Organizational and Contractual Choices in Franchising;

Four essays on the relationship between the franchisor’s choices and the network performance

These de Doctorat en Sciences Economiques

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To my family...
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This dissertation is composed of four essays dealing with the impact of organizational choices on franchised network performance. The dissertation, conceived as a contribution to managerial economics, is based on the theories of industrial organization and implements applied econometric tools to address issues with managerial implications.

The first part of the dissertation focuses on the governance structures and their impact on network performance. Chapter 2 studies the influence of the upstream organizational choices on network performance and Chapter 3 deals with the impact of multi-unit franchising on network performance.

The second part of the dissertation addresses the relationship between the royalty rate and the franchised network performance. Chapter 4 studies the influence on the royalty rate of incentive motivations and risk issues at the downstream level, in addition to the impact of the royalty rate on network performance. Chapter 5 deals with the effect of signaling motivations on the royalty rate regarding new Brazilian franchisors with a high value business concept.

As a general introduction, Chapter 1 discusses the interest in studying franchising and outlines the focus of the dissertation. The final chapter, Chapter 6, concludes the dissertation and identifies future research directions.

Keywords:
Industrial Organization, Managerial Economics, Franchising, Applied Econometrics.
Cette thèse est composée de quatre essais relatifs à l’impact des choix organisationnels sur la performance dans les réseaux de franchise.

Conçue comme une contribution à l’économie managériale, la thèse est fondée sur les théories de l’organisation industrielle, et met en œuvre des techniques d’économétrie appliquée pour aborder des problématiques ayant des implications managériales.


La deuxième partie de la thèse porte sur les choix contractuels, plus précisément sur les liens entre le taux de redevance et la performance des réseaux de franchise. Ainsi, le Chapitre 4 étudie l’influence des problèmes d’incitation sur la définition du taux de redevance, et les implications sur la performance financière du réseau. Alors que les travaux antérieurs dans la littérature empirique ont révélé l’inadaptation de la théorie du signal pour comprendre les choix contractuels des réseaux de franchise dans les pays développés, le Chapitre 5 porte l’analyse sur un pays émergent, le Brésil, et montre que la détermination du taux de redevance est influencée par une motivation de signal liée à la performance future du réseau.

L’introduction générale, Chapitre 1, met en évidence l’intérêt de travailler sur les réseaux de franchise et présente les objectifs et les orientations de la thèse. Une conclusion générale est proposée en Chapitre 6.

MOTS CLÉS:
Economie industrielle, Economie managériale, Réseaux de franchise,
Econométrie appliquée.
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This dissertation is composed of four essays dealing with the impact of organizational choices on franchised network performance. This issue has long been an important research topic among researchers studying franchising. My empirical contributions, based on the theories of industrial organization and implementing applied econometrics tools, extend and contribute to this rich literature. The rest of this general introduction presents in greater detail the focus of the dissertation and the interest in studying franchising.

1.1 **Franchising: an interesting topic for economists**

1.1.1 Definition and stylized facts

The legal definition of franchising varies with the institutional context. From the legal frameworks presented in Appendix A, and referring to Blair and Lafontaine (2005) [19], franchising can be defined as a contractual vertical relationship between two independent firms: an upstream party, the franchisor, and a downstream unit directly related to the final consumers, the franchisee.

With the franchise contract, the franchisor (1) grants to the franchisee the right to use his brand name; (2) transfers his know-how (methods, techniques, processes); (3) in exchange for monetary compensation (royalties, upfront fee). The contract establishes rules that regulate the behavior of both parties for a specified period. A group of downstream units using the franchisor brand constitutes a franchised network. This organizational form is used internationally in all retail and service sectors.
The statistics provided below allow us to understand the current scope and importance of franchising. According to the annual report of *Franchise Facts* (2011)[74], there were more than 3000 franchise networks in the United States in 2010. In addition, there were 740098 franchised units, employing approximately 7.78 million of people and generating an economic output of over USD 707 billion. This equates to 40.9% of the United States retailing sector. In fact, the contribution of franchises to GDP growth was estimated to be 4.8% between 2011 and 2012([169]). The European Franchise Federation (EFF, 2011[68]) reports that between 2007 and 2009 the growth rate of domestic brands was 8.1% in Europe. Belgium had the fastest growth, with a growth rate of 60% over the period. It was closely followed by Sweden and Poland, with growth rates of 57.1% and 47.5%, respectively. The Netherlands had the lowest growth, with only 0.4%. The franchise growth in Italy, Slovenia, Denmark, Greece, the United Kingdom, and Portugal did not exceed 5% during the same period.

In 2009, France has the highest number of franchise brands (1369), followed by Germany, Spain, Italy, and the United Kingdom (960, 919, 869, and 842 networks, respectively).

![Figure 1.1: Evolution of franchise in France.](Fédération Francaise de la Franchise[73])

The French case illustrates the trend in Europe. Figure 1.1 highlights a constant increase in the number of franchisors and franchisees between 2001 and 2010. The turnover of the franchise sector grew along with the number of units (franchisors and franchisees) until 2006, when it stabilized.

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1The EFF comprises franchise associations from the countries of the European Union (EU) as well as countries that are candidates or potential candidates to join the EU. It brings together 17 national franchise associations.
1.1. Franchising: an interesting topic for economists

Figure 1.2: International Comparisons
From: European Franchise Federation (2011[68]), World Band (2012[208]) and Pricewaterhouse Coopers (2011[169])

*For some countries there is not all available information.
Figure 1.2 provides information on the number of brands, establishments, and employees in the franchise sector, as well as the GDP growth for the whole economy between 2007 and 2009, for several countries. This figure shows that the number of brands is greater in China than in the other countries, while the United States generates more employment than the other countries.

However, franchising is present in many countries with different economic environments. This is highlighted by the case of Latin America. In particular, the reported statistics relating to the member countries of the *Federación Iberoamericana de Franquicias* in 2010 (Figure 1.3) show the importance of the franchise sector in Brazil and Mexico, in terms of employment and number of downstream units.

1.1.2 Relevance of the theories of industrial organization

A survey of past publications allows to highlight the theories of franchising, or more precisely, the theoretical frameworks used in the empirical literature on franchise data. I surveyed 23 of the top-ranked reviews in economics and management over the period 2000-2013, listed hereafter in alphabetical order:

1.1. Franchising: an interesting topic for economists

Within this group of journals, a total of 131 papers deal with franchising, 99 of them being empirical papers. From this literature, I distinguish three main theoretical fields in the study of franchising: the theories of industrial organization (IO), the theories of management (MT), and the marketing-related theories (MRT). Table 1.1 is based on this distinction.

As highlighted by this table (1.1), the theories of industrial organization play a key role in this literature. Indeed, franchising represents a rich context for investigating inter-organizational precepts and phenomena due to its particular structure and its behavioral aspects. The nature of franchising allows for different vertical relationships inside the network. For example, the franchisor can be a supplier of the franchisees or can operate directly several outlets (downstream company-owned units). In addition, different governance structures within the franchised network (e.g. dual distribution, multi-unit franchising, master franchising) provide an interesting field of study.

My dissertation is based on these theoretical foundations, or more precisely, on the theory of contracts, focusing on the contractual relationships within various informational contexts (see Figure 1.4).

In the first part of the dissertation, several theoretical branches of this research area are taken into account: the theory of incentives, in others words, the agency theory (Fama and Jensen, 1983[71]; Jensen and Meckling, 1976[107]; Laffont and Martimort, 2001[125]), the transaction costs theory (Coase, 1937[41]; Williamson, 1975[200], 1985[201]), and the property rights theory (Coase, 1960[42]; Demsetz, 1967[62]; Alchian and Demsetz, 1973[3]).

This analytical framework is presented in Chapters 2 and 3 while developing testable propositions regarding the network organizational forms. In addition, Chapter 2 also takes into account the resources scarcity theory, which is appropriate to the issues raised in the chapter, and is classified within the theories of management (see Appendix A).

In the second part of the dissertation, dealing with the contractual forms, and more precisely with the determination of the royalty rate, I choose to focus on the agency theory and on specific theoretical models, presented in Chapters 4 and 5, to derive testable propositions.
<table>
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<th>Number of related articles</th>
<th>Theories of Management (MT)</th>
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Table 1.1: Theoretical frameworks in the empirical literature on franchise data.
From a survey of 23 top ranked reviews in economics and management, over the period 2000-2013.
*These are case studies.
1.2. Focus of the Dissertation

The first part of the dissertation studies organizational choices at the network level, covering in Chapter 2 the network type, the proportion of company-owned units, and the involvement level of the franchisor in the promotion of the common brand name. The proportion of multi-unit franchising is studied in Chapter 3.

The second part of the dissertation focuses on bilateral agency relationships, covering moral hazard and incentives issues (Chapter 4), signaling issues (Chapter 5) in the determination of one of the key monetary provisions in franchise contracts.

1.2 Focus of the Dissertation

1.2.1 A contribution to managerial economics

Referring to Brickley et al. (2009), Rubin and Dnes (2010)[173], managerial economics can be defined as part of the industrial organization research area. Using economic theories and tools, this research field deals with managerial issues. More specifically, managerial economics is based on precise theoretical references in economics and resorts to modern econometrical methods in order to address managerial issues. The analysis is based on the idea that performance results from the organizational choices.

The goal then is to define the organizational structures favoring incentives. The outcome can take the form of prescriptions to the managers. Hence, rooted in economic theories and methods, managerial economics analyses individual choices and incentive issues regarding managerial decisions.
Aims and research questions

Conceived as a contribution to this research area, my dissertation aims to provide some insight to the following research question:

“What is the impact of the upstream firm’s organizational and contractual choices on the franchised network performance?”

More precisely, dealing with the relationships between the organizational form and the network performance, the first part of the dissertation addresses the following research questions:

Research question 1 Does franchising generate better performance at the network level than other forms of distribution networks?

Research question 2 Does the presence of company-owned downstream units in addition to franchised outlets within the same distribution network generate better performance at the network level?

Research question 3 Does a greater upstream effort in the promotion of the common brand generate better network performance?

Research question 4 Does multi-unit franchising lead to higher network performance? In which specific context?

Focusing on the determination of the royalty rate in franchise contracts, the second part of the dissertation investigates the following questions:

Research question 5 Does the dilemma between risk and incentives issues at the downstream level impact the determination of the royalty rate? In which way?

Research question 6 Does a well-adjusted royalty rate, that is, a royalty rate adjusted regarding risk and incentives issues, lead to higher network performance?

Research question 7 Is the determination of the royalty rate affected by signaling motivations in the case of an emerging franchise system?

Research question 8 Is it possible to distinguish complementary signaling devices to the royalty rate in the case of an emerging franchise system?
1.2.2 Discussion about the notion of performance

Pénard et al. (2004)[161] distinguish three main issues in the empirical literature on franchise data: the choice between vertical integration versus franchised outlets (Brickley and Dark, 1987[25]; Norton, 1988[158]; Minkler, 1990[135]; Brickley et al., 1991[26]); dual distribution, that is, the coexistence in the same network of company-owned units in addition to franchised units (Perrigot et al., 2009[163]; Dant et al., 2008[57]; Windsperger and Dant, 2006[206]; Kaufman and Dant, 2003[55]); and the contractual design (Gonzalez-Diaz and Solis-Rodriguez, 2012[81]; Maruyama and Yamashita, 2012[141]; Vázquez, 2005[190]; Brickley, 2002[24]; and Kaufmann and Dant, 2001[118]).

In addition to these founding directions of the literature, several issues are being developed. These include the international development of franchised networks (Mariz-Pérez and García-Álvarez, 2009[138]; Elango, 2007[67]), the impact of geographical location (Kalnins, 2004[112]), and multi-unit franchising (Dant et al., 2011[58]).

Finally, performance issues can also be distinguished as a key research field in the literature (Castrogiovanni et al., 2011[33]; Vroom and Gimeno, 2007[192]; Lafontaine and Shaw, 2005[131]; Yin and Zajac, 2004[209]; and Litz and Stewart, 2000[134]).

My dissertation is related to this last field. For this reason, I discuss below the notion of performance.

A multidimensional notion

Performance is a multidimensional notion in organizational economics and strategic management (Crook et al. 2008[50]; Lubatkin and Shrieves 1986[135]; and March and Sutton, 1997[137]). As emphasized by Miller et al.(2013)[152], several important contributions about the definition of performance can be mentioned. However, these are characterized by important differences.

Thus, while Jensen and Meckling (1976)[107] define performance as the maximization of profits, Wernerfelt (1984)[198] argue that performance consists of high returns over long periods of time. This definition is close to the rate of return on assets underlined by Rumelt (1991)[174]. In addition, performance can be divided into individual performance (Baker, 1992)[13] versus global performance. The latter is defined by Richard et al. (2009)[170] as involving financial performance (e.g., profits), product market (e.g., sales), and shareholder return (e.g., economic added value).

In this dissertation, in accordance with Venkatraman and Ramanujam (1986)[191],
I define performance as the fulfillment of economic goals. This definition includes all the dimensions. In addition, although the concept of individual performance is useful to establish incentive contracts, I consider, as Baker et al. (1994)[14], that the distinction with global performance is not so fundamental. Both are indeed related, as the performance of the firm reflects the employee’s contribution, or in the context of my subject matter, the contribution of the members of the franchised network.

In addition, in common with the variety of definitions, the concept of performance also involves a variety of measures, which are discussed hereafter.

The measure of performance

Crook et al. (2008[50]) conducted a meta-analysis of the literature highlighting the variety of the ways to measure performance. Thus, Miller et al. (2013)[152] distinguish three ways to measure performance. The first involves the use of latent multidimensional constructs (e.g., through a set of questionnaire items concerning objective measures of sales and profit growth), the second consists of separate constructs (e.g., financial outcomes), and the third involves an aggregation of constructs.

Using Miller et al. (2013) classification, I observe that most of the papers on franchising use separate constructs (Barthélemy, 2008[15]; Castrogiovanni et al 2011[33]; and Kosová et al., 2012[114]), or latent multidimensional constructs (Kidwell et al., 2007[122]; Dada et al., 2012[52]; and Gorovaia and Windsperger, 2011[82]).

Another classification is proposed by Richard et al. (2009)[170]. These authors distinguish between objective versus subjective measures of performance. Four objective measures of performance are presented: accounting measures, which are related to economic returns (e.g., profit margin, market share, return on assets, and sales growth); financial market measures, representing the present value of future cash flows; accounting and financial market measures (e.g. Tobin’s q \(^2\)); and survival measures, which are defined as categorical variables related to the financial outcomes.

In addition, two subjective measures of performance are distinguished by Richard et al. (2009)[170]: fully subjective measures, that are built through a latent variable from self-report questions; and quasi-objective, measures that are built through self-report techniques. The franchise literature takes into account objective measures (Barthélemy, 2008[15] and Castrogiovanni et al., 2011[33]) and subjective latent constructions (Gorovaia and Windsperger, 2011[82]; Kidwell et al., 2007[122]; and Dada et al., 2012[52]).

\(^2\)This variable is the ratio of the market value of the firm’s assets divided by the replacement cost of the same physical asset.
1.2. Focus of the Dissertation

The following chapter (Chapter 2) proposes a survey of the literature on franchising based on the distinction between financial versus non-financial performance criteria. In this dissertation, I use successively different ways to measure performance, depending on the issue addressed in the chapter and on the data. The empirical analysis in Chapter 2 simultaneously takes into account three non-financial performance criteria. Chapter 3 is based on a subjective measure taking into account a large set of dimensions. Financial performance criteria are used in Chapter 4. Finally, in Chapter 5, I base the empirical analysis on a synthetic variable that is constructed from several objective measures of performance.

1.2.3 Methodology of the study

This section provides an overview of the data and modeling approaches used in the dissertation. I briefly discuss the appropriateness of the datasets to the research questions, data sources and sample selection, and provide a short justification of the econometric choices. Finally, I present a synopsis of the key findings and contributions, as well as the outline of the thesis.

The data

The empirical literature on franchising is based on two types of data sources: primary data resulting from direct surveys regarding franchisors or franchisees, and yearbooks.

A yearbook is an electronic or material guide for potential franchisees. Often, franchise yearbooks are provided by associations or federations of franchisors; otherwise they are provided by private enterprises. Each yearbook contains information about the features of the franchising networks, such as the number of outlets, the monetary clauses (royalty rate, upfront fee, and advertising rate), the non-monetary clauses (contract duration, territorial exclusivity, etc.), and the economic sector.

In this dissertation, I use different data sources and samples, depending on the research questions being addressed.

In Chapter 2, when studying the impact of the network organizational form on the performance, I use primary data from the French National Institute of Statistics and Economic Studies (INSEE) regarding the French distribution system. Several types of branded distribution networks are taken into account in the INSEE datasets. My original sample results from the matching of two INSEE datasets, one regarding retail networks and the other regarding service networks. These are cross-sectional data for 2007. My sample covers different organizational forms in all of the French
retail and service sectors.

In Chapter 3, which addresses the impact of multi-unit franchising on the network performance, I use German and Swiss data, collected for a franchising research project at the University of Vienna under Josef Windsperger’s supervision, in 2009. These are primary cross-sectional data regarding the year 2009. These data are interesting as they distinguish the franchisors using multi-unit franchising from the others. In addition, they include a set of variables that can be related to the analytical framework explaining the choice for multi-unit franchising as an organizational form.

In Chapter 4, I use a unique panel sample resulting from the matching of franchise data with financial data. The franchise data come from the yearbooks of the French Franchise Federation. As already mentioned, yearbooks are a secondary source of information and are frequently used in franchise literature. However, the yearbooks do not usually contain detailed information regarding the financial situation of the franchisors. That is why, in order to study the impact of the royalty rate on the network financial performance, I matched the yearbook information with the French financial dataset DIANE\(^3\). DIANE compiles financial information regarding more than 1.3 million French firms, based on their annual accounts. The panel data structure of DIANE allowed me to track the evolution of the franchisor situations over time.

In Chapter 5, for the analytical framework requiring estimations for the case of an emerging country, I use an original dataset constructed from the yearbooks of the Brazilian Franchise Association. I collected data for 2012 and 2013. My sample is cross-sectional and I refer essentially to the year 2012, but having a dataset covering two years allows me to calculate and use growth rates in my estimations.

Model and software choices

The empirical work in this dissertation is conducted with three complementary software products: STATA 12, mainly, in addition to SPSS and R. Several estimation methods have been implemented.

Throughout the dissertation, constant attention is paid to the potential endogeneity problems that are inherent to the econometrics of contracts, and to the issue of the dissertation. Indeed, studying the impact of strategic decisions on performance outcomes raises potential endogeneity problems, as explained with more details in the following chapters.

\(^3\)This dataset is managed by the Bureau Van Dijk, which is a firm dealing with global financial and business information.
In Chapter 2, the econometrical model takes the form of a system of simultaneous
equations, which are free of endogeneity, regarding the explanatory variables. The
estimations are performed using the three-stage least squares method introduced by
Zellner and Theil (1962)[211]. This systemic method allows the estimation of all
coefficients of the system of equations simultaneously from the moment matrix of
the structural disturbances. The three stage least squares estimations are performed
using STATA 12.

In Chapter 3, I proceed in two stages. First, I deal with potential endogeneity
and selection bias problems relating to the study of multi-unit franchising as an
explanatory variable of the performance. Hence, I implement the two-step Heckman
method (Heckman, 1979[98]). In addition, I perform propensity score matching to
analyze the impact of the choice of multi-unit franchising as an organizational form
on the network performance. This method was introduced by Rosenbaum and Rubin
(1983)[171]. Second, I use a nonparametric approach to test the impact of multi-
unit franchising on network performance in different environments. This approach is
designed to avoid any specific assumption about the residues, which allows a better
distribution of the parameters. The two-step Heckman method and the propensity
score matching are implemented using STATA 12. The nonparametric estimations
are performed with the software R.

In Chapter 4, I first study the way royalty rates are determined, using a random
effect model. This model is consistent even in the presence of time-invariant variables
(Greene, 2000[83]), which is the case with most of the contract data. Then, in
order to study the impact of the royalty rate on the network performance, I use
the two-stage Murphy and Topel estimator (Murphy and Topel, 1985)[156]), which
enables to calculate asymptotically correct standard errors when joint procedures
are infeasible or inappropriate. As my panel sample consists of a large number of
franchised networks and covers a period of five years, methodologies as seemingly
unrelated regressions are not adequate\(^4\). STATA 12 is employed to perform the
estimations.

In Chapter 5, to study the royalty rate as a signaling device, I first perform
Bayesian Model Averaging (BMA) to select the relevant potential signals, then OLS
regressions to estimate the impact of the franchisor type on the royalty rate. The
franchisor type is determined with a factorial technique, or, more precisely, with a
two-step cluster analysis. R, STATA 12, and SPSS are used, respectively.

\(^4\)The Murphy and Topel methodology is appropriate for correctional samples and for longitudinal data when the number of years in the panel does not exceed the number of individuals, since this method allows to calculate the effect for every individual and year.
Synopsis of findings and contributions

This thesis addresses the role of governance structures and contractual monetary clauses on the performance of franchise networks.

Comparing several types of distribution networks and taking into account several performance criteria, Chapter 2 provides evidence that franchising is the most appropriate form when the goal is the expansion of the network. In addition, this chapter highlights the positive influence on the network market share of the presence of company-owned units.

Chapter 3 shows that the presence of multi-unit franchising in the network leads to higher performance. However, thresholds are highlighted from which the influence stabilizes, suggesting that a mix with single-unit franchising is appropriate. In addition, this chapter provides evidence that the influence of multi-unit franchising depends on the environmental and behavioral context.

Dealing with the contractual form, and more precisely with the royalty rate in franchise contracts, Chapter 4 provides evidence that the royalty rate decreases with the risk of business failure. In addition, the chapter shows that a royalty rate adjusted regarding risk and incentives issues leads to higher network performance.

Finally, Chapter 5 provides evidence that new Brazilian franchisors with a high-value business concept use the royalty rate as a signaling device, which is not the case with other organizational or contractual forms.

Outline of the thesis

The rest of the dissertation is organized in two parts followed by a general conclusion.

The first part focuses on the governance structures and their impact on network performance. Chapter 2 studies the influence of the upstream organizational choices on the network performance and Chapter 3 deals with the impact of multi-unit franchising on the network performance.

The second part of the dissertation addresses the relationship between the royalty rate and the franchised network performance. Chapter 4 studies the influence of incentive motivations and risk issues at the downstream level on the royalty rate, in addition to the impact of the royalty rate on the network performance. Chapter 5 deals with the impact of signaling motivations on the royalty rate regarding new Brazilian franchisors with a high-value business concept.

Chapter 6 concludes the dissertation and identifies future research directions.
PART I

NETWORK FORM AND PERFORMANCE
Network type and performance in distribution systems

2.1 Introduction

Organizational forms in distribution systems are the subject of a vast empirical literature and constitute an on-going issue, as demonstrated by several recent publications: Barthélémy (2011[16]), Pénard et al. (2011)[162], Cliquet and Pénard (2012)[40], Kosová et al. (2012)[114], Chaudey et al. (2013)[37]. However, as originally mentioned by Kehoe (1996)[121], most of the literature has focussed exclusively on two organizational forms in distribution networks: franchised versus company-owned outlets.

This chapter extends the previous literature by taking into account several types of distribution networks. I use interesting primary data from the French National Institute of Statistics and Economic Studies (INSEE) regarding the French distribution system. The data relate to different organizational forms. The data therefore constitute a good opportunity to address the impact of the organizational choices of a network on its performance.

As presented in Chapter 1, a distribution network is defined as a network of downstream units directly related to the final consumers - retailers or service providers - with a common brand in addition to an upstream unit in charge of the homogeneity of the network and the promotion of the shared brand.

In the French distribution system, there are several types of contracts between...
the upstream and downstream units, therefore several types of vertical relationships and several levels of constraints for the partners. In addition, there are several types of networks, which use a combination of the different contracts. However, it is interesting to note that there is no difference for the consumers. In each case, the consumers see a set of outlets sharing a brand. Five types of distribution networks are distinguished in the sample, covering a wide range of retail and services sectors.

As shown in Table 2.1, the empirical studies dedicated to the performance of distribution networks over the last decades can be classified into three main categories: one category dealing with financial performance, one with nonfinancial performance, and a third category combining financial and nonfinancial performance criteria.

In the first field of study, i.e., that relates to financial performance, Sorenson and Sørensen (2000)[182] provide a better understanding of how the governance structure (franchised versus company-owned units) affects the chain performance using sales growth as the performance measure. In the same vein, Yin and Zajac (2004)[209] also study the impact of the governance structure, but they focus on the unit-level performance, which is again measured as the evolution of sales. Combs et al. (2004)[47] take into account the return on assets (ROA), the sales growth, and the market-to-book value. This last variable reflects the stock market’s view of the net present value of firms’ future earnings. Studying the performance consequences of franchising, these authors highlight the influence of strategic groups among franchisors on the performance outcomes. Kacmar et al. (2006)[111] focus on a large franchised restaurant chain and show that the employee turnover impacts the unit-level performance, measured as the gross monthly sales and the restaurant operating profit before occupancy (ROPO). Barthélemy (2008)[15] analyzes the impact of the network resources and the governance structure. This author uses a combination of return on sales (ROS) and return on assets (ROA) as performance criteria. Chaudey and Fadairo (2010)[36] highlight the positive influence on the mean turnover of more constraining contracts for the retailers. Castrogiovanni et al. (2011)[33] analyze whether franchising units achieve better financial performance than non-franchising ones based on five financial ratios. Finally, Ehrmann and Meiseber (2012)[65] also use a financial measure of performance in franchise systems, studying the impact of corporate social responsibility on sales.

In the second field of study, Kidwell et al. (2007)[122] highlight the prejudicial effects of free-riding behaviors on the perceived performance of franchisees. Combs and Gillis (2009)[14] provide evidence that the agency theory offers an interesting explanation for the decisions and performance of firms. In this case, the performance is measured as the propensity to franchise. Decker et al. (2011)[61]
<table>
<thead>
<tr>
<th>Year</th>
<th>Author(s)</th>
<th>Dependent Variable</th>
<th>Estimation Method</th>
<th>Analytical Framework</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014</td>
<td>Zhang Lawrence Anderson[213]</td>
<td>Average daily rate (ADR) index Occupancy ADR X Occupancy</td>
<td>linear regression</td>
<td>Agency theory</td>
</tr>
<tr>
<td>2013</td>
<td>Lucia Palacios Bordonaba Juste PoloRedondo Grünhagen[136]</td>
<td>Likert scales related to economic performance</td>
<td>Structural equation modeling</td>
<td>resource-based view</td>
</tr>
<tr>
<td>2012</td>
<td>Ehrmann Meiseber[65]</td>
<td>Financial performance (sales)</td>
<td>2 SLS</td>
<td>Managerial orientation</td>
</tr>
<tr>
<td>2012</td>
<td>Kosová Lafontaine Perrigot [116]</td>
<td>Financial and non-financial performance (price, occupancy rate and revenue per room in hotel industry)</td>
<td>Panel data Random effects OLS</td>
<td>Agency and other theories of industrial organization</td>
</tr>
<tr>
<td>2011</td>
<td>Decker Ehrmann Mellewigt [61]</td>
<td>Non-financial (satisfaction level of franchisees and managers)</td>
<td>OLS</td>
<td>Agency theory</td>
</tr>
<tr>
<td>2009</td>
<td>Combs Gillis[78]</td>
<td>Non-financial (propensity to franchise)</td>
<td>OLS</td>
<td>Agency theory</td>
</tr>
<tr>
<td>2007</td>
<td>Kidwell Nygaard Silkoset[122]</td>
<td>Non-financial (perceived performance)</td>
<td>Structural equation modeling</td>
<td>Agency theory</td>
</tr>
</tbody>
</table>

Table 2.1: Empirical studies dealing with performance in distribution networks (2000-2014)

address the influence of the franchisors’ control mechanisms on the satisfaction of franchisees and employee-managers, which itself affects the overall performance of the franchise system. Using German primary data, they show that outcome control leads to higher satisfaction among more experienced franchisees, while behavior control enhances the satisfaction of both highly and lowly experienced employee-managers. Furthermore, Lucia-Palacios et al. (2013)[136] study the influence of the level of technology opportunism capability on the network performance. Using Spanish data, the authors show that the network level opportunism positively influences the performance. Lastly, using a dataset from the U.S. hotel industry, Zhang et al. (2014)[213] address the performance implications. The authors highlight a positive relationship between customer satisfaction and the average daily rate price index.

A few studies combine both types of criteria. This is the case with Dada et al. (2012)[52] and Kosová et al. (2012)[114]. Dada et al. (2012)[52] provide evidence that an entrepreneurial orientation positively impacts the performance outcomes in franchise systems. Kosová et al. (2012)[114] highlight the differences in outcomes between franchised and corporate hotels from panel data regarding a large multi-chain hotel company. The performance results are measured in terms of price, occupancy rate, and revenue per room.

As mentioned previously mentioned in Chapter 1, the measurement of economic performance is diverse, and this survey confirms that there is no generic criterion regarding the performance of distribution networks.

In this chapter, I address additional non-financial performance criteria, analytically related as three indicators of the network commercial performance: the market share, expansion rate, and internationalization rate. Moreover, the originality of this chapter is its study of the simultaneous impacts of the network organizational choices on these criteria. Thus, I examine the determinants of distribution network performance by taking into account several distinguished criteria simultaneously, that is, within a single econometrical model. This approach allows the study of the extent to which the strategic choices have a varying or uniform impact according to various criteria.

In addition, the processing of endogeneity constitutes a main goal of this chapter. As mentioned by Hamilton and Nickerson (2003)[89], Saussier and Yvrande-Billon (2004)[210], Chaudey and Fadairo (2010)[36], and Kásova et al. (2012)[114], studying performance as the result of strategic choices raises a potential problem of endogeneity. Many factors may indeed influence both the performance and the organizational choices. For this reason, the organizational choices are usually endogenous to their expected performance outcomes.
2.2 Analytical framework

Although instrumental variables are not available here, I use a specific methodology to address the potential endogeneity bias inherent to the econometrics of contracts and to the issue of the chapter. The econometrical model takes the form of a system of simultaneous equations, free of endogeneity. The estimation results highlight the influence of the organizational choices on network performance and some differences depending on the observed performance criterion.

