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Abstract:

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Keywords:

contract design, brand strategy, agency theory, distance

JEL codes:

C12, L14, M21

FRANCHISORS' CHOICE BETWEEN ROYALTIES AND FIXED FEES EVIDENCE FROM BRAZIL

EUGÊNIO JOSÉ SILVA BITTI CINTYA LANCHIMBA MURIEL FADAIRO*

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Bitti: School of Economics, Business Administration and Accounting
University of São Paulo, Brazil
Av. Bandeirantes 3900 - Monte Alegre – CEP 14040-905 Ribeirão Preto - SP
Telephone: +55 (16) 3315-3899
E-mail: ebitti@usp.br

Lanchimba: Escuela Politécnica Nacional, Ecuador
Ladron de Guevera E11-253, Quito 170517, Ecuador
Telephone: +593 988 61 43 97
E-mail: cintya.lanchimba@epn.edu.ec

Fadairo: Univ. Lyon, UJM Saint-Etienne, CNRS, GATE L-SE UMR 5824
F-42023 Saint-Etienne, France
Telephone: +336 79 65 88 25
E-mail: muriel.fadairo@univ-st-etienne.fr (Corresponding Author)

I. INTRODUCTION

The importance of contract theory was recently emphasized by the choice of the central bank of Sweden to award the 2016 prize in economic sciences in memory of Alfred Nobel to Oliver Hart and Bengt Holmström. Contract design raises issues of incentives, trust, and monitoring, with associated questions of remuneration and compensation payments. While this research field concerns many domains of economics, business-format franchising presents itself as a relevant area for applied studies on contract design, thanks to the availability of data. Franchising networks contractually bind an upstream party, the franchisor, to a network of retailers using its brand name and business format, the franchisees. This organizational form is used internationally in all retail and services sectors, and stands out as the dominant model of trade in this early 21st century.

Since the 80s, franchising has been the focus of a wide empirical literature in economics, entrepreneurship, marketing and strategy.¹ However, as underlined by Fadairo and Lanchimba (2017), relatively few works for an international audience deal with data from emerging economies. Yet in recent years statistics have highlighted the remarkable dynamism of franchising in Brazil, Mexico, China, Turkey, and in several African countries. This trend continues, despite the multidimensional crises impacting the above-mentioned countries, and is attracting a growing scientific interest.

According to the Brazilian Franchising Association (ABF, 2016), regardless of the current economic and political crisis in Brazil, notably the low economic performance and modest results of the Brazilian retail sector since 2014, franchising continues to grow in this country. The ABF estimates that the total income of Brazilian franchising grew 7.7% in 2014 / 2013, and 11.2% during the first half of 2015 compared with the same period in 2014. In addition,

¹ See Combs et al. (2011), Dant et al. (2011) for a survey of the literature on franchise data.

franchise networks are present in diverse regions of this huge country, including the most remote and least developed. Although 53.2% of the networks were located in São Paulo in 2016, significant increases in franchising were recorded in the other Brazilian states (ABF 2016). In this context, spatial dynamics and related issues are critical.

At the same time, despite some exceptions (e.g. Mathewson and Winter, 1994), most discussions in the empirical literature on the locational aspects of franchising seem short-sighted, addressing the geographic dimension only in so far as it is a means to evaluate monitoring costs between franchisors and the franchised outlets (e.g. Norton 1988; Combs and Ketchen 2003; Perryman and Combs 2012). Yet franchising represents a rich framework within which to study the impact of spatial organizational choices, while, in the literature on retailing, location has long been clearly considered a major determinant of firm performance (e.g. Jones and Simmons, 1987). This is a context of economic analysis where “space is back”,² with the renewal driven by Krugman (1991) and the “New Economic Geography”, as well as recent works at the microeconomic level on spatial competition, or on the economic impact of distance (Alderighi and Piga, 2012; Kalnins and Lafontaine, 2013).

Aiming at addressing these gaps in the literature on franchise data, our paper deals with the impact of network spatial organization on contractual choices. We focus on the payment terms linking the franchisor and the franchisees, in an agency-theoretic framework. The relevance of agency theory in franchise contracting is widely accepted, starting from the contributions of Rubin (1978), Mathewson and Winter (1985), and Rey and Tirole (1986). In addition, the empirical literature on franchise data emphasizes the role of agency-theoretic arguments in explaining the organizational choices in franchise networks (e.g., Blair and Lafontaine 2005; Lafontaine and Slade 2014). In this framework, two main monetary provisions, considered as substitutable, define the payment terms in franchise contracts: the

² The initial work dates back to A. Marshall (1920).

fixed fee, also called the franchise fee, which is an upfront fixed payment given by the franchisee when entering the network; and the royalty rate, an ongoing payment usually expressed as a percentage of the franchisee's sales.

Our goal in this paper is to address the following questions: in continent-sized Brazil, does the spatial organization of franchising networks influence the franchisor's choice regarding the payment devices? Is there any influence from the specific context – an emerging country undergoing rapid evolution in the development of franchising – on this monetary choice? Is there any influence from the support devices characterizing the relationship between the franchisor and the franchisee? Finally, what are the performance outcomes, at the network level, of that monetary choice?

