# Investment Requirements in Franchise Contracts as a Self-Enforcing Device: Theory and Evidence.

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In a setting in which franchisees that operate under a common brand name have incentives to free-ride on each other's sales effort, we examine how a franchisor uses investment requirements as a tool to reduce franchisees' underprovision of sales effort. Theoretically, we show that if the franchisor's reputation is highly important the franchisor asks for higher investment requirements when penalizing a misbehaving franchise is more difficult (weaker law enforcement) and when directly monitoring franchisees is more costly. We empirically test the theoretical predictions using two datasets at the franchisor level. We measure weak law enforcement using the passing of state level good-cause termination/nonrenewal laws for franchise contracts and we measure monitoring costs using the number of states in which a franchisor operates. Using a database that contains information for 279 franchisors, before and after the laws were passed in some states, we find that the passing of the laws implied an incremental 2% increase in investment requirements for franchisors located in states where the laws were passed. Using a large database (10,047 franchisor-year observations), posterior to the passing of the laws, we find that franchisors located in states where good-cause termination/nonrenewal laws were passed ask for investment requirements 4.8% higher than franchisors located in states without such laws, and that when a franchisor expands its operations to an additional state it increases investment requirements by 0.64%.

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# 1 Introduction

Investment requirements in franchise contracts are the amount franchisors ask franchisees to invest in the opening of a new franchise unit.[1] The franchisor determines the size of the outlet, specifies the architectural design and leasehold improvements. She also determines the equipment and furniture the franchisee needs to purchase. In addition, investment requirements usually include working capital and sometimes money for the lease. It is commonly thought that once the franchisor's retailing format is defined, variations in the investment requirements depend exclusively on the market characteristics where a franchise unit operates. Contrary to that view, this paper offers theoretical and empirical evidence that franchisors strategically choose the amount of investment requirements. Franchisors modify their investment requirement to discipline franchisees.

Franchise chains represent over 40% of retail sales in the United States according to the International Franchise Association [IFA], 2004. Franchises encompass variety of business formats. Educational services, such as day-cares, car repair shops, fast food restaurants, clothing retailers and lodging are common formats in franchises, just to mention a few.[2] On average, the investment requirements a franchisor asks franchisees is over half a million dollars.[3] In spite of its great economic relevance, the determinants of investment requirements have not being studied before, most likely because it is thought that the franchisor does not play a major role in modifying them.

This paper proposes a theoretical model that endogenizes the investment decision in franchise contracts. The model considers a moral hazard problem where each franchisee can free-ride on the other franchisees' sales effort. This engenders a misalignment of incentives between the franchisor and the franchisee even if the franchisee is the residual claimant (zero royalty rate). As a consequence, franchisees will underprovide sales effort, hurting the franchisor's reputation. Alignment of these incentives requires a self-enforcement mechanism. We consider that investment requirements generate a permanent increase in franchisee's earnings as the more franchisees invest, the higher their selling capacity will be. In this scenario, a franchisee that is asked for higher invest-

[1] The franchisee covers 100% of this ex-ante investment.

[2] See Table 3 for a broader characterization of formats common to franchising.

[3] Using 15 years of Bonds' franchise guide, for 2,017 franchisors, the average investment requirements is $520,000.

ment requirements will have more to lose, in case of contract termination. When a franchisee's incentives to provide the appropriate level of sales effort are weak, the franchisor can correct his incentives by requiring higher investments in order to generate the necessary ex-post rents that discipline the franchisee's behavior. While the higher ex-post rents might not be sufficient to cover the extra investment that generates them, asking for the extra investment might still be a profitable strategy for the franchisor, because it precludes the franchisee from underproviding sales effort and hurting the franchisor's reputation, which is the franchisor's most valuable asset. In particular, the model concludes that if the franchisor's reputation is highly important the franchisor asks for higher investment requirements when penalizing a misbehaving franchise is more difficult (weaker law enforcement) and when directly monitoring franchisees is more costly. These results hold for any degree of specificity in the assets that compose the investment requirements as the fear of losing future earnings is enough to generate self-enforcement.[4]

Empirically, we measure weak law enforcement with the passing of state level good-cause termination/nonrenewal laws, which weaken the franchisor's ability to terminate/not-renew a contract with an underperforming franchisee. These laws were passed in 14 states between 1971 and 1980 and in Iowa in 1992. We measure monitoring costs using the number of states in which a franchisor operates. We use two panel datasets to test our predictions. The unit of observation in both datasets is a franchisor-year. The first dataset consists of 279 franchisors that offered contracts to prospective franchisees both in 1979 and 1982 (558 franchisor-year observations). The main result from this dataset is that franchisors headquartered in the states in which the good-cause laws were passed in 1980, California (39 franchisors) and Illinois (21 franchisors), incrementally increased the average investment requirements asked to prospective franchisees by 2.1% relative to franchisors located in states where there was no change in the law. The second dataset is a large unbalanced panel dataset for the period 1994-2009. This dataset contains yearly prospective contract information for 2,017 franchisors, totalizing 10,047 franchisor-year observations. As this dataset is posterior to the passing of the laws it only allows us to analyze the between franchisor contract variation according to the franchisors' state regulation. It is found that franchisors located in the states where good-cause laws were passed ask for investment requirements 4.8% higher than franchisors located in states without such laws. Additionally, using both datasets we find evidence that franchisors that expand their operations to an additional state increase the average investment requirements

[4]Higher asset specificity, however, can also help generate better enforceability conditions as less is recovered by the franchisees in case of termination.

they ask a prospective franchisee between 0.6-1%. This result is robust to the inclusion of controls variables that capture the endogeneity of the expansion decision and to the inclusion of additional variables that control for alternative explanations other than the monitoring cost hypothesis.

Most prominent works in theoretical franchise literature study franchisor's royalty rates and initial franchise fees decisions (see Mathewson and Winter (1985), Lal (1990) and Bhattacharya and Lafontaine (1995)). These papers, however, do not consider investment requirements as a contract term. Additional papers have offered some arguments about how investment requirements can play a role in franchise contracts. Klein (1980, 1995) considers that investment requirement can affect the franchisee's effort through self-enforcement, because the franchisee can lose some of its investments in case of termination. Klein (1980) puts emphasis on how non-salvageable value of the assets that compose the investment requirements plays a role in self-enforcement, while Klein (1995) puts emphasis on how the future earnings that investment requirements can generate, which are lost in case of a contract termination, play a role in a self-enforcement mechanism. Dnes (1993) adapted Williamson's analysis of transaction costs to empirically study the role that the asset specificity of investment requirements plays on franchise contracts. Through a case study of 15 franchise contracts in the United Kingdom, he argues that the specificity of investment requirements plays a role in generating some termination covenants. In Klein (1980, 1995) and Dnes (1993) analyses, however, investment requirement is not considered a decision variable. Investment requirements is considered just as a channel through which asset specificity and future earnings play a role in generating new contract covenants and boosting the franchisee's effort through self-enforcement. The present paper adds to the literature by being the first to explicitly model the franchisor's choice of investment requirements and exploring what its determinants are.

Outside of the franchise literature, the present model shares similarities with an employee posting a bond to his employer, which is recovered if he does not shirk (see Shapiro and Stiglitz 1984).[5] This mechanism was argued not to work in an employer/employee relationship as presumably the employee does not have enough initial wealth to post the bond in the first place. In a franchise setting, however, this mechanism is more plausible, as potential franchisees are expected to invest in opening a franchise unit.

Due to the lack of theoretical guidance regarding the determinants of investments requirements there was no previous attempt to empirically study this variable. Empirical research in the franchise

[5]This mechanism is an extension of the efficiency wage model proposed by the same authors.

literature revolved around the study of initial franchise fees, royalty rates (Lafontaine (1992), Sen (1993), Wimmer and Garen (1997), Lafontaine and Shaw (1999), among others) and some other contract terms such as area development agreements, mandatory advertisement expenditures, franchisee's passive ownerships (Brickley (1999)) and contract length (Brickley et al. (2006)). Moreover, in all of these studies investment requirements are considered an exogenous explanatory variable, while the present paper shows that it is an endogenous contract term.[6]

The results presented here highlight that investment requirements are not completely exogenously determined. It is shown that investment requirements can be adjusted on the margin to generate better enforceability conditions. The academic and practical importance of these results, for understanding the economics of franchise contracts, is substantially enhanced by the size of the investment requirements. To put it in context, investment requirements are, on average, more than 15 times higher than initial franchise fees.

The rest of the paper is organized as follows. In section 2, we present and solve the theoretical model. Section 3 describes the empirical approach. Section 4 describes the dataset. In section 5 the results are presented. Finally, section 6 concludes.

# 2 Theoretical Model

In this section we develop a static model in which the franchisor can choose the investment requirement she asks franchisees. First, we provide the general structure of the model. Then, we define specific assumptions according to the general structure. Finally, we solve the model and derive the comparative statics on how investment requirements change with variations in the model parameters.

## 2.1 General structure

In franchise contracts, incentives of the franchisor and their franchisees do not always coincide even if the franchisees are the residual claimers of the franchisor's business, because franchisees

[6] Betancourt (2004) was the first to critique the use of investment requirements as an exogenous variable in the empirical franchise literature, given its potential endogeneity. However, he does not provide a theoretical model to guide what the determinants of investment requirements are.

can free-ride on a common brand name.[7] As Klein (1995) points out *"...when franchisees use a common brand name, each franchisee can reduce its costs by reducing the quality of the product it supplies without bearing the full consequences of doing so. Because a reduction in quality has the effect of reducing the future demand facing all franchisees using the common name, not just the future demand facing the individual franchisee who has reduced quality, the incentives for individual franchisees to supply the desired level of quality is reduced"* (pp. 12-13).

In our setting, we will treat what Klein (1995) calls 'quality' more broadly. We will define quality as sales effort, which is the effort the franchisee exerts to operate the franchise unit according to the terms agreed upon in the franchise contract with the franchisor. Within the sales effort, we are considering several dimensions of distribution services, like ambiance, product assortment, maintaining a certain level of customer service and maintaining a standardized level of quality for the products sold.[8] We assume these terms can be contracted on, but their observability is imperfect. The franchisor relies on inspections as a monitoring device to detect, with some probability, any underprovision of sales effort of franchisees. The idea of the optimal contract is that the franchisor uses the investment requirements she asks franchisees to generate a self-enforcement mechanism. This mechanism is essential for the franchisor since the value of his brand relies heavily on maintaining a uniform level of distribution services. In short, the main assumption of the model are that investment requirements are perfectly contractible, while sales efforts are not.[9]

The idea that investment requirements in franchise contracts can be used as a tool for self-enforcement is not new. Klein (1980) states that if a franchisee's investment is highly specific, the non-salvageable investment can act as a "collateral bond," because if the franchisee cheats (i.e., under-provide sales effort) and is caught, he is left almost empty-handed, given that the resale price of the assets in which he invested to run the franchise unit diminishes with their specificity. Klein (1995) additionally states that investment increases the ongoing value of the relationship, no matter who pays for the investment. In sum, higher investment increases the value of staying in

[7] Klein (1995) points out three other reasons of why incentives might be misaligned. First, franchisees can free-ride on pre-purchase services that can be obtained free from other franchisees. Second, franchisors and franchisees can disagree in the optimal amount of marketing effort. Finally, franchisees can sell the franchisor's products at a high markup if they have some monopoly power, creating a double marginalization problem. In contrast with franchising on a common brand name, none of these situations are present in all franchise contracts. However, the first two situations are captured by our model, given that they translate into franchisees under providing sales effort.

[8] For a broader definition of distribution services see Betancourt (2004).

[9] The franchisor is closely involved in the installation of a new franchisee, so he can enforce the investment requirements specifications.

the relationship but also alters the value of cheating since it affects the residual value of investment for any given asset specificity. We will add these two ingredients to our model.[10]

The future profits and the outside option of the franchisee are not the only components of the self-enforcement mechanism. As pointed out by Lafontaine and Raynaud (2002), self-enforcement also depends on the franchisor's monitoring and his ability to terminate the franchise contract.

The monitoring frequency is endogenously determined by the franchisor. To focus on the investment decision and keep the model tractable, we assume that there are only two possible monitoring intensities, high and low, such that the franchisor's decision on monitoring intensity depends solely on the cost difference of these two available options. In this fashion, a direct mapping between monitoring costs and monitoring intensities allow us to study the effect that monitoring costs has on investment requirements through its effect on monitoring intensities.