The rest of the chapter is organized as follows. Section 2.2 presents the analytical framework. Section 2.3 describes the data and the study variables. Section 2.4 contains empirical specifications regarding the processing of endogeneity. Evidence for the simultaneity between the performance criteria is provided in section 2.5. Section 2.6 contains the econometrical specification and the three-stage least squares estimates regarding the determinants of network performance. Finally, section 2.7 concludes.

2.2 Analytical framework

The literature dedicated to the organizational forms in distribution networks highlights the interest of franchising and of plural forms networks. A plural forms organization refers to the simultaneous presence of both franchised and company-owned outlets in the same network. The brand-name value plays also an important role in distribution networks where the outlets share the same brand name and the same concept, as defined and promoted by the upstream unit. Three testable propositions linking network performance to organizational choices can be derived from this analytical framework and are presented in greater detail in the following.

2.2.1 Franchising and performance in distribution networks

Several analytical contexts justify franchising as a retail strategy. The resource scarcity view, initially developed by Oxenfeldt and Kelly (1969)[159], Caves and Murphy (1976)[34], Martin and Justis (1993)[140], and Lafontaine and Kaufmann (1994)[128], focuses on the resource constraints of the upstream firm. Franchisees are seen as financial and human capital providers who enable quick growth of the network. Hence, the exploitation of a brand name through independent retailers instead of company-owned units is seen as an efficient governance strategy of the upstream firm, the goal being a rapid expansion of the network.

The agency theory offers a complementary explanation for franchising, based on the seminal contributions of Mathewson and Winter (1984[143]; 1985[144]) and
Tirole (1988)[187]. These authors analyze the moral hazard within the relationship between producers and retailers: the producer cannot observe the sales effort of the retailer, while the retailer’s actions affect the profit of the upstream firm. In this analytical context, the moral hazard is related to a range of externalities regarding the relationships in a distribution network as well as the context of uncertainty (Prendergast, 2002)[167]. Providing the first formalized analysis of franchising in the agency framework, Mathewson and Winter (1985)[144] highlight the importance of the vertical externality as the main explanation for franchising. Their agency model demonstrates that every action of the downstream firm affecting the level of the final demand impacts the producer’s profit. Organizing profit sharing between two independent firms, the franchise contract provides a better incentive structure than the company-owned retail units. Therefore, due to the vertical externality and the moral hazard on the downstream side, franchising networks have better incentive properties than vertically integrated networks.

This analytical context underlying the interest of franchising to resolve resource scarcity and agency issues is the framework of empirical works on US data (Combs et al., 2004[45]; Castrogiovanni et al., 2006b[30]; Combs and Michael, 2008[46]) and European data (Barthélemy, 2008[15]; Arruñada et al. 2009[9]).

Moreover, Barthélemy (2008)[15] and Srinivasan (2006)[184] provide evidence that financial performance actually depends on the governance structure of distribution networks, and Arruñada et al. (2009)[9] show that franchised units perform better than company-owned units in terms of productivity, labor costs, and profitability.

Based on this background literature showing that franchising both lessens the upstream firm capital constraints and provides more incentives to the downstream outlets, I formulate the following hypothesis referring to the performance of the network as a whole:

**Hypothesis 1:**

*Because franchise contracts provide more resources and better incentives, franchising generates higher performance at the network level.*
2.2.2 Plural forms and performance in distribution networks

The literature dealing with the organizational design of franchised chains emphasizes the interest in plural-form networks\(^2\), which include a proportion of company-owned outlets. Although the coexistence of franchised and company-owned units in the same network has long been considered a transitory phenomenon, it is now clearly established that the proportion of company-owned outlets remains relatively stable in mature franchised chains (Lafontaine and Shaw, 2005\[131\]). This stylized fact suggests that dual distribution, mixing vertically integrated and independent retail units as franchised ones, is strategically employed. This idea is consistent with Affuso’s (2002)\[1\] empirical results. In addition, Srinivasan (2006)\[184\] provides evidence that firms’ dual distribution strategies affect their intangible value.

In a recent theoretical work, Pénard et al. (2011)\[162\] demonstrate that, in a context of asymmetric information and moral hazards, plural forms are an efficient and stable organizational choice. The agency framework has previously been used by Bai and Tao (2000)\[12\] to study dual distribution. Adapting Holmstrom and Milgrom’s (1991)\[104\] multitask model, Bai and Tao (2000)\[12\] draw attention to the complementarities between company-owned units and independent retailers coexisting in the same network. With dual distribution, each type of downstream unit is devoted to a specific task, with owned units being more involved in the promotion of the common brand and franchised units being more heavily involved in sales efforts. Most of the empirical works on plural forms in franchising are developed in line with Bradach’s (1998)\[21\] model (Dant et al., 2008\[57\]; Cliquet and Pénard, 2012\[40\]). In this seminal work, Bradach (1998)\[21\] argues that franchise systems use plural forms because the existence of each type of outlet (franchised versus company-owned) in the same network positively impacts the management of the other side of the business. The author highlights four challenges faced by a franchisor to successfully manage distribution networks and show that for each of these challenges, dual distribution is more efficient than the other organizational forms. Bradach’s (1998)\[21\] analysis has recently been empirically tested on French data by Cliquet and Pénard (2012)\[40\]. The results support Bradach’s conceptual model. Cliquet and Pénard (2012)\[40\] show that the four designated challenges, namely, network expansion, concept uniformity, local responsiveness, and network adaptation, actually drive the statutory choices in franchised networks. From this previous literature I derive the following hypothesis, referring also\(^3\) to the network as a whole, mixing several types of downstream outlets:

---
\(^2\)“Plural forms” and “dual distribution” are used as synonyms.
\(^3\)as H1.
Hypothesis 2:
Given that dual distribution enables the management of a variety of goals, the presence of company-owned units in addition to independent outlets within the same distribution system generates better performance at the network level.

2.2.3 Brand-name value and performance in distribution networks

In addition to the agency literature regarding the downstream moral hazard in producer-retailer relationships, several theoretical (Lal[133], 1990; Bhattacharyya and Lafontaine 1995[18]) and empirical works (Lafontaine, 1992[126]; Scott, 1995; Vázquez, 2005[190]) dealing with franchising and distribution networks show that the moral hazard is two-sided and draw attention to the important role of the upstream firm.

Branded networks, as business-format franchising, are indeed based on the location of an intangible asset, namely, the upstream firm’s brand and concept. It is even possible to say that supplying and promoting the brand is the main task of the upstream unit. The promotional efforts increase the brand-name value, which is equivalent to the reputation of the network. In doing so, they positively affect the sales of the network.

The advantage of using a brand name compared with completely independent retailing is evidenced in Williams (1999)'s[199] empirical results based on US data, which suggest that franchisees’ profits would be lower if the studied downstream units were not part of a franchised network. The importance of the brand name is illustrated by the history of franchising networks, which, as noted by Mathewson and Winter (1985)[144], began their development in the 1950s, along with the development of national brands. This importance is emphasized by Windsperger (2002)[203], who studies the influence of brand-name assets on the allocation of decision rights in the Austrian franchise systems, and by Kidwell et al. (2007)[122], who deal with free-riding regarding brand-name reputation using Norwegian franchising data.

As mentioned by Lafontaine and Shaw (2005)[131], all brands are not equal, and their value depends on the long-term effort of the upstream firm. This idea is consistent with Barthélémy (2008)[15]'s empirical work on French data, which highlights the influence of the brand name on the financial performance of franchised chains. In this analytical context, I formulate the following hypothesis:
Hypothesis 3:
Considering that the upstream unit’s effort determines the brand-name value, greater upstream effort generates better network performance.

2.2.4 Analytical relationship between the performance criteria

Figure 2.1 illustrates the analytical framework composed of the three complementary hypotheses regarding the determinants of network performance (H1-H3). An additional hypothesis (H4) refers to the relationship between the performance criteria.

Three measures of performance are taken into account: the market share, international development, and expansion rate. The choice of the three performance criteria is based on the survey of the previous related literature (please see Table 2.1 and the introductory comments), the aim being to study additional measures of performance.

Considering that the network performance manifests itself in different forms, each of these criteria can be studied as an indicator of the same latent variable. Moreover, the market share, international development, and expansion rate are analytically related as three complementary and simultaneous indicators of the network commercial performance. Each of these indicators is indeed associated with the presence of the network on the market. Thus, the market share captures this presence in its sector-based dimension. In other words, with this first criterion, the presence of the network on the market is assessed relative to the sector. This presence is studied in its international dimension with the second criterion, international development, while the expansion rate refers to the presence on the market in its dynamic dimension, relating to the age of the network. H4 can be formulated as follows:

Hypothesis 4:
The network market share, the network international development, and the network expansion rate are related as complementary indicators of the same latent variable, namely, the network commercial performance.


2.3 DATA AND MEASUREMENT

2.3.1 Data

In this study, I use primary data from the National Institute of Statistics and Economic Studies (INSEE). Between 2006 and 2008, the INSEE conducted several surveys regarding the French distribution networks over seven downstream units (retailers and service providers). The networks (i.e. the head-ends) were surveyed by means of a paper questionnaire sent by post.

My sample results from the matching of two different INSEE datasets; one regarding networks of retailers, the other regarding networks of service providers. The work of retropolaltung was performed in collaboration with the INSEE services, to get a unique sample regarding the year 2007. The sample consists of 1202 networks, and covers all sectors of the French distribution system.

2.3.2 Measurement

2.3.2.1 Dependent variables

The three observed indicators of network performance are defined as follows.

The market share is the proportion of the network turnover in the total sector turnover:

\[ MS = \frac{\text{Turnover of the network}}{\text{Turnover of the sector}} \]  

(2.3.1)

This study takes into account 21 sectors, as presented in Table 2.2.
As mentioned in Table 2.2, the two main sectors in terms of the number of networks are “clothing stores” (17.9%) and “personal and household goods” (7.9%).

The international development of the network is measured, for each network, as the ratio of the number of outlets abroad to the total number of network outlets:

\[ ID = \frac{\text{Number of outlets abroad}}{\text{Total number of the network outlets}} \]  \hspace{1cm} (2.3.2)

Finally, the performance is measured using the expansion rate of the networks as a third indicator. Using cross-sectional variables, it is not possible to take into account the evolutions over time. However, for each network, I construct an index of the expansion rate using the total number of outlets in the network divided by the age of the network:

\[ ER = \frac{\text{Total number of the network outlets}}{\text{Age of the network}} \]  \hspace{1cm} (2.3.3)
Even though care must be taken in the interpretation of this variable, which attempts to capture a dynamic feature using cross-sectional data, the ratio provides an interesting proxy for the network expansion rate.

### 2.3.2.2 Independent variables

Each of the core independent variables reflects an organizational choice, and therefore a strategic choice, in line with the hypothesis of the analytical framework (H1-H3).

Related to hypothesis 1, the network type is introduced in the study as an explanatory variable. Five organizational forms are distinguished in the sample using the INSEE classification of distribution networks. Each of these organizational forms relates to a distribution network with a common brand for the outlets. These different types of distribution networks are predominately integrated networks, which are mainly composed of company-owned units; predominately franchised networks, which are mainly composed of business-format franchising units; non-predominantly franchised networks, which mix several types of contracts and use a lower proportion of franchised units; retailer or service provider cooperatives, in which the upstream unit in charge of the promotion of the common brand belongs to the downstream units; and networks organized with brand license contracts, which are similar to business-format franchising but less constraining for the downstream units.

<table>
<thead>
<tr>
<th>Network type</th>
<th>Proportion in the sample turnover</th>
<th>Allocation conditions of network types</th>
</tr>
</thead>
<tbody>
<tr>
<td>Predominantly integrated</td>
<td>69%</td>
<td>More than 50% of the network turnover is achieved by company-owned units</td>
</tr>
<tr>
<td>Predominantly franchised</td>
<td>7%</td>
<td>More than 50% of the network turnover is achieved by franchised units</td>
</tr>
<tr>
<td>Non-predominantly franchised</td>
<td>8%</td>
<td>Between 20% and 50% of the network turnover is achieved by franchised units</td>
</tr>
<tr>
<td>Retailer or service provider cooperative</td>
<td>13%</td>
<td>More than 50% of the network turnover is achieved by outlets belonging to a cooperative</td>
</tr>
<tr>
<td>Brand license</td>
<td>3%</td>
<td>More than 50% of the network turnover is achieved by outlets with a brand-license contract</td>
</tr>
</tbody>
</table>

Table 2.3: Five types of networks
Table 2.3 presents these different types of networks, as defined by the INSEE. The classification is based on the type of bilateral contract between the upstream unit and each downstream unit (franchise, company-owned unit, retailer or service provider cooperative, brand license) and the composition of each network. The five organizational forms are defined ex post to take into account the fact that most French distribution networks mix several types of downstream units, using several types of vertical contracts depending on the downstream outlet. Each network is allocated a type according to the proportion of the network turnover achieved by the different categories of outlets. The algorithm tests successively the condition in the second column of Table 2.3 and stops as soon as a condition is true.

Based on hypothesis 1, I expect that franchised networks provide better performance than the other forms.

In line with hypothesis 2, the presence of company-owned units in the network is taken into account as an explanatory variable for network performance. This variable is measured as the number of company-owned units divided by the total number of outlets in the network:

\[
O = \frac{\text{Number of company owned units}}{\text{Total number of outlets}}
\]  

(2.3.4)

This ratio is commonly used in the empirical literature on franchise data as an indicator of the extent to which a firm franchises its outlets (Castrogiovanni et al. 2006[31]). However, it is usually studied as a dependent variable, which is not the case here. As derived from hypothesis 2, the expectation concerning this variable is that the presence of company-owned units within networks of independent retailers, i.e., dual distribution, corresponds to better performance.

The third core explanatory variable is related to hypothesis 3. The upstream unit’s effort in the vertical relationship is taken into account with an index based on six qualitative variables. Each of these variables represents a specific form of involvement. In some networks, the upstream unit defines the layout of the downstream outlets and is in charge of the advertising campaigns. The upstream unit can be in charge of team training and define the different services that the outlet offers to the customers. Finally, the upstream firm can choose an information strategy concerning the sales tracking or the diffusion of the outlets’ performances within the network.
Based on the answer of each surveyed network regarding the role of the upstream unit, every qualitative variable is coded from 0-2 (0 = no, 1 = somewhat yes, 2 = completely yes). The higher the value of the variable, the greater the upstream unit’s involvement in the vertical relationship. Better performance is expected from a greater upstream effort. Taking into account the six qualitative variables, the mean effort in the sample is 0.51. For each network, I use a dummy variable to proxy the upstream effort, which equals 1 if the effort is higher than the mean value (0.51) and 0 otherwise.

### 2.3.2.3 Control variables

The dummy variable *retail-services* enables to control for the influence on the network performance of operating in retail versus service sectors. Such a variable was previously introduced by Dant *et al.* (2008)[57]. As the data relate to a developed country, it is relevant to predict that service sectors are more dynamic and generate more performance than the retail activities.

<table>
<thead>
<tr>
<th>Variables</th>
<th>Obs</th>
<th>Mean</th>
<th>Std. Dev.</th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Dependent variables</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Market share</td>
<td>1202</td>
<td>0.0191348</td>
<td>0.051123</td>
<td>0.0000104</td>
<td>0.6809489</td>
</tr>
<tr>
<td>Expansion rate</td>
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<td>2.106.948</td>
<td>1.592.495</td>
<td>0.05</td>
<td>4849.33</td>
</tr>
<tr>
<td>Internationalization rate</td>
<td>1202</td>
<td>0.1303478</td>
<td>0.2628227</td>
<td>0</td>
<td>0.9967006</td>
</tr>
<tr>
<td><strong>Independent variables</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Network type</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Predominantly integrated</td>
<td>1202</td>
<td>0.4825291</td>
<td>0.4999027</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Predominantly franchised</td>
<td>1202</td>
<td>0.2171381</td>
<td>0.412469</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Non-predominantly franchised</td>
<td>1202</td>
<td>0.0740433</td>
<td>0.2619503</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Retailer or service provider cooperative</td>
<td>1202</td>
<td>0.0873544</td>
<td>0.2824712</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Brand license</td>
<td>1202</td>
<td>0.046589</td>
<td>0.2108446</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Company-owned units</td>
<td>1202</td>
<td>0.5939847</td>
<td>0.4471412</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Upstream effort</td>
<td>1202</td>
<td>0.5174709</td>
<td>0.4999027</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td><strong>Control variables</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Retail/Services</td>
<td>1202</td>
<td>0.7129784</td>
<td>0.4525601</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Other network</td>
<td>1202</td>
<td>0.7287854</td>
<td>0.4447717</td>
<td>0</td>
<td>1</td>
</tr>
</tbody>
</table>

Table 2.4: Summary statistics

Note: Significant * at the 10% level, ** at the 5% level, *** at the 1% level
Finally, the dummy variable *other network* takes into account the operation by the upstream unit of another branded network in the same sector, each network being positioned differently, or in another sector. The role of this variable is to capture the influence of the strategic choice to operate several networks simultaneously on the performance outcomes. The impact may be positive due to the resulting broader range of activities or negative if focusing on one specific distribution network appears to be more efficient.

Summary statistics for all of the study variables are provided in Table 2.4. This table highlights the high standard deviation for the variable expansion rate. This finding is not surprising for cross-sectional data with a large sample, when a variety of organizational forms and many economic sectors are concerned.

More generally, the statistics presented in Table 2.4 reflect a good degree of diversity in the sample.

![Figure 2.2: Average performance in the five types of sample networks](image)

Figure 2.2 presents the average performance in the five types of sample networks. It is interesting to note that the form *predominantly franchised* has higher average performance indicators than the others.
2.4 PROCESSING OF ENDOGENEITY

Good instrumental variables are not available in this case. For this reason, I use a version of the Hausman specification test\(^4\). The processing can be described as follows, using the following reduced form as an example in equation (2.4.1):

\[
\begin{align*}
Y_1 &= \alpha_0 + \alpha_0 X_i + v_i \\
Y_2 &= \pi_0 + \pi_0 X_i + w_i
\end{align*}
\tag{2.4.1}
\]

The two-stage procedure consists of estimating the first equation in the reduced form (2.4.1) and then regressing \(Y_2\) on the estimated \(Y_1\) and on the residue. Finally, a t-test is performed. If the coefficient of the residue is significant, then it is not possible to reject the hypothesis of endogeneity. I use this procedure twice: first to test the hypothesis of simultaneity between the three dependent variables (H4) and then to determine the econometrical model as a system of simultaneous equations free of endogeneity problems regarding the explanatory variables.

2.5 EVIDENCE FOR THE SIMULTANEITY BETWEEN THE THREE PERFORMANCE INDICATORS

Econometrically, \(H_4\) involves a potential simultaneity concerning the internationalization rate, expansion rate, and market share of distribution networks.

To test this hypothesis, I use the procedure presented above in the following reduced form system:

\[
\begin{align*}
Y_1 &= \beta_0 + \beta_1 X_{1i} + \beta_2 X_{2i} + \beta_3 X_{3i} + \beta_4 X_{4i} + \beta_5 X_{5i} + u_i \\
Y_2 &= \alpha_0 + \alpha_1 X_{1i} + \alpha_2 X_{2i} + \alpha_3 X_{3i} + \alpha_4 X_{4i} + \alpha_5 X_{5i} + v_i \\
Y_3 &= \pi_0 + \pi_1 X_{1i} + \pi_2 X_{2i} + \pi_3 X_{3i} + \pi_4 X_{4i} + \pi_5 X_{5i} + w_i
\end{align*}
\tag{2.5.1}
\]

\(^4\)Hausman (1978)[96]; Nakamura and Nakamura (1981)[157]
where,

\( Y_1 = \text{Internationalization rate} \)

\( Y_2 = \text{Expansion rate} \)

\( Y_3 = \text{Market share} \)

\( X_1 = \text{Network type} \)

\( X_2 = \text{Company owned units} \)

\( X_3 = \text{Upstream effort} \)

\( X_4 = \text{Retail-services} \)

\( X_5 = \text{Other network} \)

The results of the procedure clearly highlight the simultaneity regarding the three dependent variables. As shown in Figure 2.3, the results are robust: the influence of each residue remains significant regardless of the order of the testing procedure.
2.6 ECONOMETRICALLY DETERMINED NETWORK PERFORMANCE

Taking into account the empirical relationships between the dependent variables, I define the econometric model as a system of three simultaneous equations. For each equation, I test the explanatory variables using the procedure previously defined (2.4) to ensure that all of the variables of the system are exogenous.

Every potential form of the system is tested, and the explanatory variables introducing endogeneity problems are removed from the equations\(^5\). Regarding the first equation (international development), the procedure shows that the hypothesis of endogeneity cannot be rejected for the variable company-owned units. In the same way, the procedure suggests that the variables network type and upstream effort are endogenous in the equation for the market share. Lastly, the variables other network, upstream effort, and company-owned units are endogenous in the equation for the expansion rate.

The resulting empirical model, free of endogeneity regarding the explanatory variables, can be written as follows:

\[
\begin{align*}
\text{International rate}_i &= \beta_0 + \beta_1 \text{Network type}_i + \beta_2 \text{Upstream effort}_i + \\
&\quad + \beta_3 \text{Retail effort}_i + \beta_4 \text{Other network}_i + u_i \\
\text{Market share}_i &= \alpha_0 + \alpha_1 \text{Company owned units}_i + \alpha_2 \\
&\quad + \alpha_3 \text{Retail-services}_i + +\alpha_3 \text{Other network}_i + v_i \\
\text{Expansion rate}_i &= \pi_0 + \pi_1 \text{Network type}_i + \pi_2 \text{Retail-services}_i + w_i
\end{align*}
\]

\(i = \text{network (1 to 1202)}\)

\(^5\)Because no good instrumental variables are available and considering the complexity of the econometrical model defined here as a system of equations, I opt to remove the endogenous variables instead of correcting the endogeneity to minimize complexity.
2.6.1 Identification and order conditions

Before estimating the model, it is necessary to check the identification and order conditions in the system. Concerning the order conditions, the criterion is as follows:

\[
\begin{align*}
K - k &= m - 1 \text{ exactly identified} \\
K - k &> m - 1 \text{ over identified} \\
K - k &< m - 1 \text{ under identified}
\end{align*}
\]

where,
- \(M\) : endogenous variables in the model
- \(m\) : endogenous variables in an equation
- \(K\) : number of predetermined variables in the model
- \(k\) : number of predetermined variables in an equation

\[
\begin{array}{|c|c|c|c|c|c|}
\hline
\text{Equation} & K & k & K - k & \text{Relationship} & m - 1 & \text{Identification} \\
\hline
\text{Expansion} & 5 & 2 & 3 & > & 0 & \text{over-identified} \\
\text{International} & 5 & 4 & 1 & > & 0 & \text{exactly identified} \\
\text{Market share} & 5 & 3 & 2 & > & 0 & \text{over-identified} \\
\hline
\end{array}
\]

Table 2.5: Identification and order conditions

Based on the conditions of Table 2.5 the first equation is exactly identified; the second and the third equations are over-identified. Therefore, this system satisfies the order conditions.

I test for potential multicollinearity and heteroscedasticity in each equation. The variance inflation factors suggest that there is no severe multicollinearity. The Brush-Pagan test is performed, revealing the presence of heteroscedasticity.

Heteroskedasticity can be controlled with the three-stage least squares (3SLS) approach, as it is a specific case of the generalized method of moments (GMM). The 3SLS estimator is indeed an efficient GMM estimator. Whereas the two-stage least squares (2SLS) method does not exploit the correlation of the disturbances across equations, the 3SLS introduced by Zellner and Theil (1962)[211] is a systemic method, which is adequate for the analytical framework and the first estimates regarding the simultaneity between the dependent variables. The first two stages
of the method are identical to the two stages of the 2SLS. The covariances of the perturbations are then estimated from the 2SLS residues in the third stage.

### 2.6.2 Three-stage least squares estimates

The estimation results are reported in Table 2.6, where the network type *Non-predominantly franchised* is taken as the reference form. Robustness checks are performed, using each network type in turn as the reference form. The detailed estimates are presented in Table 2.7.

<table>
<thead>
<tr>
<th></th>
<th>Internationalization rate</th>
<th>Expansion rate</th>
<th>Market share rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Other network</td>
<td>0.0181</td>
<td>-0.0057*</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.0164)</td>
<td>(0.00308)</td>
<td></td>
</tr>
<tr>
<td>Retail/Services</td>
<td>-0.0620***</td>
<td>-33.20***</td>
<td>-0.0109****</td>
</tr>
<tr>
<td></td>
<td>(0.0209)</td>
<td>(10.41)</td>
<td>(0.00303)</td>
</tr>
<tr>
<td>Upstream effort</td>
<td>-0.0298</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.0189)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Retailer or service</td>
<td>-0.0585**</td>
<td>-18.4</td>
<td></td>
</tr>
<tr>
<td>provider cooperatives</td>
<td></td>
<td>(0.0288)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>(17.54)</td>
<td></td>
</tr>
<tr>
<td>Brand License</td>
<td>-0.0503</td>
<td>2.51</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.0374)</td>
<td>(22.61)</td>
<td></td>
</tr>
<tr>
<td>Predominantly franchised</td>
<td>0.0691**</td>
<td>4.985</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.0305)</td>
<td>(18.59)</td>
<td></td>
</tr>
<tr>
<td>Predominantly integrated</td>
<td>0.00158</td>
<td>-21.59**</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.0179)</td>
<td>(10.75)</td>
<td></td>
</tr>
<tr>
<td>Non-predominantly franchised</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>reference</td>
<td></td>
<td>reference</td>
<td></td>
</tr>
<tr>
<td>Company-owned units</td>
<td></td>
<td></td>
<td>0.000155****</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(0.0000114)</td>
</tr>
<tr>
<td>Constant</td>
<td>0.178****</td>
<td>56.28****</td>
<td>0.0245****</td>
</tr>
<tr>
<td></td>
<td>(0.0207)</td>
<td>(10.15)</td>
<td>(0.00359)</td>
</tr>
<tr>
<td><strong>Fit Statistics</strong></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>$R^2$</td>
<td>0.0363</td>
<td>0.0174</td>
<td>0.1436</td>
</tr>
<tr>
<td>$Chi^2$/$f$</td>
<td>45.03****</td>
<td>20.85****</td>
<td>201.76****</td>
</tr>
<tr>
<td>N</td>
<td>1202</td>
<td>1202</td>
<td>1202</td>
</tr>
</tbody>
</table>

Table 2.6: Three-stage least squares estimates for network performance

Note: Significant * at the 10% level, ** at the 5% level, *** at the 1% level. Standard errors are in brackets.
2.6.3 Comments

The estimates enable us first to comment on the quality of the econometric model. The R-squared values are low (between 1.7% and 14%), which is typical of cross-sectional data. In addition, the purpose of the three-stage least squares approach is to obtain accurate estimates of the coefficients. This is why a negative or a small R-squared is not a problem with this estimation method, the focus being on the parameters. In fact, the good global significance of the model is highlighted by the chi-square tests (significance at the 0.1% level). The results are robust, as highlighted by the detailed estimates presented in Table 2.7.

The estimation results relating to the internationalization rate reveal that, as predicted, the organizational form of the network has a significant effect on the performance. The sign concerning the network type *predominantly franchised* highlights the positive influence of such this organization type on the international expansion of the network. In addition, the results suggest that the *cooperative* form has a negative impact on the first performance indicator. Moreover, sensitivity checks show that when *predominantly franchised* is taken as the reference form (Table 2.7, model 3), all of the other network types have a negative impact on the international development of the network. These results are consistent with H1, regarding the positive impact of franchising on network performance.

However, in the equation for the internationalization rate, the negative sign concerning the control variable *retail/services* suggests that services lead to better performance than retail activities.

The hypothesis H3 finds no empirical support here. The variable *upstream effort* has no significant influence. This unpredicted result could be due to the construction of the proxy variable.

Even if care must be taken in the interpretation of the proxy for the expansion rate, the estimates of the related equation provide interesting and complementary results. Here again, the evidence suggests that the organizational form impacts the performance. Consistent with H1, the network type *predominantly integrated* has a negative influence on the expansion rate.

Thus, the estimation results show that, when the network performance is measured in terms of number of downstream units, which is related to the network size in its international dimension, or to the network age, franchising is the organizational form providing the best performance. The results concerning the expansion rate highlight once again the significant influence of the sector and the positive impact of services relative to retail activities.
### Three-stage least squares estimates

<table>
<thead>
<tr>
<th></th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
<th>(5)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>International rate</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other network</td>
<td>0.0181</td>
<td>0.0177</td>
<td>0.019</td>
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<tr>
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<td>(0.0164)</td>
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<tr>
<td>Retail/Services</td>
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<td>-0.0693***</td>
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<td>(0.0209)</td>
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<td>(0.0189)</td>
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<td>-0.101***</td>
<td>-0.0564*</td>
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<tr>
<td>provider cooperatives</td>
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<td>(0.0321)</td>
<td>form</td>
</tr>
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<td>-0.056</td>
<td>-0.0924**</td>
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<td>-0.0331</td>
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<td></td>
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<td>Predominantly</td>
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<td>0.0631**</td>
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<td>franchised</td>
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<td>(0.0294)</td>
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<td>(0.0330)</td>
</tr>
<tr>
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<td>reference</td>
<td>-0.041*</td>
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<td></td>
<td></td>
</tr>
<tr>
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</tr>
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<td>(10.51)</td>
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<td>(16.52)</td>
<td>(19.01)</td>
<td>(19.62)</td>
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<td></td>
<td>(16.52)</td>
<td>(21.94)</td>
<td>(23.82)</td>
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<tr>
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<td>(20.81)</td>
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<td>45.59****</td>
<td>44.73****</td>
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<td>202.22****</td>
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</table>

Table 2.7: Robustness checks
Note: Significant * at the 10% level, ** at the 5% level, *** at the 1% level.
Standard errors are in brackets.
This is also the case within the third group of estimates, which concern the market share. Thus, regardless of the performance criterion considered, the influence of the sector is significant, and the results indicate that services versus retail activities favor network performance. This result could be explained by the fact that retailing networks represent 77% of my sample; distribution networks would be well established in this sector and expanding in the service sector. In this case, my results would illustrate on-going dynamics. The equation for the market share includes the variable *company-owned units*, which allows H2 to be tested using the data. The estimations highlight the significant and positive influence of the *company-owned units* ratio on the market share. This result provides empirical support for the hypothesis that the presence of company-owned units in addition to independent outlets within the same distribution network generates better performance, measured here in terms of market share.