The rest of the article is organized as follows. Section II presents the related literature and develops the testable predictions, based, first, on the traditional agency argument regarding monetary provisions. In addition, we discuss an alternative view specific to the context of franchising in an emerging country. Additional hypotheses are developed to study the influence of the franchise relationship on the payment terms, and the performance outcomes. Section III describes the data and the study variables. We use a unique and recent panel dataset, customized for the purpose of the investigation in this paper. The estimation strategy and the results are presented in Sections IV and V. Section IV provides evidence concerning the empirical determinants of the monetary choice (royalties versus fixed fees) in Brazilian franchising. Section V highlights the performance outcomes of the network in terms of market share. To control for endogeneity bias, we perform the estimations using the two-step methodology developed by Murphy and Topel. Section VI concludes with final remarks on the implications for franchising and academics that go beyond the Brazilian case.

II. RELATED LITERATURE, STYLIZED FACTS, AND HYPOTHESES

A. Traditional dilemma between incentives versus monitoring and the impact of geography

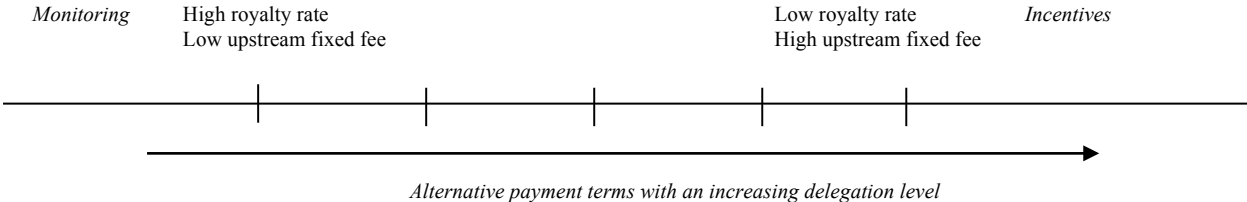
Business-format franchising is characterized by the following vertical relationship: the franchisor develops a brand and a business concept, which is then operated by independent outlets (the franchisees). Specifically focusing on the delegation of tasks – here the use of the franchisor’s brand name and business concept – an agency-theoretic context, with the franchisor being the principal and the franchisee the agent, constitutes a relevant framework for the study of franchise contracting. Indeed, as emphasized by Wimmer and Garen (1997), many of the elements of moral hazard models emerge in franchising. Thus, the literature highlights moral hazard on the franchisee’s side regarding the franchisor’s brand reputation; the common brand indeed being affected by free-riding behavior in the franchised network. Despite the above generic definition and features, a great variety of franchise contracts can be distinguished, both in business relationships and analytically. In particular, in the moral hazard context, the franchisor faces the choice between contracts oriented towards the monitoring of the independent outlets, with the associated costs related to a more integrated vertical relationship, versus contracts targeting the provision of incentives to the franchisees, which involves a greater level of delegation (e.g. Lafontaine and Slade 2001; Lal 1990; Michael 1999; Lanchimba et al. 2017).

Figure 1 illustrates the trade-off between monitoring and incentives faced by the franchisor in franchise contracting. In the agency-theoretical framework, the royalty rate is considered as the main monetary provision, and as the “share parameter” determining the partition of residual claimancy rights between the counterparties (Lafontaine and Slade 2001). For this reason, contracts with a low royalty rate play an incentive role, motivating the effort of the

franchisee (selling effort, effort in the promotion of the common brand). Then, the franchisor mainly pays itself with other monetary compensations like the upfront fee.

This argument was developed for the first time by Rubin (1978) in his early analytical work regarding the determinants of the payment design in franchise contracts. On the other hand, the franchisor may choose a payment mechanism characterizing a more integrated vertical relationship, based on an ongoing payment term (royalties) associated with a low fixed fee.

FIGURE 1
 Payment terms and franchisor’s dilemma between monitoring and incentives



In the franchise literature, as previously mentioned, location has often been taken into account as a proxy for the monitoring cost. Indeed, network expansion and spatial dispersion increase the agency-monitoring problem. In other words, with the geographical dispersion of the network, the cost of monitoring the outlets increases. This argument finds empirical support in the econometric work on franchise data. As emphasized by Perryman and Combs (2012), the most common test of the monitoring cost prediction concerns the relationship between the geographic dispersion of a network and its ownership composition, that is the proportion of franchised outlets or, conversely, the proportion of company-owned outlets (i.e. fully integrated retail outlets). The argument is as follows: monitoring the outlets in geographic markets far from headquarters is more costly, due to the number of monitoring personnel required and the related travel expenses (Carney and Gedajlovic 1991); because they are independent firms, franchisees are more likely to make significant efforts, thus

requiring less monitoring. This situation would impact the ownership structure of retailing networks, strategically mixing company-owned units and franchised units as part of their location choices. Several studies (e.g. Norton, 1988; Lafontaine, 1992; Combs and Ketchen, 2003) provide evidence that outlets located close to headquarters are more likely to be company-owned, while retail units in more distant locations are more likely to be franchised. Moreover, monitoring costs arising from the geographical dispersion of the network would be sufficient to explain the franchise option. More generally, at the network level, the higher the geographical dispersion, and thus the related monitoring cost, the lower the proportion of company-owned outlets. Therefore, a clear link is established between spatial choices and ownership structure of franchising networks. Based on this background literature and previous evidence, we push the argument a bit further, considering the different options for payment mechanisms in franchise contracts, as presented in Figure 1. The related predictions are as follows:

H1: The royalty rate decreases with the geographical dispersion of the network

H2: The fixed fee increases with the geographical dispersion of the network

The reasoning being that the geographical dispersion of the network increases the monitoring cost. Then the franchisor chooses payment terms oriented towards incentives, i.e. a low royalty rate. In this case, the franchisor's payment is mainly based on the fixed fee.

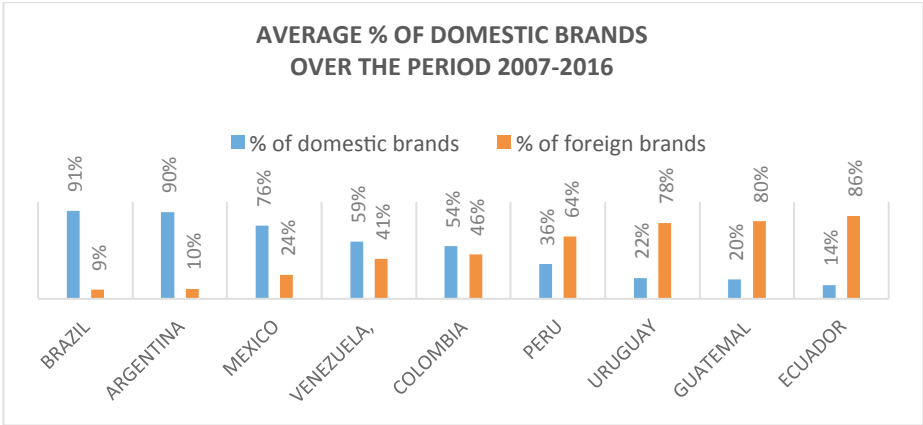
B. Alternative view of the monetary choices within the spatial development of an emerging franchise system

The specific context of franchising in Brazil may justify an alternative view on the impact of spatial development on monetary choices. Three main stylized facts characterize the Brazilian franchise sector. First, as highlighted by Figure 2, Brazilian franchising is dominated by domestic brands (average of 91% over the period 2007–2016), in common with

the developed countries and contrary to the position in the small economies of the zone like Ecuador, Guatemala, and Uruguay.

FIGURE 2

Domestic brands in Latin American franchising



Source: Authors generated from the Ibero-American Federation of Franchising (2017)

However, compared to the developed countries, the dynamism of the Brazilian franchise sector is remarkable, as highlighted by the evolutions pointed out in Table 1.

TABLE 1

Dynamism of franchising in Brazil

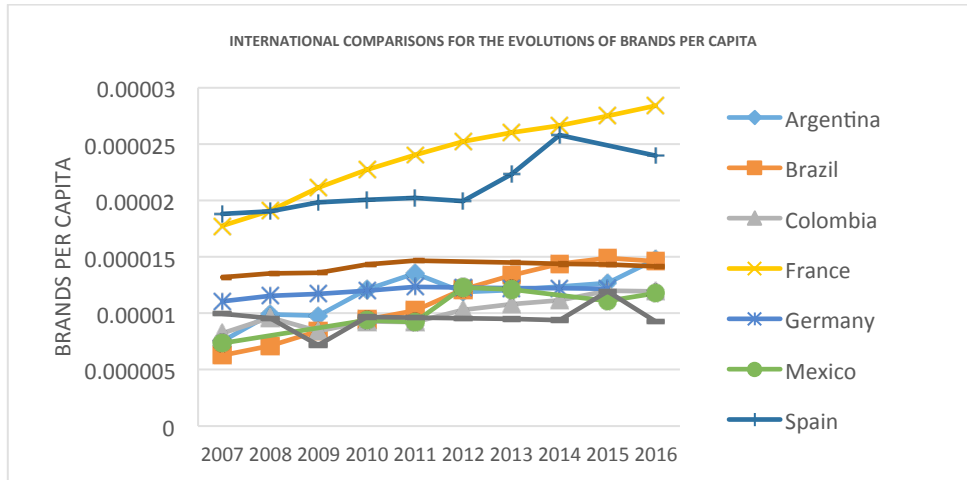
Countries	Growth of the number of brands per capita (%)		Growth of the number of outlets per capita (%)		Growth of employment in the franchise sector per capita (%)	
	2010-2011	2011-2012	2010-2011	2011-2012	2010-2011	2011-2012
Brazil	8.45%	18.33%	6.66%	11.36%	5.99%	11.24%
France	5.72%	5.16%	-5.80%	3.76%	5.81%	4.36%
Germany	2.91%	-0.19%	9.13%	-0.19%	4.05%	-2.93%
Spain	1.03%	-1.44%	3.56%	-3.85%	2.88%	-3.21%
United Kingdom	2.42%		13.12%	-7.55%	3.08%	
United States	-0.74%	-0.74%	-12.01%	21.68%	-1.25%	2.09%

Source: Authors generated from European Franchise Federation (2013), World Bank (2014), and PricewaterhouseCoopers (2013)

Finally, still compared to the developed countries, Figure 3 regarding the evolutions of brands per capita suggests a significant development potential.