On the other hand, the franchisor's ability to terminate the franchise contract is naturally exogenous, because it depends on the legal framework under which franchises operate. We will define weaker law enforcement when it is harder to terminate a franchise agreement in which the franchisee has clearly under-provided sales effort. We assume that if a franchisor ends a relationship, there will be a monetary loss for both the franchisor and the franchisee. The franchisor might be willing to undertake this loss because if he does not commit to terminate an underperforming franchisee, then no franchisee will exert the appropriate level of sales effort.[11] We analyze the effect of law enforcement on the investment requirement.

We assume that the franchisor's actions, such as giving ongoing support to the franchisees, have no incidence on the franchisees' demand. Allowing this additional feature will turn the model into a double moral hazard problem as the franchisor could also refrain to exert the appropriate level of effort in her actions. Not modeling the franchisor's moral hazard problem can be considered an important omission as Lal (1990), Battacharyya and Lafontaine (1995) showed that this feature is the main justification for the existence of a positive royalty rate.[12] The intuition is that only a positive royalty rate gives the franchisor an interest in the revenues of the franchisees. We

[10] Dnes (2003) provides a similar argument regarding the dual role of investments.

[11] In reality, monitoring intensity can also be affected by the strength of the law enforcement. We rule out this possibility in our model by only having two possible monitoring intensities.

[12] There are two alternative mechanisms that can generate positive royalty rates: franchisee's risk aversion and franchisee's limited liability. The former has not found empirical support in the literature (see Lafontaine and Slade (2007)), while the latter does not give any prediction about what the determinants of royalty rates are.

do not model the franchisor's opportunistic behavior for mathematical tractability.[13] We focus our attention on the determinants of investment requirements, not considering the potential effects these determinants might have on the royalty rate. If the franchisor's moral hazard problem is modeled, changes in the model exogenous parameters would have two margins of adjustment, royalty rates and investment requirements, rather than just investment requirements. Therefore, its inclusion would only alter the magnitude of the effect of the exogenous parameters on investment requirements, not the sign of the effect.

We also assume that franchisors cannot end (or threaten to end) franchise agreements opportunistically, that is, without a good cause for termination. In other words, we assume that the franchisor does not try to end a relationship to take over a profitable franchisee or threaten to end a profitable franchisee in order to renegotiate the contract terms in its favor. We think this is a reasonable assumption for two reasons. First, unfairly terminating a franchise agreement would hurt the franchisor's reputation. Second, Lafontaine and Shaw (2005) found that franchisors target a stable percentage of owned outlets in the long run (after 7 years of operation); therefore, when the franchise gets established no pattern of ownership redirection is observed.

Finally, we leave aside other non pecuniary clauses of franchise contracts that can affect self-enforcement, like exclusive territories (see Klein and Murphy 1988), or the effect that asset specificity might have on contract length or other specific clauses as discussed by Williamson (1975, 1979, 1985).

## 2.2 Specific Assumptions

We assume there are $N$ identical franchisees and one franchisor. The franchisor and the franchisees are risk neutral.[14] We assume that the franchisees' demand is $q_i(p_i, I_i, \hat{S}) + \varepsilon_i$, where $p_i$ is the price of the good sold, $I_i \in [0, \infty)$ is the investment requirement, $\hat{S}$ is a compound of the firm's sales effort and the other franchisees' sales efforts and $\varepsilon_i$ is a white noise random shock in the realization of the demand.

We assume that the price is fixed at $p_i = 1$, for simplicity, although relaxing this assumption

[13] The comparative statics will be based on a Hessian rather than on an implicit equation.

[14] LaFontaine and Slade (1997, 2007) document that there is no evidence in favor of the hypothesis that franchisees' risk aversion plays an important role in the design of franchise contracts.

does not change the results of the model.[15] $\hat{S} = (1-\theta)S_i + \theta \sum_{i=1}^{N} \frac{S_{-i}}{N-1}$, where $S_i \in [0, \infty)$ represents the franchisee's own sales effort, $S_{-i} \in [0, \infty)$ represents the sales effort of other franchisees and the parameter $\theta \in [0, 1]$ is a measure of the magnitude of the externality. We assume this specification so that changes in $\theta$ alter only the composition of sales efforts on demand, not its magnitude. The demand has a random shock component $\varepsilon_i \sim N(0, \sigma^2)$. This term is needed because without it the franchisor could infer the sales effort from the quantity demanded. Let $\frac{\partial q_i(I_i,\hat{S})}{\partial I_i} > 0$, $\frac{\partial^2 q_i(I_i,\hat{S})}{\partial I_i^2} = 0$, $\frac{\partial q_i(I_i,\hat{S})}{\partial \hat{S}} > 0$; $\frac{\partial^2 q_i(I_i,\hat{S})}{\partial \hat{S}^2} = 0$ and $\frac{\partial^2 q_i(I_i,\hat{S})}{\partial \hat{S} \partial I_i} = 0$. These derivatives represent that investment and sales effort increase demand and that there are no complementarities between sales effort and investment.[16] The assumption that the second derivatives of demand with respect to investment requirements and sales effort are zero was chosen for simplicity, but all the results of the model still hold if we assume they are negative.

We assume that the marginal cost of producing $q_i$ is constant and equal to zero, without loss of generality. Let $\iota(I_i)$ be the cost of investment and $C(S)$ be the cost of sales effort. Both are assumed to be increasing and convex and satisfy $\iota(0) = \iota'(0) = C(0) = C'(0) = 0$ to guarantee an interior solution.[17] Let $\rho$ be the royalty and $f$ the initial franchise fee. Each franchisee is assumed to have an outside option of $U$. Let $\Pi^{fe}$ be profits of the franchisee and $\Pi^{fr}$ profits of the franchisor. Initially, assume there is no monitoring mechanism.

The timing of the model is as follows. At time 1, the franchisor chooses $f, I$ and $\rho$. At time 2, the franchisees observes $f, I$ and $\rho$ and chooses the sales effort, $S_i$. Profits are realized at $t = 2$. In

[15] Allowing a franchisee to choose price in the model increases the marginal benefits the franchisee obtains from selling an additional unit, because the franchisee can also adjust the price optimally. As a consequence, the marginal benefit of exerting sales effort increases when the franchisee can chose the price, and this implies that more will be lost in case of contract termination. This can only alter the magnitude, but not the directions of the results we derived. The fixed price model we develop above is equivalent to a reduced-form model of the true underlying phenomenon where the price can be optimally adjusted.

[16] Investment and sales effort can be considered complements. In the case of a franchise restaurant, higher investment can imply a better ambiance or better kitchen appliances. These features makes selling easier, increasing the marginal benefit of sales effort. If this were the case, investment would facilitate self-enforcement not only due to an increased punishment in case of termination, but also by increasing the marginal benefit of sales effort directly. As a consequence, complementarities between sales effort and investment requirements only strengthen the role of investment requirements as a self-enforcing device.

[17] Investment costs are convex for 2 reasons: First, mathematically they help to satisfy the global concavity assumptions of the model. Second, intuitively, when franchisees with limited initial wealth ask for a loan, they are charged higher interest rates the higher the amount they ask, given that the risk of the loan increases. Therefore, the net present value of obtaining the financing increases in a convex fashion. If we want to be more precise, the costs of funding would be better expressed as $I + g(r(I))$ where $g(.)$ is a function of the NPV of the cost of the interest paid over the loan which is an increasing function of the interest rate, which is in turn an increasing function of the investment. Strictly speaking, the cost of the investment needs to be convex only for the relevant range. It can be flat for small values of investment (i.e: amounts that the franchisee can pay in cash).

this setting, profits represent the future stream of profits generated in the franchise agreement.

## 2.3 No monitoring technology and first best

Initially, consider a model without a monitoring mechanism: $S_i$ cannot be observed by the franchisor.

The franchisees' objective function is:

$$\max_{S_i} E\left(\Pi^{fe}\right) = (1-\rho)q_i(I_i, \hat{S}) - C(S_i) - \iota(I_i) - f$$

Assume that the franchisor's objective function includes a reputation cost if the franchisees do not provide the socially optimal sales effort, $\bar{S}$. Let this cost be $\beta\varphi\left(\bar{S} - S_i\right)$ if $S_i < \bar{S}$ and 0 if $S_i \geq \bar{S}$; where $\varphi\left(\bar{S} - S_i\right)$ is a function of the underprovision of sales effort and $\beta$ is a scalar that represents the severity of the loss in reputation. We assume that $\beta$ is positive and large to represent that the future reputation of the franchisor has a big weight in his objective function. Let the first derivative of $\varphi\left(\bar{S} - S_i\right)$ with respect to sales effort be $-\varphi'(S - S_i) < 0$ and the second derivative be $\varphi''(S - S_i) > 0$. This specification reflects that the cost of reputation increases at an increasing rate with the underprovision of sales effort.[18] Strictly speaking, the reputation cost is the loss of future reputational rents. When a franchisor cannot maintain a high level of sales effort from her actual franchisees, future franchisees that choose to contract with the franchisor will have their demand reduced and this, in turn, reduces the rents the franchisor can extract from those future franchisees.[19]

The franchisor's objective function is:

[18] A reputation cost is needed because, in absence of it, when a franchisee is underproviding sales effort, the franchisor will not use investment requirements to overcome this problem. As the marginal cost of investment is increasing, the franchisee needs to be compensated through a lower franchise fee for additional investment requirements. In this scenario, the franchisor allows the underprovision of sales effort rather than asking for a smaller franchise fee. On the other hand, when there is a reputation cost, the cost of underproviding sales effort is large. Therefore, the franchisor prefers to ask for a higher investment requirement even if this implies obtaining a reduced franchise fee.

[19] Tirole (1988, pg 122) provides a useful example of how reputational loses can be expressed in net present value.

$$\max_{\rho,I,f} E\left(\Pi^{fr}\right) = \sum_{i=1}^{N}\Big(\rho q_i(I_i,\hat{S}) + f - \beta\varphi\left(\bar{S}-S_i\right)\Big)$$

$$s.t$$

$$\text{Individual Rationality constraint}_i\ \forall i$$

$$\text{Best Response function}_i\ \forall i$$

The franchisor incorporates each franchisee's best response function at $t = 2$ and their individual rationality constraints. The franchisee's best response function is the franchisee's first order condition of profits with respect to sales effort, in a symmetric equilibrium. The individual rationally is the constraint that a franchisee's gets, in expectation, at least as much as what he would have obtained from his outside option.

In this scenario, the first best is obtained by maximizing the sum the profits of the franchisees and the franchisor. Notice that in this scenario, by definition, $S_i^* = \bar{S}$, implying that the reputation cost is zero. The first best optimization problem can be stated as:

$$\max_{S_i,I_i}\sum_{i=1}^{N}\Big(q_i(I_i,\hat{S}) - C(S_i) - \iota(I_i)\Big)$$

Taking the first order conditions with respect to investment and sales, and given the symmetry of the franchisees, we obtain:

$$\frac{\partial q_i(I_i,\hat{S})}{\partial I_i} = \iota'(I_i) \tag{1}$$

$$\frac{\partial q_i(I_i,\hat{S})}{\partial S_i} = \frac{\partial q_i(I_i,\hat{S})}{\partial \hat{S}} = C'(S_i) \tag{2}$$

Considering that $\frac{\partial^2 q_i(I_i,\hat{S})}{\partial\hat{S}\partial I_i} = 0$, equation (1) uniquely determines the first best investment requirement that a franchisor asks a franchisee, $I_{FB}^*$, and equation (2) uniquely determines the first best level of sales effort that a franchisee should exert, $S_{FB}^*$.

Without a monitoring technology, this equilibrium will not be achieved due to the externality problem. Absent monitoring, the franchisee, in period 2, chooses $S_i$ to maximize his objective function obtaining:

$$(1-\rho)\frac{\partial q_i(I_i,\hat{S})}{\partial S_i} = (1-\rho)\frac{\partial q_i(I_i,\hat{S})}{\partial \hat{S}}(1-\theta) = C'(S_i) \tag{3}$$

By symmetry $S_i = S_{-i} = S$. Thus, equation (3) can be expressed as:[20]

$$(1-\rho)\frac{\partial q(I,\hat{S})}{\partial \hat{S}}(1-\theta) = C'(S) \tag{4}$$

According to equation (4) sales effort does not depend on the investment requirement. This is because we do not have a monitoring mechanism that can create the threat of termination and cause self-enforcement. Additionally, even without solving the franchisor's optimization problem we can see that the only way the franchisor can affect the franchisee's sales effort is through the royalty rate. The lower royalty rate, the higher the sales effort is. However, even when royalty is set to be equal to zero, there is an underprovision of sales effort given that each franchisee considers the marginal benefit of their own sales effort and not the benefit their sales effort has on the other's franchisees. The higher the externality $\theta$, the more severe the underprovision of sales effort is. Therefore, the franchisor needs a method to boost sales effort.