Considering a p-value of 10%, the control variable *other network* has a significant and negative impact on the performance. This result suggests that better performance in terms of market share results from the upstream unit’s focus on one specific network. Finally, this paper highlights the differentiated impact of the network organizational choices. It shows that the performance criteria are analytically and empirically related, but also that each criterion retains its own specificity as a performance result due to the differentiated network organizational choices.


2.7 Conclusion

This chapter contributes to the on-going literature regarding the influence of organizational form on performance in distribution systems. The impact of the organizational choices of distribution networks is highlighted via econometric modeling. Moreover, the chapter underlines the relevance of simultaneously considering several criteria of performance and provides an interesting processing of endogeneity adapted to cross-sectional data. The analytical part of the chapter surveys the vast literature devoted to franchising and dual distribution. Using this framework, several testable propositions are derived, linking networks performance to the five following organizational choices: type of distribution network, considering five alternative forms in the French system; the level of company-owned units in the network; the involvement of the upstream unit in the vertical relationships; the type of sector, considering the distinction between services and retail activities; and the decision to manage several networks simultaneously.

The estimation of a system of simultaneous equations, free of endogeneity, with the three-stage least squares method provides robust results.

With the exception of the involvement of the upstream unit, the estimates highlight the significant impact of the organizational choices on the performance at the network level. Compared to retailer or service provider cooperatives and company-owned networks, franchising appears to be the most appropriate form when the goal is the extension of the network in terms of international expansion and the expansion rate relative to the age of the network. In addition, the chapter highlights the positive influence on the market share of the presence of company-owned units within branded networks of independent retailers or service providers, in other words, the positive influence of dual distribution. The choice of the sector in terms of the distinction between retailing and services also impacts the performance. More precisely, my empirical results suggest that services versus retail activities favor network performance. Finally, evidence is provided that, in terms of market share, it is better to focus on a unique distribution network instead of managing several networks simultaneously.

These empirical results show that there is room for theoretical research aiming to explain the underlying mechanisms by which the different types of network performance are related.

In addition, several limitations of the study must be mentioned, providing directions for further research. First, the empirical investigation is limited by the characteristics of the data, which are mostly composed of categorical variables.
Moreover, my analysis focuses on a single year. This approach could be complemented by estimations using panel data to highlight fixed effects and evolutions. Second, the study distinguishes only two general sectors: retail \textit{versus} services. The good estimation results regarding this variable call for a more detailed sector-based analysis. Finally, it would be interesting to consider financial performance criteria to see if the results obtained here concerning the influence of the organizational choices can be generalized to other types of performance indicators.
Chapter 3

Organizational performance
in multi-unit franchise systems

3.1 Introduction

The aim of the chapter is to study the impact of multi-unit franchising (MUF) systems on the network performance. MUF is a governance form inside franchising networks where the franchisor bestows to the franchisee the right to own and operate more than one outlet. Two types of multi-unit franchising are distinguished: area development franchising versus sequential multi-unit franchising (Kaufmann and Dant, 1996[117]; Grünhagen and Mittelstaedt, 2005[87]). Area development franchising is based on a contract that allows a franchisee to run several outlets at a certain time in a specified geographical area. It is often associated with a territorial exclusivity right. Sequential multi-unit franchising refers to a contract that transfers to the franchisee the right to open a new unit in addition to the existing one.

Since the 1980s, the emergence of MUF has been a widespread trend and now represents a major portion of the growth in the franchising business. For example, using primary US data for the fast-food industry, Kaufmann and Dant (1996)[117] show that MUF is used by 88% of the surveyed franchisors. Grünhagen and Mittelstaedt (2005)[87] mention that multi-unit ownership has become the dominant form

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1This chapter draws inspiration from the articles:
- “Is Multi-Unit Franchising an Effective Organizational Form? Evidence from European Data” presented in the International Workshop on Franchising, Retail and Service Chains, Rennes, France, June 11-12, 2014, with M. Fadairo and J. Windsperger.
All errors are mine.
of franchising in the United States. Dant et al. (2011) emphasize that MUF is present in many sectors and is often the main organizational type. These authors stress that, according to the International Franchise Association (IFA), MUF represents 52.6% of all franchised units across different sectors and countries (The IFA Educational Foundation 2002).

Previous empirical studies regarding this organizational form are based on different theoretical frameworks: resource scarcity theory (Kaufmann and Dant, 1996; Weaven and Frazer, 2003; Grünhagen and Mittelstaedt, 2005), dependence theory (Dant and Gundlach, 1999; Grünhagen and Mittelstaedt, 2002; Weaven and Frazer, 2006; Dant et al., 2011), transaction costs theory (Kaufmann and Kim, 1995; Weaven and Frazer, 2003; Hussain et al., 2012), property rights theory (Hussain and Windsperger, 2013), agency theory (Bradach, 1995; Kaufmann and Dant, 1996; Dant and Nasr, 1998; Weaven and Frazer, 2003; Kahnins and Lafontaine, 2004; Grünhagen and Mittelstaedt, 2005; Garg et al., 2005; Sanchez-Gomez et al., 2010; Gillis et al., 2011; Jindal, 2011; Perryman and Combs, 2012; Hussain et al., 2012), and organizational capability theory (Hussain and Windsperger, 2014).

The empirical literature reveals various advantages of MUF as a governance structure compared to single-unit franchising (SUF). Sequential MUF is considered to be a means to reward high quality franchisees and thereby to improve the system efficiency (Sanchez-Gömez et al., 2010). A complementary argument is that, since existing franchisees are familiar with the franchisor’s business format and with the local market conditions, MUF reduces the risk of failure (Bates, 1998) and enables the franchisor to avoid incurring additional costs for screening, recruiting, and training (Kaufmann and Dant, 1996). In addition, multi-unit franchisees usually have higher administrative capabilities than single-unit franchisees (Grünhagen and Mittelstaedt, 2005). MUF favors system uniformity (Weaven and Frazer, 2007), economies of scale for the franchisor and the franchisee (Grünhagen and Mittelstaedt, 2002), and a lower level of conflict between the two of them due to the smaller number of franchisees that need to be coordinated (Zeller et al., 1980, Weaven and Frazer, 2004). Based on these results, it is relevant to expect that MUF positively impacts the performance of franchise networks.

Indeed, Kaufmann and Kim (1995); Kaufmann and Dant (1996); Grünhagen and Mittelstaedt (2002) have highlighted the positive influence of MUF on the network growth. In this chapter, I provide results relating directly the presence of MUF to network performance.

This chapter proceeds as follows. Section 3.2 develops the hypotheses in the
3.2 Analytical framework

In the framework of the theory of contracts, the hypotheses development in this chapter is based on several theoretical branches: agency theory (Fama and Jensen, 1983[71]; Jensen and Meckling, 1976[107]; Laffont and Martimort, 2001[125]), transaction costs theory (Coase, 1937[42]; Williamson, 1975[200], 1985[201]), property rights theory (Coase, 1960[42]; Demsetz, 1967[62]; Alchian and Demsetz, 1973[3]), and incomplete contracts theory (Grossman and Hart, 1986[85]; Hart, 1988[92]; Hart and Moore, 1990[94]).

The analytical framework takes into account the influence of MUF in case of relationship hazards, environmental hazards, and in relation with formal and informal governance mechanisms.

3.2.1 MUF and relationship hazards

Agency theory emphasizes the emergence of opportunistic behavior under asymmetric information. In franchising, the analysis of free riding and shirking is based on the theoretical contributions of Rubin (1978)[172] as well as Mathewson and Winter (1985)[144]; these are the roots of a vast literature on franchising in the framework of agency theory (e.g., Lafontaine, 1992[126]; Brickley, 1999[23]; Gonzalez-Diaz and Solis-Rodriguez, 2012[80]; Barthélémy 2008[15], 2011[16]).

In the franchise relationship, due to the presence of asymmetric information in favor of the franchisee regarding his/her level of effort (moral hazard) or his/her type (adverse selection), opportunistic behavior may arise. In addition, as the franchise network is based on a common brand name and reputation, each franchisee can free ride in the network. Thus, agency costs in franchising result from behavioral uncertainty due to free riding on the common brand name and shirking behaviors to the network partners.
MUF offers a solution to this relationship hazards. Under MUF, the agency problem is transferred to the downstream level by establishing mini-chains in which the franchisees are in charge of the outlet managers.

Studding the factors that influence the choice of the organizational form when franchisors add new franchised units to their networks, Sanchez-Gomez et al., (2010)[175] provide evidence from the Spanish franchise sector that MUF mitigates free riding and adverse selection problems. From a study of longitudinal North American data, Jindal (2011)[108] shows that by reducing the size of the system internal hierarchy, MUF reduces moral hazard problems. Gillis et al. (2011)[79] obtain similar results on US data regarding restaurant franchisors. They show that faster-growing franchisors use MUF as a reward in a tournament to reduce agency problems. From this analytical context, I derive the following hypotheses:

**Hypothesis 1:**
In a context of high brand name value, MUF leads to higher performance.

**Hypothesis 2:**
In a context of high shirking risk, MUF leads to higher performance.

### 3.2.2 MUF and environmental hazards

According to the transaction cost theory, environmental uncertainty influences the choice of inter-organizational governance mechanisms (Williamson, 1975[200], 1991[202]). This concept refers to the inability to predict the state of the world (Arrow, 1974[7]). In the case of franchising, environmental uncertainty reflects the difficulty faced by the franchisor in predicting the development of the local market due to economic hazards (e.g., demand and competition) and institutional changes. Williamson (1991)[202] and Gibbons (2005)[77] show that a high level of environmental uncertainty requires the firm to be more adaptable by delegating some coordination tasks to local entrepreneurs.

Applied to franchising, this reasoning justifies the use of more SUF assuming that franchisees have a stronger entrepreneurial orientation compared to the outlet managers in a mini-chain (Hussain et al., 2012[105]), and react more quickly to the changes in local markets (Sorenson and Sorensen, 2001[182]).

Therefore, with a high level of environmental uncertainty, SUF would provide performance advantages compared to MUF due to the franchisees’ higher level of
entrepreneurial capabilities and incentives to exploit the local market opportunities versus the managers of the franchisors (Garg et al., 2005[76]).

From this framework, I formulate the following hypothesis:

**Hypothesis 3:**

*In a context of high environmental uncertainty, MUF leads to a lower performance.*

### 3.2.3 Complementarity between formal and informal governance mechanisms and MUF

According to the property rights and relational governance perspectives (e.g., Hart 1995[93]; Windsperger and Dant 2006[206]; Dyer and Singh 1998, [64]), formal and informal governance mechanisms influence the performance of inter-organizational networks.

Applied to franchising networks, it is possible to argue that the influence of MUF in terms of performance is positively related to the delegation of decision rights (as a formal governance mechanism) and partner trust (as a relational governance mechanism).

Based on the property rights reasoning, the distribution of non-contractible assets (system-specific assets and local market assets) affects the allocation of decision rights that are contractually delegated to franchisees. Thus, the level of delegation varies across franchise systems and is complementary to MUF. Although Fama and Jensen (1983)[71] emphasize that the decision structure of the firm consists of decision management rights and decision control rights, under MUF the franchisor transfers more decision management rights to the local multi-unit franchisees.

These decision rights concern the monitoring of local outlets, the management of local human resources, and the transfer of knowledge between the headquarters and the local outlets. Expecting that complementarity between MUF and the delegation of decision rights will increase the performance of franchise network, I formulate the following hypotheses:

**Hypothesis 4:**

*In a context of high delegation of decision rights, MUF leads to a higher performance.*
A few studies have investigated the role of trust in franchising (e.g., Cochet et al., 2008[43]; Dickey et al., 2008[63]; Croonen, 2010[51]; Dant et al., 2011[58]; Davies et al., 2011[60]; Gorovaia and Windsperger, 2011[82]; Mumdziev and Windsperger, 2013[155]).

However, as an important informal governance mechanism (e.g., Heide and John, 1992[100]; Gulati, 1995[88]; Poppo and Zenger, 2002[166]; Palmatier et al., 2007[160]), trust may mitigate the problem of contractual incompleteness due to non-verifiability.

In a recent study, Griessmair et al. (2014)[84] highlight the impact of trust on the franchisor’s organizational choice regarding MUF. Applying relational governance reasoning, it is relevant to expect that a high level of trust between the franchisor and the franchisees will improve the performance of MUF systems by reducing relational risk and increasing information sharing.

Hence, I formulate the following hypothesis:

**Hypothesis 5:**

*In a context of a high level of trust, MUF leads to a higher performance.*

### 3.3 Data and Measurement

#### 3.3.1 Data

In this chapter, I use German and Swiss data, collected for a franchising research project at the University of Vienna under Josef Windsperger’s supervision, in 2009. The directories of the German and Swiss franchise associations and “Franchise Wirtschaft” (a Bond’s Franchise Guide type directory of all franchise systems in Austria, Germany, and Switzerland) list all franchise systems operating in these countries. Various demographic data (i.e., the year the system was established, the number of outlets, the business sector, etc.) are also listed regarding each system in the Franchise Wirtschaft. Judgmental sampling was employed and the sample regroups franchised networks with at least five outlets. The final sample consists of 491 German and 176 Swiss franchise systems.

The data were collected via self-administered questionnaires developed in several steps. After several preliminary refinements, in-depth interviews were conducted with franchise professionals from the Austrian and German franchise associations and a pre-test was conducted with 20 franchisors in Austria. The respondents are selected based on their expertise and relevance to the subject under investigation. This
demonstrates the use of the key informant (McKendall and Wagner III, 1997[145]) approach for data collection. Accordingly, the key informants for this study were senior managers who are mainly responsible for the expansion of their franchises. The information about the key informants was retrieved from the Franchise Wirtschaft. The personally addressed questionnaires were mailed to the key informants of all of the 491 relevant franchise systems in Germany and 176 in Switzerland. A total number of 166 questionnaires were completed. The response rate is 27.9% for Germany and 17.05% for Switzerland.

Two methods were used to check for non-response bias. First, the non-response bias was estimated by comparing early versus late respondents (Armstrong and Overton, 1977[6]), where late respondents serve as proxies for non-respondents. Second, the respondents were compared to non-respondents in terms of age, size, advertising fee, and royalties to determine whether non-response was a serious problem for the data. These variables are available in the Franchise Wirtschaft for the listed systems. These data were used to run independent sample t-tests in order to check whether the sample is representative. The results show that there is no significant difference between the respondents and the non-respondents.

In addition, on the basis of Podsakoff et al. (2003)[165], the Harman’s single factor test is used to examine whether a significant amount of common method variance exists. After conducting factor analysis, it was possible to feel confident that common method variance is not a serious problem in this study.

Figure 3.1: MUF and the network performance: a comparison
Based on this data, Figure 3.1 shows that the influence of MUF on the network performance is not clear. The highest performances are obtained by networks organized with MUF. However, high performance levels are also achieved by networks which do not use MUF.

This chapter is based on the assumption that the influence of MUF on the network performance depends on the context, which means that three dimensions are worth taking into account.

3.3.2 Measurement

Appendix B summarizes the measurement for all the study variables, presented hereafter.

3.3.2.1 Dependent variable

In this chapter, the dependent variable is the performance of the franchised network as evaluated by the franchisor. The franchisors were asked to rate their network performance on a seven-point Likert scale.

Thus, the perceived performance is measured as the sum of the following items: system growth, reduction in costs, increase in yields, increase in innovation, coordination and control costs, profit growth, and better alignment to the customer needs.

3.3.2.2 Independent variables

The following independent variables are used.

MUF: two measures of MUF are successively used. First, a dummy variable indicating the presence of MUF in the network, then, a quantitative variable expressing the percentage of MUF in the system. Measured as a dummy variable, MUF is the dependent variable in the probit selection equation of the two-step Heckman method performed to control for the potential selection bias (Section 3.4).

Brand name: this variable is based on the works of Combs et al. (2004)[45] and Barthélémy (2008)[15]. The brand name is measured on a seven-point Likert scale. The franchisors were asked to rate their network on brand name strength compared with competitors, brand recognition compared with competitors, reputation for quality, and the importance of the brand name for achieving competitive advantage (Gorovaia and Windsperger 2011[82]).

System know-how: consistent with Erramilli et al. (2002), this variable measures the difficulties of transferring the system knowledge from the franchisor to the
franchisees. When a new outlet is about to be opened, the franchisor has to transfer this know-how to the franchisee. The franchisors were asked to rate the transfer of brand name, marketing, organizational quality management, accounting, human resources, and know-how to franchisees on a seven-point Likert scale.

Behavior uncertainty (Shirking risk): this variable is adapted from Anderson (1985)[4] and John and Weitz (1989)[110]. The franchisors were asked to rate the difficulty of measuring the outlet performance (the franchisee or manager), controlling their behavior, and assessing their competencies and capabilities on a seven-point Likert scale.

Decision rights: this variable is based on the works of Windsperger (2004)[204] and Mumdziev and Windsperger (2011)[154]. The franchisors were asked to rate the franchisee’s influence on operational decisions in the franchising network in respect of procurement, price and product, advertising, human resources (recruitment and training), investment and finance, and the application of accounting systems on a seven-point Likert scale.

Trust: in line with the works of Anderson and Narus (1990)[5] and Dyer and Chu (2000)[39], the franchisors were asked to rate the level of trust between themselves and their franchisees, the atmosphere of openmess and sincerity, and the degree of mutual cooperation.

Environmental uncertainty: this variable is derived from the measures used by Celly and Frazier (1996)[35] and John and Weitz (1988)[109]. The franchisors were asked to rate fluctuations in outlet sales, the irregularity of the market, and the instability of the local economic situation on a seven-point Likert scale.

3.3.2.3 Control variables

I add the following control variables.

Age: this variable is measured as the number of years since the establishment of the network.

Size: this variable is measured as the total number of outlets in the network.

Advertising rate: this variable is measured as the percentage of the franchised unit’s turnover used devoted to the promotion of the network.

Advantages of franchising: this variable measures the advantages of franchising, evaluated by the franchisor, compared to company-owned outlets in respect of quality control, innovation, local market knowledge, administrative skills, and human resource management.

Franchisor’s investment: the franchisors were asked to rate their initial investment on a seven-point Likert scale with regard to their expenses for their franchisees’
training at the beginning of the contract, and their expenses for the provision of technical support to the franchisee at the beginning of the relationship.

### 3.3.3 Summary statistics

Table 3.1 reports the means, standard deviation, and correlations between the dependent, independent, and control variables.

Because the presence of a few missing values may bias the estimations, I choose to impute them using the multiple imputation method, as in Chapter 2.

In addition, because the data are based on Likert scales, I compare the Cronbach coefficients for the completed and the uncompleted data. For all the variables, I find evidence that the change is not significant, which justifies the use of the completed data. Descriptive statistics regarding the variable MUF show that 106 of the sample networks (versus 60) use this organizational form. ANOVA analysis underlines the relevance of examining the link between MUF and the network performance. The analysis highlights the statistically significant difference in the mean performance of the two types of organizational forms; that is, MUF networks compared to SUF networks ($F = 12.652$, $p-value = 0$).

### 3.4 Control for potential selection bias

#### 3.4.1 Methodology

##### 3.4.1.1 Heckman method

The choice to use MUF as an organizational form is a strategic decision of the franchisor. For this reason, studying MUF as an explanatory variable of performance raises a potential problem of endogeneity and selection bias. Because the decision is not made randomly, the results can be biased and inconsistent.

These problems regarding the impact of strategic decisions in terms of performance have previously been emphasized by Masten (1996)[142], Hamilton and

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2 The missing values vary between 0.6% and 15.6%. The lower bound relates to several components of the brand name, trust, and performance variables; the upper bound relates to components of the decision rights variable.

3 This coefficient was presented in 1951 by Cronbach[49]. It is an index used to measure the reliability of internal consistency for a scale. The Cronbach’s alpha is measured as the average of the correlations between the items that are part of an instrument. In general, the minimum acceptable value for the Cronbach’s alpha coefficient is 0.70.

4 e.g., regarding the decision rights variable, alpha = 0.874 with the uncompleted data versus 0.867 with the completed data.
### Table 3.1: Descriptive statistics

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>SD</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
<th>12</th>
<th>13</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Performance</td>
<td>35.5177</td>
<td>7.36157</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 MUF(%)</td>
<td>.4765</td>
<td>.92669</td>
<td>.311**</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 Environmental uncertainty</td>
<td>7.6329</td>
<td>3.32415</td>
<td>-.228**</td>
<td>-.270**</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4 Decision rights</td>
<td>58.8609</td>
<td>14.22159</td>
<td>.446**</td>
<td>.205**</td>
<td>.012</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5 System know-how</td>
<td>29.1220</td>
<td>10.47697</td>
<td>.402**</td>
<td>.261**</td>
<td>-.011</td>
<td>.226**</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6 Brand name</td>
<td>22.5663</td>
<td>4.41263</td>
<td>.376**</td>
<td>.187*</td>
<td>-.055</td>
<td>.188*</td>
<td>.112</td>
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<td></td>
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<td></td>
</tr>
<tr>
<td>7 Trust</td>
<td>13.3734</td>
<td>4.01929</td>
<td>-.024</td>
<td>-.079</td>
<td>.157*</td>
<td>.015</td>
<td>-.286**</td>
<td>.080</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8 Behavioral uncertainty</td>
<td>6.5489</td>
<td>2.89779</td>
<td>.283**</td>
<td>.268**</td>
<td>-.011</td>
<td>.251**</td>
<td>.371**</td>
<td>.157*</td>
<td>-.235**</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9 Advertising rate</td>
<td>1.1584</td>
<td>3.57935</td>
<td>.051</td>
<td>.033</td>
<td>-.064</td>
<td>-.070</td>
<td>-.083</td>
<td>.176*</td>
<td>-.063</td>
<td>.001</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10 Franchisor’s investment</td>
<td>13.0602</td>
<td>2.88735</td>
<td>.198*</td>
<td>.143</td>
<td>-.013</td>
<td>.007</td>
<td>.211**</td>
<td>.159*</td>
<td>.057</td>
<td>-.064</td>
<td>.092</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11 Age</td>
<td>11.3081</td>
<td>7.97799</td>
<td>.123</td>
<td>.196*</td>
<td>.015</td>
<td>.026</td>
<td>.103</td>
<td>.106</td>
<td>-.033</td>
<td>.162*</td>
<td>.030</td>
<td>-.052</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12 Size</td>
<td>137.1080</td>
<td>282.98744</td>
<td>.069</td>
<td>.085</td>
<td>.001</td>
<td>.164*</td>
<td>-.021</td>
<td>-.144</td>
<td>.033</td>
<td>.059</td>
<td>-.020</td>
<td>-.119</td>
<td>.390**</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>13 Advantages of franchising</td>
<td>17.7496</td>
<td>6.11307</td>
<td>-.079</td>
<td>-.172*</td>
<td>.145</td>
<td>.015</td>
<td>.108</td>
<td>-.032</td>
<td>.266**</td>
<td>.027</td>
<td>-.135</td>
<td>.041</td>
<td>-.088</td>
<td>-.023</td>
<td>1</td>
</tr>
</tbody>
</table>

Note: Significant * at the 10% level, ** at the 5% level, *** at the 1% level.
Nickerson (2003)[89], Saussier and Yvrande-Billon (2004)[210], Chaudey and Fadairo (2010)[36].

The two-step Heckman method (Heckman, 1979[98]) handles this problem. It consists of first estimating a probit selection equation for the strategic choice; here, the presence of MUF. This stage is used to calculate the non-selection hazard; that is, the inverse of Mills’ ratio. In a second step, the regression equation for the performance includes the non-selection hazard as an additional parameter. The significance of the inverse of Mills’ ratio highlights the presence of a selection bias.

I use the following probit model as the first step to estimate the probability that a network chooses MUF; that is, the self-selection decision. Consistent with the literature assessing why franchisors choose MUF versus SUF, the model is specified as follows:

\[
Pr(M_i = 1) = \alpha_0 + \alpha_1 t_i + \alpha_2 e_i + \alpha_3 l_i + \alpha_4 f r_i + \alpha_5 s k_i \\
+ \alpha_6 b_i + \alpha_7 d_i + \alpha_8 a_i + \alpha_9 s_i + \epsilon_i
\]  
(3.4.1)

\[i = franchisor\]

where:
- \(M_i\) = dichotomous variable that takes the value 1 if there is at least one multi-unit franchise in the network and 0 otherwise
- \(t_i\) = level of trust of the franchisor in the franchisee
- \(sk_i\) = system know-how
- \(e_i\) = environmental uncertainty
- \(s_i\) = size of the franchised network
- \(fr_i\) = behavioral uncertainty
- \(d_i\) = decision rights
- \(b_i\) = brand name value
- \(l_i\) = advantages of franchising
- \(a_i\) = age
- \(\epsilon_i\) = error term
3.4. Control for potential selection bias

A problem of endogeneity may emerge in this equation regarding the decision rights variable. Indeed, unobservable characteristics may simultaneously affect this variable and the outcome variable. There is no good instrument in the data for the decision rights variable. For this reason, the instrumental variables method, or the test of exogeneity for a probit (tobit) model developed by Smith and Blundell (1986), cannot be performed.

To deal with this problem, the Heckman model is estimated once with the decision rights variable and once without this variable. As the estimation results are qualitatively similar, I conclude that the variable is not endogenous.

The inverse of the Mills ratio ($\lambda$), which captures the magnitude of the selection bias, is obtained from equation (3.4.1). In the second step of the Heckman method, that is, the equation for the performance ($P_i$), the parameter $\lambda$ is enclosed as an additional regressor. This second equation includes all the explanatory variables of the probit equation, less the variable advantages of franchising.

$$P_i = \lambda + \beta_0 + \beta_1 e_i + \beta_2 t_i + \beta_3 fr_i + \beta_4 sk_i + \beta_5 b_i + \beta_6 d_i + \beta_7 a_i + \beta_8 s_i + \epsilon_i$$ (3.4.2)

If the inverse of the Mills ratio ($\lambda$) is not significant, the self-selection decision variable, here MUF ($M_i$), can be introduced in the equation for the performance with no risk of selection bias.

Regarding this last stage, that is, the OLS estimates for the network performance based on MUF, I control for heterocedasticity with the Breusch-Pagan test and for multicolinearity with the variance inflation factor (VIF).

In addition, I control for the potential endogeneity using the same methodology as in Chapter 2. Finally, I check for the normality of the residues with the skewness and kurtosis tests.

---

5 A good instrument satisfies two conditions: it has an explanatory power with respect to the suspected endogenous variable, and it does not influence directly the outcome variable.

6 The Heckman method requires the inclusion in the first equation of at least one explanatory variable affecting the strategic choice (here MUF) but not directly the performance. In the estimations, the variable advantages of franchising ($l_i$) are used in this way.
3.4.1.2 Propensity score matching (PSM)

As a complement to the Heckman method, PSM enables us to control whether the decision to use MUF provides the expected effects and whether these effects are attributable to the presence of this organizational form. In other words, PSM enables us to study what would have happened if the franchisor had not decided to use MUF.

The method requires us to select a group of franchisors not using MUF (the control group) that are comparable to the group of franchisors using MUF (the treatment group). This selection is based on observable characteristics.

The literature shows that PSM reduces the bias in the estimation of treatment effects when traditional regression methods are often unreliable because of the nonrandom assignment of individuals to the treatment and control groups. Thus, the estimation of the treatment effect can be biased by the existence of confounding factors. In this chapter, the confounding factors can be viewed as unobservable factors that may affect both the franchisor’s performance and the franchisor’s propensity to use MUF as a governance form (e.g., intrinsic managerial abilities and unobservable changes in the franchisor’s operating environment). PSM corrects the estimations of the treatment effects by controlling for the existence of these confounding factors. The method is based on the idea that the bias is reduced when there is a comparison of the outcomes using treated and control individuals (i.e., MUF and not MUF) who are as similar as possible.

PSM was first introduced by Rosenbaum and Rubin, 1983[171] on the propensity score in which the conditional probability of receiving treatment given $tr$, denoted $p(tr)$ as a matching measure. According to Cameron and Trivedi (2005)[29], when the data justify the matching on $tr$, the matching based on the propensity score is also justified. The aim here is to estimate the average effect of the treatment group on the treated group (Att).

$$Att \equiv EY_{1i}|D_i = 1 - EY_{0i}|D_i = 1$$ (3.4.3)

where, $Y_{1i}$ is the performance of the network $i$ when the franchisor is using MUF and $Y_{0i}$ when it is otherwise and $D = 1, 0$ is the indicator of exposure to the treatment (1=MUF, 0 did not use MUF). $EY_{1i}|D_i = 1$ and $EY_{0i}|D_i = 0$ are observable whereas $EY_{0i}|D_i = 1$ and $EY_{1i}|D_i = 0$ are not. They are called unobservable counterfactuals.
The following matching methods are relevant to estimate $\text{Att}$:

- **Nearest neighbor method**: this method enables us to match each individual in the treatment group with the individual in the control group that has the closest propensity score. The problem could be that the distance between propensity scores can be very large. Following Cameron and Trivedi (2005), pg. 899[29], a matching set can be defined as:

$$A_i(p(tr)) = p_j |\min_j ||pi - pj||.$$

- **Radius matching**: unlike the previous method, it defines a neighborhood bounded by a radius that limits the differences that should be in the propensity scores for the matching.

- **Kernel matching**: the individuals in the treatment sample are compared to a weighted average of the individuals in the control sample. The weights are inversely proportional to the distance between the propensity scores of the treatment and of the control group.