FIGURE 3

International comparisons for the evolutions of brands per capita



Source: Authors, generated from the Ibero-American Federation of Franchising, the European Franchise Federation, and the World Bank (2017)

Based on these three stylized facts, it is relevant to assume that the franchise sector in Brazil is still emerging. This argument is consistent with the institutional features. Indeed, Brazil is one of the few Latin American countries to have a specific law about franchising. Yet this law is recent, having been established in 1994, whereas in Europe the Treaty and Commission Regulation was introduced in 1967, and in the United States the rules of the Federal Trade Commission for franchising date back to 1978.

As previously mentioned, business-format franchising is based on having a common brand name and concept within the network, developed by the franchisor. As intangible assets, the brands and the related business concepts do not all have the same profitability. This idea is captured by the synonymous notions of “brand-name capital” or “brand-name value” related to the reputation of the network.

Distinguishing emerging *versus* mature franchise sectors, we assume that in the first case, a significant part of the local franchisors have not yet established their reputation, because they are at the first stages of their network development. The geographical expansion of a franchise network in a continent-sized market is then associated with the need to set efficient

mechanisms enabling the enforcement of quality standards for the brand and business concept throughout the network. In this context, franchisors might choose a payment mechanism allowing more control of the franchisees, i.e. a lower level of delegation (cf. Figure 1). For this reason, we formulate the following counter-propositions expressing an alternative view of the monetary choices in the specific context of an emerging franchise sector, on a wide market:

H3: The royalty rate increases with the geographical dispersion of the network

H4: The fixed fee decreases with the geographical dispersion of the network

C. Support devices as an alternative to monetary provisions in maintaining the common brand reputation

Consistent with the preceding reasoning, we here develop the idea that support devices can be an alternative to monetary provisions in maintaining a common brand reputation. As previously mentioned, franchising covers a variety of organizational forms and vertical integration levels. Still in the context of an emerging franchise sector, with network reputations yet to be settled, the franchisor can use non-monetary contractual terms to maintain a close relationship with the franchisees, and then to keep control over the operating of the brand. These support devices may act as substitutes for the monetary clauses (royalty rate, fixed fee), which leads to the following prediction:

H5: The higher the support devices in the franchise relationship, the lower the monetary clauses

D. Performance outcome

While the literature on franchise data often addresses the performance outcome of organizational choices (e.g Madanoglu et al., 2011; Fadairo and Lanchimba, 2014), few empirical studies deal with the impact of contractual terms, and more precisely of the royalty

rate, on network performance.

Shane et al. (2006) study the impact of strategic decisions on the network performance and their evolution over time, measured as increase in the network size. The royalty rate is taken into account as one of the pricing policy decisions. The authors provide evidence that the size of a franchise system is negatively related to its royalty rate, and that, as the system ages, the relationship between the network size and the royalty rate becomes more negative. In the study of Kosova and Lafontaine (2010), the royalty rate is a control variable in econometric models for the growth and survival of franchised networks, with the age and size of the network being the core explanatory variables. Based on US panel data, they do not find evidence for any influence of the royalty rate on network performance, which is measured in terms of franchising growth and exit from franchising. Recently, based on US retail and service network data, El Akremi et al. (2015) find that upfront fees, level of internationalization, network age, training, and experience before franchising have a positive impact on performance of franchise network. However, the influence of the royalty rate on sales (as a performance measure) is negative. More recently, combining French franchise and financial panel data, Lanchimba et al. (2017) provide empirical support for the hypothesis of a negative relationship between risk and the royalty rate, which contradicts the prediction of the standard agency theory. They highlight the positive significant influence of an adjusted royalty rate on network performance.

Based on these contrasting previous empirical results, we formulate the following prediction:

H6: The payment mechanism affects the network performance

III. DATA AND MEASUREMENT

We use recent panel data for the period 2011–2016, regarding 335 franchise networks implanted in the Brazilian market. The sample franchise networks occupy 1,397 Brazilian municipalities, and are present in the 26 Brazilian states. Our unique dataset compiles information from three main sources: 1) ABF’s Official Franchise Guides, 2) websites of franchise networks, and 3) Brazilian Institute of Geography and Statistics (IBGE). In what follows, we present the data collection process and the study variables derived from the analytical framework. Finally we provide summary statistics.