## 2.4 Monitoring Mechanism

The probability of detecting a franchisee underproviding sales effort has two components: the monitoring intensity, which is how often a franchisor inspects a franchisee, and the franchisor's ability to detect an underprovision of sales effort during an inspection.

The monitoring intensity is endogenously chosen by the franchisor. Given that the model only has two periods, the monitoring intensity represents the probability of being monitored. Let $\eta$ be the monitoring intensity which can be either high, $\eta^H$, or low $\eta^L$, and they satisfy $0 < \eta^L < \eta^H < 1$. Let $\Phi$ be the monitoring cost. Without loss of generality let $\Phi^L = 0$ and $\Phi^H > 0$. We only allow for two intensities in order to keep the model tractable.[21] Initially, we assume that $\Phi^H$ is small such

[20] The fact that each franchisee's sales effort does not depend on the other's franchisee's sales effort is not a consequence of symmetry. This result follows our simplifying assumption that $\frac{\partial^2 q_i(I_i,\hat{S})}{\partial \hat{S}^2} = 0$.

[21] If we allow the monitoring intensity to be a continuous variable the comparative statics will be based on Hessians rather than single equations.

that it is always profitable for the franchisor to monitor more intensively, $\eta^H$, for any investment requirement and sales effort. Later, we study the consequences of an increase in monitoring costs.

Even if the franchisor inspects the franchisee and the franchisee is underproviding sales effort, it can still be the case that the underprovision is not perceived because the underprovision is small and can go unnoticed, or because an error of assessment. Therefore, we assume there is an exogenous probability of detecting underprovision of sales effort when there is underprovision. Let the probability of detecting underprovision during an inspection be $F(\bar{S}-S_i)$, where $F(\bar{S}-S_i) > 0$ $\forall S_i < \bar{S}$ and $F(\bar{S}-S_i) = 0$ $\forall S_i \geq \bar{S}$. For $\forall S_i \leq \bar{S}$ we assume that higher sales effort makes detection of an underprovision less likely, $-f(\bar{S}-S_i) \leq 0$, and that higher sales effort decreases this probability at a decreasing rate, $f'(\bar{S}-S_i) < 0$. Further, we assume that $f(0) = 0$ and $f''(\bar{S}-S_i) = 0$. The intuition for this specification is that during an inspection, if the underprovision of sales effort is small it is harder to detect it than when it is large.

Putting together the monitoring intensity and the probability that the franchisor detects an underprovision of sales effort, when there is one, during an inspection, we get the ex-ante probability of detecting an underprovision of sales effort: $F(\bar{S}-S_i)\eta$. This monitoring mechanism expresses the contractibility of imperfectly observed sales effort. The timing of the game is as follows: The franchisor selects the monitoring intensity at $t = 1$ along with $f, \rho$ and $I$, and the franchisees, observing those decisions, simoultaneosuly select their sales efforts at $t = 2$.

We assume that if the franchisor finds a franchisee underproviding sales effort she would like to sanction the franchisee by terminating the franchise contract. Nevertheless, if the law enforcement under which they operate is weak it might be difficult to impose this sanction. Let $\gamma \in [0,1]$ be the probability of terminating the franchise contract when an underprovision has been detected. A higher $\gamma$ means stronger law enforcement. Therefore, the probability of terminating a franchise contract can be expressed as $F(\bar{S}-S_i)\eta\gamma$.[22]

We assume that if a franchisee is found cheating the franchise relationship will be terminated and the franchisee will only have access to the salvage value of his investment: $(1-\alpha)I$. Let $\alpha \in [0,1]$

[22] The probability of termination/nonrenewal has been quantified in the franchise literature. Dnes (2003) surveyed 57 franchisors in the United Kingdom finding that 58% of them declared to have used anticipated termination as a control device when observing misbehaving franchisees. Additionally, 5% if the franchisors responded that they have not renewed a franchise agreement for the same reasons. In the United States, Blair and Lafontaine (2005) using USDOC (1988) data, provide evidence that in 1986, 3% of the 246,664 franchised outlets in operation in the United States were terminated in anticipation. This rate is consistent with Williams (1996) finding of a 15.7% of contract termination for a four-year period for 1,001 contracts analyzed. Blair and Lafontaine (2004) further document that around 40% of the anticipated contract terminations were propitiated by franchisors.

be the degree of asset specificity; $\alpha = 1$ means complete specificity and $\alpha = 0$ means complete generality.[23]

In this setting the franchisee's optimization problem at $t = 2$ is:

$$\begin{aligned}\max_{S_i} E\left(\Pi^{fe}\right) &= (1-\rho)\left[q_i(I_i,\hat{S})(1 - F(\bar{S} - S_i)\eta\gamma)\right] \\ &\quad + \left(F(\bar{S} - S_i)\eta\gamma\right)(1-\alpha)I_i - C(S_i) - \iota(I_i) - f\end{aligned}$$

The first order condition is:

$$(1-\rho)\left[\begin{array}{c} q_i(I_i,\hat{S})f(\bar{S} - S_i)\eta\gamma + \\ \frac{\partial q_i(I_i,\hat{S})}{\partial \hat{S}}(1-\theta)(1 - F(\bar{S} - S_i)\eta\gamma) \end{array}\right] - f(\bar{S} - S_i)\eta\gamma(1-\alpha)I = C'(S_i) \tag{5}$$

By symmetry $S_i = S_{-i} = S$. This implies that $\theta \sum_{i=1}^{N} \frac{S_{-i}}{N-1} = \theta S$. Thus, we can dispense the subindex $i$ from investment and demand.

Manipulating terms we obtain:

$$(1-\rho)\left[\begin{array}{c} \left(q(I,S) - \frac{(1-\alpha)I}{(1-\rho)}\right) f(\bar{S} - S)\eta\gamma + \\ \frac{\partial q(I,S)}{\partial \hat{S}}(1-\theta)(1 - F(\bar{S} - S)\eta\gamma) \end{array}\right] = C'(S) \tag{6}$$

For the monitoring technology to be useful it should increase the sales effort relative to the no monitoring scenario. This will happen if the marginal benefit of sales effort in equation (6) is higher than the marginal benefit of sales effort in equation (4) (without monitoring technology). This condition holds if:

$$\frac{f(\bar{S} - S)}{F(\bar{S} - S)} > \frac{\frac{\partial q(I,\hat{S})}{\partial \hat{S}}(1-\theta)}{\left(q(I,\hat{S}) - \frac{(1-\alpha)I}{(1-\rho)}\right)} \tag{7}$$

We assume the monitoring technology satisfies this criterion. The intuition is that the marginal effect of the monitoring technology, $f(\bar{S} - S_i)$, is strong enough so that the marginal benefits of

[23] Allowing for the possibility that the franchisee can sell the franchise to other potential franchisees pre-selected by the franchisor would lead to the same conclusions. In that case, specificity plays the role of limiting the number of potential buyers, reducing the resale value of the franchise. Other types of penalties such as non-renewal of the agreement or the franchisor's encroachment of the franchisee's territory have similar implications as contract termination. These penalties reduce the profits of the franchisee in case of misbehavior, so they can also act as self-enforcing devices.

increasing sales effort are big in comparison to the expected losses from ending the relationship and losing profits. If $F(\bar{S}-S)$ is large relative to $f(\bar{S}-S_i)$ the franchisee will end up exerting a lower sales effort than in the no-monitoring case since he will anticipate that his efforts will be in vain with a high probability.

We also assume that using the monitoring technology is profitable for the franchisor: the boost the monitoring technology generates in sales effort exceeds the expected losses from ending the agreement and the monitoring cost $\Phi$. In other words, we are using the assumption that the reputation cost is large. Finally, we assume that the monitoring technology is effective in controlling the externality. In equilibrium, $S$ is below, but near, the desired $\bar{S}$.

## 2.5 Solving the model

The model is solved by backwards induction. For space reasons, some of the mathematical derivations are relegated to Sertsios (2010). We keep here the derivations needed to understand the intuition of the model. Solving at $t=2$, we obtain equation (5), the reaction function of the franchisee. Applying the implicit function theorem to this equation it can be shown that franchisees' sales efforts are strategic complements: $\frac{dS_i}{dS_j}>0$. The intuition is that the higher the sales effort of the other franchisees, the higher the demand is, and thus it is more costly for the franchisee to lose profits, which in turn motivates them to exert a higher sales effort. Recall that using symmetry we can obtain equation (6). Here, we will write equation (6) in a more general way as:

$$\phi(S,\Omega,\rho,I)=0 \tag{8}$$

Equation (8) represents the behavior of each franchisee in equilibrium at $t=2$; $\Omega$ represents all the parameters in the model, from the point of view of the franchisee, besides $\rho$ and $I$.

At $t=1$ the franchisor solves:

$$\max_{\rho,I,f,\eta} E\left(\Pi^{fr}\right)=\sum_{i=1}^{N}\left(\begin{array}{c}\rho q_i(I_i,\hat{S})(1-F(\bar{S}-S_i)\eta\gamma)\\ +f-\beta\varphi\left(\bar{S}-S_i\right)-\Phi\end{array}\right)$$

$$
\begin{aligned}
\text{subject to} &: \\
\phi(S,\Omega,\rho,I) &= 0 \\
E\left(\Pi^{fe}(S,\Omega,\rho,I)\right) &\geq U
\end{aligned}
$$

The loss in the franchisors' profits due to the termination of a contract is captured by the probability of termination: $F(\bar{S}-S_i)\eta^H\gamma$. Only in the nontermination scenarios does the franchisor perceive the fraction $\rho$ of the franchisee's revenues. Franchisees are symmetric, implying that $\hat{S}=S_i=S$. This, in turn, implies that the outside summation can be simplified into just $N$. Recall that we are initially assuming that the costs of monitoring at high intensity are low, implying that the franchisor always decides to monitor with high intensity. Thus, the franchisor only needs to choose $\rho, I$ and $f$. Replacing the individual rationality constraint, which is binding through the appropriate choice of $f$, in the franchisor's objective function further reduces the choice variables to: $I, \rho$. Moreover, we can incorporate $\phi(S,\Omega,\rho,I)=0$ in the objective function by using the notation $S^*(I,\rho,\Omega)$. Then, the optimization problem can be expressed as:

$$
\max_{\rho,I} E\left(\Pi^{fr}(I,\rho,S^*(I,\rho,\Omega),\Omega)\right) = \begin{pmatrix} q(I,S^*(\rho,I,\Omega))(1-F(\bar{S}-S^*(\rho,I,\Omega))\eta^H\gamma \\ +\left(F(\bar{S}-S^*(\rho,I,\Omega))\eta^H\gamma\right)(1-\alpha)I \\ -\beta\varphi\left(\bar{S}-S^*(\rho,I,\Omega)\right)-C(S^*(\rho,I,\Omega))-\iota(I)-U-\Phi^H \end{pmatrix}
$$

Since we assume no moral hazard problem for the franchisor, the optimal royalty rate will be zero.[24] All the conclusions of the model are invariant to the inclusion of a royalty rate. The only variable left in the franchisor's optimization problem is the investment requirement.