- **Stratification matching**: this method separates the propensity scores into categories (quartile). For each quartile, the method allows to match the treatment and the control individuals.

### 3.4.2 Results

#### 3.4.2.1 Results from Heckman method

The first set of estimates resulting from the Heckman method are presented in Table 3.2.

These results highlight that the inverse of Mills’ ratio ($\lambda$) is not significant (model 2). In other words, there is no problem of selection bias. Therefore, I introduce the variable MUF ($M_i$) in the last stage of the estimations (model 3) as the core explanatory variable for the network performance, with the other independent variables ($\text{Age, Size, Franchisor’s investment, Advertising rate}$) being used as control variables.

At this last stage, to provide the OLS estimates for the performance, with MUF as the main regressor, (model 3), I use the White’s method correction for the standard errors (Breusch-Pagan $\chi^2$: 4.91, pvalue: 0.0268). In this equation I do not find any severe multicolinearity (VIF: 1.12) or endogeneity problems (Appendix B).

The estimates show that the influence of ($M_i$) on performance is significant and positive. In other words, the organizational form MUF impacts significantly and positively the network performance.
Table 3.2: Control for selection bias and first set of results

<table>
<thead>
<tr>
<th></th>
<th>Heckman Method</th>
<th>OLS</th>
<th>OLS</th>
<th>Quantile regression</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>First stage (probit)</td>
<td>Second stage (ols)</td>
<td>Huber and Tukey</td>
<td>regression</td>
</tr>
<tr>
<td></td>
<td>$M_i (1)$</td>
<td>$P_i (2)$</td>
<td>$P_i (3)$</td>
<td>$P_i (4)$</td>
</tr>
<tr>
<td>Environmental uncertainty</td>
<td>-0.0942*** (0.0346)</td>
<td>-0.720** (0.293)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Decision rights</td>
<td>-0.0131 (0.00830)</td>
<td>0.147*** (0.0621)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>System know-how</td>
<td>0.0215* (0.0127)</td>
<td>0.297*** (0.0781)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Brand name</td>
<td>0.027 (0.0265)</td>
<td>0.528*** (0.182)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trust</td>
<td>-0.0134 (0.0311)</td>
<td>0.0465 (0.175)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Behavioral uncertainty</td>
<td>0.0542 (0.0445)</td>
<td>0.128 (0.268)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Network age</td>
<td>0.018 (0.0158)</td>
<td>0.024 (0.117)</td>
<td>0.073 (0.0712)</td>
<td>0.04609 (0.0689)</td>
</tr>
<tr>
<td>Size</td>
<td>0.00377*** (0.00123)</td>
<td>0.00368 (0.00325)</td>
<td>0.000499 (0.00121)</td>
<td>0.00059 (0.00194)</td>
</tr>
<tr>
<td>MUF (dummy)</td>
<td></td>
<td></td>
<td>2.814** (1.191)</td>
<td>2.185** (1.085)</td>
</tr>
<tr>
<td>Franchisor's investment</td>
<td></td>
<td></td>
<td>0.358** (0.168)</td>
<td>0.01548 (0.1302)</td>
</tr>
<tr>
<td>Advertising rate</td>
<td></td>
<td></td>
<td>0.0448 (0.0625)</td>
<td>0.0771 (0.1400)</td>
</tr>
<tr>
<td>Franchise advantage</td>
<td>0.0181 (0.0202)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>constant</td>
<td>-0.38 (0.844)</td>
<td>6.704 (5.880)</td>
<td>28.09*** (2.297)</td>
<td>31.239 (1.9532)</td>
</tr>
<tr>
<td>mills lambda ($\lambda$)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$N$</td>
<td>166</td>
<td>166</td>
<td>166</td>
<td>166</td>
</tr>
<tr>
<td>pseudo $R^2$, $R^2$</td>
<td>0.1757</td>
<td>0.0905</td>
<td>0.0415</td>
<td></td>
</tr>
<tr>
<td>$\chi^2/F$</td>
<td></td>
<td>38.11***</td>
<td>4.53***</td>
<td>1.72**</td>
</tr>
</tbody>
</table>

Note: Significant * at the 10% level, ** at the 5% level, *** at the 1% level. Standard errors are in brackets.
3.4. Control for potential selection bias

In addition, due to the non-normality of the residues, highlighted by the skewness and kurtosis tests, I perform robustness checks using a Huber and Tukey biweights regression (model 4) and a quantile regression (model 5). These estimation methods address the problem of non-normality of the residues. The estimations show that the significantly positive influence of MUF on the network performance is robust.

3.4.2.2 Results from PSM

To carry out the estimation of \( p(tr) \), I study the role played by several franchisor’s characteristics on the probability of introducing MUF as the governance structure in the network. The treated networks are those using MUF as the governance form, whereas the controls are the networks that do not use MUF at all.

That is why, I perform a probit regression with the dummy variable \( MUF \) as the dependent variable.

As independent variables, I use the same independent variables as in the Heckman specification. These independent variables define characteristics of the franchisors using MUF. The estimation results of PSM are the same as the probit estimations (1) in Table 3.2.

The balancing property condition is satisfied after the partition of the sample into six homogeneous blocks, according to their estimated propensity score value.

Table 3.3 reports the results of Att, which were calculated by using the following matching methods: nearest neighbor, radius, kernel and stratification.

As highlighted by Table 3.3, the PSM results confirm the Heckman results, providing evidence that franchising networks using MUF have higher performance than the networks that do not use it as a governance form.

This key result calls for us to go further, and to take into account the percentage of MUF in the franchised network instead of the dummy variable \( M_i \), as well as the different contexts distinguished by the testable predictions (Hypotheses 1-5).

\[ \text{The first one reduces the influence of outliers in the estimation. This method consists of applying a regression in which weights based on absolute residuals are obtained. A new regression is then performed using these weights. Weights are obtained from one of two weight functions (Hamilton, 1991[90]). Quantile regression (Koenker and Bassett, 1978[124]), on the other hand, is considered as an alternative to robust regression. This method performs an estimation by minimizing the sum of the absolute deviations from the median (\( \theta = 0.5 \)). This method is robust to non-normal errors and outliers because it doesn’t assume a parametric distribution of the errors.} \]
Chapter 3. Organizational performance in multi-unit franchise systems

<table>
<thead>
<tr>
<th>Methodology</th>
<th>Treated</th>
<th>Control</th>
<th>ATT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nearest neighbor matching</td>
<td>106</td>
<td>35</td>
<td>3.675*** [1.231]</td>
</tr>
<tr>
<td>Radius matching</td>
<td>106</td>
<td>56</td>
<td>3.122*** [0.428]</td>
</tr>
<tr>
<td>Kernel matching</td>
<td>106</td>
<td>56</td>
<td>3.065*** [1.917]</td>
</tr>
<tr>
<td>Stratification matching</td>
<td>105</td>
<td>57</td>
<td>3.148*** [1.176]</td>
</tr>
</tbody>
</table>

Table 3.3: Results of PSM estimations
Note: Significant * at the 10% level, ** at the 5% level, *** at the 1% level.
Standard errors are in brackets.

Regarding this last point, a nonparametric analysis is required and a reasoning in three dimensions, to study the influence of MUF (1), on the network performance (2), in a specific context (3): business-format, level of behavioral uncertainty, decentralization level of decision rights, level of trust in the franchise relationship, level of environmental uncertainty. I deal with these issues in the following section.

3.5 Empirical impact on the network performance

3.5.1 Estimations

3.5.1.1 Methodology

The additive regression analysis enables a reasoning in three dimensions, as required by the hypotheses. In addition, it is a nonparametric method, which overcomes the problem of non-normality affecting the data.

The nonparametric regression analysis is designed to avoid any specific assumption about the residues, which allows a better distribution of the parameters. In other words, this method relaxes the assumption of linearity. The only restriction imposed is that the function \( g(.) \) is smooth. For this reason, such type of methods are also called smoothing methods.

Among the nonparametric methods, additive regression specifies the mean of the response variable as the sum of the smooth functions of the regressors. When the response variable does not follow a normal distribution, the method can be generalized, as proposed by Hastie and Tibshirani (1986)[95]. The generalized additive model is a generalized linear model, which implies a sum of smooth functions of covariates\(^8\).

\(^8\)For more detailed information, see Wood (2006)[207].
My model can be written as follows:

\[ P_i = g_1(e_i) + g_2(t_i) + g_3(f r_i) + g_4(s k_i) + g_5(b_i) + g_6(d_i) + \epsilon_i \]  

(3.5.1)

The simple regression smoother is used to fit the partial regression function \( g_j(.) \).

### 3.5.1.2 Results

Table 3.4 presents the estimation results of six additive models (8-13) regarding the influence of MUF expressed as a percentage, on the performance, taking into account six contextual variables: brand name value, system know-how, level of behavioral uncertainty, decentralization level of decision rights, level of trust in the franchise relationship, and level of environmental uncertainty.

In addition, for robustness checks, I report the estimation results of a Huber and Tukey regression (model 6) and of a quantile regression (model 7), including all the explanatory variables\(^9\).

The good global significance of these models is highlighted by the \( R^2 \) (additive models) and \( \text{Pseudo}R^2 \) (quantile regression), which are quite high for cross-sectional data (between 21.58% and 37%), and by the \( \chi^2 \) test (Huber and Tukey regression). In addition, regarding the additive models, I perform an analysis of deviance by means of \( \chi^2 \) tests for linearity that compare each additive model with its linear version. Such tests for linearity show that, in all the cases, the difference is highly statistically significant, which means that the additive nonparametric regressions provide a more accurate estimate of the relationship between the performance and the independent variables.

Complementary results are provided by additive models including interactive terms; that is, for each model, the interaction of MUF (expressed as a percentage) with a contextual variable (models 14-19, Table 3.5). Here again, the high level of the \( R^2 \) (between 28.6% and 39.5%) underlines the good global significance of the estimations.

---

\(^9\) OLS estimates with all the explanatory variables do not present any problem of endogeneity (see Table B.1 in Appendix B, model 3'), heterogeneity, or multicollinearity (Breusch-Pagan \( \chi^2 \): 0.44, pvalue: 0.5048; VIF: 1.20). However, as in the preceding case of model (3), the normality tests (skewness and kurtosis) highlight the non-normality of the residues (\( \chi^2 \):14.36, pvalue: 0.0008). For this reason, this estimation method is not appropriate here.
3.5.1.3 Comments

The results are robust, and clearly emphasize the significant positive impact of MUF on the network performance.

The two models including all the study variables (models 6 and 7) highlight the relevance of the analytical framework. Indeed, except for trust, and behavioral uncertainty in model (7), all of the explanatory variables exert a significant influence on the network performance.

The signs of the impact on performance are coherent, and indicate a negative impact of environmental uncertainty, a positive impact of the delegation of decision rights, a positive impact of the system know-how, and a positive impact of the brand name.

These results are confirmed by additive nonparametric regressions (8) to (13), except for the variable environmental uncertainty. In the additive models, trust and behavioral uncertainty have a significant effect.

The estimations are completed with models enclosing interactive terms. As suggested by the hypotheses, the interaction of MUF with the contextual variables derived from the analytical framework has a significant effect on the network performance in all of the cases. Estimates based on the tensor product method are presented in Table 3.5 (models 14 to 19). For robustness checks, I perform, additional estimations using a variant of the tensor product method in Table 3.6. Here again, the impact of the interactive terms on the performance is highly significant.

Parametric methods estimate the slope of linear relationships between independent and dependent variables, this slope is supposed to be the same whatever the level of the independent variable. Nonparametric estimations provide more complex information.

Thus, regarding the additive nonparametric estimations (models 8 to 13), Table 3.4 reports four pieces of information for each independent variable (e.g., the MUF% in model 8). First, the smoothing term of the partial-regression function (e.g., 7.289). Second, the result of the Fisher’s test regarding this smoothing term, which indicates whether the effect of the independent variable on the performance is significant (e.g., 4.711***). Third, the type of relationship between the independent variable and the performance; that is, decreasing (DR) or increasing (IR). Finally, the point (i.e., the level of the independent variable) from which the influence does not significantly differ from zero; for example, IR: 0.25 regarding MUF in model (8). As MUF is expressed as a percentage, this specific result means that the higher the percentage of MUF in the network, the higher the performance (IR), as long as the percentage of MUF in the network is below 25%. Similar thresholds are highlighted
### Table 3.4: Estimation results

Note: Significant * at the 10% level, ** at the 5% level, *** at the 1% level.
Standard errors are in brackets. †Smoothes terms; it is not possible to interpret them directly. DR: Decreasing effect. IR: Increasing effect.

<table>
<thead>
<tr>
<th></th>
<th>OLS</th>
<th>Quantile regression</th>
<th>Additive models†</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$P_i$ (6)</td>
<td>$P_i$ (7)</td>
<td>$P_i$ (8)</td>
</tr>
<tr>
<td>MUF(%)</td>
<td>0.944*</td>
<td>1.384***</td>
<td>7.289</td>
</tr>
<tr>
<td></td>
<td>[0.511]</td>
<td>[0.667]</td>
<td></td>
</tr>
<tr>
<td>Environmental</td>
<td>-0.375***</td>
<td>-0.475***</td>
<td>3.005</td>
</tr>
<tr>
<td>uncertainty</td>
<td>[0.135]</td>
<td>[0.176]</td>
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<tr>
<td>Decision</td>
<td>0.160***</td>
<td>0.128**</td>
<td>1</td>
</tr>
<tr>
<td>rights</td>
<td>[0.0318]</td>
<td>[0.0415]</td>
<td></td>
</tr>
<tr>
<td>System</td>
<td>0.157***</td>
<td>0.138**</td>
<td>4.331</td>
</tr>
<tr>
<td>know-how</td>
<td>[0.0461]</td>
<td>[0.0601]</td>
<td></td>
</tr>
<tr>
<td></td>
<td>[0.100]</td>
<td>[0.131]</td>
<td></td>
</tr>
<tr>
<td>Trust</td>
<td>0.0986</td>
<td>0.0977</td>
<td>7.695</td>
</tr>
<tr>
<td></td>
<td>[0.114]</td>
<td>[0.150]</td>
<td></td>
</tr>
<tr>
<td>Behavioral</td>
<td>0.291*</td>
<td>0.329</td>
<td>1.861</td>
</tr>
<tr>
<td>uncertainty</td>
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<td>[0.217]</td>
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<tr>
<td>constant</td>
<td>10.36***</td>
<td>11.67***</td>
<td>35.5177***</td>
</tr>
<tr>
<td></td>
<td>[3.235]</td>
<td>[4.224]</td>
<td>[0.0004603]</td>
</tr>
<tr>
<td>$N$</td>
<td>166</td>
<td>166</td>
<td>166</td>
</tr>
<tr>
<td>$R^2$, Pseudo $R^2$</td>
<td>21.58</td>
<td>23.6</td>
<td>22</td>
</tr>
<tr>
<td>$\chi^2$</td>
<td>19.82***</td>
<td></td>
<td></td>
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<tr>
<td>AIC</td>
<td>1135.809</td>
<td>1103.513</td>
<td>1065.686</td>
</tr>
<tr>
<td>Freedom</td>
<td>11.29</td>
<td>9.22</td>
<td>6.58</td>
</tr>
<tr>
<td>$\chi^2$ test for linearity</td>
<td>7870.424***</td>
<td>1260.819***</td>
<td>1645.709***</td>
</tr>
</tbody>
</table>
Table 3.5: Main-effects and interactive structure
Note: Significant * at the 10% level, ** at the 5% level, *** at the 1% level.
Standard errors are in brackets.
† As interactive terms in the generalized linear model, the tensor product interactions are made through the estimation of the marginal smooths to which identifiability restrictions have already been applied.
‡ These smoothes terms cannot be directly interpreted.
§ Interaction between MUF and each contextual variable.
3.5. Empirical impact on the network performance

by the other estimation results: 20.5% in model (9), 55% in model (11), 8.9% in model (12), 66.7% in model (13).^10

<table>
<thead>
<tr>
<th>Additive models†</th>
<th>$P_1$ (20)</th>
<th>$P_1$ (21)</th>
<th>$P_1$ (22)</th>
<th>$P_1$ (23)</th>
<th>$P_1$ (24)</th>
<th>$P_1$ (25)</th>
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<td>MUFX Environmental uncertainty</td>
<td>18.48</td>
<td>5.977***</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MUFX Decision right</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MUFX System know-how</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MUFX Brand name</td>
<td>13.94</td>
<td>4.45***</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MUFX Trust</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>18.5</td>
</tr>
<tr>
<td>MUFX Behavioral uncertainty</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>18.4</td>
</tr>
<tr>
<td>constant</td>
<td>35.517**</td>
<td>35.517**</td>
<td>35.517***</td>
<td>35.517***</td>
<td>35.517***</td>
<td>35.517***</td>
</tr>
<tr>
<td></td>
<td>[0.4429]</td>
<td>[0.4933]</td>
<td>[0.4225]</td>
<td>[0.4859]</td>
<td>[0.4509]</td>
<td>[0.4774]</td>
</tr>
<tr>
<td>N</td>
<td>166</td>
<td>166</td>
<td>166</td>
<td>166</td>
<td>166</td>
<td>166</td>
</tr>
<tr>
<td>$R^2$</td>
<td>39.9</td>
<td>25.5</td>
<td>45.3</td>
<td>27.7</td>
<td>37.7</td>
<td>30.2</td>
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<tr>
<td>AIC</td>
<td>1069.53</td>
<td>1105.563</td>
<td>1055.808</td>
<td>1096.254</td>
<td>1075.467</td>
<td>1094.365</td>
</tr>
<tr>
<td>Freedom</td>
<td>19.48</td>
<td>19.77</td>
<td>21.76</td>
<td>14.94</td>
<td>19.5</td>
<td>19.4</td>
</tr>
</tbody>
</table>

Table 3.6: Interactive structure

Note: Significant * at the 10% level, ** at the 5% level, *** at the 1% level.
Standard errors are in brackets.
† The smooth term that produces a full tensor product smooth is presented here, which is more appropriate when the main effects are not present and the variables are not in the same measure unit.
‡ These smooth terms cannot be directly interpreted.

This is a key result of the nonparametric estimations, suggesting that MUF improves the network performance, but only up to a certain threshold.

In others words, some mix between MUF and SUF is required, with the mix level depending on the context: delegation level of decision rights (model 9), brand name value (model 11), level of trust (model 12), and behavioral uncertainty (model 13). The point from which the effect of the explanatory variable is null is derived

^10The effect of MUF in model (10) is not significant, as highlighted by the Fisher’s test.
from the graphs regarding the partial-regression functions\textsuperscript{11}. The points in each graph are partial residuals for the corresponding predictor, removing the effect of the other predictor (see Figure 3.2).

Graphical analysis is continued and developed hereafter with the three-dimensional perspective plots.

3.5.2 Graphical analysis

3.5.2.1 Three-dimensional perspective plots

Each of the following graphs is a fitted surface for the additive nonparametric regression of the impact of the percentage of MUF and of a contextual variable\textsuperscript{12} (brand name (a), system know-how (b), behavioral uncertainty (c), decision rights (d), trust (e), environmental uncertainty (f)), on network performance. The plots are predictions of the nonparametric models based on the data.

3.5.2.2 Comments

As previously mentioned\textsuperscript{13}, nonparametric regression analysis relaxes the assumption of linearity, substituting the much weaker assumption of a smooth population regression function. Although the gain is a more accurate estimate of the regression function, relaxing the assumption of linearity has a cost in the difficulty of understanding the results.

However, a considerable advantage of the additive regression model is that it reduces to a series of two-dimensional partial-regression problems, which facilitates the interpretation. Thus, for each three-dimensional perspective plot of the fitted additive regression surface relating the performance to MUF and to a contextual variable, the slices of the surface in the direction of MUF (i.e., holding the contextual variable constant at various values) are all parallel. Similarly, the slices in the direction of the contextual variable (holding MUF constant) are parallel, which allows for interpretation.

All of the perspective plots highlight a relationship for both MUF and each contextual variable with performance. This result provides important support to the analytical framework. In addition, this relationship is not linear, because each perspective plot consists of a set of curves \textit{versus} lines.

\textsuperscript{11}For further information, see Ahamada \textit{et al.} (2007).
\textsuperscript{12}Additive models (8) to (13).
\textsuperscript{13}See the methodological part 3.5.1.1.
Figure 3.2: Partial-regression functions for the additive nonparametric models (estimations 8 to 13).
Gray area gives point-wise 95% confidence envelopes around the fit.
Figure 3.3: Perspective plots of the fitted additive regression surfaces for $H1$ and $H2$. 
3.5. Empirical impact on the network performance

Figure 3.4: Perspective plots of the fitted additive regression surfaces for $H3$ to $H5$. 
The study of each perspective plot separately enables us to confront more precisely the hypotheses to the data. As I am dealing with non-linear relationships, the comments on the hypotheses cannot be summed up as “validated” or “non-validated” as they could be with parametric estimations. The relations between the variables are more complex in this case, as, for example, each hypothesis can be validated on a specific interval of the explanatory variable, but not on the other one.

Regarding $H_1$, the graphs (a) and (a’) highlight that MUF increases performance between 0 and 30% in the context of a strong brand name. This result suggests that in a context of a high-value brand name, the highest performance is reached with a 30% level of MUF.

Also relating to $H_1$, the surfaces (b) and (b’) address the system know-how context. The graphs are consistent with the results presented in Table 3.4. In this context, the level of MUF has no significant effect on the performance, whereas the level of system know-how does impact the performance. In fact, in all the models including the system know-how variable, the impact of the level of MUF is not significant. This result suggests that the value of the business concept has a higher impact on the performance than the organizational form.

Hypothesis $H_2$ finds empirical support, with the estimation results plotted in graphs (c), (c’). In a context of behavioral uncertainty, the higher the percentage of MUF in the network, the higher the performance. Broadly speaking, the interaction of behavioral uncertainty with MUF has a positive effect on the network performance.

Regarding hypothesis $H_3$, graphs (d) and (d’) show that in a context of delegation of decision rights, MUF increases the performance until 30%. The plots also reveal that a high level of decision rights increases the performance.

Regarding $H_4$, the graphs (e) and (e’) reveal an increase of MUF improves the performance in the network, regardless of the level of trust. Thresholds between the level of MUF and trust are highlighted, depending on the level of trust.

The estimations regarding $H_5$ are plotted in graphs (f) and (f’). The key evidence from these three dimensional perspective plots is the existence of cycles in the impact of MUF on the performance, depending on environmental uncertainty. Thus, a first threshold of 8% can be distinguished, suggesting that, in a context of environmental uncertainty, an increase in MUF improves the performance, to the threshold of 8% of MUF in the network.
3.6 Conclusion

This chapter deals with the impact of MUF on the network performances while controlling for selection and endogeneity bias related to the choice of an organizational choice as explanatory variable. The key results can be summarized as follows: the presence of MUF in the network significantly and positively impacts the performance. However, the results based on nonparametric models highlight thresholds from which the effect stabilizes (e.g., in the case of brand name and system know-how as contextual variables, where the threshold is about 30% of MUF) and even cycles (taking into account the levels of trust, behavioral uncertainty, and delegation of decision rights). In addition, consistent with the hypotheses derived from the analytical framework, I find evidence of interaction effects between MUF and each contextual variable, except for the variable system know-how.

This study has important implications for both researchers and franchisors. In terms of managerial implications, the results show that the performance of MUF depends on the mix between MUF and SUF, and that is influenced by different contingency factors, such as uncertainty, brand name, trust, network age, size, and sector, or a combination of such variables. Furthermore, the results of the study call for future research. Specifically, the mix between MU franchisees and SU franchisees in the network, highlighted for the first time in this study, opens up a new research program. Both theoretical and additional empirical evidence would be required to explain the relationship between SUF and MUF within a franchising network. In addition, this study highlights the existence of cycles regarding the effect of an organizational form on performance. Further research is required to understand the turning points. Moreover, in addition to the mix between MUF and SUF in the network, the relationship between MUF and the proportion of company-owned outlets may also influence franchise system performance. For instance, the franchisor’s decision rights are more diluted under MUF than under SUF because the franchisor transfers more decision management rights to the multi-unit franchisees. Under MUF, the franchisees have more decision rights regarding the monitoring of local outlets, local human resource management, and knowledge transfer between headquarters and local outlets (Windsperger, 2013[205]). In this case, the franchisor may compensate for the dilution of decision rights under MUF by an increase in control through more company-owned outlets. As a result, future research has to investigate the relationship between MUF and proportion of company-owned outlets and its impact on performance.

Finally, two main limitations of the study have to be acknowledged.
First, the data do not allow differentiation between area development *versus* sequential MUF. Hence, I could not examine the performance differences between both forms. Second, in this study, the performance measurement is based on subjective indicators. Objective measures have greater validity, but most of the franchise systems in this survey do not disclose financial data. Although the literature has demonstrated that there is a strong positive correlation between objective and subjective performance indicators, future studies could test the analytical framework by using both subjective and objective performance indicators (Crook *et al.*, 2008[50]).
- PART II -

ROYALTY RATE AND PERFORMANCE
4.1 **Introduction**

Together with the upfront franchise fee, the royalty rate is a key monetary provision defining the “share-contract”; that is, the conditions under which the profit generated by the decentralized vertical relationship is shared between the franchisor and the franchisee. For this reason, this contractual provision plays a key role as an incentive device.

The status of a residual claimant stands as the most attractive incentive arrangement for the downstream firm. In such a case, the contract includes a franchise fee and no royalties. Thus, once the upfront fee is paid, the franchisee gets the whole result of his efforts. Because the franchisor’s profit does not anymore depend on the results of sales in the retail market and, therefore, because it does not anymore depend on the franchisee’s efforts, this type of contract has the advantage of eliminating the downstream moral hazard. This argument was developed for the first time by Rubin (1978)[172] in his precursor analytical work regarding the determinants of the payment design in franchise contracts.

However, as shown by Blair and Lafontaine (2005)[19], royalties are common in franchise contracts, and networks using only a franchise fee are clearly in the minority.

In the framework of agency theory, the presence of royalties in franchise contracts has two justifications. The first one concerns the need to insure the downs-
tream firm against risk, especially the hazard on the level of final demand. With this explanation, the share-contract defined by the royalty rate corresponds to a level of risk sharing.

Most of the literature on royalties in franchise contracts focuses on the second justification, which is based on incentives issues in the context of bilateral moral hazard. In that case, the presence of royalties is justified by the need to provide incentives to the upstream party.

This argument has developed from the seminal article of Mathewson and Winter (1985)[144]. These authors study the conditions requiring a profit-sharing mechanism between two firms engaged in a vertical relationship. Their theoretical model demonstrates that the risk issue is not necessary and that, even if both parties are risk neutral, the incentive issue on the franchisor’s side justifies the presence of royalties in vertical contracts. Mathewson and Winter include the concept of a bilateral moral hazard; in other words, not only located on the franchisee’s side. This context is related to the assumption of an incomplete contract regarding the role of the franchisor in terms of promotional effort. A share-contract, that is, a contract where the royalty rate is not null, is required to solve the upstream incentive problem.

The theoretical framework explaining the presence of royalties by the need to provide incentives to the franchisor was augmented by Lal (1990)[133] and Bhattacharyya and Lafontaine (1995)[18].

Lal (1990)[133] models the interaction between an upstream firm and its distributor to analyze the role of franchise contracts in coordinating the network members. Specifically, the model examines different environments to determine when royalties are required. The double moral hazard is placed at the heart of the explanation, and the presence of royalties in franchise contracts is exclusively justified by the influence of the brand on the final demand.

The model developed by Bhattacharyya and Lafontaine (1995)[18] stands as the main theoretical reference of econometric works dealing with monetary provisions in franchise contracts. Bhattacharyya and Lafontaine (1995)[18] provide a theoretical explanation of the stylized facts regarding the payment rules in share-contracts. Their model specifies the conditions determining the share parameter (royalty rate) of the joint profit and demonstrates that the bilateral moral hazard is a sufficient condition to justify the use of royalties. In other words, this monetary device is required even if the parties are risk neutral.

This explanation of royalties in franchise contracts in terms of upstream moral hazard finds empirical support in the econometric literature. This is the case with Lafontaine (1992)[126], Agrawal and Lal (1995)[2], and Brickley (2002)[24],

Using a multi-sectoral database comprising 548 franchisors, Lafontaine (1992b)[126] estimates Tobit equations for the royalty rate, the franchise fee, and the proportion of company owned-units, and compares several explanations deriving from the agency theory. The results for the royalty rate show that the two-sided moral hazard model is the most appropriate, with a positive impact of the franchisor’s input on the level of royalties.

This result is consistent with the empirical work of Agrawal and Lal (1995)[2], which submits the predictions of Lal’s (1990)[133] model of primary data concerning 43 networks and 7 sectors. The estimation of simultaneous equations highlights the influence of the royalty rate on the franchisor’s incentive to promote the brand.

Brickley (2002)[24] provides new empirical evidence on the determinants of the royalty rate and on the upfront fee in franchise contracts that supports the bilateral moral hazard explanation while incorporating the risk issue. The dataset covers 711 networks and 54 sectors. In the theoretical model developed in the first step, the optimal royalty rate is increasing with the franchisor’s effort and with the risk aversion of the franchisee. Tobit estimates for the royalty rate and for the upfront fee are consistent with the prediction of the algebraic model.

The simultaneous impact on the royalty rate of the two-sided moral hazard context and of the franchisee’s risk issue is also highlighted by Vázquez (2005)[190], using a sample of 145 Spanish networks. The results of the OLS and Tobit estimations show that the ongoing payment variables, that is, the royalty rate, are positively affected by the risk faced by the franchisee and by the upstream moral hazard.

Two recent studies underline the key role of the franchisor’s incentive issue in the explanation of the presence of royalties in franchise contracts. Dealing with a sample of 278 franchised networks in Japan, Maruyama and Yamashita (2012)[141] test several hypotheses relating to the moral hazard on the franchisor’s side, the risk issue, and the capital constraint issue. Probit and OLS estimations show that the franchisor incentive issue is the main determinant of the presence of royalties in franchise contracts.