A. Data collection

Our first source is the ABF’s Official Franchise Guide. This annual publication provides valuable information on the Brazilian franchise sector. More precisely, the guide contains data concerning network characteristics, notably the franchise fee, total number of outlets, required investment level of the franchisees, number of employees, and so on. We obtained data for the period 2011–2016. In order to achieve a better understanding of how the ABF collected the information used to construct our dataset, we performed interviews with executives from this organization: specifically, the President of the ABF, his executive director, and his marketing analyst, who is responsible for both collecting and pooling information provided by the franchised networks. The ABF has an internal information system accessible to associated franchised networks, which are able to update information regarding their network in real time. The networks have an interest in keeping information up to date, since the Guide is an important communication channel with potential franchisees. Divergent or even fake information could damage the reputation of the network, or make the search for potential franchisees more difficult. Therefore, there is a strong incentive for franchising networks to

offer good quality information. In addition, the ABF controls for the consistency of the data, systematically analyzing the annual variations before publishing official information. Any abnormal variation is checked and corrected. However, the ABF does not have a scientific advisory council: for this reason, the ABF marketing department performs both the monitoring and the validation of provided data. If necessary, specialized consultants are hired for more specific studies.

The websites of the sample franchise networks comprise our second main source of information. The manual capturing of website data was used to perform control checks, and to complete the missing values from the ABF guides. In addition, we used this data source to collect spatial information regarding the Zip codes of cities where the franchised networks are established, in addition to the proportion of network outlets operated in shopping malls. Where the network websites were incomplete, we used the PEGN publication, which is a SME-specialized Brazilian media.

As our analysis requires localized data, we use a third source of information, the Brazilian Institute of Geography and Statistics (IBGE). We collected information about geo-referencing (longitude and latitude) of the municipalities where the sample networks are established.

We pooled the different sources of information and performed crosschecks to match the data. Finally, we obtained a unique panel data sample (6 years) of 2010 franchised networks in Brazil, containing localized variables.

B. Dependent variables

Three dependent variables are distinguished: the two main monetary provisions, and the performance indicator.

The Royalty Rate is defined as the percentage of the downstream sales accruing to the franchisor.

The Fixed Fee is defined as the upfront fixed amount paid by the franchisee when entering the network.

As *Network Performance* variable, we use the market share, measured as the franchisor's turnover divided by the sector turnover.

C. Independent variables

The *Network Geographic Dispersion* is our first variable of interest. To construct this variable, we first surveyed the addresses of all the sample network outlets. We thus created a dataset containing information regarding the Brazilian municipalities where the franchising networks are established. Then we geo-referenced the cities where the stores are located, obtaining their latitude and longitude. We used the software R, specifically the GEOCODE function of the package GGMAP. These artifacts are available at the Comprehensive R Archive Network (CRAN). GEOCODE uses Google Maps to geo-reference the addresses entered in the dataset.

On this basis, we constructed geographic clusters for each network, grouping together stores located in the same area. Each cluster is thus an area of agglomeration of network outlets. We defined the center for each cluster so that the cumulative distance between the stores and the cluster center is the smallest possible. The distance criterion is the Euclidean distance based on the latitude and the longitude of the cities where each store is located. For example, assuming that a store A is located at the point (x_A, y_A) and a store B is located at the point (x_B, y_B) , the Euclidean distance between them is defined as follows: $D(A, B) = \sqrt{((x_A - x_B)^2 + (y_A - y_B)^2)}$.

The Euclidean formula only applies to metric geographical coordinate systems. Thus it underestimates the true distance that would be travelled by a road connecting the two points. This bias is greater at points distant from each other. However, alternative measures of distance were not available: the Euclidian distance was the best and most intuitive proxy available. Our variable, the *Network Geographic Dispersion*, is measured as the distance between the stores in the clusters, to which we add the distance between the centers of the network clusters.

The data related to city of occupation by the networks of the sample were available for the years 2011, 2014 and 2016. To avoid using an unbalanced panel, we have chosen to fill the missing values related to the other years, assuming linearity in two sub-periods: 2010–2014 and 2014–2016. Then we filled the dispersion missing values with linear coefficients.

Our second variable of interest is the *Support Devices* provided by the franchisor to the franchisees, representing the level of control *versus* delegation in the vertical relationship regarding the exploitation of the franchisor's brand name. We constructed this variable based on the ABF indications. Thirteen types of support are indicated in the guide:

- Legal support
- Plant and equipment selection
- Organization & methods
- Operation project
- Marketing project
- Advertising and promotion
- Training
- Trading point selection
- Support for financing leverage
- Promotional stuff
- Architectonic project
- Financing project
- Layout project

For every support, the information is available as a dummy variable. Summing these categorical variables for each network, we created the *Support Devices* variable as an ordered multinomial variable.

D. Control variables

To deal with the monetary contractual choice (level of the royalty rate; level of the fixed fee), we consider the following structure variables related to the franchise contract general feature (contract length), or to the characteristics of the network (age, proportion of franchised units) as control variables.

Contract length: this variable allows us to control for the influence of the duration of the contract in the determination of the monetary clauses. It is indeed relevant to assume that the contract length may impact the royalty rate and/or the upfront fixed payment given by the franchisee when entering the network.

Age of the network: this variable refers to the difference between the year of creation of the first franchised unit, and the present year in the panel data. We assume that the network experience may influence the contractual design.