## 2.6 Comparative statics

Our main goal is to analyze the effect on the investment requirement of an increase in the monitoring costs, $\Phi^H$, and weaker law enforcement, measured as a decrease in $\gamma$. We study the effect of these two parameters on investment requirements rather than studying the effect of all the model parameters on the investment requirements because only the predictions from these two parameters

[24] The franchisor's first order condition with respect to $\rho$, evaluated at $\rho=0$ is negative.

are empirically testable using the available franchise data sources.[25]

To begin, we analyze the effect of a change in any parameter in $\Omega$ on the investment requirement. Our starting point is the first order condition of the franchisor with respect to investment. We can write this first order condition in a general way as the following implicit function:

$$\omega(\Omega, I^*(\Omega), S^*(I^*(\Omega), \Omega)) = 0 \tag{9}$$

Total differentiation of equation (9) with respect to $\Omega$ and algebraically manipulating terms we obtain:

$$\frac{\partial I^*}{\partial \Omega} = -\frac{\left(\frac{\partial \omega}{\partial \Omega} + \frac{\partial \omega}{\partial S}\frac{\partial S^*}{\partial \Omega}\right)}{\left(\frac{\partial \omega}{\partial I} + \frac{\partial \omega}{\partial S}\frac{\partial S^*}{\partial I}\right)} \tag{10}$$

First, consider the denominator of equation (10). Using the franchisees first order conditions, it can be shown that $\frac{\partial S^*}{\partial I} > 0$. The intuition is that the higher the investment, the more each franchisee has to lose from not providing the appropriate sales effort since profits will be higher (this reflected in $\frac{q_i(I,\hat{S})}{\partial I}$) and they will be lost in case of termination. From the second order condition of the franchisor's problem we know that the marginal net benefit of investment for the franchisor decreases with investment: $\frac{\partial \omega}{\partial I} < 0$. Then, to get the sign of the denominator of equation (10), we need to derive the sign of $\frac{\partial \omega}{\partial S}$. That is, how does the marginal net benefit of investment for the franchisor change with a change in sales effort. It can be shown that if the reputation cost, $\beta$, is positive and large, $\frac{\partial \omega}{\partial S} < 0$. The interpretation of $\frac{\partial \omega}{\partial S} < 0$ is that the higher the sales effort, the lower the marginal net benefit of asking for a large investment requirement. When sales effort is near the desired $\bar{S}$, the loss in reputation is small, given the convex cost of reputation, and using investment as a mechanism to increase the franchisee's benefits from not underproviding sales effort is not profitable given that the franchisor has to compensate the franchisee for his costly investment through a reduction in the initial franchise fee. On the other hand, when the sales effort is far below the desired $\bar{S}$, the loss in reputation is large, given the convex cost of reputation, and given that $\beta$ is large this loss in reputation diminishes heavily the franchisor's profits. Therefore, the marginal

[25] For instance, in the available data sources there is no decomposition of investment in order to assess how specific it is. In addition, any variable that can be used to measure the franchise externality, such as the number of outlets the franchisors operate or the franchisor's experience also captures the franchise brand-name value, which in turn affects the level of the franchisees' demand. Thus, externality and franchisor's brand-name value cannot be told apart.

net benefit of investment requirements is large since it disciplines franchisees and reduces the large loss in reputation for the franchisor.

Using $\frac{\partial S^*}{\partial I} > 0$, $\frac{\partial \omega}{\partial I} < 0$ and $\frac{\partial \omega}{\partial S} < 0$ we obtain that:

$$\left( \frac{\partial \omega}{\partial I} + \frac{\partial \omega}{\partial S} \frac{\partial S^*}{\partial I} \right) < 0 \tag{11}$$

Plugging this into equation (10) we can conclude that:

$$sign \left( \frac{\partial I^*}{\partial \Omega} \right) = sign \left( \frac{\partial \omega}{\partial \Omega} + \frac{\partial \omega}{\partial S} \frac{\partial S^*}{\partial \Omega} \right) \tag{12}$$

The effect of any parameter change on the investment can be decomposed into the direct effect of it on the marginal net benefit of investment, $\frac{\partial \omega}{\partial \Omega}$, and the indirect effect, $\frac{\partial \omega}{\partial S} \frac{\partial S^*}{\partial \Omega}$. The indirect effect holds more economic meaning because it refers to how a change in the parameter affects sales effort and how sales effort affects the incentives of the franchisor to ask for investment requirements. The intuition of the model can be summarized as follows: if some parameter diminishes the franchisees' provision of sales effort, $\frac{\partial S^*}{\partial \Omega} < 0$, then the marginal net benefit of asking for higher investment requirements increases given that $\frac{\partial \omega}{\partial S} < 0$. In other words, the franchisor sets investment to avoid a big loss in reputation.

### 2.6.1 Law enforcement

Adapting equation (12) to analyze the effect of law enforcement we get:

$$sign \left( \frac{\partial I^*}{\partial \gamma} \right) = sign \left( \frac{\partial \omega}{\partial \gamma} + \frac{\partial \omega}{\partial S} \frac{\partial S^*}{\partial \gamma} \right) \tag{13}$$

It can be shown that the direct effect of stronger law enforcement on the marginal net benefit of investment, $\frac{\partial \omega}{\partial \gamma}$, is negative. The intuition is that the stronger the law enforcement, the higher the probability of termination is, reducing the marginal net benefit of asking for high investment requirements as more is lost in case of termination.[26] It can also be shown that sales effort increases

[26] The direct effect is expected to be small. If the franchisor is effective in controlling the franchisees' sales effort to maintain her reputation, the probability of finding a franchisee underproviding sales effort when he under provides it is low, so the increase in the probability of termination conditional on a detected misbehavior is low as well. The direct effect cannot drive the comparative static on its own right, that is, without the presence of the indirect effect that correct sales effort. If the comparative statics were driven solely by the direct effect, the franchisor would ask for higher investments to franchisees that she knows are more prone to underprovide sales effort. In equilibrium, bigger franchisees, in terms of investment requirements, would have lower expected sales effort and the reputation of

with law enforcement: $\frac{\partial S^*}{\partial \gamma} > 0$. The intuition is that the expected punishment for misbehaving franchisees is larger when the probability of terminating a franchise contract is higher. This, in turn, increases the franchisees incentives to exert a higher level of sales effort.

Therefore,

$$\begin{array}{rcccc} sign\left(\frac{\partial I^*}{\partial \gamma}\right) = & sign(\frac{\partial \omega}{\partial \gamma}) & + & sign((\frac{\partial \omega}{\partial S})\left(\frac{\partial S^*}{\partial \gamma}\right)) & < 0 \\ & (-) & + & (-)(+) & \end{array}$$

An increase in the probability of being able to end the franchise agreement, provided that underprovision of sales effort has been observed, decreases the investment requirement. The intuition is that stronger law enforcement increases the sales effort of franchisees. This, in turn, decreases the marginal net benefit to the franchisor of requiring high levels of investment.

We thus generate the following implication:

**H1:** Franchisors ask for lower (higher) investment requirements when law enforcement is stronger (weaker).

### 2.6.2 Monitoring Cost

So far we have assumed that the cost of monitoring intensively, $\Phi^H$, is so small that the franchisor always prefers the high monitoring intensity to the low monitoring intensity. Now, let us assume that the cost of monitoring intensity increases and it is no longer profitable for the franchisor to monitor with high frequency. This might be the case of a franchisor that has broadened his geographical scope of operations. In this scenario, maintaining a high monitoring frequency is only possible at a very high cost. As a consequence, the franchisor optimally monitors less often, choosing $\eta^L$. Thus, the effect of an increase in the monitoring costs is exactly the same of weaker law enforcement, because when monitoring costs are high, monitoring intensity will diminish. When monitoring intensity is lower, the expected punishment of a misbehaving franchisee is reduced and its sales effort is hindered. As a consequence the franchisor increases the investment requirements in order offset this underprovision.

We thus generate the following implication:

**H2:** Franchisors ask for higher (lower) investment requirements when monitoring costs are higher (lower).

the franchisor would be severely damaged.

Notice that investment specificity is not required for the model to predict that investment should increase with higher monitoring costs or with weaker law enforcement. In fact, setting $\alpha = 0$ in the model does not change any of the predictions.[27] The intuition is that even without specificity, an increase in investment increases the earnings that are forgone if the franchisee is caught misbehaving. More specificity helps self-enforcement, however, because investment does not only increase the value of not cheating, but also decreases the value of cheating.[28]

# 3 Empirical Strategy

In our empirical analysis we examine the effect of law enforcement and monitoring costs on investment requirements. Investment requirement data, as well all contract data, are available solely at the franchisor level.[29] Franchisor level data come from private and government surveys in which the franchisor is asked about the contract terms that she will ask prospective franchisees. This type of data also contains information on how many outlets a franchisor operates, in how many states, where the franchisors' headquarters is located as well as other franchisors' characteristics. It does not contain, however, the location of her franchise units or the identity of the states where they operate. In what follows we explain how we measure law enforcement and monitoring costs using data at the franchisor level to empirically analyze their impact on investment requirements. Our measures are based on previous works that have studied the effects of law enforcement and monitoring costs on royalty rates.

## 3.1 Law enforcement

From 1971 to 1992, 15 states have passed good-cause termination/nonrenewal laws.[30] Good-cause laws are laws that restrict the franchisor's ability to terminate and not renew, a franchise agreement. These laws were passed because it was feared that franchisors could use their bargaining power to

[27] This is shown in Sertsios (2010).

[28] In this paper the effect of monitoring costs and law enforcement on the initial franchise fee are omitted. This is not an important omission as in Sertsios (2010) it is shown that both effects are ambiguous.

[29] With the exception of study cases such as Dnes (1993).

[30] From the 15 states that passed these laws, only Virginia has good-cause restrictions for termination and does not have any restriction for nonrenewal. The other 14 states that passed a good-cause law are Arkansas, California, Connecticut, Delaware, Hawaii, Indiana, Illinois, Iowa, Michigan, Minnesota, Nebraska, New Jersey, Washington and Wisconsin. Additional states have passed milder termination restrictions, such us a 90- or 30-days notice upon termination.

unfairly terminate, or threat to terminate, a franchise agreement in order to get back a profitable outlet or renegotiate contract terms in their favor. One consequence of these laws is that it is more difficult to control franchisees' sales effort because these laws increase the costs of termination and non-renewal (Brickley et al 1991). Courts ask for more detailed evidence about the cause of the termination/nonrenewal of the franchise contracts. Arguments like "economic reasons" or that a franchisee is not on "good standing" are not usually considered good causes (Brickley et al 1991). In our terminology, law enforcement is weakened with the passing of these laws.

Brickley (2002) studies the effect of termination laws on royalty rates using data at the franchisor level. As this type of data does not contain information on where each of the franchisees are located, Brickley (2002) measures the effect of the good-cause laws with a dummy that takes a value of one if the franchisor's headquarters is located in a good-cause law state and zero otherwise. The validity of using this dummy variable depends on whether good-cause laws apply to a franchisor located in a good-cause law state, considering that franchisors can operate in multiple states. There are two scenarios under which, if the franchisor is located in a good-cause law state, the good-cause law is likely to influence the franchise contracts and one scenario where it is unlikely to influence them. First, if a franchisor's headquarters is located in a good-cause law state and the franchisee is located in the same state, the law is going to affect the contract between the two parties. This scenario is particularly important given that, between 32% to 46% of the franchisors' units are located in the same state in which the franchisor is located.[31] Second, Brickley (2002) points out that *"Franchisors headquartered in a state without a termination law sometimes can avoid termination laws in other states by contractually specifying that all litigation must take place in the home state and under the law of the home state."* (p. 520).[32] Therefore, when a franchisor's headquarters is located in a good-cause law state, she cannot contract around the law while a franchisor located in a state without a good-cause law potentially can. On the other hand, if the franchisee is located in a state without a good-cause law the contract between the parties is unlikely to be affected by good-cause

[31] In our main data we have information for the number of units a franchisor has in the three states in which they operate more units. If these states happen to coincide with the state in which the franchisor is headquartered, then we know what fraction of units that state represents for each franchisor. Using these observations we obtain that 46% of the outlets are located in the headquarters state, on average. This number represents an upper bound. Alternatively, if we assume that the franchisor that does not has its headquarters state among the three states with more outlets has zero outlets in it, we obtain a lower bound of 32%.

[32] See Klick et al. (2010) for the specific details when the firms can select the law and courts of non-regulating states.

laws even if the franchisor is located in a good-cause law state.[33] It is in the best interest of the franchisor to be ruled by the franchisees' state regulations, in case the good-cause laws do not apply there. This last scenario just adds noise to the dummy that measures the effect of good-cause laws.