Fadairo (2013)[69] focuses on the franchisor’s effort in the explanation of royalties, distinguishing several types of inputs. Probit estimations are performed on a sample of 413 French networks. The results show clearly that the choice to include royalties in distribution contracts is related to incentive issues on the upstream side.
Based on this background literature, the contribution of this chapter is twofold. First, considering the previous empirical results, I assume that the presence of royalties in franchise contracts solves the franchisor’s incentive issue, and I make the choice to focus on the downstream side. The aim is to study the effect of the trade-off between the franchisee’s risk and incentive issues on the level of the royalty rate, which has not yet been addressed in the empirical literature. In addition, I deal with the influence of the royalty rate on the network performance, comparing the impact of the observed and the unobserved royalty rate, with the latter being derived from the predictions of the econometric model.

A few empirical studies have addressed the impact of monetary contractual terms on the franchised network performance. With Kásova and Lafontaine (2010) [115], the royalty rate is a control variable in econometric models for the growth and survival of franchised chains, with the age and size of the chain being the core explanatory variables. These authors, who base their work on US panel data, do not find evidence for any influence of the royalty rate on the network performance, which is measured as the franchising growth and the exit from franchising.

Shane et al. (2006)[180], who also use US panel data, study the impact of strategic decisions and their evolution over time on the franchised network performance, measured as the 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 this chapter, I use the market share as the performance indicator, in addition to others financial indicators that are taken into account for robustness checks.

The chapter is organized as follows. Section 4.2 focuses on the analytical framework and develops the testable predictions. The data and the study variables are presented in section 4.3. Section 4.4 deals with the empirical determinants of the royalty rate. Section 4.5 is devoted to the empirical impact of the observed and unobserved royalty rate on the network performance. Section 4.6 concludes.
4.2 Analytical framework

4.2.1 Downstream incentives

The literature, which emphasizes the role of the upstream moral hazard in the explanation of the presence of royalties in franchise contracts, also shows the influence of the franchisee moral hazard on the royalty rate.

As previously explained, the contract with the highest incentive for the downstream party includes no royalties. Thus, the agency literature on monetary clauses in franchising highlights a dilemma regarding the need to incentivize the franchisor without degrading the franchisee incentives too heavily.

Mathewson and Winter (1985)[144] compare employment versus franchise contracts and stress the advantages of the latter, which provides more incentive because the franchisee has a claim on the residual directly related to his efforts. Bhattacharyya and Lafontaine (1995)[18] show that the optimal royalty rate provides incentives simultaneously to the franchisor and the franchisee to invest in their respective inputs (promotion of the brand name and sales efforts).

In addition, the empirical literature based on the two-sided moral hazard argument provides evidence for a trade-off regarding the franchisor and franchisee incentives in the determination of the royalty rate. Lafontaine (1992b)[126] concludes that the royalty rate is inversely related to the importance of the franchisee’s input and positively related to the franchisor’s investment in the network brand name. Agrawal and Lal (1995)[2] provide additional evidence in the same vein.

Therefore, I expect to observe the following relationship:

Hypothesis 1:
The royalty rate decreases with the importance of the franchisee’s effort.

4.2.2 Market uncertainty and risk aversion

The foundation contribution of Tirole (1988)[187] defines the sources of uncertainty in the manufacturer-retailer relationship. Two types of uncertainty are distinguished: uncertainty regarding the final demand resulting from variations in consumer tastes, or from the level of intra-brand competition, and uncertainty depending on the distribution cost.

Consistent with the agency framework, I take into account both types of uncertainty as follows. First, I assume that the franchise contract is signed in a context
of uncertainty. Then I assume that the uncertainty is resolved, and the franchisee makes his managerial decisions. Therefore, the right to make decisions in response to environmental changes is delegated to the franchisee. The risk imposed on the franchisee increases with the uncertainty of the environment.

In this framework, the status of a residual claimant is efficient in a context of unilateral moral hazard on the franchisee’s side if the franchisee is risk neutral.

However, in the case of risk aversion, the franchisee suffers too much risk with a payment mechanism that is based on a fixed fee charged by the franchisor, and on a residual claim for the franchisee that depends on an uncertain outcome. For this reason, the principal must implement an output-based pay structure for himself in order to share the risk with the franchisee. The royalty rate acts as a risk-sharing device and thereby, acts as an insurance mechanism for the franchisee.

In his empirical work on franchising in the framework of agency theory, Martin (1988)[139] emphasizes the risk issue and argues that upstream firms versus franchisees are risk neutral, since stockholders can costlessly diversify their portfolios.

In the literature, it is now widely presumed that franchisees are more risk-averse than franchisors (Lafontaine 1992b[126], Sen 1993[177], Brickley 2002[24], Vázquez 2005[190], Maruyama and Yamashita 2012[141]).

Accordingly, and as predicted by the theoretical model of Brickley (2002)[24], I formulate the following hypothesis:

**Hypothesis 2:**

The royalty rate increases with the risk of business failure.

### 4.2.3 Interplay between uncertainty and incentives

Hypotheses H1 and H2 highlight a negative trade-off between risk and incentives in the determination of the royalty rate. This negative risk-incentive relationship is a central prediction of the principal-agent theory (Holmstrom and Milgrom, 1987[103]).

However, as underlined by Prendergast (2002a[167] and [168]), Serfes (2005)[178], and He et al. (2014)[97], the literature provides mixed empirical evidence on the negative relationship between risk and incentives; accordingly, the relationship remains inconclusive. The absence of systematic empirical support for the standard risk model is documented by Prendergast (2002b)[168], who takes into account four areas: literature on executives, where there is mixed evidence on the trade-off; literature on sharecropping, where the data suggests a positive relationship between
observed measures of uncertainty and incentives; literature on the compensation of salesforce workers, where there is little evidence of any relationship between uncertainty and incentives; and literature on franchising.

In this last field, Lafontaine (1992)[126] highlights a positive relationship between risk and the decision to franchise instead of having a company-owned outlet. Assuming that the downstream unit is the more risk-averse party, this result is unexpected. In fact, as emphasized by Lafontaine and Slade (2001)[132] in their survey of the empirical literature regarding risk and the decision to franchise, this positive relationship, which is contrary to the agency prediction, is a robust pattern. Franchising versus vertical integration would be more common in uncertain environments.

These empirical results challenge the standard assumption of risk aversion concerning the agent. Thus, taking into account several contexts of risk aversion in his agency theoretical model, Serfes (2005)[178] demonstrates that the resulting equilibrium relationship between risk and incentives can be negative, positive, or U-shaped. The theoretical model of He et al. (2014)[97] predicts a positive uncertainty-incentive relationship, in contrast to the standard negative risk-incentive trade-off. Using a manager-firm matched panel dataset, they also provide evidence for this theoretical prediction.

Considering agents with low degrees of risk aversion, and adapting Holmstrom and Milgrom’s (1991)[104] multitasks model, Prendergast (2002a)[167] demonstrates formally that uncertain environments result in the delegation of responsibilities, which in turn generates incentive pay based on output. Delegation with an incentive mechanism is more likely with greater uncertainty about what the agent should be doing and when the monitoring cost is high. Moreover, firms design endogenous optimal incentive contracts as a response to uncertainty.

These theoretical results are consistent with the well-established evidence that franchising is more likely when direct monitoring costs are high; this is often due to geographic dispersion (Brickley and Dark, 1987[25]; Norton, 1988[158]; Martin, 1988[139]; Minkler, 1990[153]; Brickley et al. 1991[26]; Scott, 1995[176]; and Combs et al. 2004[45]).

Therefore, if franchisees have a low degree of risk aversion, uncertainty requires more incentives for the downstream party and hence a lower royalty rate:

**Hypothesis 3:**

*The royalty rate decreases with the risk of business failure.*
4.2.4 Impact of the royalty rate on the network performance

With hypotheses H1-H3, the royalty rate is a strategic variable enabling the franchisor to deal with the franchisee’s risk and incentives issues.

For this reason, a well-adjusted royalty rate should result in a higher performance at the network level.

I formulate the following hypothesis:

**Hypothesis 4:**
*The network performance increases with a correctly adjusted royalty rate.*

Appendix C provides theoretical results regarding H2 and H3. The analytical context of this chapter is graphically summarized in Figure 4.1.

![Figure 4.1: Overview of the analytical framework](image)

4.3 Data and Measurement

4.3.1 Data

In this chapter, I use panel data from the French Federation of Franchising covering the period 1996 to 2000, matched with the French financial dataset DIANE.

Complete information is available for 184 networks. The sample consists of 67% of the franchised networks affiliated to the federation and these are in diverse retail and service sectors.

In the initial dataset, the variable royalty rate has 10% of the data missing, while the other variables do not present any significant problems. As is the case in the rest of this dissertation, I use the multiple imputation method to complete the data. When analyzing the sample, I notice that the imputation method has generated outliers when the variables used to predict the missing value are also
missing. In those few cases, I replace the data with the average of the network. Finally, a comparison of the completed data with the original dataset shows that the difference is not significant.

### 4.3.2 Measurement

#### 4.3.2.1 Dependent variables

The dependent variables used in this Chapter are as follows:

- **The royalty rate, \( r_i \):** this variable is the percentage on the downstream sales accruing to the franchisor.
- **The market share, \( P_i \):** this variable is measured as the turnover of the franchisor divided by the sector turnover.

Two additional performance variables are used for robustness checks:

- **The intangible assets:** this variable is measured as the total intangible assets of the franchisor divided by the total fixed assets.
- **The net cash over turnover:** this variable is a liquidity indicator measured as the net cash of the franchisor; that is, the cash and cash equivalents, or the most liquid assets of the company, minus the bank overdrafts, divided by the turnover\(^1\).

#### 4.3.2.2 Independent variables

The study variables derived from the theoretical framework are:

- **The franchisees’ effort, \( \alpha_i \):** this variable is measured as the number of franchisees in each network divided by the total number of downstream units in the sector.
- **The risk of business failure, \( \rho_i \):** this variable is measured with the Conan-Holder score. This scoring measures the risk of business failure in each network. It is calculated with five financial ratios, as follows (equation 4.3.1):

\[
\rho_i = 0.24 \frac{\text{Gross operating surplus}}{\text{Total Debt}} + 0.22 \frac{\text{Permanent Capital}}{\text{Total Assets}} - 0.10 \frac{\text{Staff Expenses}}{\text{Value added}} + 0.16 \frac{\text{Attainable and available}}{\text{Total Assets}} - 0.87 \frac{\text{Financial Expenses}}{\text{Turnover}} \quad (4.3.1)
\]

\(^1\)A high liquidity indicator means that the company is liquid and does not suffer liquidity risk. However, it can also mean that the firm does not invest enough.
4.3.2.3 Control variables

Several control variables are included in this study:

The **upfront fee**, \( F_i \): this variable is defined as the fixed amount paid by the franchisee when entering the network. In the franchise literature, the upfront fee is often considered to be related to the royalty rate. More precisely, since Rubin (1978), both payment mechanisms are usually regarded as inversely related. The upfront fee is defined as a rent extraction mechanism. The empirical results do not clearly support this hypothesis. Thus, although Vázquez (2005)[190] provides evidence for a significant negative relationship between the two provisions, based on Spanish data, previous results of Lafontaine (1992)[126] on US data show that the two monetary devices are not always related.

The **proportion of company-owned units**, \( p_{c_i} \): this variable is measured as the number of company-owned units in the network divided by the total number of outlets in the network. The proportion of company-owned units can be studied as a proxy for the reputation of the network; in other words, for the brand-name value (Lafontaine and Shaw, 2005[131]). In this case, this variable is related to the upstream moral hazard (Scott, 1995), and allows us to control for its influence in the estimations, whereas the analytical framework developed in this chapter focuses on the downstream level.

The **age of the network**, \( a_i \): this variable refers to the difference between the year of creation of the franchisor’s upstream unit, and the present year in the panel data. In addition to the proportion of company-owned units, this variable can also be studied as a proxy for the reputation of the network.

The **economic sector**: this dummy variable controls for the influence of operating in the service sector versus the retail sector.
4.3. Data and measurement

4.3.3 Summary statistics

Table 4.2 reports the means, standard deviation, and correlations between the dependent, independent, and control variables.

In addition to Table 4.2, the following comments can be provided regarding the royalty rate variable. In almost 50% of the cases, the standard deviation of the royalty rate is different to 0. Figure 4.2 presents the evolution of the average royalty rates by sector over five years.

Furthermore, Table 4.1 presents the frequency of the royalty rates, in percentages.

![Figure 4.2: Evolution of the royalty rate by sector](image)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 0.5</td>
<td>125</td>
<td>126</td>
<td>115</td>
<td>113</td>
<td>116</td>
<td>110</td>
</tr>
<tr>
<td>&lt; 1</td>
<td>98</td>
<td>98</td>
<td>93</td>
<td>87</td>
<td>95</td>
<td>87</td>
</tr>
<tr>
<td>&lt; 2</td>
<td>23</td>
<td>23</td>
<td>17</td>
<td>20</td>
<td>14</td>
<td>17</td>
</tr>
<tr>
<td>&lt; 3</td>
<td>3</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>TOTAL</td>
<td>125</td>
<td>126</td>
<td>115</td>
<td>113</td>
<td>116</td>
<td>110</td>
</tr>
</tbody>
</table>

Table 4.1: Frequency of royalty rates (%)
<table>
<thead>
<tr>
<th>Column</th>
<th>Mean</th>
<th>Std. Dev.</th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
<th>(5)</th>
<th>(6)</th>
<th>(7)</th>
<th>(8)</th>
<th>(9)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Royalty rate</td>
<td>4.30643</td>
<td>3.241417</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Age</td>
<td>31.17935</td>
<td>30.93563</td>
<td>0.1354**</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Franchisee’s effort</td>
<td>0.0652317</td>
<td>0.0896946</td>
<td>-0,0162</td>
<td>0,0119</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Risk of business failure</td>
<td>14,2144</td>
<td>69,17129</td>
<td>-0,0634*</td>
<td>-0,0185</td>
<td>0,0054</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Upfront fee</td>
<td>81,989,33</td>
<td>54,680,86</td>
<td>0,0451</td>
<td>-0,0494</td>
<td>0,0711**</td>
<td>-0,0352</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Market-share</td>
<td>0,0631282</td>
<td>0,1405298</td>
<td>0,0607</td>
<td>0,1449**</td>
<td>0,2692***</td>
<td>-0,0549*</td>
<td>0,0468</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Intangible assets</td>
<td>0,0866821</td>
<td>0,1985201</td>
<td>-0,0397</td>
<td>-0,0791**</td>
<td>-0,1051***</td>
<td>-0,0786**</td>
<td>-0,0275</td>
<td>-0,1177**</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. Net cash</td>
<td>0,1288385</td>
<td>0,8330894</td>
<td>-0,0412</td>
<td>0,008</td>
<td>-0,01</td>
<td>0,0048</td>
<td>0,1297**</td>
<td>-0,0376</td>
<td>-0,0281</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>9. Owned-units</td>
<td>0,3170745</td>
<td>0,2951384</td>
<td>0,1224**</td>
<td>0,2978**</td>
<td>-0,2283***</td>
<td>-0,0562</td>
<td>0,1420**</td>
<td>0,1237**</td>
<td>-0,0748**</td>
<td>-0,0355</td>
<td>1</td>
</tr>
</tbody>
</table>

Table 4.2: Summary statistics
Note: Significant * at the 10% level, ** at the 5% level, *** at the 1% level.
4.4 Empirical determinants of the royalty rate

4.4.1 Methodology

4.4.1.1 Random versus fixed effects model

The methodology with panel data requires to compare first the random effects model and the fixed effects model, since both address the problem of the unobserved heterogeneity, by specifying an error term constant over time for each unit (fixed effects model), or randomly distributed over time for each unit (random effects model).

It is interesting to note that, with short period panels, as with the sample, the random effects model may produce better estimators than the fixed effects model (Heckman, 1981[99]). In addition, the random effects model is consistent in the presence of time-invariant variables (Greene, 2000[83]). This is not the case with the fixed effects model. Indeed, time-invariant variables can be perfectly collinear with the fixed effects model, whereas most of the contract variables are by nature almost time-invariant.

The Hausman test confirms my intuition (Hausman, 1978[96]), and shows that the random effects model is more appropriate to the data ($\chi^2 = 1.75, p = 0.6257$). Additional checks are performed, which confirm the choice for the random effects model. I use the Lagrange multiplier test (Breusch and Pagan, 1980[22]) to see if the variance across the franchised networks is zero. This test supports the random effects model, since it provides evidence of significant differences across the networks ($\chi^2 = 270.75, p - value = 0.000$).

The random effects model is often estimated through the generalized least squares method (GLS). This method enables to estimate the unknown parameters of a linear regression model. The GLS is applied when the variances of the observations are unequal (heteroscedasticity problem) or when there is a certain degree of correlation between the observations. It is well known that in both cases, the ordinary least squares method (OLS) can be statistically inefficient, or even provide misleading inferences.

However, the GLS method assumes that the covariance structure of the composite errors is known, even if this is usually not the case in the data. For this reason, I choose to estimate the random effects model using the feasible generalized least squares method (FGLS). This method is useful to estimate the full variance-covariance matrix. 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.

Using the FGLS method, I perform a likelihood ratio test regarding heteroskedasticity at the panel level. The results ($\chi^2$: 1143.25, p: 0.000) confirm that the data in the sample do not have a common disturbance variance, thereby providing another support for the random effects model. Given that I use a five-year panel, I assume there is no serious problem of autocorrelation.

### 4.4.1.2 Tests for potential endogeneity problems

I check for potential problems of endogeneity, using again the Hausman test.

Two regressors may indeed raise endogeneity problems, because they are managerial variables deriving from the franchisor’s choices: the importance of the role devoted to the franchisees’ effort in the network, and the upfront fee.

I compare an instrumental model with the previous results in two stages, including the lagged variable as an instrument. The results presented in Table 4.3 show that there is no problem of endogeneity.

<table>
<thead>
<tr>
<th></th>
<th>Fixed Effects</th>
<th>Random Effects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Franchisees’ effort</td>
<td>0.43 p: 0.8069</td>
<td>0.21 p: 0.9756</td>
</tr>
<tr>
<td>Upfront fee</td>
<td>1.5 p: 0.6832</td>
<td>0.73 p: 0.8661</td>
</tr>
</tbody>
</table>

Table 4.3: Tests for potential endogeneity

### 4.4.2 Econometric model

Hypotheses 1-3 are submitted to data with the following econometric model:

\[ R_{it} = \mu + \pi_1 f_{it} + \pi_2 e_{it} + \pi_3 \rho_{it} + \pi_4 a_{it} + u_i + \epsilon_{it} \]  \hspace{1cm} (4.4.1)

where:
- \( R_{it} = \text{royalty rate} \)
- \( \mu = \text{constant term} \)
- \( f_{it} = \text{upfront fee} \)
- \( e_{it} = \text{importance of the franchisees’ effort} \)
- \( \rho_{it} = \text{risk of business failure} \)
4.4. Empirical determinants of the royalty rate

\[ a_t = \text{age of the network} \]
\[ u_i = \text{random disturbance that characterizes the } i\text{th observation (constant over time)} \]
\[ \epsilon_{it} = \text{error term} \]

This model can be re-written as follows:

\[
\text{Model}_1 : E[R_t|X_1, \theta_1]
\]

where:
\[ X_1 = \text{matrix of explanatory variables} \]
\[ \theta_1 = \text{vector of parameters containing the regression coefficients} \]

4.4.3 Estimation results

The estimation results are presented in table 4.4.

A first comment concerns the good global significance of the econometric models. In addition, the results are robust, since they are qualitatively identical in the model including time dummies and in the other model.

The significant and negative influence of the risk variable on the royalty rate suggests that, consistent with the trade-off view, the rate decreases with the risk of business failure, thus providing evidence for hypothesis 3 versus hypothesis 2.

Hypothesis 1 does not find empirical support here, as the proxy variable for the franchisees’ effort has no significant effect.

Finally, the results regarding the control variables are interesting with, in both cases, a significantly positive impact. Contrary to the argument of rent capture by the franchisor, the two monetary provisions appear here as complementary devices. The positive sign of the age variable can be interpreted as a reputation effect, which is consistent with the explanation in terms of the upstream moral hazard: the higher the network reputation, the higher the royalty rate required to motivate the franchisor to preserve this asset.
4.5 **Empirical impact on the network performance**

Within a comparative approach, I use two distinct *royalty rate* variables to test hypothesis 4 (i.e., to study the impact of the royalty rate on the network performance): the observed royalty rate, enclosed in the dataset, *versus* the predicted royalty rate deriving from model (4.4.1). The latter can be seen as correctly adjusted regarding risk and incentives issues.

### 4.5.1 Methodology regarding the observed royalty rate

#### 4.5.1.1 Random *versus* fixed effects model

The Hausman test regarding the influence of the observed royalty rate on the network market share shows that the random effects model is more appropriate than the fixed effects model ($\chi^2 = 3.96, p = 0.1383$). This result is confirmed with the Lagrange...
multiplier test \( (\chi^2 = 674.08, \ p\text{-value} = 0.000) \), which reveals significant differences across the franchised networks, thus supporting the random effects model.

For robustness checks, I take into account two additional performance indicators (\textit{intangible assets} and \textit{net cash}). Table 4.5 confirms the results obtained with the \textit{market share} indicator in favor of the random effects model.

<table>
<thead>
<tr>
<th>Test</th>
<th>Intangible assets</th>
<th>Interpretation</th>
<th>Tie net</th>
<th>Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hausman</td>
<td>( \chi^2: 1.89 )</td>
<td>( p: 0.3877 ) Random effects over fixed effects</td>
<td>( \chi^2: 0.79 )</td>
<td>( p: 0.6734 ) Random effects over fixed effects</td>
</tr>
<tr>
<td>Lagrange multiplier</td>
<td>( \chi^2: 923.27 )</td>
<td>( p: 0.000 ) Random effects over pooled</td>
<td>( \chi^2: 5.14 )</td>
<td>( p: 0.0117 ) Random effects over pooled</td>
</tr>
</tbody>
</table>

Table 4.5: Tests regarding the additional performance indicators

Finally, the likelihood ratio heteroskedasticity test is performed. The results confirm the choice for the random effects model: \( \chi^2: 4670.03, \ p: 0.000 \) with the \textit{market share} indicator, \( \chi^2: 864.91, \ p: 0.000 \) with the \textit{intangible assets} indicator, and \( \chi^2: 4256.30, \ p: 0.000 \) with the \textit{net cash} indicator.

### 4.5.1.2 Tests for potential endogeneity problems

Table 4.6 presents the results of Hausman tests regarding the potential problems of endogeneity. In the equation for the performance, two regressors can be suspected of endogeneity because they result from the franchisor’s choice: the royalty rate and the proportion of company-owned units in the network.

Table 4.6 shows that, whatever the performance indicator taken into account, there is no problem of endogeneity regarding these two variables.
<table>
<thead>
<tr>
<th>Performance indicator</th>
<th>Variable</th>
<th>Fixed Effects</th>
<th>Random Effects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Market share</td>
<td>Royalty rate</td>
<td>0.03 p: 0.9985</td>
<td>0.84 p: 0.8389</td>
</tr>
<tr>
<td></td>
<td>Owned-units</td>
<td>0.00 p: 1.000</td>
<td>2.67 p: 0.4458</td>
</tr>
<tr>
<td>Intangible assets</td>
<td>Royalty rate</td>
<td>0.44 p: 0.9323</td>
<td>0.40 p: 0.9404</td>
</tr>
<tr>
<td></td>
<td>Owned-units</td>
<td>5.34 p: 0.1482</td>
<td>0.00 p: 1.000</td>
</tr>
<tr>
<td>Tie net</td>
<td>Royalty rate</td>
<td>0.000 p: 0.9999</td>
<td>0.53 p: 0.9119</td>
</tr>
<tr>
<td></td>
<td>Owned-units</td>
<td>0.08 p: 0.9945</td>
<td>1.69 p: 0.6397</td>
</tr>
</tbody>
</table>

Table 4.6: Tests for potential endogeneity

### 4.5.1.3 Econometric model

The econometric model is as follows:

\[ P_{it} = \varphi + \beta_1 r_{it} + \beta_2 p_{ci} + \beta_3 s_i + v_i + \psi_{it} \]  \hspace{1cm} (4.5.1)

where:

- \( P_{it} = \text{market share} \)
- \( \varphi = \text{constant term} \)
- \( r_{it} = \text{observed royalty rate} \)
- \( p_{ci} = \text{proportion of company-owned units} \)
- \( s_i = \text{sector \ (retail and services)} \)
- \( v_i = \text{random disturbance that characterizes the } i\text{th observation \ (constant over time)} \)
- \( \psi_{it} = \text{error term} \)
4.5.2 Methodology regarding the adjusted royalty rate

4.5.2.1 Murphy and Topel methodology

The econometric work regarding the adjusted royalty rate is also based on the random effects model. To take into account the predictions from model (4.4.1), I use the two-step methodology developed by Murphy and Topel.

Indeed, Murphy and Topel [156] formally established an econometric model in two steps that contains an unobservable variable, which is replaced 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 small.

The method is as follows: in the first stage, the unobservable variable (here: \( r_{i,t} \)) is estimated as a function of a matrix of variables \( X_1, (n \times q) \) and \( \theta_1 (q \times 1) \); that is, the covariance matrix and the parameters of vectors that also contains the coefficient \( \beta_1 \), respectively. In the second stage, the dependent variable (here: \( P_i \)) is estimated as a function of \( X_2, (n \times p) \), which also contains the values predicted from the first stage and \( \theta_2 (p \times 1) \). Since \( \hat{\theta}_1 \) is the estimation of \( \theta_1 \), the covariance matrix is corrected in order to have asymptotically correct standard errors.

According to Hardin (2002)[91], Greene (2003)[83], and Hole (2006)[102], the Murphy and Topel variance estimation for \( \theta_2 \) is as follows:

\[
V_2 + V_2(CV_1C' - RV_1C' - CV_1R')V_2
\]

where \( V_1(q \times q) \) and \( V_2(p \times p) \) are the asymptotic variance matrix of \( \theta_1 \) and \( \theta_2 \), respectively. \( C \) and \( R \) are the matrix given by: \( \{ \sum^n_i \left( \frac{\partial \ln f_{1,2}}{\partial \theta_2} \right) \left( \frac{\partial \ln f_{1,2}}{\partial \theta_1} \right) \} \) and \( \{ \sum^n_i \left( \frac{\partial \ln f_{1,2}}{\partial \theta_2} \right) \left( \frac{\partial \ln f_{1,2}}{\partial \theta_1} \right) \} \), respectively; \( f_{1,2} \) represent the observable i’s contribution to the likelihood function of each stage.

4.5.2.2 Tests for potential endogeneity problems

Due to the difficulty of performing a test for endogeneity concerning the predicted royalty rate in the equation for the performance, I proceed as follows: first, I test for the potential problem of endogeneity between the performance and the explanatory variables of the royalty rate, then I assume that if the explanatory variables of the royalty rate do not raise an endogeneity problem with the performance, it is also the case with the predicted royalty rate.

Table 4.7 presents the results of the Hausman tests. From these results, it is
reasonable to assume there is no endogeneity problem in the second stage of the Murphy and Topel estimation.

<table>
<thead>
<tr>
<th>Performance indicator</th>
<th>Variable</th>
<th>Fixed Effects</th>
<th>Random Effects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Market share</td>
<td>Franchisees’ effort</td>
<td>3.58 p: 0.3103</td>
<td>0.11 p: 0.9906</td>
</tr>
<tr>
<td></td>
<td>Upfront fee</td>
<td>1.22 p: 0.8751</td>
<td>4.9 p: 0.2979</td>
</tr>
<tr>
<td>Intangible assets</td>
<td>Franchisees’ effort</td>
<td>0.94 p: 0.8162</td>
<td>0.04 p: 0.9976</td>
</tr>
<tr>
<td></td>
<td>Upfront fee</td>
<td>0.1 p: 0.9989</td>
<td>0.33 p: 0.9875</td>
</tr>
<tr>
<td>Tie net</td>
<td>Franchisees’ effort</td>
<td>0.000 p: 1.000</td>
<td>4.41 p: 0.2204</td>
</tr>
<tr>
<td></td>
<td>Upfront fee</td>
<td>0.04 p: 0.9998</td>
<td>5.26 p: 0.2619</td>
</tr>
</tbody>
</table>

Table 4.7: Tests for potential endogeneity

4.5.2.3 Econometric model

The model is as follows:

\[ P_i t = \gamma + \delta_1 \hat{R}_{it} + \delta_2 pc_i + \delta_3 s_i + w_i + \xi_{it} \]  

(4.5.2)

where:

\( \gamma = \text{constant term} \)

\( \hat{R}_{it} = \text{adjusted royalty rate (predicted from model (4.4.1))} \)

\( w_i = \text{random disturbance that characterizes the ith observation (constant over time)} \)

\( \xi_{it} = \text{error term} \)

This model can be re-written as follows:

\[ \text{Model}_2 : P_i f(X_2, \theta_2, E[R_{it}|X_1, \theta_1]) \]
where:

\[ X_2 = \text{matrix of explanatory variables} \]
\[ \theta_2 = \text{vector of parameters containing the regression coefficients} \]

One of the columns in \( X_2 \) contains the predicted values from model (4.4.1).

### 4.5.3 Estimation results

The final empirical results are reported in Table 4.8, and concern the influence of the observed royalty rate (models 3, 4, 6, and 7) and the unobservable royalty rate (models 5, 8, and 9) on the network performance. The main results use the network market share as the performance indicator (models 3-5). For robustness checks, I perform estimations with alternative performance criteria (models 6-9).

Here again, the good global significance of the models has to be mentioned.

The key result from this set of estimations is the positive and clearly significant influence of the adjusted royalty rate on the network performance, whereas the observed royalty rate has no significant effect. This result is robust, whatever the performance indicator, and consistent with hypothesis 4.

### 4.6 Conclusion

The royalty rate is one of the most studied provisions regarding franchise contracts (e.g., Vázquez, 2005[190]; Kaufmann and Dant[118], 2001; Maruyama and Yamahita, 2012[141]). However, much less is known about the empirical effect of the royalty rate on the network performance. A major objective of this chapter is to study the factors determining the royalty rate and the relationship with the performance outcome in franchising.