Proportion of franchised units: this variable is measured as the number of franchised units in the network divided by the total number of outlets in the network. In addition to the proportion of franchised units, this variable can also be studied as a proxy for the reputation of the brand name, which is related to our second set of hypotheses and to the specific context of an emerging franchise system (H3–H4).

Regarding the performance outcome of the monetary contractual choice, we add the following control variables.

Economic sector: this variable allows us to control for the influence of operating in a specific sector. We made the choice to follow the ABF taxonomy, distinguishing 11 economic sectors³ to construct a set of sector dummies.

Localized HDI: we use this multidimensional indicator to control for the performance impact of the socioeconomic development level of the network location. The IBGE provides information about Brazilian HDI (Human Development Index) scores at the municipality levels. To construct our *localized HDI* variable, for each network we measured the average HDI of the cities where the network operates. Information from IBGE refers to the year 2010. However, for each network, the localized HDI changes every year with its geographical expansion.

Population: Brazilian government conducts the population census approximately every 10 years, with the last three censuses conducted in 1991, 2000 and 2010. Outside this period, IBGE estimates the population by municipality. Using the same approach as for the localized HDI, for each network we measured the average population of the cities across which the network operates.

As for the *Network Geographic Dispersion*, we filled the missing values of the *localized HDI* and *population* variables with linear coefficients, through the linearization of the trends indicated by the censuses.

E. Summary statistics

Summary statistics are provided by Table 2, and highlight the heterogeneity of the sample networks regarding the variable *Network Geographic Dispersion*. This is also the case with

³ Advertising, Informatics & Electronics; Business, Services & Other Retailers; Cars; Cleaning; Clothes; Education; Food; Hoteling & Tourism; House & Building; Shoes & Accessories; Sports, Health, Beauty & Leisure.

the *performance* variable. The other variables are quite homogenous in the sample, as shown by the means, which are higher than the standard deviations. Lastly, the correlation matrix shows that it is necessary to check for multi-collinearity relating to the following variables: population and dispersion, age, and percentage of franchised units.

TABLE 2
Summary statistics and correlations

	Mean	SD	1	2	3	4	5	6	7	8	9	10
1. <i>Net. Perf.</i>	0.03169	0.05382	1									
2. <i>Roy. Rate</i>	0.05748	0.05032	0.038	1								
3. <i>Fixed Fee</i>	37.4214	26.3754	0.0693***	0.0142	1							
4. <i>Net. Geo. Dispersion</i>	76501.6	452421.	-0.0232	0.3308***	-0.0811***	1						
5. <i>Support Devices</i>	10.5217	2.72061	-0.0415*	-0.0555**	-0.0109	-0.0138	1					
6. <i>P. of fran.</i>	0.84911	0.20926	-0.011	0.0239	-0.1403***	0.0900***	0.1295***	1				
7. <i>Age</i>	25.0868	17.3381	0.1006*	-0.0463*	0.025	0.1749***	-0.0209	-0.0612**	1			
8. <i>Length</i>	61.7053	21.1793	0.1163***	-0.0291	0.1590***	-0.0719***	0.1074***	-0.031	0.004	1		
9. <i>Pop.</i>	3.4E+7	2.5E+7	0.1120***	0.1609***	-0.0252	0.2452***	0.1101***	0.2643***	0.2594***	0.0281	1	
10. <i>Loc.HDI</i>	0.7741	0.021722	0.0337	-0.0538**	0.1838*	-0.2129***	0.0572**	-0.1676***	-0.1068***	0.0359	-0.2202***	1

Note: Pearson correlations. Significant * at the 10% level, ** at the 5% level, *** at the 1% level.

IV. ESTIMATION STRATEGIES

A. Step one: determinants of the monetary choice

Methodology - To test H1–H5, we estimate the following linear model:

$$MC_{it} = \mu + \pi_1 D_{it} + \pi_2 S_{it} + \pi_3 \rho X_{it} + u_i + \epsilon_{it} \quad (1)$$

$$i = 1, \dots, 2010$$

$$t = 2011, \dots, 2016$$

where MC is the monetary clause, μ the constant term, D the network geographic dispersion, S the support devices, X the matrix of control variables, u_i the random disturbance that characterizes the i th observation (constant over time) and ϵ_{it} the error term.

Three regressors raise a potential problem of endogeneity because they are managerial variables deriving from the franchisor's choices. These are the *network geographic dispersion*, the *support devices*, and the *contract length*. We perform exogeneity checks using the Hausman test, which allows us to compare model (1) with an instrumental model in two stages including the lagged variable as an instrument in random-effects and fixed-effects specification. The results presented in Table 3 confirm that there is no problem of endogeneity.