In sum, using a dummy variable based on the franchisor's headquarters location is a reasonable measure for the influence of the good-cause laws since it captures the law's influence when the franchisee is located in the same state as the franchisor and when the franchisee is located in another good-cause law state. The scenario in which a franchisee is located in a state without a good-cause law adds noise to the dummy variable. As this noise weakens the result of an empirical analysis, rather than overstating it, using this dummy seems as a good strategy when dealing with franchisor level data such as ours. Thus, we measure law enforcement using the franchisor's headquarters location. We expect the average investment requirements that franchisors ask prospective franchisees to be affected by the passing of a good-cause law in the state where their headquarters is located.

## 3.2 Monitoring costs

Rubin (1978) and Brickley and Dark (1987), among others, have pointed out that the further away outlets are, the less frequently they will be monitored, because monitoring costs are higher. This intuition was also shared by industry experts.[34] Lafontaine (1992) and Lafontaine and Shaw (1999) study the effect of monitoring costs on royalty rates using data at the franchisor level. As they do not have information about the location of franchisees, they measure monitoring costs using the number of states in which a franchisor operates.

In our setting, the number of states in which a franchisor operates is a valid measure for monitoring costs only after controlling for the franchisor's brand-name, which can have a direct impact on investment requirements, and is likely to be positively correlated with the number of states. Therefore, once one controls for variables such as the number of outlets a franchisor operates and franchisor's experience, which affect a franchisor's brand-name value, the number of states in which a franchisor operates is a good measure of monitoring costs.[35]

[33] Brickley (2002) points out that even though it is unlikely that a contract between a franchisor located in a good-cause law state and a franchisee located in a state without such law is affected by the good-cause law, there have been some cases where the good-cause law influences the courts' rulings. See, for example, Dayan v. McDonald Corp. [125 III. App.3d 972, 466 N.E.2nd 958(I11. App. 1984)]. This scenario would justify even more the use of the location of the franchisor's headquarter as a measure for the good-cause law influence on franchise contracts.

[34] Victor Dacarret, CEO franchising Chile.

[35] We consider several robustness checks to evaluate the validity of this measure.

The mechanism by which the number of states in which a franchisor operates affects investment requirements asked to prospective franchisees is as follows. The average investment requirement a franchisor asks a prospective franchisee is determined based on past experience and future expectations, and the number of states in which a franchisor operates affects both factors. When a franchisor increases the number of states in which she operates, she adjusts the investment requirements she asks considering the amounts involved in the recent deals, which are related to the latest geographic expansion. For example, a franchisor that used to operate only in California and recently expanded her operations to Oregon is going to update the investment requirements asked to prospective franchisees considering the amounts involved in the contract she just signed with the new franchisee located in Oregon. Additionally, the franchisor expects that new deals are likely to occur in the market to which she has expanded. Thus, the average investment requirement she asks prospective franchisees is likely to incorporate the expectation of new openings in a broader geographical area. In the recent example this translates as follows: the franchisor that has just expanded to Oregon forecasts that, given the realization of an opening in Oregon, it is more likely that new franchise units are going to be opened in that state. The higher probability of new openings in Oregon affects the average investment requirements she asks prospective franchisees.

# 4 Data

We have two data sources: the Handbook of Franchise Opportunities (HFO) and Bond's Franchise Guide (BFG). They both contain information about contract terms that franchisors offer prospective franchisees.[36] The HFO data's main advantage is that is older, so it allows us to study the within franchisor effect of the passing of the good-cause laws on investment requirements, at the time some of the laws were passed. The BFG data's main advantage is that it is much richer, allowing us to perform robustness tests on our results. In what follows we describe in detail the data available to us from each data source.

## 4.1 Bond's Franchise Guide

BFG is a private survey that started in 1993, issuing yearly editions, except for the year 2000, when there was no survey. Since 1994 the dataset has a complete computerized version. We have access to

[36] Both datasets contain information about business format franchises only.

the computerized version of the data for the period 1994-2009. As the good-cause laws were passed from 1971-1980 in 14 states, and in 1992 in Iowa, this dataset does not allows us to analyze the within franchisor effect of the passing of the good-cause laws on investment requirements. However, it does allow us to study the long run effect of the passing of the good-cause laws. That is, we are able to analyze whether a franchisor whose headquarters is located in a good-cause law state asks for investment requirements higher than a franchisor located in a state without such laws. Additionally, this dataset allows us to study the within-franchisor effect of monitoring costs, measured by the number of states in which the franchisor operates, on investment requirements. Moreover, given the richness of this dataset we are able to perform several robustness tests using some variables reported in it.

We drop observations below the 1st percentile and above the 99th percentile of franchisors' annual percentage change in investment requirements to avoid obtaining results driven by the presence of outliers.[37] Our final dataset consists of 10,047 franchisor-year observations. The number of franchisors in the sample is 2,017 and the average number of years a franchisor appears in the sample is five. Our panel is highly unbalanced for two reasons: franchisors' entry and exit; and because franchisors do not always answer the survey.

Table 1 shows the summary statistics of the main variables we use in our analysis. The main dependent variable of our analysis is the investment requirement a franchisor asks prospective franchisees, net of the initial franchise fee.[38] Additional contract terms shown in table 1 are franchise fee and royalty rate. Investment requirements and franchise fee are expressed in nominal thousands of dollars, while royalty rate is expressed as a percentage of the franchisee's revenues. Whenever a franchisor asks for a range in any of these contract terms, we report the average between the two points of the range. This implies that these contract terms should be interpreted as the average contract terms a prospective franchisee would face if he chooses to do business with the franchisor.

**–>Insert Table 1 here**

Table 1 shows that while the mean investment requirement is $520,000 the mean initial franchise fee is only $31,700, highlighting that the economic magnitude of the investments requirements

[37] These observations are likely to be misreports. The 1th percentile represents an 82% decrease in the yearly investment requirement and the 99th percentile represents an increase of 200%. Results still hold when including these observations.

[38] Franchise fee does not increase a franchisee's demand, so it should not be considered as part of the self-enforcement mechanism.

is quite large, relative to other contract terms. There are 9,648 franchisor-year observations for the royalty rate, 399 observations less than for the other contract terms because some franchisors answered in the survey that their royalty rate varied or was a fixed monthly amount. Additional variables included in table 1 are the number of outlets a franchisor operates, the number of states in which they operate, the experience they have franchising, measured as the number of years since they started franchising, and the dummy law, which takes a value of one if the franchisor is located in a state that has passed a good-cause termination/nonrenewal law and zero otherwise.[39] Thirty six percent of the franchisors are located in states that have passed good-cause laws.

Finally, the bottom three rows of table 1 show the yearly within-franchisor variation of investment requirements, expressed in percentage change; and the yearly within-variation of the number of units and number of outlets, expressed in simple differences. Showing the yearly differences is helpful since in some of the econometric analyses we study within franchisors' contract variations. We expressed the first difference of investment requirements in percentage rather than in simple differences to get a more accurate picture of this variable. As the magnitude of investments requirements in different industries can be quite large, if measured in simple differences, the yearly change in investment would be driven mainly by industries with big investment requirements, distorting the real picture. A franchisor, conditional on staying in the sample, on average increases the investment requirement she asks prospective franchisees by 4.3% a year, opens 18 new units and expands her operations by "half" a state.

## 4.2 Handbook of Franchise Opportunities

The HFO data is a periodic survey that the Department of Commerce conducts. It was issued yearly from 1972 to 1987, and afterwards it has been issued irregularly. The main advantage of this data base is that it goes back to the period where some of the termination laws were passed, allowing us to study the within franchisor effect of the passing of the good-cause laws and number of states on investment requirements. Nevertheless, it has several shortcomings. First, there is no electronic version of this data, so it has to be hand-collected. Second, it does not have as many variables as the BFG data base. It only contains information on the number of states in which a franchisor operates, the number of outlets a franchisor operates, the year the franchisor started his business

[39] Alternatively, we could have measured experience as the number of years that a firm is in business, rather than the number of years since it started franchising. Results are insensitive to the way experience is defined.

—from which a proxy for experience can be constructed— and investment requirements. Third, the way they report investment requirements, makes it a noisy measure of the real variable. Rather than having separate information about the investment requirements and the initial franchise fee, the HFO reports the sum of these two variables.[40] In addition, it is not clear whether they report the equity needed or the total investment that is needed for opening a new franchise unit.

We hand-collected data for the years 1979 and 1982. We selected these two years because in 1980 California and Illinois passed good-cause laws. These two states are the states with biggest economic relevance, in terms of total income, among the 15 states that passed these laws. This allows us to have many observations from which to derive our results, as many franchisors are headquartered in California or Illinois. We collected data for 1982, rather than 1981, to allow franchisors to adapt their contracts to the new economic environment, after the passing of the law.

We address the HFO data shortcomings in two ways. First, we take advantage of the richness of the BFG data. Using the BFG database we are able to show that the control variables that are not available in the HFO database play no significant role in the estimations. Also, using the BFG data base, we show that when the dependent variable is defined as investment requirements, including franchise fees rather than just investment requirements net of initial franchise fees, the effect of the number of states and good-cause laws are biased downwards. Hence, using this aggregate measure of investment requirements understates the effect of the explanatory variables of interest on the true dependent variable rather than overstating it. This implies that the effect of monitoring costs and weaker law enforcement that it is found using the HFO database can be considered a lower bound of the true effect. Second, we carefully hand-collect the HFO data for franchisors that have consistent data descriptions for both 1979 and 1982. When it is not explicitly mentioned that the data represents total investment, meaning it could represent equity investments, we only include the observations in which the financial terms remain unaltered in both periods. If it is the case that equity requirements is what is reported, when financial terms remain unaltered the percentage change in equity requirements is, on average, equivalent to a percentage change in total investment requirements. This adds noise to the dependent variable, but does not bias the parameters on the explanatory variables.

[40] Entrepreneur Magazine's Franchising in the Economy has information about the capital a franchisor needs to start a business, separate from amount franchisors ask as a franchise fee. This survey has yearly editions starting in 1980. As the information in this database is presented with a one year lag, the 1980 edition actually contains information about 1979. However, the question asked about capital requirements changed after the 1980 edition, making the comparison between surveys unreliable.

Consistent with the procedure we use for the main sample, we drop observations below the 1st percentile and above the 99th percentile of franchisors' percentage change in investment requirements to avoid obtaining results driven by the presence of outliers. The final sample consists of 279 franchisors that did not change their headquarters location for the years 1979 and 1982. Table 2 shows the summary statistics of the HFO database. Investment is measured in nominal thousands of dollars. The mean investment is $49,800. A franchisor, conditional on staying in the sample, on average increases the investment requirement she asks prospective franchisees by 33% in the three-year period; opens 60 new units and expands her operations in 1.2 states.[41] Out of the 279 franchisors, 39 are located in California and 21 in Illinois, representing 21.5% of the franchisors in the sample.

–>**Insert Table 2 here**

### 4.3 Sample Industry Composition

In both datasets there is a description of the industry to which each franchisor belongs. The industry description is much richer in the BFG than in the HFO. BFG provides 45 industries classifications, while in the HFO database there are only 9. Table 3, panel A, shows the industry composition of the BFG data and panel B shows the industry composition of the HFO data.

–>**Insert Table 3 here**

## 5 Results

In this section, we empirically examine the effect of monitoring costs and law enforcement on franchisors' investment requirements. First, using the HFO database, we analyze franchisors' investment requirements within variation. Then, using the BFG database we analyze within industry variation of investment requirements. Finally, we perform robustness tests using the BFG database.

[41] Considering franchisors that appear three consecutive years in the BFG database, the average percentage investment requirement change is only 19%. The bigger change in investment requirements in the HFO database is likely to be attributable to differences in the sample periods, because in former years experimenting with contracting terms was more likely to occur.

## 5.1 Main results: HFO database within franchisor variation

The dependent variable is the logarithm of investment requirements. We use logarithms rather than levels to avoid obtaining results driven by a few changes in investment requirements from franchisors that ask for big amounts. The explanatory variables are the number of states in which a franchisor operates, the dummy law, the interaction between these last two terms and control variables. We include the interaction between the dummy law and the number of states to examine two competing effects that might be at work. On the one hand, when a franchisor expands to other states, the franchisor might be able to avoid his in-state regulation.[42] As a consequence, the effect of the good-cause law in the franchisor's headquarters state would have less impact on the average investment requirement she asks. Under this logic, the expected sign of the interaction term is negative. On the other hand, it can be argued that higher monitoring costs and weaker law enforcement could strengthen each other's effect on investment requirements, since more extreme measures are needed to avoid franchisees' underprovision of sales effort. In this scenario, the interaction effect is expected to be of positive sign. For simplicity reasons, this last possibility was not considered in the theoretical model. It was assumed that a change in monitoring costs directly maps into monitoring intensity, without interacting with the degree of law enforcement.[43] If the interaction effect is important empirically the theoretical assumption would need to be revised.