Using French franchise and financial panel data, I provide evidence for the negative influence of the risk of business failure affecting the network franchisees on the level of the royalty rate. This result suggests that the contractual choices, more precisely here the level of the royalty rate, are motivated by incentives issues, and that a higher level of risk results in more incentive contracts. Thus, the hypothesis of a positive relationship between risk and incentives, reverse to the standard agency framework, finds support here.

The estimation results regarding the influence of the royalty rate on the network performance emphasize a different impact of the observed and the adjusted royalty rate.
<table>
<thead>
<tr>
<th>Performance indicator</th>
<th>(3)</th>
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<th>(6)</th>
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<td>Market share</td>
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<td>Net cash</td>
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</tbody>
</table>

| Observable royalty rate | -0.00000583 [0.000510] | -0.0000402 [0.000523] | -0.00073 [0.000562] | -0.00337 [0.0113] |     |     |     |
| Unobservable royalty rate |     |     |     |     |     |     |     |
| Owned-units            | 0.0517*** [0.00501] | 0.0470*** [0.00526] | 0.0344*** [0.0055] | -0.0152*** [0.00542] | -0.0796*** [0.00931] | 0.0169*** [0.00541] | 0.0591*** [0.01141] |
| Sector dummies         | 0.0238*** [0.00534] | 0.0234*** [0.00534] | 0.0254*** [0.0052] | -0.0384*** [0.00418] | 0.0116 [0.00767] | -0.0321*** [0.00434] | 0.0332*** [0.00768] |
| Time dummies           |     |     |     |     |     |     |     |
| Yes                   |     |     |     |     |     |     |     |
| constant               | 0.00823*** [0.00240] | 0.00401 [0.00354] | -0.0844* [0.0202] | 0.0804*** [0.00446] | 0.123*** [0.00714] | 0.0035*** [0.0232] | -0.158*** [0.0469] |
| 920                   |     |     |     |     |     |     |     |
| 126.70***             |     |     |     |     |     |     |     |
| 920                   |     |     |     |     |     |     |     |
| 106.24***             |     |     |     |     |     |     |     |
| 920                   |     |     |     |     |     |     |     |
| 111.38***             |     |     |     |     |     |     |     |
| 920                   |     |     |     |     |     |     |     |
| 920                   |     |     |     |     |     |     |     |
| 83.84***              |     |     |     |     |     |     |     |
| 920                   |     |     |     |     |     |     |     |
| 84.67***              |     |     |     |     |     |     |     |
| 920                   |     |     |     |     |     |     |     |
| 197.75***             |     |     |     |     |     |     |     |

**Table 4.8: Estimation results for performance**

Note: Significant * at the 10% level, ** at the 5% level, *** at the 1% level.
Indeed, while the observed royalty rate has no significant influence on the performance indicators, a robust significant positive influence of the adjusted royalty rate is highlighted. This result shows that the fit of the royalty rate affects the performance. More precisely, the estimation results regarding the performance equations suggest that a royalty rate fitted to provide more incentive when the risk increases leads to higher performance.

In line with prior references, the results provide evidence of a positive relationship between the royalty rate and the upfront fee, instead of a negative relationship, which is the reverse of the rent extraction hypothesis concerning the fee.

In addition, considering the distinction between service and retail sectors, the empirical results suggest that service versus retail activities favor network performance, which consistent with the results obtained in Chapter 2. Thus, this study offers an understanding of how the fit of the royalty rate influences the performance in franchised networks, thereby providing practitioners with a better basis for decision making.

Several limitations have to be mentioned.

First, the empirical investigation is limited by the size of the data, with the analysis being based on a five-year panel sample. This analysis could be complemented with a longer panel in order to highlight fixed effects, thereby avoiding the potential problem regarding the collinearity between the time-invariant variables and fixed effects.

Second, the study distinguishes only two general sectors, retail versus service. A more detailed analysis taking into account further economic sectors could provide important implications for managerial decisions.

Finally, in this chapter, I chose to focus on downstream issues, assuming that the presence of royalties in the sample networks fulfills the incentive motivations of the upstream party. Further research could include the influence of the franchisor’s incentives on the royalty rate in the study of performance outcomes.
Chapter 4. The royalty rate and the trade-off between risk and incentives
5.1 Introduction

Signaling theory provides a relevant framework to study franchising, or more precisely, to study the case of new franchisors establishing their networks.

This theory, which was introduced by Spence (1973)[183], deals with situations of asymmetric information with hidden information; in other words, with anti-selection. Spence (1973) studies the labor market, assuming that the employers do not know the productivity level of the candidates (i.e., the potential future employees) to be hired. Thus, the employers face a problem of asymmetric information about the quality of the potential employees. The idea developed by Spence (1973)[183] is that the level of education acts as a signal for such quality; having a high education level is too costly for the potential workers with a low productivity level.

As mentioned by Connelly et al. (2011)[48], the following conditions are required to have an efficient signaling mechanism. The receiver knows what information has to be searched for (the signal). The signal is clear, costless, and easily observable for the receiver. The reverse of this is that the signal is too costly for the low quality party, which avoids this party sending signals. The result is a separating equilibria implying differences in a firm’s behavior, which means that the receiver is able to distinguish between the two types: “low quality party” versus “high quality party”.

---

1I am grateful to Francine Lafontaine for helpful comments. All errors are mine.
Therefore, under asymmetric information, a signal is a pertinent piece of information about the signaler that allows the receiver to distinguish the “high quality party” from the other party before making any decision.

Applied to franchising, the framework is as follows. The potential franchisees look for information regarding their decision to invest and their choice for a franchise system. The youngest franchisors, with no established reputation, have private information concerning the value of their business concept. In others words, the franchisors can better predict the profitability of their business concept than the potential franchisees. In this context the “good type franchisors”, that is, the franchisors with a high value concept, can be motivated to signal their type in order to attract new franchisees more easily and develop their network.

The model developed by Gallini and Lutz (1992)\textsuperscript{[75]} is the main theoretical reference on this topic. These authors demonstrate formally that the royalty rate is a central signal mechanism that can be addressed to the potential franchisees. Indeed, this contractual device links the franchisor’s revenue to the outcome of the downstream unit, which depends on the value of the business concept. Thus, having a high royalty rate in the network can be a way for the franchisor to indicate that he truly believes in his concept. This signal is observable and costly enough for the “bad type franchisor” to obtain a separating equilibria.

However, in the wide literature on franchising, a few studies address the adverse selection phenomena and the signaling explanation of the franchisors’ organizational choices. This is highlighted by Table 5.1, which has been constructed from the survey of 23 top-ranked reviews in economics and management between 2000 and 2013\textsuperscript{2}.

<table>
<thead>
<tr>
<th>Theories of contracts</th>
<th>Number of related articles</th>
</tr>
</thead>
<tbody>
<tr>
<td>Theory of incentives</td>
<td>26</td>
</tr>
<tr>
<td>Transaction costs theory</td>
<td>5</td>
</tr>
<tr>
<td>Signaling theory</td>
<td>2</td>
</tr>
<tr>
<td>Total</td>
<td>33</td>
</tr>
</tbody>
</table>

Table 5.1: Empirical articles regarding franchising in the framework of the theories of contracts.
From a survey of 23 top-ranked reviews in economics and management over the period 2000-2012.

\textsuperscript{2}See Chapter 1.
As shown in this table, although the theories of contracts are the main research field in the applied works on franchise data, adverse selection and signaling problems are addressed by only two papers.

This orientation of the literature over the past 13 years is consistent with Lafontaine's (1993)[127] empirical results.

Deriving predictions from Gallini and Lutz's (1992)[75] model, Lafontaine (1993)[127] performs Tobit regressions for the royalty rate, the upfront fee, and the proportion of company-owned outlets, as signaling devices on US data. The main regressor is the franchisor's type, proxied by the growth rate of the number of outlets in the network during a five-year period. The estimations suggest that, contrary to incentives theory, signaling theory does not provide adequate explanations for the organizational choices regarding franchising.

In addition, studying the changes in ownership patterns of franchise networks as they mature, Kaufman and Dant (2003)[55] show that the predictions from the signaling theory are not consistent with their US panel data regarding the fast food industry. These authors compare three alternative theories, and provide evidence for the resource acquisition theory and the tapered integration theory, while the empirical results clearly reject the explanation deriving from the signaling theory.

However, these key results concern developed countries. The aim of this chapter is to test the explanatory power of signaling theory in the case of an emerging country. I assume that, as it is characterized by rapid evolution, emergence involves a high degree of uncertainty and exacerbated informational asymmetries. For this reason, although the signaling explanation dealing with franchising provides inconclusive empirical results in the case of developed countries, this theory may be particularly appropriate to the study of emerging franchise systems.

Over the last four decades, most of the empirical work regarding franchising has focused on developed countries. Only a few studies deal with data from emerging countries, even though, as previously mentioned by Welsh et al. (2006)[197], emerging markets represent 80% of the world’s population and offer the most dynamic potential for long-term growth to businesses, in general, and to franchisors, in particular.

Table 5.2 presents the few empirical studies devoted to franchising in Ibero-America. Using different empirical methods, most of this literature underlines the main differences between developed versus emerging countries.
## Table 5.2: Franchising in Latin America: a survey of the empirical works.

<table>
<thead>
<tr>
<th>Authors</th>
<th>Year</th>
<th>Studied country</th>
<th>Focus</th>
<th>Method</th>
<th>Differences highlighted?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Falbe Welsh[70]</td>
<td>1998</td>
<td>Canada Mexico USA</td>
<td>Executive perceptions in success and failure</td>
<td>Covariance Factor analyses</td>
<td>Yes</td>
</tr>
<tr>
<td>Lafontaine Oxley[129]</td>
<td>2004</td>
<td>Canada Mexico USA</td>
<td>Contracts customization</td>
<td>Logit Model</td>
<td>No</td>
</tr>
<tr>
<td>Dant Perrigot Cliquet[57]</td>
<td>2008</td>
<td>Brazil France USA</td>
<td>Plural form</td>
<td>ANOVA MANOVA OLS</td>
<td>Yes</td>
</tr>
<tr>
<td>Silva Corvacho Franco Sanches[181]</td>
<td>2009</td>
<td>Brazil</td>
<td>Food service economic contribution</td>
<td>Statistical description</td>
<td>-</td>
</tr>
<tr>
<td>Vance Madeira Brashear[188]</td>
<td>2011</td>
<td>Brazil</td>
<td>International geographic expansion</td>
<td>OLS</td>
<td>Yes</td>
</tr>
<tr>
<td>Michael[150]</td>
<td>2012</td>
<td>Latin America</td>
<td>Development</td>
<td>VAR</td>
<td>Yes</td>
</tr>
<tr>
<td>Streed Cliquet[185]</td>
<td>2013</td>
<td>Latin America Asia Central and Eastern Europe, Middle East and Africa</td>
<td>Retail failures</td>
<td>ANOVA OLS</td>
<td>Yes</td>
</tr>
</tbody>
</table>

This is the case with Falbe and Welsh (1998)[70], who deal with three locations: Mexico, Canada, and the United States. These authors highlight international differences in the franchisors’ perception regarding executive and strategic choices, which determine the success or failure of the network.

Dealing as well with various locations, Streed and Cliquet (2013)[185] study several emerging countries and point out the differences between these and the developed countries. They show that a successful expansion abroad requires adaptation to the specificities of the host market.

Vance et al. (2011)[188] address a similar question but focus on the international development of the Brazilian franchisors. Based on the theory of psychic distance, they provide empirical evidence that in terms of the international de-
velopment of the franchised network, the choice of a country is influenced by the geographic distance, the linguistic distance, and the market size.

Dant et al. (2008) [57] underline the differences between Brazil, France, and the United States regarding the plural form phenomenon.

The international differences are also underlined by Azevedo and Silva (2005) [11]. They show that the international franchisors use different organizational strategies in Brazil compared to the strategies developed in their own countries. Their explanation emphasizes the Brazilian jurisdictional uncertainty.

In addition, Silva et al. (2009) [181] provide evidence that Brazilian franchisors have a different perception of franchising. Furthermore, studying franchising as an economic development strategy for emerging countries, Michael (2012) [150] highlights the differences between franchising in Latin America versus franchising in developed countries, emphasizing a greater growth potential in the first case.

Finally, Lafontaine and Oxley’s (2004) [129] empirical work is an exception in this literature as the authors find no main differences when comparing franchising in emerging versus developed countries. These authors investigate the differences between the contracts offered in Mexico by North American franchisors and the contracts offered by the same franchisors in their own countries. In this case, the differences are minor. The authors show that there is no customization of the franchise contracts for Mexico; more than 75% of the sample franchisors require the same franchise fee whatever the location of the franchisees.

One of the main differences between emerging versus developed countries regarding franchising is that the local franchise system is more recent in the first group of countries. For example, using data relating to the year 2004, Dant et al. (2008) [57] show that in the United States there was one franchised outlet for every 382.63 inhabitants and in France, there was one franchised outlet for every 1,708.57 inhabitants, whereas in Brazil, during the same year, there was one franchised outlet for every 9,294.74 inhabitants. This situation suggests that the local franchise system is less developed in Brazil. In addition, the Brazilian franchise system is relatively young compared to the United States. Indeed, according to the Brazilian Franchise Association, the first Brazilian franchise system started in 1960.

In this context, it is relevant to assume that the reputation of a significant part of the local Brazilian franchise networks is not well established. In this case, signaling via the royalty rate may be a useful strategy. This chapter deals with recent Brazilian franchising data to address this issue.

The following section presents the analytical framework in greater detail and derives testable predictions. Section 5.3 presents some key features of the Brazi-
lian franchising sector, the data, and the study variables. Section 5.4 highlights the empirical relationship between the royalty rate and the franchisor type. The estimations proceed in two steps. First, Bayesian Model Averaging (BMA) is used to select the variables relevant for the final regressions. These variables explain the network growth. They are potential signals in (t-1) or control variables in the final regressions. As a final step, several models are estimated for each relevant potential signal distinguished with BMA, with the main regressor being the franchisor type. Section 5.5 concludes this chapter.

5.2 Hypotheses development

In this chapter, the analytical framework focuses on the informational power of contracts, and on the case of emerging franchise systems, where environmental uncertainty and informational asymmetries are extreme.

As presented in Chapter 2, business-format franchising networks are based on a common brand name and concept, developed by the franchisor, among legally autonomous downstream units. As intangible assets, all the brands and the related business concepts do not 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.

In the empirical literature on franchise data, the brand-name value is a variable used very often, and proxied by the size of the network (Lafontaine, 1992[126]; Vázquez 2004[189]), the age of the network (Lafontaine, 1992[126]; Arrunada et al., 2001[8]), or the training provided by the franchisor (Lafontaine, 1992[126]). Likert-scale measures are also used (Barthélémy 2008[15]).

The success, that is, the expansion of a franchising network, depends on the capacity to attract new franchisees, which is related to the profitability of the concept. However, new franchisors with a valuable concept face a problem of asymmetric information because the reputation of their brand is not yet established. This private information causes a problem of adverse selection regarding the type of the new franchisors: “good type” franchisors with a highly valuable business concept versus “bad type” franchisors with an unprofitable business concept.

I distinguish emerging versus developed franchise systems, assuming that in the first case, a significant part of the local franchisors have not yet established their reputation, because they are at the first steps of their network development.

In such a context of informational asymmetries, the principal (franchisor) is the informed party and the contract terms can signal the information, as in the
5.2. Hypotheses development

model of Milgrom and Roberts (1986)[151]. The aim for the principal is to indicate his type to the potential franchisees by distinguishing him from other types that would not have proposed the same contract.

The time line of events is as follows:

![Diagram](image)

Figure 5.1: Overview of the analytical framework

My study focuses on the first time period, which relates to an emerging system. In the first stage, the franchisor learns about his type, that is, about the profitability of his business concept. Then the good type franchisor sends a signal to the potential franchisee, transmitting information via contractual terms. The contract is a take-it or leave-it type, hence the franchisee chooses whether to enter the network. Finally, in the second period, the franchisor’s type becomes common knowledge in a mature franchising system.

In their formal model, Gallini and Lutz (1992)[75] take into account an upstream firm that markets a new product through several downstream units. The profitability of this new product is unobservable for the outlets, but informational assumptions of the model introduce an asymmetry as the firm holds private information on the demand for the product.

The good type franchisors can signal their type and therefore provide relevant information to the future franchisees. Thus, the model defines the separating equilibrium under asymmetric information and demonstrates that, at a separating equilibrium, a positive royalty rate is always used. In addition, the model predicts that, as information about the franchisor’s product becomes more widely known, the royalty rate drops, as the need to signal demand decreases.
As already presented in Chapter 4, unlike the franchise fee, the royalty rate is an ongoing payment variable that is usually expressed as a percentage of the franchisee’s turnover. Only the youngest franchisors who believe in their concept, in other words, the “good type” franchisors with a highly valuable concept, will favor this monetary device and commit themselves with a high level of royalty rate, pointing out in this way that a high level of sales is expected in the downstream market from the exploitation of the business concept.

Therefore, I expect to observe the following relationship:

**Hypothesis 1:**
The level of the royalty rate is positively influenced by the value of the business concept.

In addition, Gallini and Lutz (1992)[75] highlight the role of dual distribution as a signaling device. Thus, at equilibrium, signaling devices are complementary organizational and contractual forms that make the franchisor’s revenue highly dependent upon the performance of the business concept.

Considering that several instruments can provide relevant information on the franchisor’s type, I formulate the following, more general, hypothesis:

**Hypothesis 2:**
All signaling devices are positively influenced by the value of the business concept.

### 5.3 STYLIZED FACTS, DATA, AND MEASUREMENTS

#### 5.3.1 Brazilian franchising

Despite the recent economic crisis, the central role of Brazil in the economy of Latin America is well known. Brazil is the strongest economy in the zone with several developed sectors, such as agriculture, mining, manufacturing, and services. This country is a member of the “BRICS” grouping with Russia, India, China, and South Africa. These emerging economies have several common features: a large population, a vast territory with a continental strategic dimension, a large amount of natural resources, and a remarkable GDP growth during the last ten years.

The emerging position of Brazil also appears regarding franchising. Thus, Dant et al. (2011)[53] consider that, together with India and China, Brazil has the greatest potential for the future development of franchising.
As shown in Figure 5.2, this country plays a key role in Latin American franchising with the highest number of franchised brands in the zone. It is even more important than Spain, where franchising is well established.

![Figure 5.2: The key role of Brazil in Ibero-American franchising](image)

Data from: Federación Iberoamericana de Franquicias - 2010

In addition, as shown by Figure 5.3, the structure of the Brazilian franchise sector is dominated by domestic brands (93%), in common with the developed countries and contrary to the position in the small economies of the zone like Ecuador, Guatemala, and Uruguay.

![Figure 5.3: A Brazilian franchising system based on domestic brands](image)

Data from: Federación Iberoamericana de Franquicias - 2010

However, in contrast to the situation in the developed countries, the Brazilian franchise sector is still small in comparison to the size of the population. This is highlighted by Figures 5.4, 5.5, and 5.6, which compare for several countries the number of brands, franchised outlets, and the per capita employment in the franchise sector. These figures suggest that the Brazilian franchise sector is indeed emerging but it is not yet mature.
Figure 5.4: Emerging Brazilian franchising sector (1):
Brands per capita
Data from: Franchise business economic outlook - 2011 and World Bank

Figure 5.5: Emerging Brazilian franchising sector (2):
Franchised outlets per capita
Data from: Franchise business economic outlook 2011 and World Bank

Figure 5.6: Emerging Brazilian franchising sector (3):
Employment in the franchise sector per capita
Franchise business economic outlook 2011 and World Bank
Moreover, compared to the developed countries, the Brazilian franchise sector is characterized by its dynamism and rapid changes, as highlighted by Table 5.3.

<table>
<thead>
<tr>
<th></th>
<th>Brand growth per capita %</th>
<th>Growth of employment in the franchise sector per capita %</th>
<th>Growth of franchised outlets per capita %</th>
</tr>
</thead>
<tbody>
<tr>
<td>France</td>
<td>0.0749</td>
<td>0.1079</td>
<td>0.0507</td>
</tr>
<tr>
<td>Germany</td>
<td>0.0459</td>
<td>0.0131</td>
<td>0.0224</td>
</tr>
<tr>
<td>Spain</td>
<td>0.0141</td>
<td>0.0422</td>
<td>-0.0085</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>0.0253</td>
<td>0.0016</td>
<td>-0.0335</td>
</tr>
<tr>
<td>United States</td>
<td>-0.0424</td>
<td>-0.248</td>
<td>-1</td>
</tr>
<tr>
<td>Brazil</td>
<td>0.1416</td>
<td>0.1809</td>
<td>0.0917</td>
</tr>
<tr>
<td>China</td>
<td>-</td>
<td>0.4214</td>
<td>-</td>
</tr>
<tr>
<td>Turkey</td>
<td>0.1227</td>
<td>0.0312</td>
<td>0.1962</td>
</tr>
</tbody>
</table>

Table 5.3: Dynamism of Brazilian franchising.

It is relevant to consider that these rapid changes in the franchise sector are taking place in a context of instability, economic environmental uncertainty, and informational asymmetries.

In addition, with the rapidity of the evolutionary process, another source of instability in the Brazilian franchising sector is related to the legal environment. The specific law regarding franchising 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.

After comparing 21 franchise cases in Brazil and France to study their organizational strategies, Azevedo and Silva (2005)[11] point out the Brazilian jurisdictional uncertainty, even though Brazil is one of only two Latin American countries having a specific law about franchising; Mexico is the other one.
5.3.2 Data and measurement

5.3.2.1 Data collection

The sample consists of 174 Brazilian franchising networks in 2012 and 2013. Only local franchise systems are included.

The original dataset is based on information provided by the Brazilian Franchise Association (BFA). This information is completed using two additional sources: the Brazilian website Franquia Agora, which is provided for potential franchisees and is where franchisors communicate about their system; and the official website of each network. The sample covers a wide range of retail and service sectors. Table 5.4 presents the sectors in Brazilian franchising that were used to construct this variable.

<table>
<thead>
<tr>
<th>Sector</th>
<th>Number of franchising networks in the sample</th>
<th>Sector-based of the sample compared to the total population of networks affiliated to BFA*</th>
<th>Mean turnover**</th>
</tr>
</thead>
<tbody>
<tr>
<td>Personal Accessories Footwear</td>
<td>9</td>
<td>12%</td>
<td>8.333.333.333</td>
</tr>
<tr>
<td>Feeding</td>
<td>16</td>
<td>62%</td>
<td>97812.5</td>
</tr>
<tr>
<td>Bars, restaurants, Pizzerias</td>
<td>6</td>
<td>13%</td>
<td>9.083.333.333</td>
</tr>
<tr>
<td>Drinks, coffee, sweets</td>
<td>11</td>
<td>15%</td>
<td>45000</td>
</tr>
<tr>
<td>Beauty, health and natural products</td>
<td>16</td>
<td>13%</td>
<td>77512.5</td>
</tr>
<tr>
<td>Communication, Computer, Electronics</td>
<td>9</td>
<td>29%</td>
<td>6.833.333.333</td>
</tr>
<tr>
<td>Construction and Real estate</td>
<td>12</td>
<td>38%</td>
<td>8.455.833.333</td>
</tr>
<tr>
<td>Cosmetics and perfumery</td>
<td>6</td>
<td>40%</td>
<td>4.433.333.333</td>
</tr>
<tr>
<td>Education and Training</td>
<td>16</td>
<td>28%</td>
<td>46200</td>
</tr>
<tr>
<td>Entailment, toys and leisure</td>
<td>2</td>
<td>8%</td>
<td>125000</td>
</tr>
<tr>
<td>Language Schools</td>
<td>14</td>
<td>37%</td>
<td>4.978.571.429</td>
</tr>
<tr>
<td>Hospitality and tourism</td>
<td>3</td>
<td>25%</td>
<td>2.733.333.333</td>
</tr>
<tr>
<td>Care and Cleaning</td>
<td>16</td>
<td>59%</td>
<td>38731.25</td>
</tr>
<tr>
<td>Furniture, decoration and gifts</td>
<td>10</td>
<td>29%</td>
<td>88500</td>
</tr>
<tr>
<td>Business services</td>
<td>14</td>
<td>24%</td>
<td>1.662.142.857</td>
</tr>
<tr>
<td>Automotive services</td>
<td>5</td>
<td>16%</td>
<td>53200</td>
</tr>
<tr>
<td>Clothing</td>
<td>14</td>
<td>16%</td>
<td>117500</td>
</tr>
<tr>
<td>Total</td>
<td>179</td>
<td>23%</td>
<td>823.452.514</td>
</tr>
</tbody>
</table>

Table 5.4: Retail and service sectors in the sample

* BFA : Brazilian Franchise Association
** Brazilian Currency: Real - Brazilian data - 2012
All the sectors of the population are well represented in the sample except the sector “entailment-toys-and-leisure” (8%).

As in the rest of the dissertation, I use the multiple imputation method to deal with the few missing values.

[^3]: http://www.franquiaagora.com.br/
5.3.2.2 Dependent variables

In this chapter, I use several dependent variables at different stages of the empirical investigation. The network growth is the dependent variable in the BMA estimations. The potential signals resulting from the BMA procedure are the dependent variables of the final set of regressions. These variables are presented below.

**Network growth:** the growth rate is measured as the percentage of new franchised units in the network in 2013 compared to 2012. I use this variable at the first step of the estimation process (BMA) to distinguish the relevant variables for the final regressions. For robustness checks, two different growth rates are taken into account, reasoning at the network level $i$.

These ratios are as follows:

$$f_{1i} = \frac{\text{franchised units in 2013} - \text{franchised units in 2012}}{\text{franchised units in 2013}}$$

(5.3.1)

In the second step, as franchised networks are usually not exclusively composed of franchised downstream units, I use the following ratio:

$$f_{2i} = \frac{\text{franchised units in 2013} - \text{franchised units in 2012}}{\text{franchised units in 2013} + \text{owned units in 2013} + \text{international units in 2013}}$$

(5.3.2)

The dependent variables at the final stage of estimation are potential signals used by the franchisor. I measure these variables in 2012 (t-1), as follows:

**The royalty rate:** this is the variable of interest to the study; it is defined as the percentage of the downstream sales accruing to the franchisor.

**The proportion of company-owned units:** this variable is measured as the number of company-owned units divided by the total number of outlets in the network.

**The upfront fee:** this variable is defined as a fixed amount paid once by the franchisee when entering the network.

In addition to these three contractual and organizational forms highlighted by the theory, I take into account as potential signals the following variables in the analysis:
The advertising rate: previously used in the literature on franchise data as a dependent variable (e.g., Vázquez, 2005[190]) or as an independent variable (e.g., Kasová and Lafontaine, 2010[115]), this ratio defines the proportion of the income from the downstream sales dedicated to the promotion of the network.

The franchisor quality label: this variable refers to a Brazilian distinction resulting from an evaluation of franchised networks by the Brazilian Franchise Association. This annual evaluation takes into account the franchisees’ satisfaction. The franchisor has to pay to get this label. I construct a dummy variable that equals 1 if the franchisor has obtained the quality label once in the last five years, and 0 otherwise.

The franchisor’s location: this dummy variable distinguishes the franchisors located in Sao Paulo from the others. Indeed, as highlighted by Figure 5.7, most of the franchisors are located in this Brazilian state.

![Map of Brazil showing localisation of Brazilian network headquarters in 2012.](image)

Figure 5.7: Localisation of Brazilian network headquarters in 2012.

More precisely, Figure 5.7 shows that most of the Brazilian franchisors are located in the southwest region (in red), where Sao Paulo is the state with the highest concentration of franchisors (119 franchisors). The other franchisors are often located in states close to Sao Paulo.

Sao Paulo, Rio de Janeiro, and Minas Gerais are the biggest states in Brazil. According to the Brazilian Institute of Geography and Statistics (IBGE), they accounted for 53.1% of the Brazilian GDP in 2011. Sao Paulo accounts for 32.6% of the Brazilian GDP and has a population of 41 252 160 (IBGE, 2011). This state has the biggest financial center in Brazil and the Brazilian Stock Exchange in Sao
Paulo is the most important in Latin America. The Brazilian headquarters of the international and local banks are located in the capital city of the state, which is also called Sao Paulo.

Therefore, the fact that most of the franchised network headquarters are located in Sao Paulo appears to be related to the economic power of the state, and of the city, where the major business headquarters converge. As far as the new franchisors are concerned, this location may act as a signal.

5.3.2.3 Independent variable

The franchisor type \((ft)\) is the core independent variable in the final set of estimations.

I construct this variable with a two-step cluster analysis\(^4\) based on three variables: the net present value (NPV), the franchisor prior experience, and the market saturation in terms of downstream units.

The NPV is a financial indicator allowing us to estimate the present value of future cash flows resulting from an investment.

It is measured as follows:

\[
NPV_i = I - \frac{t}{(1 + d)^r}
\]

where \(I\) denotes the total investment made by the franchisee. This variable aggregates the required initial capital, the upfront fee, and the working capital. \(d\) represents the deposit interest rate paid to the banks for demand, time, or savings deposits. I choose to use the rate of the World Bank. In addition, because I do not have the information regarding the contract duration, I take into account the return on investment \(r\). Finally, \(t\) represents the average turnover.

The NPV is related to the franchisor type as it reflects the average present value of the investment that the franchisee agrees to make when he believes that the franchisor belongs to the “good type” category. Thus, the “good type” franchisor has a positive NPV. This means that the franchisor ensures that the franchisee can at least recoup his investment.

---

\(^4\)The two-step cluster analysis is a statistical multivariate technique developed in two phases. The aim is to achieve the maximum intra-group homogeneity and the biggest inter-group heterogeneity, which would otherwise not be apparent. To carry out this analysis, in the first stage, the individuals are distributed into pre-clusters, which become single individuals in the second stage. This second stage involves applying a hierarchical algorithm in the pre-clusters. The advantage of this method compared to the others is that categorical and continuous variables can be included. In addition, the number of clusters is automatically selected.
However, the fact that the NPV can be biased, as the information regarding $I$, $t$, and $r$ is provided by the franchisor, must be taken into account.

