQUIPINDI), home equipment (HOMEQUIP), hotels/coffee-bar/restaurants (HCR), automobile (AUTO) and food (FOOD).

⁷ Classification of Economic Activities in the European Community.

2. Descriptive Statistics

2.1. Summary statistics

**Table 1 – The variables
(1975 networks: France/Germany/Spain)**

<i>Label</i>	<i>Measures</i>	<i>Mean</i>	<i>St. error</i>	<i>Min</i>	<i>Max</i>	<i>Function</i>
ROYALTY	Royalty rate / turnover per outlet in the network	0.632	1.125	0	7	Dependent variable
FEE	Up-front fee (€) */ turnover per outlet in this network	1.355	1.490	0	6.25	Dependent variable
CONTRIB	Personal capital contribution per retailer (€) **	0.603	0.837	0	10	Proxy for franchisee moral hazard
OWNED UNITS	Number of owned units in the network / size of the European network.	0.102	.257	0	1	Proxy for franchisee moral hazard
AGE	Age of the European network. (years)	8.016	7.703	0	119	Proxy for franchisor moral hazard
COUNCIL	Presence or absence of a franchisees council in the network: dummy variable (1/0)	0.427	0.494	0	1	Proxy for franchisor moral hazard
GERMANY	Indicating the country (1/0)	0.347	0.476	0	1	Control variable
FRANCE	Indicating the country (1/0)	0.317	0.465	0	1	Control variable
SPAIN	Indicating the country (1/0)	0.336	0.472	0	1	Control variable
SERVIND	Services for individuals: hair and beauty care, education, sports and leisure. Dummy (1/0)	0.101	0.301	0	1	Control variable
MISCEL	Miscellaneous services for individuals and businesses: building, advertising, computers, telecom. Dummy (1/0)	0.205	0.404	0	1	Control variable
AUTO	Automobile: maintenance, equipment, rental. Dummy (1/0)	0.054	0.227	0	1	Control variable
FOOD	Food. Dummy (1/0)	0.087	0.274	0	1	Control variable
EQUIPINDI	Equipment for individuals: textiles, clothing, accessories. Dummy (1/0)	0.143	0.350	0	1	Control variable
HOMEQUIP	Home equipment. Dummy (1/0)	0.135	0.342	0	1	Control variable
HCR	Hotels, Coffee-bar, Restaurants. Dummy (1/0)	0.137	0.344	0	1	Control variable
SERVBUSINES	Services for businesses. Dummy (1/0)	0.077	0.267	0	1	Control variable

* values divided by 10 000

** values divided by 100 000

Table 1 shows summary statistics for the dependent and explanatory variables.

The dependent variables are i) the royalty rate (percent of sales) charged by the franchisor as an ongoing variable payment, and ii) the franchise fee. Both of them are bounded at zero. In our sample, 150 franchisors use a fixed-rent contract (then each franchisee is a full residual claimant; royalty rate = 0 within 7.59% of the networks), while 134 franchisors charge no up-front fee (fee = 0 within 6.78% of the networks).

2.2. Distribution of networks

Table 2- Sector-based distribution of sample networks
(1975 networks)

Sectors	Part in the full sample
Services for individuals	10.1 %
Miscellaneous services for individuals and businesses	20.4 %
Automobile	5.4 %
Food	8.1 %
Equipment for individuals	20.4 %
Home equipment	14.3 %
Hotels, Coffee-bar, Restaurants	13.6 %
Services for businesses	7.7 %

The distribution through 8 sectors highlights the large range of activities concerned with franchising at the European level. The sector related to automobile appears to be the smallest in the sample.

Our sample gathers the networks located in the three leading European countries for franchising according to the *Forby's Franchise Guide*: Germany, France and Spain⁸:

⁸ See appendix 2.

**Table 3- International distribution of sample networks
(1975 networks)**

Country	Number of networks
Germany	687
France	623
Spain	665

The number of networks is similar in the three countries (table 3). However descriptive statistics highlight some main differences and so three features of franchising countries (tables 4-6).

**Table 4- Number of networks per country charging no royalties and no franchise fee
(1975 networks)**

Country	FEE = 0	ROY = 0	FEE = 0 (%)	ROY = 0 (%)
Germany	2	1	0.30%	0.14%
France	130	144	20.90%	23.11%
Spain	2	5	0.30%	0.75%

France has got a different profile from Spain and Germany concerning the use of royalty rate and up-front fee in franchising contracts: there are more French networks with no royalties or no fee. It appears as if, more than the others, French networks would prefer to use only one monetary provision, instead of a combining both of them.