We include franchisor fixed effects to examine franchisor's within variation. The identification of the effect of the good-cause laws on investment requirement is given by the two states that adopted good-cause laws in 1980: California and Illinois. Equation (14) summarizes the specification described.

$$\ln(I_{fit}) = \alpha + \beta states_{fit} + \gamma Law_{fit} + \delta(states_{fit} * Law_{fit}) + \phi x_{fit} + \eta_f + \varphi_t + \varepsilon_{fit} \tag{14}$$

Where $I_{fit}$ represents the investment requirement that franchisor $f$ in industry $i$ at time $t$ asks prospective franchisees; $s_{fit}$ represents the number of states in which franchisor $f$ in industry $i$ operates at time $t$; $x_{fit}$ are control variables; $\eta_f$ are franchisor fixed effects; and $\varepsilon_{fit}$ is the error

[42] By 1980, besides California and Illinois, there were only 12 states that have passed good-cause laws and 36 states that did not. Therefore, a franchisor operating in more states, on average, has more chances of avoiding the in-state regulation by setting the litigation in the franchisee's state when possible.

[43] Analyzing the interaction between these two effects implies generating comparative statics from a Hessian rather than a single equation. This complicates the model without providing further insight.

term. In this setting $\varphi_t$ is dummy variable that takes a value of 1 for 1982 and zero otherwise. This specification is equivalent to a difference-in-difference estimation. We correct standard errors to account for clustering at the industry level.

–> **Insert Table 4 here.**

Table 4, column I, shows the estimation of equation (14). Both theoretical hypotheses find support in the data. Monitoring costs and weaker law enforcement increase investment requirements. A franchisor that operates in an additional state increases the average investment requirements it asks prospective franchisees by 1.2% and the passing of good-cause laws implied an incremental 9% increase in investment requirements for franchisors located in California or Illinois. Both variables are statistically significant at the 5% level.

The interaction between the number of states and the change in the law is negative and insignificant, implying that the avoidance of in-state regulation dominates any potential reinforcing effect between weak law enforcement and high monitoring costs. The fact that the reinforcement effect is not empirically relevant supports the simplifying theoretical assumption that monitoring costs maps directly into monitoring intensity, without interacting with law enforcement. The marginal effects of the passing of the law and number of states, on investment requirements, considering the interaction term evaluated at the sample means, are 2.1% and 1%, respectively.

The control variables included are number of outlets, its quadratic term and experience squared.[44] We do not include experience alone as all franchisors gain the same 3 years of experience in the 1979-1982 period, making experience perfectly collinear with the constant. Experience and number of outlets are included to control for the franchisor's brand-name value as a better known franchisor might ask for higher investment requirements. However, these variables do not affect investment requirements in a statistically significant way.

The standard errors reported in column I can be biased. While we correctly cluster at the industry level, there are only 9 industry classifications and the cluster-robust standard errors we compute assume that the number of clusters is large enough to apply asymptotic properties in their computation. Cameron et al (2008a), doing a Monte Carlo experiment for a data generating process with small number of clusters, showed that the cluster-robust estimation gives underestimated standard errors. Therefore, there is a possibility that we are incorrectly rejecting the null hypotheses

[44] Number of outlets squared is included to control for franchisors that operate a particularly large number of outlets.

that the parameters of number of states and the dummy law are zero. Cameron et al. (2008a) propose asymptotic refinements that try to consistently compute the parameters true p-values when the number of clusters in the sample is as small as 5. The asymptotic refinement that showed better performance was the wild cluster bootstrap-t. In this type of bootstrap the errors of each replication are multiplied by minus one and plus one with 50% of probability each, and in addition, the bootstrap is performed over errors generated from a null imposed specification. We performed this methodology for the parameters of the variables number of states and dummy law. We obtain that the p-values are virtually unchanged for the dummy law, remaining statistically significant at the 5% level. For the number of states, the p-value increases. However, this variable remains statistically significant, now at the 10% level. Therefore, we find empirical support to both theoretical hypotheses even after correcting for the finite sample problem in the computation of the parameters standard errors.

We modify equation (14) by including two dummy variables to account for the passing of the good-cause laws, rather than one. We include a dummy variable for the California change in the law and another for Illinois. We also include the interaction of these dummies with the number of states. The purpose of this specification is to show that the results are not driven solely by one state. The results of this specification are shown in Table 4, column II. The parameters that accompany both California and Illinois good-cause laws are positive. However, given that the number of franchisors located in California is almost twice as many as the number of franchisors located in Illinois, only the California passing of the law remains statistically significant. Evaluated at the sample mean number of states, franchisors located in California and Illinois increase the investment requirements they asked prospective franchisees by 2.15% and 1.88%, respectively, relative to franchisors located in states where there was no change in the law. These marginal effects are not statistically different from each other.

To sum up, it is shown that some of the within franchisors investment requirements variation is due to changes in their average monitoring costs and enforceability conditions. Consistently with the theoretical predictions, franchisors ask for higher investment requirements when the franchisees' incentives to provide the appropriate level of self-effort are weaker (i.e., when good-cause laws apply -weaker law enforcement- and when the franchisor operates in more states -higher monitoring costs).[45,46]

## 5.2 Main Results: BFG database within industry variation

Relative to the HFO database, the BFG database has the disadvantage of covering a period of time posterior to the passing of the good-cause laws, 1994-2009. This implies that we are unable to analyze the within franchisor effect of good-cause laws on investment requirements. However, we can analyze the long-run effects of the laws. We can study whether franchisors located in states where these laws apply ask for higher investment than franchisors located in states without such laws. The main drawback of this analysis is that if the franchisors' characteristics are correlated with their location we will obtain biased parameters. We partially address this concern by controlling for industry fixed effects. This specification can be summarized in equation (15).

$$\ln(I_{fit}) = \alpha + \beta states_{fit} + \gamma Law_{fit} + \delta(states_{fit} * Law_{fit}) + \phi x_{fit} + \eta_i + \varphi_t + \varepsilon_{ijt} \qquad (15)$$

The main difference between equation (15) and equation (14) is that in equation (15) we replace franchisor's fixed effects for industry fixed effects. Additionally, now $\varphi_t$ incorporates 14 time dummies rather than just one.

The most conservative clustering strategy is to correct standard errors by clustering at the industry level (45 industry classifications), given that franchisors are nested within industry classifications. This type of clustering captures the potential autocorrelation of the variables, which is especially relevant in long panels such as this, and the common group component of the error term

[45] Notice, though, that franchisors can increase investment requirements not only to improve self-enforcement conditions in franchise contracts, but also to improve the quality of franchisees they want to attract. The intuition follows closely the logic of the theoretical model. Low quality franchisees—with intrinsically higher probability to under provide sales effort—will be discouraged to sign a contract with the franchisor when they are asked for high initial investments, given that they have a high probability of being terminated. Although empirically we cannot assess whether investment requirements increase to improve the enforceability conditions within franchise contracts or to improve the quality of applicants, most likely both factors are at work. Higher investments generate a permanent increase in earnings that would be lost in case of termination. Under providing sales effort and/or being of a cheating type increases the probability of termination, thus sales effort is increased endogenously and/or better franchisees apply, reducing the under provision of sales effort.

[46] Notice, though, that even though there is an optimal adjustment through investment requirements due to the passing of the laws, franchisors should still be worst off because of the good-cause laws as they increase investment requirements at the cost of losing potential franchisees or at the cost of compensating franchisees for the extra investment they ask them to do. Brickley et al (1991) show that franchisors are indeed worst-off with the passing of the laws. They provide evidence that franchisors located in California suffered a reduction in stock prices due to the passing of the good-cause law in that state.

at the same time (see Cameron et al. (2008b)).[47] However, once one controls for industry fixed effects, if there is no suspicion of autocorrelation within industries, standard errors can be corrected by clustering franchisor level as well. This method has the advantage that the number of groups is large (2,017 franchisors), so there are few concerns regarding whether the asymptotic properties used to compute the cluster-robust standard errors apply. The results we present show standard errors corrected by clustering at the industry level. However, when standard errors are corrected by clustering at the franchisor level, they are reduced slightly. Therefore, the results we are presenting are the most conservative between the two types of clustering alternatives.

The BFG database has the advantage of reporting investment requirements and initial franchise fees separately. This allows us to analyze the effect of good-cause laws and number of states on investment requirements, net of franchise fees, and on total investment requirements. While investment requirements net of franchise fees is our main variable of interest, analyzing the impact of the number of states and good-cause laws on total investments is useful for comparison reasons, as the results from table 4 were generated using total investments. Table 5, column I, shows the estimation of equation (15) using investment net of franchise fees as dependent variable and column II shows the estimation of equation (15) using total investment as dependent variable.

–> **Insert table 5 here**

The results presented in table 5, column I, give support to both theoretical predictions and are in agreement with the results found in table 4. The number of states in which a franchisor operates, and operating in states where good-cause laws have been passed, increase investment requirements in a statistically significant way. Also, consistent with the HFO database results, the interaction between number of states and the dummy law is negative. Considering the interaction term evaluated at the sample means, the marginal effects are the following. Franchisors, within the same industry, ask for investment requirements 0.75% higher for every additional state in which they operate. In addition, franchisors, within the same industry, that operate in states where good-cause termination/non-renewal have been passed ask for investment requirements 4.8% higher than franchisors operating in states without such laws.[48]

[47] See Bertrand et al (2004) for an example of policy autocorrelation in long panels.

[48] These results are robust to the inclusion of the additional control variables presented in the next subsection. In addition, the effect of the passing of the laws increases its relevance when Virginia is not considered in the good-cause law group. Virginia is the only state, within the states that have passed good-cause laws, which did not require a good-cause for renewal. It only required a good-cause for anticipated termination.

The results using total investment as dependent variable—column II—are similar to the results using investment net of franchise fee—column I. More importantly, the parameters of number of states and dummy law are smaller when using when total investments, rather than net investments, as dependent variable.[49] Therefore, when using the HFO data, the evidence in favor of the theoretical hypotheses is found in spite of measuring investments including franchise fees rather than because of it.

The short-term effect of the passing of the laws on investment requirements (table 4) is smaller than the long-term effect (table 5). The short-term effect is around 2% while the long run effect is between 4-5%. One possible explanation is that the three-year period surrounding the passing of the law is not long enough to study the full adjustment of franchisors contract terms. Studying whether there is a larger effect using a longer window surrounding the passing of the laws, using the HFO data, could shed some light on this intuition. The drawback of this procedure is that some observations are lost if the window is broadened as not all franchisors respond to the survey each year. Thus, power is reduced, and additionally, sample selection concerns obscure the comparison of the results. In spite of these concerns, we rerun equation (14) using data for the period 1978-1982, rather than for the period 1979-1982, to study the possibility that franchisors partially adjust investment requirements in anticipation to the passing of the good-cause laws in California and Illinois. Broadening the time window one year into the past and not one year into the future is the relevant exercise, because prospective contract terms can be adjusted immediately, so there is no reason to expect a delay in the franchisor's actions. The sample is reduced to 224 franchisors. We find that the marginal effect of the law increases its impact on investment requirements to 4.5%. This result is in agreement with the intuition that the differences in the magnitudes of the results obtained from the two samples can be explained by length of adjustment.[50] However, the statistical significance of the law parameter decreases due to the reduction in the sample size, which was already small. Before correcting for the small number of the clusters, the Law parameter remains statistically significant only at the 10% level and it drops its statistical significance to the 20% level after the asymptotic refinement is performed.

In the theoretical model we do not model the franchisor's moral hazard problem. The consequence of this omission is that the optimal royalty rate in the model is zero. If the franchisor's

[49] The marginal effects, which consider the interaction between the dummy headquarter good-cause and number of states, evaluated at the sample means, are similar.