This is why the allocation of the franchisors into two types resulting from the use of the NPV is completed by the two-step cluster analysis. Given the graphics and the related statistics in Appendix D, cluster 1 is defined as the “good type” franchisors cluster. Networks classified in this cluster have the highest NPV, a better prior experience in business, and a better market saturation.

In addition, the statistics highlight higher means in cluster 1 than in cluster 0 for the following variables: the network growth in terms of downstream units between 2012 and 2013, the average growth measured as the ratio of the network size to the network age, the internationalization rate measured as the ratio of the downstream outlets abroad to the network size, and the market share defined as the ratio of the average network turnover to the sector turnover.

5.3.2.4 Control variables

The control variables are related to the value of the franchisor’s business concept:

*The franchisor’s prior experience in business:* this variable indicates the time it took the franchisor for developing his concept. It was previously used by Kalnins (2005)[113], Hoffman and Preble (2003)[101], and Kasová and Lafontaine, 2010[115] it is often used in the literature as a proxy of the brand-name value.

*The age:* the age of the network is measured as the number of years since the first franchised unit was established.

*The return on investment ($r$):* this information is provided by the franchisor as the estimated average recovery time of the investment.

*The required initial capital:* this variable is also provided by the franchisor; it is an estimation of the capital required for the franchisee to set up the franchised outlet.

*The required working capital:* this variable was previously used by Dant et al.(2008)[57]; again, this information is provided by the franchisor. It is the estimated average amount that the franchisee needs to run the business.

*The average turnover ($t$):* this variable refers to the average monthly downstream turnover and is estimated by the franchisor.

*The market saturation:* this ratio is the proportion of downstream units in the network (franchised and company-owned) in the total outlets of the sector.

*The internationalization rate:* this variable is measured, for each network, as the ratio between the number of outlets abroad and the total number of the network
5.4. Empirical relationship between the franchisor’s type and signaling devices

outlets.

*The market share:* as in Chapter 3, this ratio is defined as the proportion of the average franchisee turnover to the total sector turnover.

In addition, I add a dummy variable to control for the influence of the sector:

*Sector:* this dummy variable enables us to control for the influence of operating in the retail *versus* the services sectors. This control variable is often used in the literature on franchise data (e.g., Dant *et al.*, 2008[57]).

5.3.2.5 Descriptive statistics

Table 5.5 highlights the heterogeneity of the sample networks regarding the main variable, the *royalty rate*, in addition to the *proportion of company-owned units*, the *working capital*, the *market saturation*, the *average turnover*, and the *network growth* in terms of downstream units. The others variables are quite homogenous in the samples, as shown by the means, which are higher than the standard deviations.

The correlation matrix highlights a high significant correlation can be observed between the two indicators of the *network growth* in terms of downstream units, which is not a problem either as these two variables are not used in the same models.

The matrix shows that it is necessary to check for potential multicollinearity relating to the following variables: the *return on investment*, the *required capital for the installation*, the *market share*, and the *average turnover*.

Lastly, the correlation matrix highlights a significant and negative correlation between the *proportion of company-owned units* and the *royalty rate*, suggesting that these two variables are substitutable.

5.4 Empirical relationship between the franchisor’s type and signaling devices

5.4.1 Main and control subsamples

In order to submit the hypotheses deriving from signaling theory to data, I construct a subsample regrouping the youngest Brazilian franchisors. According to the theory, such franchisors need to signal their type to the potential franchisees, since their reputation is not established yet. To distinguish the networks involved, the sample is divided into percentiles based on the age of the franchise systems.
<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>SD</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
<th>12</th>
<th>13</th>
<th>14</th>
<th>15</th>
<th>16</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. $f_1$</td>
<td>0.10</td>
<td>0.29</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>2. $f_2$</td>
<td>0.11</td>
<td>0.36</td>
<td>0.954**</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>3. Owned</td>
<td>0.20</td>
<td>0.28</td>
<td>0.181*</td>
<td>0.261**</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>4. Royalty</td>
<td>0.74</td>
<td>2.09</td>
<td>0.062</td>
<td>0.055</td>
<td>-0.017</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>5. Advertising</td>
<td>0.03</td>
<td>0.03</td>
<td>-0.016</td>
<td>-0.029</td>
<td>-0.054</td>
<td>0.104</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>6. Upfront fee</td>
<td>36624.68</td>
<td>26334.26</td>
<td>-0.111</td>
<td>-0.167*</td>
<td>0.103</td>
<td>-0.194*</td>
<td>-0.124</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>7. Age</td>
<td>17.66</td>
<td>14.95</td>
<td>-0.051</td>
<td>-0.05</td>
<td>-0.132</td>
<td>-0.134</td>
<td>0.177*</td>
<td>-0.046</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>8. R. investment</td>
<td>23.73</td>
<td>8.23</td>
<td>0</td>
<td>-0.072</td>
<td>0.023</td>
<td>-0.340**</td>
<td>-0.032</td>
<td>0.325**</td>
<td>0.308**</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>9. Installation</td>
<td>153231.96</td>
<td>114240.95</td>
<td>-0.213**</td>
<td>-0.358**</td>
<td>0.054</td>
<td>-0.167*</td>
<td>-0.021</td>
<td>0.371**</td>
<td>0.155*</td>
<td>0.559**</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>10. Working capital</td>
<td>38712.79</td>
<td>43488.70</td>
<td>-0.035</td>
<td>-0.027</td>
<td>0.044</td>
<td>0.097</td>
<td>0.006</td>
<td>0.078</td>
<td>0.011</td>
<td>0.084</td>
<td>0.006</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>11. Experience</td>
<td>8.65</td>
<td>8.33</td>
<td>-0.191*</td>
<td>-0.205**</td>
<td>-0.315**</td>
<td>-0.132</td>
<td>0.220**</td>
<td>-0.154*</td>
<td>0.530**</td>
<td>0.222**</td>
<td>0.1</td>
<td>-0.061</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>12. M share turnover</td>
<td>0.08</td>
<td>0.08</td>
<td>-0.069</td>
<td>-0.107</td>
<td>-0.012</td>
<td>-0.082</td>
<td>0.001</td>
<td>0.224**</td>
<td>-0.024</td>
<td>0.277**</td>
<td>0.201**</td>
<td>0.094</td>
<td>-0.02</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>13. M saturation</td>
<td>0.08</td>
<td>0.13</td>
<td>0.034</td>
<td>0.017</td>
<td>-0.244**</td>
<td>0.056</td>
<td>0.178*</td>
<td>-0.023</td>
<td>0.166*</td>
<td>-0.086</td>
<td>-0.048</td>
<td>-0.023</td>
<td>0.210**</td>
<td>0.171**</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>14. International rate</td>
<td>0.01</td>
<td>0.03</td>
<td>-0.022</td>
<td>-0.021</td>
<td>-0.106</td>
<td>-0.064</td>
<td>0.127</td>
<td>-0.031</td>
<td>0.091</td>
<td>-0.012</td>
<td>0.014</td>
<td>-0.01</td>
<td>0.144</td>
<td>0.186*</td>
<td>0.290**</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>15. Average turnover</td>
<td>76750.34</td>
<td>78624.63</td>
<td>-0.089</td>
<td>-0.12</td>
<td>0.053</td>
<td>-0.028</td>
<td>-0.099</td>
<td>0.245**</td>
<td>0.041</td>
<td>0.264**</td>
<td>0.238**</td>
<td>0.157*</td>
<td>-0.007</td>
<td>0.597**</td>
<td>-0.029</td>
<td>-0.005</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

Table 5.5: Summary statistics

Note: Significant * at the 10% level, ** at the 5% level, *** at the 1% level.
5.4. Empirical relationship between the franchisor’s type and signaling devices

Table 5.6: Quartiles depending on the age in 2012.

<table>
<thead>
<tr>
<th></th>
<th>Quartiles</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Q1</td>
</tr>
<tr>
<td>Age</td>
<td>8</td>
</tr>
<tr>
<td>Franchises</td>
<td>54</td>
</tr>
<tr>
<td>Mean</td>
<td>4,311</td>
</tr>
<tr>
<td>Min</td>
<td>1</td>
</tr>
<tr>
<td>Max</td>
<td>8</td>
</tr>
<tr>
<td>S.D.</td>
<td>1,917</td>
</tr>
<tr>
<td>N</td>
<td>52</td>
</tr>
</tbody>
</table>

The first quartile corresponds to the youngest franchisors (Q1). This is the main subsample. Quartiles 2, 3, and 4 (Q2, Q3, and Q4, respectively) serve as controls to observe the likely change of results as a function of the group’s age.

5.4.2 Bayesian model averaging

5.4.2.1 Methodology

In this chapter, the estimations proceed in two stages. First, I implement BMA in order to select the signals and the control variables that best fit the data.

BMA is an econometrical method allowing us to choose which independent variables should be included as regressors of a dependent variable. In others words, BMA is suitable to select variables among a large number of potential independent variables. I consider that this method is particularly appropriate here. A total of fifteen potentially relevant variables are tested regarding the network growth as dependent variable.

With BMA, I perform regressions for all possible combinations of independent variables in order to build a weighted average of the posterior distributions over all of them (Brown et al., 2002[28], Eicher et al. (2011)[66]).

In the case, $2^{15}$ variable combinations, that is, regressions, are estimated. BMA enables to determinate a weighted average of the posterior distributions of the outcome for each likely model that arises from Bayes’ theorem. In others words, the posterior inclusion probability of a potential signal, or control variables, provides the probability of the importance of the variable. It is calculated as the sum of the
Given the network growth variable (\(f_i\), with \(i = 174\) franchisors), and the potential relevant variables, signals, and control variables, (\(X_{ij} f = 1, \ldots, 15\)), the main objective here is to determine the most effective subset of regressors (\(m_1, \ldots, m_p\) with \(p = 2^{15}\)). The model can be expressed as follows:

\[ f_i = \alpha_i + \sum_{k=1}^{jp} \beta_k^{(p)} X_{ki}^p + \epsilon_i \tag{5.4.1} \]

where \(X_{ki}^p \in X_{ij}\), \(\beta_k^{(p)}\) are the coefficients to be estimated, with \(\epsilon \sim N(0, \sigma^2)\). The parameters \((\alpha, \beta_k^{(p)}, \sigma)\) are replaced by \(\pi_p\).

\[ pr(C|m_p) = \int pr(C|\pi_p, m_p) pr(\pi_p|m_p) d\pi_p \tag{5.4.2} \]

where \(pr(C|m_p, \pi_p)\) is the likelihood function of the function \(m_p\) that contains the information about \(\pi_p\) of the data \(C\). As presented by Eicher et al. (2011)\[66\], the integrated likelihood is the probability density of the data, conditional on the model \(m_p\), which equals the likelihood times the prior density, \(pr(\pi_p|m_p)\).

\[ pr(m_p|C) = \frac{(C|m_p)pr(m_p)}{\sum^K_{k=1} pr(C|M_s)pr(M_s)} \tag{5.4.3} \]

If \(m_p\) is the correct model, \(pr(m_p)\) is its previous probability. Based on Bayes’ theorem, BMA weights the average form of the posterior model probability, as presented by equation 5.4.3. In sum, with BMA I get the value of several models, with the best having the lowest bayesian information criterion (BIC) and the highest probability.

This method requires that the error terms in the above equations are normally distributed. Since the quartiles are small (between 36 and 52 networks), the normality of the subsamples must be guaranteed. More generally, it is necessary to be careful about all the basic assumptions of the linear model.

For this reason, I perform OLS estimations taking into account all possible variables. In those equations, I test for heteroscedasticity using the White’s method, for multicolinearity with the variance inflation factors, and for normality with the skewness and kurtosis test\[5\]. I also analyze the standardized residuals in order to detect the potential outliers. The results highlight the presence of outliers in all the

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\[5\] This test combines the skewness test and the kurtosis test into an overall test statistic.
subsamples. Once the outliers are removed from the data, the error terms become normally distributed and homoscedastic. Finally, I test for endogeneity using the same methodology as in Chapter 2. The variables raising a problem of endogeneity are removed from the regressions.

The detailed results of the tests are presented in Appendix D.

### 5.4.2.2 Results

BMA enables us to get for each subsample the potential signals and control variables related to the network growth in terms of franchised units between 2012 and 2013.

Table 5.7 summarizes these estimation results. For each quartile, the combination of variables that better fit the data is presented. These combinations have the lowest BIC and the highest probability.

The results are robust regarding the dependent variable $f_1$ versus $f_2$. These estimations reveal that the variables explaining the network growth differ from the subsample.

From the large set of initial potentially relevant variables, the BMA procedure enables us to extract a tight selection.

Thus, the selected variables are: the prior experience (control variable) in $Q1$ and $Q4$; the royalty rate (signal i.e., dependent variable) in $Q1$ and $Q2$; the upfront fee (signal i.e., dependent variable) in $Q3$ and $Q4$; the proportion of company-owned units (signal i.e., dependent variable) in the three quartiles $Q1-Q3$.

Despite their interest, this first set of results do not enable us to distinguish the potential signals actually used by the “good type” franchisor. For this reason, I complete this empirical analysis with final regressions relating the potential signals to the franchisor type.

### 5.4.3 Final regressions

#### 5.4.3.1 Methodology

The econometric model includes the potential signals resulting from BMA methodology as dependent variables. The dummy variable constructed from the cluster analysis and denoting the franchisor type is introduced as the main regressor.

Thus, I estimate on each subsample the following equation, including industry dummies in addition with the control variables highlighted as relevant by BMA estimations:

$$X_i = \pi + ft_i + z_i + \varepsilon_i$$

(5.4.4)
<table>
<thead>
<tr>
<th></th>
<th>Q1</th>
<th>Q2</th>
<th>Q3</th>
<th>Q4</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>f1</td>
<td>f2</td>
<td>f1</td>
<td>f2</td>
</tr>
<tr>
<td><strong>Constant</strong></td>
<td>2.579e-01</td>
<td>7.767e-02</td>
<td>7.524e-02</td>
<td>3.153e-02</td>
</tr>
<tr>
<td><strong>Location</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>franchisor quality</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>turnover a.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>experience</td>
<td>-3.679e-02</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Owned</td>
<td>4.443e-01</td>
<td>3.724e-01</td>
<td>3.689e-01</td>
<td></td>
</tr>
<tr>
<td>Interna. Rate</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>M. share</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>M. saturation</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>R. investment</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Adver. rate</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Royalty rate</td>
<td>6.321e-02</td>
<td>6.185e-02</td>
<td>3.064e-02</td>
<td>3.510e-02</td>
</tr>
<tr>
<td>Upfront fee</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Working capital</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>T. investment</td>
<td>-7.193e-07</td>
<td>-4.471e-07</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>nVar</strong></td>
<td>3</td>
<td>3</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td><strong>r2</strong></td>
<td>0.517</td>
<td>0.346</td>
<td>0.286</td>
<td>0.145</td>
</tr>
<tr>
<td><strong>BIC</strong></td>
<td>-2.595e+01</td>
<td>-1.026e+01</td>
<td>-5.228e+01</td>
<td>-2.185e+01</td>
</tr>
<tr>
<td><strong>post prob</strong></td>
<td>0.161</td>
<td>0.176</td>
<td>0.120</td>
<td>0.085</td>
</tr>
</tbody>
</table>

X removed because of potential endogeneity.
- removed because of potential multicollinearity.

Table 5.7: Summary of BMA results.
where,

\[ X_i = \text{Signal} \]
\[ ft_i = \text{Franchisor type. } 1 \text{ good type franchisor, } 0 \text{ otherwise} \]
\[ z_i = \text{The set of control variables} \]
\[ \pi = \text{Constant term} \]
\[ \varepsilon_i = \text{error term} \]

As usual, the checks for multicolinearity, heterocedasticity, and endogeneity\(^6\) are performed. For robustness checks, I also estimate the same model without the control variables.

### 5.4.3.2 Results

The OLS estimation results for the four quartiles are reported in Table 5.8. This table presents for each subsample the potential signals determined by the BMA procedure, here used as dependent variables, and highlights their relationship with the franchisor type and the control variables resulting from BMA.

Except for the regression regarding the potential signal location, the good global significance of this final set of estimations is emphasized by the Fisher’s tests and by the \(R^2\). The results are robust, as underlined by the estimations deleting the control variables. My main hypothesis regarding the royalty rate as a signaling device finds strong empirical support here.

Indeed, BMA results show that this payment mechanism can only be relevant as a signaling device in the case of young networks (\(Q1-Q2\)), which is consistent with the theory. In addition, as predicted by hypothesis H1, OLS estimates highlight a positively significant impact of the franchisor type on the level of the royalty rate.

Hypothesis H2 regarding the other signaling devices does not find evidence here, which underlines the key role of the royalty rate. The geographical location of the franchisor is not influenced by the franchisor type. In the same way, the results regarding the proportion of company-owned outlets and the upfront fee do not provide evidence for the explanation in terms of signaling.

However, it is interesting to note that the results regarding the proportion of company-owned units are economically coherent. Thus, while the franchisor type has no significant influence on the proportion of company-owned outlets in the first stage (\(Q1\)), the impact is clearly negative in the case of mature networks with a good business concept (\(Q2-Q3\)). This result suggests that franchisors with reputedly profitable concepts easily find franchisees, and do not have to directly operate a large

\(^6\)Using the VIF, the White’s test, and the same methodology as in Chapter 2, respectively.
<table>
<thead>
<tr>
<th></th>
<th>Royalty rate</th>
<th>Proportion of company-owned outlets</th>
<th>Upfront fee</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Q1</td>
<td>Q2</td>
<td>Q1</td>
<td>Q2</td>
</tr>
<tr>
<td>Franchisor type</td>
<td>1.627*** [0.557]</td>
<td>3.277** [1.439]</td>
<td>-0.056 [0.085]</td>
<td>-0.175* [0.093]</td>
</tr>
<tr>
<td>Average turnover</td>
<td>0.373 [0.431]</td>
<td>0.991 [0.626]</td>
<td>-0.076 [0.111]</td>
<td>-0.189 [0.118]</td>
</tr>
<tr>
<td>Return on investment</td>
<td>-0.0492 [0.157]</td>
<td>-0.034** [0.019]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sector dummies</td>
<td>0.804 [0.524]</td>
<td>-1.05 [0.981]</td>
<td>0.424 [0.14]</td>
<td>0.315** [0.118]</td>
</tr>
<tr>
<td>Experience</td>
<td>0.104** [0.046]</td>
<td>0.069*** [0.007]</td>
<td>0.312*** [0.076]</td>
<td>0.338*** [0.084]</td>
</tr>
<tr>
<td>Constant</td>
<td>8.66*** [0.046]</td>
<td>8.09*** [0.007]</td>
<td>5.28** [0.076]</td>
<td>12.23** [0.084]</td>
</tr>
</tbody>
</table>

Table 5.8: Final regressions results (OLS estimator)
Note: Significant * at the 10% level, ** at the 5% level, *** at the 1% level.
Standard errors are in brackets.
† The same methodology as in Chapter 2 is used regarding endogeneity.
‡ OLS estimations without the control variables for robustness checks (See equation (5.4.4))
proportion of downstream units. This explanation is relevant to the results regarding the franchisor prior experience, highlighting a significantly negative influence of the prior experience on the network proportion of company-owned units in the first quartile.

The significant and negative influence of the franchisor type on the upfront fee in the last quartile (Q4) suggests that well established franchisors with a strong reputation do not require a high fee level. This evidence is the reverse of the prediction from the theory. Indeed, the model developed by Gallini and Lutz (1992)[75] predicts that as information about the franchisor type is revealed, the fee increases, because the need to signal fades. This result calls into question the assumed negative relationship between the two fees (royalty rate and upfront fee) and the definition of the upfront fee as a rent extraction mechanism. It also implies that in the Brazilian case, the choice of the upfront fee is not related to the value of the franchisor business concept, as also suggested by the negative sign of the variable experience in the equation for the fee estimated on the last quartile.

Several control variables have no significant influence in these estimations: the total investment, the average turnover, and the sector dummies. Finally, the return on investment influences significantly and positively the upfront fee in the subsample Q4; that is, it is economically coherent.
5.5 Conclusion

The estimations in this chapter are performed in two stages on recent Brazilian franchising data. The sample is divided in quartiles depending on the franchised network age. The first step of estimation selects, among the set of variables relating to the network growth, those that best fit the data. The second stage provides evidence of the positive relationship between the “good type” franchisors, with a profitable business concept, and the royalty rate. The type of the sample franchisors is defined via a two-step cluster analysis. The empirical results show that the estimated models, both in the first and second stages, have a good fit. They provide several interesting outcomes regarding franchising in emerging markets.

The results suggest that the organizational choices of local franchisors in emerging markets differ from what has been observed so far regarding franchising in developed countries. More precisely, this chapter provides evidence that signaling may motivate the contractual choices in emerging market local systems. This result is particularly interesting knowing that most of the literature dealing with franchising in the framework of the theory of contracts focuses on the explanations in terms of moral hazard. The royalty rate and the proportion of company-owned units are two signaling devices identified in the seminal model of Gallini and Lutz (1992) concerning signaling in franchise networks. In terms of the signal of the franchisor type, these two devices may be considered as substitutes. The empirical results of this chapter suggest that this is not the case, and that the franchisors use the contractual design (high level of royalty rate) rather than the organizational form of the network (dual distribution) to signal the value of their business concept to potential franchisees. However, the results also show that, unlike the royalty rate, the definition of the upfront fee required by the Brazilian franchisors is not influenced by signaling motivations.

Thus, this chapter shows that signaling theory is useful to understand the contractual design of franchised networks in emerging markets but that complementary explanations are required. Further research could extend the analysis to other emerging markets, notably to Latin American countries with different levels of economic development.
Chapter 6

General Conclusion

Conceived as a contribution to managerial economics, this dissertation addresses the empirical impact of organizational and contractual decisions taken by franchisors, on the performance of franchising networks. The analytical framework is based on the theories of industrial organization. More precisely, the predictions tested derive from contract theory. Several performance criteria are taken into account throughout the dissertation. Estimations are performed on diverse samples, extracted from varied datasets.

In addition to the conclusions drawn at the end of each chapter (Chapters 2-5), I would like to emphasize several findings to conclude this thesis. The four empirical contributions of the dissertation highlight robust relationships between the organizational choices and the network performance.

However, the influence of the organizational decisions varies depending on the performance indicator taken into account. This is a key finding from Chapter 2. Even if evidence is provided for the link between the performance criteria, the managerial implication regarding the network organizational form depends on the target; that is, it depends on the selected performance criterion. If the goal is a fast and wide network expansion, franchising appears to be an adequate organizational form compared to other organization types in branded distribution networks. In the same vein, the estimations in Chapter 2 also show that dual distribution is appropriate when the goal is an increase in the network market share.

The clear and robust result concerning the overall positive impact of multi-unit franchising on the network performance, as set out in Chapter 3, must also be commented upon. The nonparametric estimations provide more accurate evidence, revealing that the relationship depends on the context, notably the informational context (type and level of informational asymmetries), and that it is a non-linear
relationship. Thresholds, and even cycles, are highlighted when studying the impact of an increase of the proportion of multi-unit franchisees in the network.

Chapter 4 provides evidence for the influence of the contractual form (here the royalty rate) on the financial network performance. In the studied case, a high level of risk, that is, a risky business environment, increases the need for higher incentives to the franchisees, which involves a lower royalty rate. In other words, the estimation results in Chapter 4 suggest that the incentive impact of the royalty rate exceeds the franchisees’ risk aversion. It would be interesting to study another context, with different data, that is, with different levels of risk aversion, to see if this result remains.

Finally, Chapter 5 offers precisely a change of context, and highlights the relevance of signaling theory to study the determination of royalty rates by young Brazilian franchisors with a high value concept.

This set of results supports the idea that managerial economics is an interesting way to study franchising. In the following, I present several limitations of the present work and prospective areas for future research.

LIMITATIONS AND FURTHER RESEARCH

To conclude this dissertation, three main limitations can be discussed, which open the way for further research.

- Several performance criteria are taken into account in the dissertation and part of the estimations (Chapter 1) highlight empirical relationships between them. The issue regarding the analytical links between the diverse performance criteria in a franchised network could be addressed in more detail. In addition, some important aspects of franchised network performance are not studied in the dissertation; these include growth and survival issues, coordination and conflict issues, and corporate social responsibility (see Appendix A).

- This dissertation is an applied research work and, as is usually the case with applied econometrics, I have been limited by the data. In Chapter 4, I use a five-year panel dataset. It would be interesting to work on a longer period of time. In addition, Chapter 5 highlights the interest of working on different franchising contexts. The case of emerging countries, with different economic development levels, for example in Latin America, calls for further research.
In this dissertation, my empirical work is based on existing theoretical frameworks. Testable propositions are derived from previous theoretical models. One of my perspectives for future research is to develop my own theoretical models and to then empirically test them in a second step. For example, Chapter 3 highlights thresholds regarding the impact of a specific organizational form on the network performance. Theoretical developments on this specific issue could enable an explanation of this result.
References


Appendices
Appendix to Chapter 1

Definition of franchising in different institutional contexts

The definition of franchising in the European Union

According to the European Community treaty:

“(a) “franchise” means a package of industrial or intellectual property rights relating to trademarks, trade names, shop signs, utility models, designs, copyrights, know-how or patents, to be exploited for the resale of goods or the provision of services to end users; (b) “franchise agreement” means an agreement whereby one undertaking, the franchisor, grants the other, the franchisee, in exchange for direct or indirect financial consideration, the right to exploit a franchise for the purposes of marketing specified types of goods and/or services; it includes at least obligations relating to: - the use of a common name or shop sign and a uniform presentation of contract premises and/or means of transport, - the communication by the franchisor to the franchisee of know-how, - the continuing provision by the franchisor to the franchisee of commercial or technical assistance during the life of the agreement”.

The definition of franchising in the United States

According to the Federal Trade Commission, there is not a single definition of franchise in the United States. The Federal Trade Commission provides disclosure rules

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for the franchisors. There are two clarifications in order to have a better view of franchising:

“(1) that a business relationship will be deemed a franchise if it satisfies the three elements of a franchise, regardless of the nomenclature used to label or describe them; and (2) that a business relationship will be deemed a franchise if the franchisor represents that the relationship being offered has the characteristics of a franchise, regardless of any failure on the franchisor’s part to perform as promised”. The three elements are: “first, the franchisor must license a trade name and trademark that the franchisee operates under, or the franchisee must sell products or services identified by this trademark. Second, the franchisor must exert significant control over the operation of the franchisee or provide significant assistance to the franchisee. Third, the franchisee must pay at least $500 to the franchisor at any time before or within the first six months of operation” (Blair and Lafontaine, 2005, pg.4).

The definition of franchising in Latin America

The definition of franchising in Mexico

The law about franchising in Mexico was established by the Law of Promotion and Protection of Industrial Property (1991-with reforms in 1994). Article 142, announces that:

“there will be a franchise when in addition to the license of a brand use, there exists a transfer of knowledge or technical assistance, in order to guarantee that the person who is granted the license can produce or sell goods, or provides services uniformly and operationally; using operational, business and management methods, established by the owner of the brand, in order to maintain the quality, prestige and image of the goods or services that it designates. Prior to the conclusion of the respective agreement, the person that grants a franchise should provide, to the party who is intended to receive it, the information about the current status of his business, in the terms established by the regulations of this Act”.

The definition of franchising in Brazil

The current law for franchises in Brazil (Franchising law No 8.955, 1994) defines:

“Franchise business as a system by which a franchisor grants the franchisee the right to use the trademark or patent associated with the right of exclusive or semi-exclusive distribution of products or services and possibly also the right of use of technology deployment and administration business or operating systems developed by the franchisor or held through direct or indirect compensation, without, however,
be characterized employment”.

In addition to the legal requirements in place in the relevant jurisdictions, franchisor associations exist that ensure compliance with laws and with the interests of both parties. The associations often establish codes of ethics that must be respected by the partners (e.g., in Brazil). Hence, the franchisor associations work as a control body. The International Franchise Association has a membership of more than 40 franchise associations around the world. Moreover, there are public records to register agreements that deal with technology transfer and licenses to use trademarks or patents (e.g., in Ecuador, Chile, Argentina, and Colombia).

MANAGEMENT AND MARKETING RELATED THEORIES

Management theories (MT)

The principal management theories used in the theoretical framework to explain franchising are set out below.

Resource scarcity view

The resource scarcity view explains the use of franchising as result of the resource constraints of the franchisor in the early stage of the life cycle. Franchising appears as a means to gain access to scarce resources, such as financial and human capital, which enables a faster growth of the chain (Oxenfeldt and Kelly, 1968[159]; Caves and Murphy, 1976[34]; Lafontaine and Kaufmann, 1994[128]; Michael, 2003[149]), especially when the traditional financial markets are not an available option to get easy access to capital. In addition, the franchise may be essential to build economies of scale (Castrogiovanni et al. (2006)[31]). Companies that use franchising early in their life cycle gain first mover advantage (Shane 1996[179]), which allows them to gain faster market share and leads to a better financial performance (Michael, 2002[148]).

The mainly empirical results explain that the proportion of company-owned outlets increases over the time (life cycle), and the multi-units franchised would increase with the franchisor’s financial constraints. On the other hand, under the resource dependence theory, according to Dant et al. (2011)[58], dependence is present in the franchisee-franchisor relationship because franchisees contract exclusively with their franchisor’s brand, thereby excluding alternative sources of business revenue.
Multimarket contact

According to Artus (2004)[10], multimarket contact has not been investigated enough even though multimarket dynamics can be present in a lot of firms. This dynamic is present through competition in the same market by the franchisees. The franchisor is remunerated through the royalty rate, so the franchisor could be encouraged to induce competition among their franchisees in order to have units with higher sales.