**Table 5- Number of networks per country with a franchisees' council
(1975 networks)**

	COUNCIL= 1	COUNCIL= 1 (%)
Full sample	504	25.5%
Germany	239	34.8%
France	205	32.9%
Spain	60	9.02%

Table 5 shows that franchisees' councils are less developed in Spain, in comparison with France and Germany.

**Table 6- Summary statistics per country
(1975 networks)**

	Mean			St. error			Min			Max		
	Ger.	Fr.	Sp.	Ger.	Fr.	Sp.	Ger.	Fr.	Sp.	Ger.	Fr.	Sp.
SIZE OF THE NETWORK	85.82	98.89	290.7	253.98	446.56	736.7	0	0	0	2500	4600	3500
OWNED UNITS	0.01	0.178	0.222	0.106	0.314	0.372	0	0	0	1	1	1
CONTRIB	0.172	0.88	0.42	0.244	0.966	0.38	0	0.02	0.01	2.5	10	1.6

A few Spanish networks gave the information concerning their size. This could explain the very high mean for this variable (290.7), considering that mainly the biggest networks have answered. As a consequence the standard error is also very high.

In addition we have to mention that the mean for the variable OWNED UNITS in Germany is lower than in France and in Spain. This would suggest that German networks prefer franchising versus owning, may be in order to provide better incentives at the outlet level.

At last, we can notice that in France the franchisee's contribution is higher compared with Germany and Spain.

2.3. Correlation matrix for independent variables

Table 7- Correlation matrix
(1975 networks)

	FRANCE	GERM	SPAIN	SERVIND	MISC	AUTO	FOOD	EQUIP	HOMEQ	HCR	SERVBUSIN	AGE	OWN UNITS	CONTRIB	COUNCIL
FRANCE	1														
GERMANY	-0.979	1													
SPAIN	-0.102	-0.099	1												
SERVIND	0.193	-0.185	-0.038	1											
MISCEL	-0.264	0.270	-0.049	-0.185	1										
AUTO	-0.001	0.006	-0.024	-0.091	-0.117	1									
FOOD	-0.091	0.097	-0.029	-0.111	-0.142	-0.070	1								
EQUIPINDI	0.301	-0.291	-0.051	-0.193	-0.247	-0.122	-0.148	1							
HOMEQUIP	0.063	-0.092	0.144	-0.162	-0.207	-0.102	-0.124	-0.217	1						
HCR	-0.102	0.090	0.058	-0.151	-0.194	-0.095	-0.116	-0.202	-0.170	1					
SERVBUSINES	-0.203	0.208	-0.023	-0.088	-0.113	-0.056	-0.068	-0.118	-0.099	-0.092	1				
AGE	-0.110	0.102	0.040	-0.074	-0.007	-0.017	0.033	-0.037	0.127	0.016	-0.090	1			
OWNED UNITS	0.320	-0.321	0.002	-0.003	-0.174	-0.001	-0.054	0.197	-0.045	0.095	-0.052	-0.103	1		
CONTRIB	0.414	-0.412	-0.009	-0.057	-0.195	-0.004	-0.078	0.085	0.064	0.245	-0.109	-0.087	0.429	1	
COUNCIL	0.041	-0.020	-0.101	-0.069	0.090	0.028	0.091	-0.115	0.088	0.002	0.075	0.216	-0.085	-0.001	1

The correlation matrix shows that there is no collinearity problem between the quantitative explanatory variables, except between Germany and France. This negative correlation suggests that the franchising features are strongly divergent between the two countries.

The collinearity resulting from this correlation is suppressed using Germany as the referent country in the estimations.

V. ESTIMATION MODELS AND RESULTS

To study the impact of the bilateral moral hazard on the provision ROYALTY we estimate the following models. The second model (4a) adds controls for the sectors:

$$\begin{aligned}
 ROYALTY_i = & \alpha_0 + \underset{<0}{\alpha_1} CONTRIB_i + \underset{>0}{\alpha_2} OWNED\ UNITS_i + \underset{>0}{\alpha_3} AGE_i + \underset{<0}{\alpha_4} COUNCIL_i \\
 & + \alpha_5 PREDFEE + \sum_{p=1}^3 \alpha_6^p COUNTRY_i + \varepsilon_i \quad \begin{array}{l} i = \{1, \dots, 1975\} \\ p = \{1, \dots, 3\} \\ s = \{1, \dots, 8\} \end{array} \quad (4)
 \end{aligned}$$