[50] The table with this result is reported in Sertsios (2010). It is not reported here for space reasons.

moral hazard would have been modeled, law enforcement and monitoring costs may have had an impact on royalty rates. The intuition is that when the franchisees' incentives to provide sales are weaker the franchisor might choose to reduce the royalty rate, in addition to increase investment requirements, to correct the franchisee's incentives. We can examine whether this logic holds empirically by estimating equation (15) replacing investment requirements with royalty rates. This result is presented in table 5, column III. Neither the number of states nor the dummy law have a statistically significant impact on the franchisor's royalty rate. This result indicates that franchisors adjust franchisees' self-enforcement conditions through investment requirements and not through royalty rates, justifying not explicitly modeling the franchisor's moral hazard problem.

## 5.3 Robustness checks

One of the results shown in sections V.1 and V.2 is that monitoring costs, measured by the number of states in which a franchisor operates, is positively related with investment requirements. This relation is unlikely to be driven by reverse causality because the data with which the results were generated comes from surveys in which franchisors are asked the number of states in which they operate in the present date and what are the contract terms they set for prospective franchisees. Thus, contract terms decisions are made after the geographic expansion is realized. However, the positive relationship between number of states and investment requirements can potentially be spurious and simply be due to an omitted variable that affects simultaneously both variables in the same direction. We propose four alternative mechanisms that could be driving the results and show that after controlling for them the number of states in which a franchisor operates and investments requirements are still positively correlated. The variables that are going to be included as additional explanatory variables to control for those mechanisms are: franchisor's projected new units, franchisor's financial assistance, contract length and advertisement fees. These variables are available in the BFG database. While incorporating these variables is a good exercise to discard the possibility of omitted variable bias, the parameters that are estimated might be biased as franchisor's financial assistance, contract length and advertisement fees are endogenous contract terms chosen by the franchisor. This is why they were not included in the previous estimations based on the BFG data.

Once we control for the number of outlets in which a franchisor operates, a franchisor that operates in more states arguably has higher monitoring costs as she has a broader geographic scope of operations. However, the decision to operate in a broader geographical area is endogenous and the underlying reason of the geographic expansion might be what really causes the increase in investment requirements. Thus, higher monitoring costs, which is a consequence of the expansion, might be unrelated to investment requirements once the reason of the expansion is properly controlled for. The most likely reason for a franchisor to geographically expand is having good investment opportunities. It can be argued that a franchisor with better investment opportunities might also be interested in franchising bigger outlets, which require higher investment. Therefore, we need to control for franchisor's investment opportunities to discard the possibility that its omission is what drives the positive relation between number of states and investment requirements. The ideal control for investment opportunities is Tobin's q. The usual proxy for Tobin's q is constructed dividing firms' market value by firm's asset value. Thus, this measure can be constructed only for publicly traded firms. This implies several shortcomings. First, only a handful of the franchisors in our data are publicly traded firms. Second, most franchisors that are publicly traded have nationwide operations, implying no variability in the number of states in which they operate. Third, many of the franchisors that are publicly traded belong to a parent company, so their investment opportunities cannot be told apart from the investment opportunities of all the firms that operate under the same parent company. An alternative variable that proxies for investment opportunities and is available at BFG database is franchisor's projected new units. If a franchisor thinks her business is likely to have a big expansion, she projects that a large number of units are going to be opened in the upcoming year. Thus, projected new units is one of the additional control variables we use.

Variations in the financial assistance that franchisor's offer franchisees can also be thought of as an important omitted variable. It can be the case that franchisors that expand to newer states concurrently start offering financial assistance. If this is the case, investment requirements are likely to increase, given that credit constraints are relaxed for franchisees. In the BFG database there is information regarding the offering of financial assistance by the franchisor. The answer that franchisors give when asked if they give financial assistance is either Yes or No. Thus, we construct a dummy variable for financial assistance and include it as an additional control.

Longer contract lengths imply more protection for the franchisees investment; thus, more investment is expected, in equilibrium, when longer contract terms are offered. To the extent that longer contract terms are offered to franchisees in new markets it can be the case that the positive relationship between investment requirements and number of states is driven by the omission of the contract length as an explanatory variable. Contract length can be found in the BFG database. It ranges from 1 to 40 years with a mean of 11.2. This variable is also included as an additional control.

A franchisor that expands to newer markets might find it optimal to advertise more given her broaden scope of operations. This, in turn, can increase the optimal size of the outlets. Therefore, we include the advertisement fee rate that franchisors ask, as a percentage of the franchisees' revenues, as an additional explanatory variable. This variable can also be found in the BGF database.

Besides including additional explanatory variables to shoot down a potential omitted variable bias, in the present setting we reincorporate franchisors' fixed effects to address the potential correlation between franchisor's characteristics with the explanatory variables. As we use BFG to perform this additional estimation, the cost of using franchisor's fixed effects is that the dummy law has to be dropped as there is no within franchisor variation in the passing of the laws. This is not a major drawback since in this section we are interested in providing robustness to the positive relationship between number of states and investment requirements. Equation (16) is what we estimate.

$$\ln(I_{fit}) = \alpha + \beta states_{fit} + \phi x_{fit} + \eta_f + \varphi_t + \varepsilon_{fit} \tag{16}$$

We estimate equation (16) correcting standard errors by clustering at the industry level (45 industries). The results are reported in Table 6. Column I shows the estimation of equation (16) without including the additional controls. It is shown that even after including franchisor fixed effects the number states increases investment requirements in a statistically significant way using the BFG data. In column II, the additional controls are included. The number of observations is only 7,837 as the additional control has some missing values.[51] Besides contract length, no control variable has a statistically significant effect on investment requirements. More important, the number of states still has a positive and statistically significant effect on investment requirements

[51] To the extent that the decision of not replying is not random, the missing observations can potentially generate sample selection problems by considering only the franchisors that choose to answer. We use a multiple imputation procedure to overcome this problem. Multiple imputation procedure replaces each missing value with a set of plausible values to represent the uncertainty about the right value to impute (Rubin (2004)). Using states, experience squared, number of outlets, number of outlets squared, firm and time fixed effects, we generate the deterministic distribution of the regression coefficients used for the imputation. Then, standard errors are adjusted to account for the uncertainty in their generation. After replacing the missing values for projected new units, financial assistance and contract length (advertisement fees has no missing observations) we re-run equation (16). The results are qualitatively unaltered relative to the ones reported in table 6, column I. These results are shown in Sertsios (2010).

after including these additional control variables. A franchisor that expands its operations to another state increases the investment requirements she asks prospective franchisees by 0.64%.

**–>Insert Table 6.**

The BFG database allows us to perform a final robustness check. This database contains not only the total number of outlets a franchisor operates, but also the number of units that are franchised and owned by the franchisor. This allows us to construct the percentage of franchised units a franchisor operates from the data. The sample mean of franchised units is 81%. Previous literature finds that higher monitoring costs increases the percentage of franchised units a franchisor operates (see Lafontaine and Slade (2007) for a literature review on this topic). Thus, if the number of states is a good measure of monitoring costs we would expect it to have a positive impact on the percentage of franchise units a franchisor operates.

The intuition behind higher monitoring costs increasing the percentage of franchised units is as follows. A franchisee has more powerful incentives than an owned unit, managed by an employee, as the franchisee is the residual claimant of the store revenues. Thus, free-riding on the store brand-name, by reducing sales effort, is less likely to occur in a franchised outlet than in an owned outlet when the monitoring frequency is the same. This implies that when monitoring costs increase it is optimal for franchisors to franchise a larger fraction of outlets as it is relatively harder to control sales effort in owned units.

We estimate equation (16) replacing investment requirements with percentage of franchise units. The results of this estimation are shown in table 6, column III. We show that it is actually the case that a franchisor that operates in more states franchises a higher proportion of their outlets, even after controlling for her experience. This result reinforces the notion that number of states is a good measure of franchisors' monitoring costs.[52]

[52] An additional robustness check is performed in Sertsios (2010). Rather than using number of states as independent variable, the headquarters' location is exploited to obtain a measure of traveling distance to directly monitor, which is used as independent variable. Franchisors expansion patterns is usually regional. They expand first to the states nearer the state from where they are headquartered and last to the states that are further away from their headquarters location. Sertsios computes the distance between each state to all other possible states, generating a 51 by 51 matrix, where the 51st state is the District of Columbia. Then, each state was sorted according their distance to each other, from closer to the further, and the average travel distance from each state to the "ith" closer states was computed. This average distance was merged with the number of states in which a franchisor operates according to their headquarters state. Thus, a measure of the average distance to monitor is computed, according to the franchisors location and how many states she serves. This variable has one advantage and one disadvantage relative to measuring geographic dispersion using the number of states. The advantage is that it does not assign the same incremental value for each additional state; it computes the increase in the average distance to monitor depending on the franchisor's headquarters location. The disadvantage is that it uses the assumption that the franchisor's

# 6 Conclusion

The theory and evidence presented here suggest that investment requirements in franchise contracts are, at least, partially determined by the franchisor's ability to directly monitor her franchisees and enforce contract termination. The mechanism proposed is that franchisors increase investment requirements when the franchisees' opportunities to free ride on the franchisor's brand-name, without being caught and punished, are greater. The intuition is that higher investment requirements increase franchisees' selling capacity; therefore, franchisees have more to lose in case of termination. As a consequence, franchisees tend to avoid misbehaving when investment requirements are higher.

We show that franchisors increase investment requirements after the passing of the good-cause termination/nonrenewal laws as these laws weakened the franchisor's ability to terminate a contract with a misbehaving franchisee. We also show that a franchisor increase investment requirements when they expand geographically as her ability to directly monitor is hindered

Our results are relevant because the investment requirements franchisors asks franchisees are shown to play a sizable and unique role in self-enforcing franchise contracts that was not documented in the literature. Previous literature puts emphasis on asset specificity playing a role in self-enforcement, while our approach puts emphasis on how initial investments alter the parties' future earnings to generate conditions for self-enforcement, irrespective of the specificity of the assets that compose the investment.

In addition, our results show that investment requirements are an endogenous contract term. This contrasts with the previous empirical franchise literature in which investment requirement was considered as an exogenous explanatory variable. Knowing what the determinants of investment requirements are can help to generate new identification strategies when using investment requirements as an explanatory variable.

expansion is perfectly ordered, expanding to the closer states first and later to the ones that are further away. It was found that when a franchisor increases its average monitoring distance by 100 miles, she increases the investment requirements she ask franchisees by 3%. This result is statistically significant at the 1% level.

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# Table 1

## BFG: Summary Statistics.

This table reports sample statistics for Bond's Franchise Guide data. We present the 10th percentile, mean, median, 90th percentile, standard deviation and number of observations for the variables shown in the left column. The data consists of an unbalanced panel of 2,017 franchisors for the period 1994-2009. Net Investments are the investment requirements asked by franchisors to franchisees, net of initial franchise fee. Franchise Fee is the initial lump sum amount the franchisee has to pay the franchisor in order to operate under her brand-name. Net Investments and Franchise Fees are measured in nominal thousands of dollars. Royalty Rate is the percentage of the franchisee's revenues that franchisors ask franchisees. Experience is the number of years the franchisor has been franchising. Total units are the number of units a franchisor operates. States is the number of states in which a franchisor operates. Dummy Law is a dummy that takes a value of one if the franchisor's headquarter is located in a good-cause termination/nonrenewal state, and zero otherwise. %Δ Investment is the within franchisor yearly percentage change in Net Investments. ΔUnits is the within franchisor yearly change in the number of units she operates. ΔStates is the within franchisor yearly change in the number states where she operates.

| Variable | Pctile 10 | Mean | Median | Pctile 90 | sd | N |
|---|---|---|---|---|---|---|
| Net Investment (000's) | 13.7 | 520.1 | 120 | 625 | 8236 | 10047 |
| Franchise Fee (000's) | 9.9 | 31.70 | 22 | 39 | 529.3 | 10047 |
| Royalty Rate (%) | 0.03 | 0.06 | 0.05 | 0.08 | 0.167 | 9648 |
| Experience (years) | 3 | 15.38 | 13 | 31 | 11.76 | 10047 |
| Total Units (#) | 7 | 341 | 60 | 530 | 1476 | 10047 |
| States (#) | 1 | 17.72 | 12 | 43 | 15.73 | 10047 |
| Dummy Law | 0 | 0.36 | 0 | 1 | 0.481 | 10047 |
| %Δ Investment | 0 | 0.043 | 0 | 0.184 | 0.211 | 8032 |
| Δ Units (#) | -6 | 17.82 | 0 | 34 | 241.9 | 8032 |
| Δ States (#) | 0 | 0.532 | 0 | 2 | 3.18 | 8032 |