TABLE 3

Exogeneity checks (1)

	Royalty rate		Fixed fee	
	RE2sls χ^2 (p-value)	FE2sls χ^2 (p-value)	RE2sls χ^2 (p-value)	FE2sls χ^2 (p-value)
<i>Network geographic dispersion</i>	5.15 (0.3982)	0.22 (0.9989)	1.62 (0.8987)	0.0001 (0.9999)
<i>Support devices</i>	0.83 (0.9753)	1.53 (0.9096)	0.0001 (0.9999)	0.02 (0.999)
<i>Contract length</i>	0.53 (0.9911)	0.42 (0.9947)	2.11 (0.8340)	0.57 (0.9894)

We complete the specification tests with a likelihood ratio test regarding heteroskedasticity at the panel level for both monetary clauses. The results ($\chi^2_{ROYALTY}=2.5e+08^{***}$, $\chi^2_{FEE}=2.06^{***}$) show that the data in the sample do not have a common disturbance variance, thus providing evidence for heteroskedasticity across the panel. In addition, the Wooldridge test for autocorrelation highlights a problem of autocorrelation affecting the royalty rate variable, which is not the case with the fixed fee ($F_{ROYALTY}=119.947^{***}$, $F_{FEE}=2.157$).

To handle these problems we use the generalized least squares method (FGLS). The FGLS estimator is asymptotically normal, even under weak conditions – that is, even if the errors do not follow a normal distribution. Two stages are required. First, a consistence covariance matrix is built with the residuals of an OLS or another estimation. In the second stage, the

FGLS is calculated, and replaces the value of the unknown covariance matrix for its estimation.

Results - The estimation results are presented in Table 4.

TABLE 4
Results for the monetary clauses

	(1) Royalty rate	(2) Royalty rate	(3) Royalty rate	(4) Fixed fee	(5) Fixed fee	(6) Fixed fee
<i>Net. Geo. dispersion</i>	1.31e-05*** (1.20e-06)	1.29e-05*** (1.45e-06)	1.11e-05*** (1.87e-06)	-6.49e-03*** (8.9e-04)	-5.48e-03*** (7.64e-04)	-5.25e-03*** (7.22e-04)
<i>Support devices</i>	-2.31e-04*** (2.72e-05)	-3.16e-04*** (2.74e-05)	-1.67e-04*** (0.3e-04)	-0.150* (0.0626)	-0.0786* (0.00750)	-0.262*** (0.0770)
<i>P. of franchised units</i>		-2.88e-05 (8.04e-05)	-2.97e-04 (3.32e-04)		-14.72*** (0.538)	-15.27*** (0.685)
<i>Age of the network</i>		-3.08e-04*** (2.86e-06)	-2.79e-04*** (9.77e-06)		0.0461*** (0.0109)	0.0241** (0.00778)
<i>Contract length</i>		5.08e-06 (3.6e-06)	2.99e-06 (3.95e-06)		0.170*** (0.00999)	0.166*** (0.0113)
<i>Year dummies</i>	no	no	yes	no	yes	yes
_cons	0.0576*** (0.000365)	0.0657*** (0.000346)	0.0629*** (0.000544)	39.64*** (0.662)	39.25*** (0.729)	33.11*** (1.143)
<i>N</i>	2010	2010	2010	2010	2010	2010
<i>Wald Chi2</i>	190.18	11805.90	903.42	59.15	1244.69	825.94

Standard errors are in brackets
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

A first comment concerns the good global significance of the econometric models, highlighted by the *Wald Chi 2* tests. Furthermore, the results are robust, since they are qualitatively similar in all the models, whether or not including time dummies or control variables.

The influence of *network geographic dispersion* is clearly significant in all the models. This variable positively impacts the royalty rate, and negatively impacts the fixed fee, which is consistent with the alternative view of the monetary choices, thus providing evidence for hypotheses H3 and H4, while H1 and H2 are rejected. The significant and negative influence

of *support devices* on both monetary clauses suggests that these are substitutes, thus providing evidence for hypothesis 5.

Regarding the control variables, we find a significant positive effect for the *age* variable on the fixed fee, and a negative one on the royalty rate. Those results provide evidence that the network experience impacts the contract design, and that more experienced networks, with a well-established reputation, delegate more; which is also consistent with the alternative view of the monetary choices. The *proportion of franchised units* has no significant influence on the royalty rate, but impacts the fixed fee significantly and negatively. Finally, the *contract length* has a significant positive effect on the fixed fee, and no significant influence on the royalty rate.

B. Step two: performance outcome

Methodology - To test H6, we estimate the following linear model:

$$P_{it} = \varphi + \beta_1 MC_{it} + \beta_2 Z_{it} + v_i + \psi_{it} \quad (2)$$

$$i = 1, \dots, 2010$$

$$t = 2011, \dots, 2016$$

where P , the *performance* variable, is the market share, φ is a constant term, MC is the monetary clause (royalty rate *versus* fixed fee), Z is a matrix of control variables, v_i is a random disturbance that characterizes the i th observation (constant over time), and ψ_{it} is the error term.

Here again, a problem of endogeneity may be suspected, regarding two regressors, the royalty rate and the fixed fee. Following the same methodology as previously (4.1.1.), we confirm the endogeneity bias. The results of the Hausman tests are presented in Table 5.