$$\begin{aligned}
 ROYALTY_i = & \alpha_0 + \underset{<0}{\alpha_1} CONTRIB_i + \underset{>0}{\alpha_2} OWNED\ UNITS_i + \underset{>0}{\alpha_3} AGE_i + \underset{<0}{\alpha_4} COUNCIL_i \\
 & + \alpha_5 PREDFEE + \sum_{p=1}^3 \alpha_6^p COUNTRY_i + \sum_{s=1}^8 \alpha_7^s SECTOR_i + \varepsilon_i \quad \begin{array}{l} i = \{1, \dots, 1975\} \\ p = \{1, \dots, 3\} \\ s = \{1, \dots, 8\} \end{array} \quad (4.a)
 \end{aligned}$$

Where:

ε = the error term.

i = network

p = country (Germany as reference)

s = sector (Services for individuals as reference)

The symbols <0 and >0 below the parameters indicate the predicted sign

Similar models are estimated for the provision FEE, with opposite predicted signs for the parameters:

$$\begin{aligned}
 FEE_i = & \beta_0 + \underset{>0}{\beta_1} CONTRIB_i + \underset{<0}{\beta_2} OWNED\ UNITS_i + \underset{<0}{\beta_3} AGE_i + \underset{>0}{\beta_4} COUNCIL_i \\
 & + \beta_5 PREDROY + \sum_{p=1}^3 \beta_6^p COUNTRY_i + \varepsilon_i \qquad \qquad \qquad \begin{aligned} i &= \{1, \dots, 1975\} \\ p &= \{1, \dots, 3\} \\ s &= \{1, \dots, 8\} \end{aligned} \quad (5)
 \end{aligned}$$

$$\begin{aligned}
 FEE_i = & \beta_0 + \underset{>0}{\beta_1} CONTRIB_i + \underset{<0}{\beta_2} OWNED\ UNITS_i + \underset{<0}{\beta_3} AGE_i + \underset{>0}{\beta_4} COUNCIL_i \\
 & + \beta_5 PREDROY + \sum_{p=1}^3 \beta_6^p COUNTRY_i + \sum_{s=1}^8 \beta_7^s SECTOR_i + \varepsilon_i \qquad \qquad \qquad \begin{aligned} i &= \{1, \dots, 1975\} \\ p &= \{1, \dots, 3\} \\ s &= \{1, \dots, 8\} \end{aligned} \quad (5.a)
 \end{aligned}$$

In order to take H_3 to data, we include instrumental values of the dependent variables (PREDROY and PREDFEE). These are predicted values from the regression of each dependent variable on all the independent variables.

To take account of the lower-limit censoring, we use the maximum likelihood Tobit estimator in the regressions. The results are reported in tables 8 and 9.

Table 8 – Tobit estimates for the royalty rate

Independent variable	(4)	(4.a)
	Coefficient (std. error)	Coefficient (std. error)
AGE	.522E-03 (.103E-02)	.600E-03 (.104E-02)
CONTRIB	.593E-02*** (.105E-02)	.571E-02*** (.107E-02)
OWNED UNITS	.881E-03 (.696E-03)	.100E-02 (.691E-03)
COUNCIL	.217E-02*** (.592E-03)	.199E-02*** (.5854E-03)
PREFEE	-.923E-03 (.849E-03)	-.879E-03 (.839E-03)
FRAN	9.286*** (1.163)	9.472*** (1.177)
SPAIN	4.863*** (1.727)	5.572*** (1.889)
<i>Sector dummies</i>	<i>not-included</i>	<i>included</i>
Constant	-10.634*** (1.210)	-10.585*** (1.216)

* Significant at the 10 % level

** Significant at the 5 % level

*** Significant at the 1 % level

Table 9 – Tobit estimates for the up-front fee

Independent variable	(5)	(5.a)
	Coefficient (std. error)	Coefficient (std. error)
AGE	.124E-02 (.474E-02)	.152E-02 (.481E-02)
CONTRIB	.333E-01*** (.532E-02)	.323E-01*** (.542E-02)
OWNED UNITS	.128E-02 (.347E-02)	.177E-02 (.342E-02)
COUNCIL	.124E-01*** (.285E-02)	.124E-01*** (.282E-02)
PREDROY	-.302E-02 (.419E-02)	-.350E-02 (.412E-02)
FRAN	46.751*** (5.807)	47.080*** (5.850)
SPAIN	32.517*** (7.807)	34.974*** (8.444)
<i>Sector dummies</i>	<i>not-included</i>	<i>included</i>
Constant	-53.633*** (5.974)	-53.732*** (6.020)

* Significant at the 10 % level

** Significant at the 5 % level

*** Significant at the 1 % level

Estimations conducted on the models 4.a and 5.a show that the results are robust to the introduction of industry dummy variables: for each provision, estimates are qualitatively similar with and without including the sector dummies. On this point our results are identical to the one reported by Lafontaine (1992) on US data.