Marketing-related theories (MRT)

Relational exchange theory

The relational exchange theory explains that social change and stability is a process of negotiated exchanges between parties. In franchising, the satisfaction of franchisees with their relationship with the franchisor can contribute to cooperation and reciprocity, thereby reducing conflict. In this way, it is possible to avoid the costly consequences of litigation resulting from the breaching of contractual clauses (Chiou et al., 2004[38]; Davies et al. (2011)[60], Brown et al. (2000)[27]). According to Davies et al. (2011)[60], economic satisfaction is linked to perceptions of equity in the distribution of resources, which is why it could be considered as overall satisfaction in the relational exchange theory sense.

Other authors use more than one theory as an analytical framework. Thus, the agency theory and the resource scarcity theory are frequently combined in the literature. In that sense, Castrogiovanni et al. (2006)[30] suggest that resource-scarcity considerations take precedence when franchisors are young, but that agency considerations prevail as franchisors age. In others words, if resources are a problem in the short run and agency is a problem in the long run, agency and scarcity theories are complementary (Michael, 2003[149]). In addition, franchisors may achieve a competitive advantage by financing growth through the network as a form of internal capital market, which is in accordance with the resource scarcity theory (Dant and Windsperger, 2006[59]).

Another example of this is the combination of signaling theory and resource acquisition theory. Signaling theory refers to new franchisors whose reputation is not yet established². On the other hand, Dant and Kaufmann (2003)[55] argue that in the resource acquisition theory context the franchising is explained when resources are constrained because franchisors prefer to manage their company units instead of a franchised unit. A few theories regarding franchising have been analyzed. The complexity of franchising structures has made it necessary to carry out research from

²See chapter 5 for further information
different angles and sometimes a combination of theories is preferable in order to better understand these structures.

SURVEY OF ADDITIONAL ISSUES REGARDING PERFORMANCE IN THE LITERATURE ON FRANCHISING

Growth and Survival

In franchising literature, one of the main questions is whether companies using franchising can achieve higher performance levels than those using vertical integration. Under resource scarcity theory, franchising is presented as a solution to obtain the managerial and financial resources that are needed for a faster growth of the firm (Oxenfeldt and Kelly, 1968[159]; Kaufmann and Dant, 1996[117]). In that sense, Kaufmann and Dant (1996)[117] provide empirical evidence in line with this proposal. They find that franchising systems produce faster growth, especially with the presence of multi-unit franchising.

Furthermore, Shane (1996)[179] argues that the fact that franchising may help to solve agency problems -moral hazard and adverse selection- would allow firms grow faster. The author examines 138 franchisees over 10 years, finding a positive link between the use of franchising and growth and survival. In fact, using data from U.S. restaurants, Castrogiovanni et al., (2011)[33] found that enterprises using franchises have a better performance level than the others. Nevertheless, Lafontaine and Shaw (1998)[130] argue that the growth of the franchising sector is sometimes confused with the success of this governance structure; the number new franchises entering the system offset the output of many franchises each year in the U.S. market. They provide evidence that the net growth of the franchising system in the United States is almost similar to the growth of the economy.

Castrogiovanni and Justis (2002)[32] also study the factors that affect growth in franchising. They analyze the growth patterns of the franchise chains over five years and find empirical evidence that from a growth orientation, franchisee startup costs have a positive influence on the growth of the chain. Likewise, industry growth and the franchisor age would have an impact on the growth of the chain. Kasová and Lafontaine (2010)[115] also find empirical evidence that age influences growth, in addition to the size of the chain. Moreover, Shane et al. (2006)[180] provide empirical evidence that low royalty rates, low upfront franchise fees that rise over time, a low initial investment, and financing of franchisees is positively associated with the growth of the chain. However, Kasová and Lafontaine (2010)[115] did not
find support for the assertion that royalty has an impact on growth.

Finally, Bates (1998)[17], studying newly-entering franchisees and non-franchisees in the market, argues that there is not much evidence that the purchase of a franchise minimizes the risks facing a new business start-up, since they tend to compete with the other franchisees. There was empirical evidence that young franchisees have lower survival rates than independent start-ups.

Coordination and Conflict

According to Combs et al. (2004)[47], coordination and conflict are two performance outcomes in franchising chains since the franchisee-franchisor contractual relationship is not always easy to manage. The objectives and perspectives to maximize the surplus can be different. Thus, according to Dant et al. (2008)[57], the franchisor is not always interested in monitoring the franchised unit or working to signal the brand-name value (quality and confidence) in the market; the franchisor is more interested in conserving his financial assets. The franchisee, on the other hand, will try to recover his investment and generate a surplus during the duration of the contract. In addition, the franchisee learns about the business so he is able to work autonomously and the franchisor can therefore benefit from the continuing efforts of the franchisee to enhance his own expertise (Tiko, (2002)[186]).

Coordination is an issue in every business. On the one hand, because the brand name covers all units in the chain, a customer expects to have the same advertised quality and price in every single unit of the chain, whether it be a franchise chain or a unit of a traditional company. Michael (2002)[148] found empirical evidence that a traditional company would be more able to coordinate these three elements than a franchise chain. On the other hand, internal routines needs to be coordinated and good coordination is a valuable resource under a resource based view (Knott, 2003[123]). Therefore, good coordination of price, quality, advertising, and routines would weaken the conflicts in the franchisor-franchisee relationship.

As mentioned above, the client expects that the quality in a franchised unit is the same in every unit in a specific chain. However, this is not always the case. Suppose that franchisor (A) has two franchised units (B, C) and a company owned-unit (D). (A) works to improve the brand name value whereas the activity of B, C and D is directed towards offering a service. If C decides not make a maximal effort in his own unit, he could still receive clients because A, B and D contribute with their actions to the maintenance of the value of the brand name. However, over time the clients can identify unit C as different to the others, which can reduce the performance of this unit and hurt the brand name value of the chain. Therefore,
while the franchisor will try to improve the brand name value, the actions of the franchisees and the managers also affect the brand name. Negative actions can have a prejudicial effect on performance (Kidwell R. et al. (2007)[122]) since a single unit (C) can harm the brand name value. This situation is known as the free-riding problem. In order to avoid this situation, the franchisor could prefer to have more control in his units and this could be achieved through the company-owned units. Lafontaine and Shaw (2005)[131] found empirically that there is a higher presence of company-owned units in franchises with more valuable brands because the franchisor decides to better protect his brand from franchisee free riding. For this reason, he is encouraged to have more company-owned units since it allows him to exert more control.

Another source of conflict in franchising is the royalties paid by the franchisee to the franchisor. The franchisor is sometimes seen by the franchisee as the person who exploits him. That is why many franchising chains have associations of franchisees that meet to solve problems or defend against possible abuses of the franchisor within the network. Thus, Kaufmann and Lawrence (2011)[120] show empirically that the existence of franchisee associations help to solve the problems associated with cooperation and the conflict in franchise relationships. In addition, the franchisor can write more complete contracts in order to avoid conflicts. The experience of the franchisor could help him to better develop contracts in which the franchisor is better able to transmit his know-how. Thus, Gonzalez-Diaz and Solis-Rodriguez (2012)[81] find empirical evidence that the chain’s experience determines the degree of contractual completeness.

**Corporate social responsibility**

In recent years, corporate social responsibility has had an important place in the economy and in society. Corporate social responsibility is an ensemble of good or ethical actions that benefit the employees, the customers, or the society. Those actions allow the franchisor to have a better reputation in the market (brand name) and could therefore offer a competitive advantage to the firm. Corporate social responsibility includes handling environmental challenges, managing impacts on the community, customers, or employees, and corporate governance practices (Meiseber and Ehrmann, 2012[146]). Meiseber and Ehrmann, 2012[146] found empirical evidence that corporate social responsibility seems to have a positive effect on financial performance. However, the chain’s size can be really important when the franchisor decides to care about corporate social responsibility. Corporate social responsibility enables the franchisor to increase their reputation in the market and,
as a consequence, this may create a competitive advantage to the firm. In line with this, Mellewigt et al. (2011)[147] found evidence that the satisfaction of franchisees and managers affects performance. They argue that due to the different nature of the franchisee and the manager of a unit the control mechanism affects the agents differently. The control mechanisms are used to control the behavior of franchisees and managers; however, they do not improve their satisfaction and their own performance, even if these aspects could be affected. In the end, the overall performance is also affected because the performance of a chain depends on the franchisees and the managers, but not only corporate social responsibility should have an influence in franchising performance.

It is clear from the empirical work that performance depends on a lot of factors. The decisions made by the franchisor that affect performance interact because the franchise network is a complex structure that contains the franchisor, the franchisees, and the managers. Therefore, a simultaneity of factors would affect performance.
DEPENDENT VARIABLE:

Perceived performance of the chain

Ten items measured on a seven-point scale likert scales anchored with: 1 = “is much worse than expected” and 7 = ”much better than expected”; (α = 0.849). The franchisors were asked: “To what extent did you realized the following objectives last year? ”:

1. Saving in administrative costs
2. System growth
3. Better alignment of products and services to the customer needs
4. More effective coordination between the head office and outlets
5. Reduction in costs, increase in yields
6. Increase in innovation, saving in coordination and control costs
7. Better quality of offered products and profit growth

INDEPENDENT VARIABLES:

Brand name

Five items measured on a seven-point scale likert scales anchored with: 1 = “not at all” and 7 = “to great extent”; (α = 0.803).

The franchisors were asked to rate the following items:

\(^1\)Cronbach alpha.
1. Our brand name is very strong as compared to our competitors.

2. Our franchise system enjoys higher brand recognition as compared to our competitors.

3. Our franchise system enjoys a good reputation for quality.

4. Our brand name is very important for achieving competitive advantage.

**System know how**

Seven items measured on a seven-point scale Likert scales anchored with: 1 = “very easy to transfer” and 7 = “very difficult to transfer”; (α = 0.915).

The franchisors were asked: “How difficult is it to transfer to the franchisee”:

1. Brand name
2. Marketing know-how
3. Organizational know-how
4. Administrative know-how
5. Quality management know-how
6. Accounting know-how
7. Human resources know-how and know-how

**Behavior uncertainty**

Three items measured on a seven-point scale likert scales anchored with: 1 = “strongly disagree” and 7 = “strongly agree”; (α = 0.768).

The franchisors were asked:

1. Measure the performance of the outlet manager (franchisee or manager)?
2. Control the behavior of the outlet manager (franchisees or managers)?
3. Assess the competencies and capabilities of the outlet manager (franchisee or manager)?
Decision rights

Twelve items measured on a seven-point scale Likert scales anchored with: 1 = “not at all” and 7 = “to great extent”; (α = 0.867). The franchisors were asked: “To what extent does the franchisee decides regarding the following value chain activities:”:
1. Implementation of investment activities at the outlet level?
2. Financing the investment project at the outlet level?
3. Selection of suppliers?
4. Hiring employees at the outlet level?
5. Training of the employees at the outlet level?
6. Product / service offering in the local market?
7. Sale price at the outlet level?
8. Use of advertising and sales promotion?
9. Equipment at the franchised outlets?
10. Procurement of inputs?
11. Introduction of new products in the local market?
12. Use of accounting system at the outlet level?

Trust

Three items measured on a seven-point scale likert scales anchored with: 1 = “not at all” and 7 = “to great extent”; (α = 0.803). The franchisors were asked to rate the following items:
1. There is great trust between us and franchisees.
2. There is an atmosphere of openness and sincerity.
3. The mutual cooperation is on a partnership basis.

Environmental uncertainty

Three items measured on a seven-point scale Likert scales anchored with: 1 = “strongly disagree” and 7 = “strongly agree”; (α = 0.845). The franchisors were asked:
1. The economic environment in the local market changes frequently?
2. The sales at the outlet level is very fluctuating?
3. It is very difficult to predict the market development at the outlet level?
Multi-unit franchises:

Two measures:

- Dummy variable: 1 MUF is used in the chain, 0 otherwise
- Quantitative variable: The percentage of MUF used by the franchisees: it is the ratio between the number of franchised units divided by the number of franchisees.

CONTROL VARIABLES:

Franchise advantage

Five items measured on a seven-point scale Likert scales anchored with: 1 = “great advantage through franchising” and 7 = “great advantage through company outlets”; (α = 0.788).

The franchisors were asked: “As a franchisor, how do you see the advantages of franchising compared to company outlet?”:

1. Better quality control.
2. More innovation.
4. Higher administrative skills.
5. More efficient human resource management.

Franchisor’s investment

Two items measured on a seven-point scale likert scales anchored with: 1 = “Strongly disagree” and 7 = “strongly agree”; (α = 0.722).

The franchisors were asked: To what extent the franchisor bears:

1. Expenses for franchisee’s training at the beginning of the contract
2. Expenses for technical support to the franchisee at the beginning of the relationship

Age: The number of years since the first franchise outlets was established.
Size: The total number of outlets in the chain.
Advertising rate: Advertising expenses as percentage of franchised unit’s sales.
### Results of the endogeneity tests

<table>
<thead>
<tr>
<th></th>
<th>(3)</th>
<th>p-value</th>
<th>(3')</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Franchisor investment</td>
<td>0.04</td>
<td>0.8422</td>
<td></td>
<td></td>
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<tr>
<td>Advertising rate</td>
<td>1.27</td>
<td>26.12</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Network age</td>
<td>0.79</td>
<td>0.3766</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Size</td>
<td>0.05</td>
<td>0.8316</td>
<td></td>
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<tr>
<td>Environmental uncertainty</td>
<td>1.75</td>
<td>0.1876</td>
<td></td>
<td></td>
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<tr>
<td>Decision rights</td>
<td>0.44</td>
<td>0.5064</td>
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<tr>
<td>System know-how</td>
<td>0.94</td>
<td>0.3348</td>
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<td></td>
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<tr>
<td>Brand name</td>
<td>0.08</td>
<td>0.7804</td>
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<tr>
<td>Trust</td>
<td>1.57</td>
<td>0.2115</td>
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<tr>
<td>Behavioral uncertainty</td>
<td>0.75</td>
<td>0.3879</td>
<td></td>
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</tr>
<tr>
<td>MUF (%)</td>
<td>0.04</td>
<td>0.8372</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table B.1: Results of the endogeneity tests.

OLS estimator for performance
Models (3) and (3')
Same methodology as in Chapter 2
A simple model regarding the impact of the trade-off between risk and incentives on the royalty rate

As a theoretical background for the hypotheses, I consider the simplest possible model of a franchise contract between a franchisor and a single franchisee and provides theoretical results for the trade-off between the risk and the incentive (royalties). Serfes (2005)[178] develops a model of matching patterns between heterogeneous principals and agents in a principal agent model (negative assortative matching, NAM). We adapt this model to the franchise, using as an incentive the optimal royalty rate found by Blair and Lafontaine (2005)[19] in a one-side moral hazard problem between a risk-averse agent (franchisee) and a risk neutral principal (franchisor).

**Proposition 1** When NAM exist (profit function is sub-modular, i.e. equation (C.0.5) is negative), the equilibrium is given by:

(i) Positive if \( \theta^2_L < \frac{\theta^2_H \rho_H}{2 \rho_H - \rho_L} \)

(ii) Negative if \( \rho_H > 2 \rho_L \) and \( \theta^2_H < \frac{\theta^2_L \rho_L}{2 \rho_L - \rho_H} \)

(iii) U-shaped if one of the two conditions are satisfied

(a) \( \rho_H < \rho_L \), \( \theta^2_H < \frac{\theta^2_L \rho_L}{2 \rho_L - \rho_H} \) and \( \theta^2_L < \frac{\theta^2_H \rho_H}{2 \rho_H - \rho_L} \)

(b) \( \rho_H < \rho_L \) and \( \theta^2_L < \frac{\theta^2_H \rho_H}{2 \rho_H - \rho_L} \)

where, \( \theta^2 \) is the variance of sales \( [\theta^2_L, \theta^2_H] \), \( \alpha \) is the importance of the franchisee effort, and \( (\rho) \) the franchisee risk aversion \( [\rho_L, \rho_H] \).
The empirical implication is that a positive relationship between risk and incentives exists when there is NAM (Serfes (2005)[178]).

**Proof**

**Incentive contract**

Blair and Lafontaine (2005[19]) demonstrated that given the franchisee risk aversion (\(\rho\)) and unobservable effort (\(e\)), equation (C.0.1) provides the best level of effort that the franchisor can achieve, even if it is lower than the first-best level (incentive constraint). The effort depends on the royalty rate (\(r\)) and on the importance of the effort (\(\alpha\)).

\[
e = (1 - r)\alpha
\]

Then they show that in this case the best linear contract from a franchisor’s perspective is given by the equation C.0.2, since it provides a balance between the need to motivate franchisee effort and the need to provide insurance to the franchisees. Therefore, the incentive royalty rate (\(r\)) depends on the importance of the franchisee effort (\(\alpha\)), the franchisee risk aversion (\(\rho\)), and the variance of sales (\(\theta\)).

\[
r = \frac{\rho \theta^2}{\alpha^2 + \rho \theta^2}
\]

**Efficient matching**

Following Serfes (2005)[178], we focus on monotone assortative matching.

\[
\Pi = r \alpha e + F
\]

To carry out efficient matching we introduce equation (C.0.2) and (C.0.1) in the franchisor’s expected profit (equation (C.0.3)), where \(F\) is the upfront fee.

\[
\Pi = \frac{\rho \theta^2 \alpha^4}{(\alpha^2 + \rho \theta^2)^2} + F
\]

The cross partial derivative is:

\[
\frac{\partial^2 \Pi}{\partial \rho \partial \theta^2} = 2 \frac{\alpha^4}{(\alpha^2 + \rho \theta^2)^5} (-3 \rho^3 \theta^6 + 25 \rho^2 \theta^4 \alpha^2 - 19 \rho \theta^2 \alpha^4 + \alpha^6)
\]
The derivative in equation (C.0.5) can be positive and negative (see equation (C.0.6)).

\[-3\rho^3\theta^6 + 25\rho^2\theta^4\alpha^2 - 19\rho\theta^2\alpha^4 + \alpha^6 = 0 \quad (C.0.6)\]

According to Becker 1973 (in Serfes, 2005[178]), there exists a negative assortative matching (agents with higher degrees of risk aversion are matched with lower risk principals and vice versa) when C.0.5 is negative, since the profit function is submodular.

**Equilibrium risk incentives**

Following Serfes, 2005[178], we assume that equation (C.0.7) provides a matching function, which is an equilibrium relationship between risk aversion and variance.

\[\rho = k - b\theta^2 \quad (C.0.7)\]

where,

\[k = \frac{\rho_H\theta_H^2 - \rho_L\theta_L^2}{\theta_H^2 - \theta_L^2} \quad (C.0.8)\]

and

\[b = \frac{\rho_H - \rho_L}{\theta_H^2 - \theta_L^2} \quad (C.0.9)\]

Substituting equation (C.0.8), (C.0.9), and (C.0.7) in (C.0.2), and differentiating to \(\theta^2\), we obtain:

\[\frac{d_r}{\theta^2} = \frac{\alpha^2(\rho_H\theta_H^2 - \rho_L\theta_L^2)(\rho_H\theta_H^2 - \rho_L\theta_L^2 - 2\theta^2(\rho_H - \rho_L))}{[\alpha^2(\theta_H^2 - \theta_L^2) + \theta^2(\rho_H\theta_H^2 - \rho_L\theta_L^2) - \theta^4(\rho_H - \rho_L)]^2} \quad (C.0.10)\]

It is verified that \(\frac{d_r}{\theta^2} > 0\) if, and only if, \(\theta^2 < \lambda = \frac{\rho_H\theta_H^2 - \rho_L\theta_L^2}{\theta_H^2 - \theta_L^2}\). Similar to Serfes, 2005[178], the conditions to have \(\lambda\) in \([\theta_L^2, \theta_H^2]\) are: (i) \(\lambda < \theta_H^2\) if, and only if, \(\rho_H > 2\rho_L\), (ii) \(\lambda < \theta_L^2\) if, and only if, \(\rho_H > 2\rho_L\) and \(\theta_H^2 < \frac{\theta_L^2}{\rho_H - \rho_L}\), and (iii) \(\lambda > \theta_H^2\) if, and only if, \(\theta_L^2 < \frac{\theta_H^2 \rho_H}{2\rho_H - \rho_L}\).
Appendix to Chapter 5

SPECIFICATION TESTS

Specification tests: new franchised-outlets f1

<table>
<thead>
<tr>
<th></th>
<th>Q1</th>
<th>Q2</th>
<th>Q3</th>
<th>Q4</th>
</tr>
</thead>
<tbody>
<tr>
<td>F</td>
<td>2.66, pv: 0.0088</td>
<td>1.41, pv: 0.02308</td>
<td>1.86, pv: 0.0904</td>
<td>3.41, pv: 0.0058</td>
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<tr>
<td>$R^2$</td>
<td>0.5013</td>
<td>0.5012</td>
<td>0.5592</td>
<td>0.7191</td>
</tr>
<tr>
<td>Leverage</td>
<td>-2.05, pv: 2.68</td>
<td>-1.64, pv: 2.83</td>
<td>-1.64, pv: 2.504</td>
<td>-1.94, pv: 2.02</td>
</tr>
<tr>
<td>Ramsey RESET</td>
<td>0.74, pv: 0.5335</td>
<td>1.73, pv: 0.1964</td>
<td>1.14, pv: 0.3569</td>
<td>3.65, pv: 0.338</td>
</tr>
<tr>
<td>omitted variables</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Breusch-Pagan*</td>
<td>2.18, pv: 0.1397</td>
<td>2.21, pv: 0.1374</td>
<td>0.26, pv: 0.6082</td>
<td>1.19, pv: 0.2747</td>
</tr>
<tr>
<td>Skewness/Kurtosis</td>
<td>5.19, pv: 0.0747</td>
<td>5.84, pv: 0.0540</td>
<td>5.4, pv: 0.0673</td>
<td>0.78, pv: 0.6755</td>
</tr>
<tr>
<td>VIF mean</td>
<td>1.96</td>
<td>2.67</td>
<td>3.71</td>
<td>2.71</td>
</tr>
<tr>
<td>N</td>
<td>52</td>
<td>37</td>
<td>38</td>
<td>36</td>
</tr>
</tbody>
</table>

Variables removes because of VIF: capital for the installation,
Franchisor remove because of outliers: Service - Light Depil, Auto Spa express

<table>
<thead>
<tr>
<th></th>
<th>capital for the installation,</th>
<th>capital for the installation,</th>
<th>capital for the installation,</th>
<th>capital for the installation,</th>
</tr>
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<tbody>
<tr>
<td>Franchisor remove because of outliers</td>
<td>- Service Pratis e Lanches Premiatto Frelhados, massas esaladas Buddha Spa</td>
<td>- Service Primal Clean</td>
<td>- Ntw Contabilidad e Gestao Empresarial</td>
<td></td>
</tr>
<tr>
<td>Endogeneity</td>
<td>upfront fee</td>
<td>Royalty rate</td>
<td>advertising rate</td>
<td>market share</td>
</tr>
<tr>
<td></td>
<td>0.7, pv: 0.4055</td>
<td>1.05, pv: 0.3096</td>
<td>0.04, pv: 0.8495</td>
<td>0.17, pv: 0.6830</td>
</tr>
<tr>
<td></td>
<td>3.51, pv: 0.0696</td>
<td>1.81, pv: 0.1878</td>
<td>0.00, pv: 0.9714</td>
<td>3.7, pv: 0.0630</td>
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<td></td>
<td>0.58, pv: 0.4509</td>
<td>1.64, pv: 0.2082</td>
<td>0.23, pv: 0.6316</td>
<td>0.22, pv: 0.6457</td>
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<tr>
<td></td>
<td>1.82, pv: 0.1868</td>
<td>0.98, pv: 0.3297</td>
<td>5.23, pv: 0.0287</td>
<td>1.69, pv: 0.2020</td>
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<tr>
<td>market share income</td>
<td>1.17, pv: 0.2841</td>
<td>0.46, pv: 0.5006</td>
<td>0.28, pv: 0.6007</td>
<td>0.00, pv: 0.9995</td>
</tr>
<tr>
<td>turnover average</td>
<td>0.05, pv: 0.8226</td>
<td>0.61, pv: 0.4394</td>
<td>5.27, pv: 0.0278</td>
<td>0.37, pv: 0.5463</td>
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<tr>
<td>international rate</td>
<td>0.28, pv: 0.5962</td>
<td>0.09, pv: 0.7601</td>
<td>0.26, pv: 0.6160</td>
<td>7.97, pv: 0.0080</td>
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<tr>
<td>P company-owned</td>
<td>0.37, pv: 0.5463</td>
<td>2.12, pv: 0.1544</td>
<td>0.25, pv: 0.6185</td>
<td>0.49, pv: 0.4876</td>
</tr>
<tr>
<td>age</td>
<td>10.31, pv: 0.0023</td>
<td>3.08, pv: 0.0883</td>
<td>0.37, pv: 0.5460</td>
<td>1.32, pv: 0.2593</td>
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Table D.1: OLS regression f1. * After removing the outliers. pv: p-value. OLS coefficients results are not included in this table.
Specification tests: new franchised outlets f2

<table>
<thead>
<tr>
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<th>Q1</th>
<th>Q2</th>
<th>Q3</th>
<th>Q4</th>
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</thead>
<tbody>
<tr>
<td>F</td>
<td>3.67, 0.0008</td>
<td>1.24, 0.000</td>
<td>1.81, 0.0004</td>
<td>4.23, 0.0014</td>
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<tr>
<td>$R^2$</td>
<td>0.4424</td>
<td>0.4589</td>
<td>0.5528</td>
<td>0.7514</td>
</tr>
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<td>Leverage</td>
<td>-1.71,1.46</td>
<td>-1.61,2.23</td>
<td>-1.51,2.70</td>
<td>-1.97,2.12</td>
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<tr>
<td>Ramsey RESET</td>
<td>4.74,0.072</td>
<td>0.76,0.5327</td>
<td>2.33,0.1067</td>
<td>0.94,0.3319</td>
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<tr>
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</tr>
<tr>
<td>Breusch-Pagan*</td>
<td>0.47,0.4919</td>
<td>1.36,0.2433</td>
<td>0.15,0.685</td>
<td>1.14,0.2851</td>
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<td>Skewness/Kurtosis</td>
<td>2.32,0.3137</td>
<td>4.63,0.0989</td>
<td>4.71,0.0947</td>
<td>0.49,0.7818</td>
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<tr>
<td>VIF mean</td>
<td>1.97</td>
<td>2.37</td>
<td>3.53</td>
<td>2.76</td>
</tr>
<tr>
<td>N</td>
<td>52</td>
<td>37</td>
<td>38</td>
<td>36</td>
</tr>
</tbody>
</table>

Variables removes because of VIF
- capital for the installation, proportion of franchised

Franchisor remove because of outliers
- Service: Light Depil
- Service: Parmeggio, Pratos e Lanches
- Premiatto-Frehados, massas esaladas
- Buddha Spa
- Ortodontic Center
- On byte Commerce
- Moldura Minuto
- Service: Prima Clean
- Ntw Contabilidad e Gestao Empresarial
- Service: Sigbol Fashion

Endogeneity
- upfront fee
- Royalty rate
- advertising rate
- market share
- market share income
- turnover average
- international rate
- Proportion of company-owned
- age

Table D.2: OLS regression f2
* after removing the outliers
pv: p-value.
OLS coefficients results are not included in this table.
RESULTS FROM THE TWO-SEPT CLUSTER ANALYSIS

Cluster analysis: Q1

Q1. Cluster Quality

Figure D.1: Cluster Quality of Q1

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<th>Experience</th>
<th>G. average units 2012</th>
<th>International rate</th>
<th>M. share income ave.</th>
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Table D.3: Cluster statistics Q1
Cluster analysis: Q2

Q2. Cluster Quality

![Figure D.2: Cluster Quality of Q2](image)

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<th>M. share income ave.</th>
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Table D.4: Cluster statistics Q2
Cluster analysis: Q3

### Q3. Cluster Quality

![Silhouette measure of cohesion and separation](image)

**Figure D.3: Cluster Quality of Q3**

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<th>Market Saturation</th>
<th>NVP</th>
<th>Growth units 2012</th>
<th>Experience</th>
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<th>Internatio- nal rate</th>
<th>M. share income ave.</th>
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**Table D.5: Cluster statistics Q3**
Cluster analysis: Q4

Q4. Cluster Quality

![Figure D.4: Cluster Quality of Q4](image)

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| Intercept      | 100.0      | 1.789e-02| 4.502e-02| 3.153e-02       | 1.219e-01       | -6.466e-02      | 9.749e-03       | 8.422e-02      |
| localization   | 16.3       | 1.431e-02| 1.824e-02|                 |                 |                 |                 |                 |
| franchisor quality | 5.8     | 4.620e-04| 6.008e-07|                 |                 |                 |                 |                 |
| turnover a.    | 24.4       | 2.650e-07| 4.055e-03| 1.206e-06       |                 |                 |                 |                 |
| experience     | 7.3        | 1.847e-04| 8.492e-02|                 |                 |                 |                 |                 |
| Propor. owned  | 26.2       | 3.389e-02| 3.684e-01|                 |                 |                 |                 |                 |
| intern. rate   | 7.4        | -5.069e-02| 2.738e-01|                 |                 |                 |                 |                 |
| M. share       | 7.3        | 1.648e-02| 1.241e-01|                 |                 |                 |                 |                 |
| M. saturation  | 6.5        | -3.460e-03| 4.996e-01|                 |                 |                 |                 |                 |
| Adver. rate    | 6.5        | 8.152e-03| 1.721e-02|                 |                 |                 |                 |                 |
| Royalty rate   | 66.1       | -1.883e-02| 3.493e-07| 3.51E+01        | 6.81E+07        | 4.62E+07        |                 |                 |
| T. investment  | 38.7       | 2.221e-07| 3.780e-07|                 |                 |                 |                 |                 |
|                |            |          |           | 2               | 1               | 2               | 2               | 2               |
| nVar           |            |          |           | 0.145           | 0.213           | 0.130           | 0.195           | 0.189           |
| r2             |            |          |           | -2.185e+00      | -1.634e+00      | -1.554e+00      | -7.966e-01      | -5.493e-01      |
| BIC            |            |          |           | 0.085           | 0.065           | 0.062           | 0.043           | 0.038           |
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Table D.10: Q4 results from BMA