TABLE 5
Exogeneity checks (2)

	Performance (Market share)	
	RE2sls χ^2 (p-value)	FE2sls χ^2 (p-value)
<i>Royalty rate</i>	52.66 0.000	9316 0.000
<i>Fixed fee</i>	52.71 0.000	7477 0.000

We deal with this endogeneity problem by using the two-step methodology developed by Murphy and Topel (1985). This methodology allows the replacement of an unobservable variable in the equation of interest by the predicted values from another model. Similar methodologies using seemingly unrelated regressions are not adequate here because of the features of the panel, where N (the number of franchised networks) is big whereas T (the number of years) is rather small. In addition, again to avoid any endogeneity bias in the estimations, we include the royalty rate and fixed-fee variables separately in the econometric models.

Regarding heteroskedasticity, we perform a likelihood ratio test at the panel level for both monetary terms. The results ($\chi^2_{ROYALTY \text{ in model}} = 1.7e+08^{***}$, $\chi^2_{FEE \text{ in model}} = 1.5e+08^{***}$) confirm that the data in the sample do not have a common disturbance variance, thus highlighting a problem of heteroskedasticity. Concerning autocorrelation, we use the Wooldridge test. The results do not provide evidence of a problem of autocorrelation ($F_{ROYALTY \text{ in model}} = 2.312$, $F_{FEE \text{ in model}} = 1.972$) in the sample.

Based on the results of these specification tests, we choose to use the feasible generalized least squares method (FGLS).

Results - Our second set of results, regarding the influence of the monetary clauses on the network performance, are presented in Table 6.

TABLE 6

Performance outcome of the monetary choice

	(7) Performance (Market Share)	(8) Performance (Market Share)	(9) Performance (Market Share)	(10) Performance (Market Share)	(11) Performance (Market Share)	(12) Performance (Market Share)
<i>Royalty rate</i>	-0.349*** (0.0479)		-0.539*** (0.0547)		-0.437*** (0.0269)	
<i>Fixed fee</i>		8.00 e-4*** (0.0000434)		1.08 e-4*** (0.0000624)		7.00 e-5*** (0.0000280)
<i>Population</i>			2.59e-10*** (1.46e-11)	2.59e-10*** (1.36e-11)	8.65e-11*** (5.19e-12)	1.14e-10*** (5.09e-12)
<i>Localized HDI</i>			0.126*** (0.0124)	0.109*** (0.0123)	0.132*** (0.00607)	0.127*** (0.00594)
<i>Sector dummies</i>	<i>no</i>	<i>no</i>	<i>no</i>	<i>no</i>	<i>yes</i>	<i>yes</i>
<i>_cons</i>	0.0460*** (0.00274)	-0.00238 (0.00158)	-0.0506*** (0.00991)	-0.107*** (0.00943)	0.0378*** (0.00578)	-0.00929 (0.00595)
<i>N</i>	2010	2010	2010	2010	2010	2010
<i>Wald chi2</i>	53.11***	339.34***	193.82***	443.10***	6024.62***	6063.84***

Standard errors are in brackets
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

All the estimations have a good global significance (*Wald chi2* results), and the results are robust to the inclusion of control variables or sector dummies.

The main result from this stage of estimation is the clear, robust, and significant influence of the monetary clauses on network performance. Consistent with the assumption of substitutability between the two provisions, the royalty rate and the fixed fee have an opposite effect, with a negative impact of the royalty rate, and a positive one of the fixed fee.

V. CONCLUSION

Dealing with the impact of spatial organizational choices of franchising networks in Brazil, this article develops an analytical framework based on the agency explanation of monetary contractual clauses. In franchise contracts, these are the royalty rate and the fixed entrance fee.

In the agency-theoretic context, both devices are considered as substitutes. Within the traditional agency view, the presence of distant outlets, related to higher monitoring costs for the franchisor, results in a vertical relationship (franchisor/franchisee) based on the delegation of tasks and a payment mechanism designed to provide incentives to the franchisees, that is a low royalty rate associated with a high fixed fee.

Providing stylized facts, we argue that in the specific Brazilian case, the opposite impact of spatial dispersion may occur. Indeed, a payment mechanism based on monitoring (*versus* incentives), with a low fixed fee and high ongoing payments (royalties) is a way for the franchisors to keep control over the exploitation of their brand names by the franchisees, in a context of network inception and expansion.

We use a unique and recent panel dataset to provide evidence for this alternative view: in Brazilian franchising, the network geographic dispersion leads the franchisors to choose a payment contract based on a high level of royalties and a low fixed fee. However, studying the performance outcome of these contractual choices with a two-step Murphy and Topel econometric model, we show that the traditional orientation for delegation and incentives would produce higher performances.

These results have important practical implications for organizational and contractual choices in franchising, suggesting that the payment mechanism (payment terms linking the franchisor and the franchisees) should be focused on the provision of incentives for the

franchisees operating the common brand name, while alternative tools, like the “support devices” also studied in our paper, are more appropriate for brand-name management.

This article has interesting implications for future research. By reference to performance outcomes, we here provide clear and robust evidence that spatial organizational choices impact contractual design. Yet the limitations of this study open new research opportunities. It would be interesting to address the same issue in different empirical contexts, i.e. other continent-sized emerging countries like China; or with a longer panel (we dealt here with a six-year panel dataset, and perhaps a longer perspective would provide complementary results); or with types of vertical contracts other than the franchise contract, such as patent license contracts.

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