# Table 2

## HFO: Summary Statistics

This table reports sample statistics for Handbook of Franchise Opportunities data. We present the 10th percentile, mean, median, 90th percentile, standard deviation and number of observations for the variables shown in the left column. The data consists of a balanced panel of 279 franchisors that operated both on 1979 and 1982. Investments are the investment requirements asked by franchisors to franchisees, measured in nominal thousands of dollars. Experience is the number of years the franchisor has been in business. Total units are the number of units a franchisor operates. States is the number of states in which a franchisor operates. Dummy Law is a dummy that takes a value of one if the franchisor's headquarter is located in a good-cause termination/nonrenewal state, and zero otherwise. %Δ Investment is the within franchisor percentage change in Investments for the 1979-1982 period. ΔUnits is the within franchisor change in the number of units she operates for the 1979-1982 period. ΔStates is the within franchisor change in the number states where she operates for the 1979-1982 period.

| **Variable** | **Pctile 10** | **Mean** | **Median** | **Pctile 90** | **sd** | **N** |
|---|---|---|---|---|---|---|
| Investment (000's) | 7.2 | 49.8 | 35 | 100 | 64.3 | 558 |
| Experience (years) | 6 | 19.36 | 16 | 35 | 13.95 | 558 |
| Total Units (#) | 6 | 329.5 | 52 | 490 | 1432 | 558 |
| States (#) | 1 | 16.16 | 11 | 43 | 15.4 | 558 |
| Dummy Law | 0 | 0.323 | 0 | 1 | 0.468 | 558 |
| %Δ Investment | 0 | 0.330 | 0.166 | 1 | 0.573 | 279 |
| Δ Units (#) | -21 | 60.24 | 1.00 | 79 | 611.1 | 279 |
| Δ States (#) | -2 | 1.189 | 0.000 | 7 | 4.93 | 279 |

## Table 3

## Industry Composition per Sample

This table shows the industry composition for Bonds Franchise Guide data and Handbook of Franchise Opportunities data. The left column shows the industry classification, the center column shows the number of Franchisor-Year observations per industry classification and the right column shows the percentage of the total number of observations that each industry classification represents. There are 45 industry classifications in Bonds Franchise Guide data and 9 industry classifications in the Handbook of Franchise Opportunities dataset.

**Panel A: BFG**

| Industry | Firm-Years | % |
|---|---|---|
| Auto/Truck Rental | 51 | 0.5% |
| Car Repair | 716 | 7.1% |
| Building & Remodeling | 448 | 4.5% |
| Business: Advertising | 80 | 0.8% |
| Business: Financial Services | 255 | 2.5% |
| Business: Telecommunications | 157 | 1.6% |
| Child Development | 315 | 3.1% |
| Education / Personal Development | 206 | 2.1% |
| Employment & Personnel | 323 | 3.2% |
| Food: Coffee | 133 | 1.3% |
| Food: Donuts / Cookies / Bagels | 328 | 3.3% |
| Food: Ice Cream / Yogurt | 241 | 2.4% |
| Food: Quick Service / Take-out | 1,641 | 16.3% |
| Food: Restaurant / Family-Style | 618 | 6.2% |
| Food: Specialty Foods | 366 | 3.6% |
| Hairstyling Salons | 136 | 1.4% |
| Health / Fitness / Beauty | 237 | 2.4% |
| Laundry & Dry Cleaning | 183 | 1.8% |
| Lawn and Garden | 109 | 1.1% |
| Lodging | 217 | 2.2% |
| Maid Service & Home Cleaning | 109 | 1.1% |
| Maintenance / Cleaning | 578 | 5.8% |
| Medical / Dental Products | 80 | 0.8% |
| Miscellaneous | 229 | 2.3% |
| Packaging & Mailing | 162 | 1.6% |
| Printing & Graphics | 148 | 1.5% |
| Publications | 50 | 0.5% |
| Real Estate Inspection Services | 130 | 1.3% |
| Real Estate Services | 160 | 1.6% |
| Recreation & Entertainment | 105 | 1.0% |
| Rental Services | 66 | 0.7% |

| Industry | Firm-Years | % |
|---|---|---|
| Retail: Art Supplies | 65 | 0.6% |
| Retail: Sporting Goods | 129 | 1.3% |
| Retail: Clothing / Shoes | 33 | 0.3% |
| Retail: Convenience Stores | 92 | 0.9% |
| Retail: Home Furnishings | 190 | 1.9% |
| Retail: Home Improvement | 72 | 0.7% |
| Retail: Miscellaneous | 47 | 0.5% |
| Retail: Pet Products | 58 | 0.6% |
| Retail: Photographic Products | 93 | 0.9% |
| Retail: Specialty | 439 | 4.4% |
| Retail: Electronics | 67 | 0.7% |
| Security & Safety Systems | 36 | 0.4% |
| Signs | 102 | 1.0% |
| Travel | 47 | 0.5% |
| **Total** | **10,047** | |

**Panel B:HFO**

| Industry | Firm-Years | % |
|---|---|---|
| Auto Repair/Rental | 62 | 11.1% |
| Business Services | 60 | 10.8% |
| Construction | 24 | 4.3% |
| Educational | 18 | 3.2% |
| Employment | 42 | 7.5% |
| Food | 238 | 42.7% |
| Home Furnishing | 34 | 6.1% |
| Real Estate | 20 | 3.6% |
| Retail | 60 | 10.8% |
| **Total** | **558** | |

# Table 4

## Main Results: HFO database within franchisor variation

This table reports two regressions estimated using HFO data. The dependent variable in both regressions is the logarithm of investment requirements. In column I the main explanatory variables are the number of states in which the franchisor operates and the Dummy Law, which takes a value of one if the franchisor's headquarter is located in a state that have passed a good-cause law by the time they were surveyed (1979 and 1982), and zero otherwise. The within variation in the passing of the laws is given by franchisors located in California and Illinois, given that the good-cause law was passed in those states in 1980. Additional controls are experience squared, total units, total units squared and firm fixed effects. The explanatory variables in n column II differs from the ones in column I in column II we there are two dummies measuring the passing of the laws: one that takes a value of one if the franchisor's headquarter is located in California in 1982, and zero otherwise; and another that takes a value of one if the franchisor's headquarter is located in Illinois in 1982, and zero otherwise. Robust standard errors adjusted by clustering at the industry level are reported in parentheses. The statistical significance are *10%, **5% and ***1%.

| Variable | log(Investment) | log(Investment) |
|---|---|---|
| **States** | 0.0118** | 0.0109** |
| | (0.0046) | (0.0038) |
| **Dummy Law** | 0.0903** | |
| | (0.0279) | |
| **States*(Dummy Law)** | -0.0043 | |
| | (0.0028) | |
| **Dummy Δ law California** | | 0.1029** |
| | | (0.0421) |
| **Dummy Δ Law Illinois** | | 0.0348 |
| | | (0.0245) |
| **States*(Dummy Δ law California)** | | -0.0050*** |
| | | (0.0009) |
| **States*(Dummy Δ Law Illinois)** | | -0.0010 |
| | | (0.0042) |
| **Experience squared** | -0.0003 | -0.0003* |
| | (0.0002) | (0.0002) |
| **Total Units** | 0.0002 | 0.0001 |
| | (0.0001) | (0.0001) |
| **Total Units squared** | -0.0000 | -0.0000 |
| | (0.0000) | (0.0000) |
| **Dummy 1982** | 0.2334*** | 0.2362*** |
| | (0.0290) | (0.0245) |
| **N** | 558 | 558 |
| **Firm-Fixed Effects** | Yes*** | Yes*** |
| **Industry Cluster** | Yes | Yes |
| **R-squared** | 0.3085 | 0.3086 |
| **F** | 277.63 | 463.44 |

# Table 5

## Main Results: BFG database within industry variation

This table reports three regressions estimated using BFG data. The dependent variables of columns I, II and III are logarithm of net investments, logarithms of total investments and royalty rates, respectively. The main explanatory variables are the number of states in which the franchisor operates, the Dummy Law, which takes a value of one if the franchisor's headquarter is located in state that has passed good-cause termination/nonrenewal laws, and zero otherwise, and the interaction between these two variables. Additional controls are experience, experience squared, total units, the squared values of these two variables and industry fixed effects. Robust standard errors adjusted by clustering at the industry level are reported in parentheses. The statistical significance are *10%, **5% and ***1%.

| Variable | log(Net Investment) | log(Investment) | Royalty |
|---|---|---|---|
| **States** | 0.0088*** | 0.0074*** | -0.0002 |
| | (0.0017) | (0.0013) | (0.0002) |
| **Dummy Law** | 0.1104* | 0.0938* | 0.0059 |
| | (0.0625) | (0.0486) | (0.0046) |
| **States*(Dummy Law)** | -0.0035* | -0.0025 | -0.0001 |
| | (0.0021) | (0.0018) | (0.0001) |
| **Experience** | 0.0003 | -0.0031 | -0.0002 |
| | (0.0048) | (0.0046) | (0.0007) |
| **Experience squared** | 0.0001 | 0.0001* | -0.0000 |
| | (0.0001) | (0.0001) | (0.0000) |
| **Total Units** | -0.0000 | 0.0000 | 0.0000 |
| | (0.0000) | (0.0000) | (0.0000) |
| **Total Units squared** | 0.0000 | 0.0000 | -0.0000 |
| | (0.0000) | (0.0000) | (0.0000) |
| **N** | 10,047 | 10,047 | 9,648 |
| **Industry-Fixed Effects** | Yes*** | Yes*** | Yes*** |
| **Time-Fixed Effects** | Yes*** | Yes*** | Yes*** |
| **Industry-Cluster** | Yes | Yes | Yes |
| **R-squared Within** | 0.1757 | 0.2226 | 0.0022 |
| **R-squared Between** | 0.4075 | 0.4234 | 0.0372 |
| **R-squared Overall** | 0.4454 | 0.4648 | 0.0285 |

# Table 6

## Robustness Checks: BFG database within franchisor variation

This table reports three regressions estimated using BFG data. The dependent variable of columns I and II is logarithm of net investments. The dependent variable of column III is the percentage of franchise units, which is the fraction of franchised to total units (franchised and owned) a franchisor operates. The main explanatory variable is the number of states in which the franchisor operates. Controls variables are experience squared, total units, total unit squared and franchisor fixed effects. Additional control variables are the projected units a franchisor estimates to open in the present year; the dummy financial assistance, which takes a value of one if financial assistance is offered to prospective franchisees, and zero otherwise; the average contract length offered to prospective franchisees, measured in years; and the advertisement fee that franchisors ask prospective franchisees, measured as a percentage of the franchisees revenues. Robust standard errors adjusted by clustering at the industry level are reported in parentheses. The statistical significance are *10%, **5% and ***1%.

| Variable | log(Net Investment) | log(Net Investment) | % Franchised Units |
|---|---|---|---|
| **States** | 0.0078*** | 0.0064** | 0.0020*** |
| | (0.0020) | (0.0025) | (0.0006) |
| **Experience squared** | 0.0001** | 0.0001* | -0.0001*** |
| | (0.0000) | (0.0001) | (0.0000) |
| **Total Units** | -0.0000 | -0.0000 | 0.0000 |
| | (0.0000) | (0.0000) | (0.0000) |
| **Total Units squared** | 0.0000 | -0.0000 | -0.0000 |
| | (0.0000) | (0.0000) | (0.0000) |
| **Projected new Units** | | -0.0004 | -0.0000 |
| | | (0.0003) | (0.0000) |
| **Dummy Financial Assistance** | | 0.0231 | 0.0116 |
| | | (0.0348) | (0.0111) |
| **Contract Length** | | 0.0070* | -0.0007 |
| | | (0.0036) | (0.0011) |
| **Advertisement fee** | | 0.1320 | 0.0260 |
| | | (0.1087) | (0.0280) |
| **N** | 10,047 | 7,837 | 7,837 |
| **Firm-Fixed Effects** | Yes*** | Yes*** | Yes*** |
| **Time-Fixed Effects** | Yes*** | Yes*** | Yes*** |
| **Industry Cluster** | Yes | Yes | Yes |
| **R-squared** | 0.1747 | 0.1621 | 0.0456 |
| **F** | 19.0413 | 12.9847 | 6.5535 |