For both provisions, the same explanatory variables have a significant impact.

The influence of the variables COUNCIL and CONTRIB is positive and significant ($p < 0.01$) in the four Tobit equations. These results lend empirical support to the hypothesis H_2 and H_{4a} : as predicted, the up-front fee increases when the franchisee effort (its personal capital contribution) is larger (H_2) and when it is not hard to monitor the franchisor effort thanks to the franchisees council (H_{4a}). This evidence on multinational European data is consistent with Vazquez's one (2005) on Spanish data.

However in the equations for the royalty rate, both variables (COUNCIL and CONTRIB) have an unexpected influence (positives signs for α_1 and α_4 when as negative

were predicted). In addition the two variables of interest OWNED UNITS and AGE have no significant influence in the four Tobit models. As a consequence, the evidence does not support the hypothesis concerning the royalty rate (H_1, H_{1a}, H_3, H_{3a}).

One main explanation for these unpredicted results is that the underlying assumption (H_5) does not find empirical evidence within our data. Contrary to what is suggested by theoretical models of franchising, the up-front fee and the royalty rate does not appear to be inversely related here. This last evidence is different from the result reported by Vazquez (2005), but it is consistent with the results from Lafontaine (1992) and Lafontaine and Shaw (1999). This difference from the theoretical prediction is usually explained by the fact that the franchisor would not extract the whole rent downstream.

Finally, the results highlight the influence of the country in all the regressions. This means that concerning the monetary provisions the choices of the networks located in France and in Spain differ significantly from what happens in Germany. This influence was already suggested by descriptive statistics.

VI. CONCLUSION

This paper provides new empirical evidence on the way franchisors choose the monetary provisions in franchise contracts. We conducted tests of hypotheses developed from the bilateral moral hazard models of franchising.

In contrast with the preceding works on this issue (Lafontaine, 1992, Agrawal and Lal 1995, Brickley, 2002, Vazquez, 2005), our estimations on multinational European data lend little empirical support to the theoretical framework. Several limitations and directions for further research may explain this result.

First, the use of proxy variables is always a delicate question. The proxies employed in our study for the franchisor input (the age of the network) and for the costs of monitoring the franchisees (the proportion of owned units) lead to disappointing results. Both variables appear to be not suitable.

Secondly it seems necessary to include the issue of risk aversion and risk sharing in the explanation.

Finally it may be interesting to use seemingly unrelated regression (SUR) estimators to take into account the theoretical relation between the equations for the royalty rate and the franchise fee.

Despite the limitations, our results support the notion that the two monetary devices are not necessarily substitutes. Many other elements, as the connexion with the non-monetary provisions, should be included in the explanation. This highlights the complexity of the contractual design.

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**APPENDIX 1: SUMMARY RESULTS
FOR THE EXPLANATORY VARIABLES OF INTEREST**

Table 10 – Sign of the parameters (equations for Royalty)

ROYALTY	Expected	Estimated
α_1 (CONTRIB)	-	+***
α_2 (OWNED UNITS)	+	<i>n.s</i>
α_3 (AGE)	+	<i>n.s</i>
α_4 (COUNCIL)	-	+***

n.s: non-significant

Table 11 – Sign of the parameters (equations for Fee)

FEE	Expected	Estimated
β_1 (CONTRIB)	+	+***
β_2 (OWNED UNITS)	-	<i>n.s</i>
β_3 (AGE)	-	<i>n.s</i>
β_4 (COUNCIL)	+	+***

n.s: non-significant

APPENDIX 2: COMPLEMENTARY DESCRIPTIVE STATISTICS

**Tableau 12.- European Distribution of sample networks
(source: *Forby's Franchise guide* - 2242 networks)**

Country	Number of networks
Germany	687
Austria	85
Belgium	32
France	623
Italy	33
Netherlands	17
Portugal	18
Spain	665
Sweden	10
United Kingdom	72