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THE DYNAMICS OF FRANCHISE CONTRACTING: EVIDENCE FROM PANEL DATA

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ABSTRACT

In this paper, we model the determinants of franchise contract terms, namely royalty rates and franchise fees, using a unique panel data set of about 1000 franchisors for the period 1980-1992. We focus on the extent to which firms adjust the terms of their contracts as they become better established, and find that adjustment is relatively infrequent and that firms do not systematically raise or lower their royalty rates or franchise fees when they do adjust them. These results tend to refute a number of existing theories of franchising that are based on risk-sharing, asymmetric information, and certain incentive structures, but support those based on franchisor opportunism and to some extent double-sided moral hazard. Our results also suggest that when industrial organization economists do not have access to panel data, their work may well suffer from the omitted variable bias caused by unobserved firm effects.

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The Dynamics of Franchise Contracting: Evidence from Panel Data

1. Introduction

A franchise agreement is typically defined as a contractual arrangement between two legally independent firms, whereby the franchisee pays the franchisor for the right to sell the franchisor's product and/or the right to use his trademark. This form of organization is now a well-established business phenomenon: in 1986, it was estimated that about 35% of all retailing in the U.S. took place through franchised companies, and that franchising accounted for about 13.5% of GDP.[1]

Consistent with its economic importance, one now finds in the literature a number of alternative explanations for the existence of franchising, and for the structure of franchise contracts. These models, however, like much of the theoretical literature on contractual arrangements, have received only a limited amount of empirical attention. Furthermore, the empirical work that has been done on franchising, like the work on contracting and vertical integration more generally, is largely cross sectional in nature.[2] As a result, researchers have been unable to assess how firms adjust the terms of their contract as they become better established, and they have been unable to control for unobserved firm specific effects.

In this paper, we model franchise contracting using a unique panel data set that we assembled on the key monetary contract terms of about 1000 individual franchisors each year for the 1980-1992 period. We use these data to assess how firms do adjust their choice of franchise contract terms as they become established, and at the same time determine the extent to which earlier work in the area may have been affected by

[1] See U.S. Dept. of Commerce (1988), which gives data for 1986. In 1988, the Department of Commerce cancelled the publication of "Franchising in the Economy", the only source of census-type data on franchising in the U.S. Efforts by the International Franchise Association, the main franchisor - and now also franchisee - trade association, to take over the yearly publication of this report, have been unsuccessful.

[2] See e.g. Anderson and Schmittlein (1984), Crocker and Masten (1988), Goldberg and Erickson (1987), Joskow (1987), Masten (1984) Masten and Snyder (1992), and Monteverde and Teece (1982) for contributions on contracting and vertical integration. Also see Crocker and Masten (1996) and Shelanski and Klein (1995) for reviews of some of this literature. For empirical work on franchising, see Goldberg (1983), Brickley and Dark (1987), Norton (1988), Martin (1988), and Lafontaine (1992a, 1993)). Note that Banerji and Simon (1992) and Minkler and Park (1992) use very small panels of publicly traded franchisors. Also, Shane (1995) follows a group of 138 franchisors that started franchising in 1983 over the following 10 years. However, he is concerned with the effect of franchising on firm growth and survival.

omitted firm effect biases. Our goals in doing this are to relate the observed dynamic patterns in franchise contract terms to the implications of the various theories of franchising and, hopefully, suggest avenues for future theoretical work not only on franchising, but on contracting and vertical relationships more generally.

We focus specifically on the determinants of royalty rates – the proportion of sales that franchisees pay their franchisors on an ongoing basis over the duration of the contract – and franchise fees – the fixed upfront payments that franchisors require franchisees to pay at the start of the franchise contract.[3] This focus on the terms of the contract is consistent with the theoretical literature's emphasis on explaining contract terms, but is in contrast to most of the existing empirical literature on franchising, which has been concerned with the extent to which firms use franchising versus company-ownership. To date, only Lafontaine (1992, 1993) and Sen (1993) have had data allowing them to examine empirically the determinants of franchise contract terms. However, given the limitations of their cross-sectional data, these authors were unable to control for the effects of potentially important omitted variables, such as the quality of the firm, of its technology or management, or profitability differences.

The paper is organized as follows. In the next section, we briefly discuss existing theories of franchising and present our conceptual framework. In Section 3, we discuss our sources of data, and some of the issues that arise in constructing our panel data set on franchised chains. Our empirical methodology and results are found in Section 4. We conclude in Section 5.

2. Conceptual Framework

In this section, we use the existing theoretical literature on franchising to derive

[3] Because of our focus on these contract terms, which are used by what the U.S. Dept. of Commerce calls business-format franchisors and not by "traditional" franchisors, our work relates to business-format franchise contracting only. "Traditional" franchising refers to cases where the franchisor-franchisee relationship is basically one of manufacturer-retailer under exclusive marks. Traditional franchising includes gasoline stations, car dealerships, and soft-drink bottlers, and accounts for about three quarters of all franchised sales. In this type of franchising, franchisors obtain revenues by selling inputs at a markup to their franchisees. In business-format franchising, the franchisor provides mostly a tradename and method of doing business, for which the franchisee typically pays an upfront franchise fee and a percentage of sales on an ongoing basis. Examples include restaurants, business and employment services, and real estate agencies. Business format franchising, which accounts for the other 25% of franchised sales, is where most of the growth in franchising has occured over the last few decades.

empirical predictions as to how the terms of franchise contracts should change as the franchise becomes better established. Theoretical models of franchising rely on risk-sharing, moral hazard and selection issues – framed in either static or dynamic settings – to explain the structure of franchise contracts. To clarify the discussion below, Table 1 summarizes the models' empirical predictions regarding how royalty rates should adjust as firms become better established. By and large, this table shows that existing theories make very different predictions as to the dynamics of franchise contracting. Hence the issue of how contract terms are adjusted over the life of a franchised chain is clearly an empirical one.

In discussing the empirical implications of the theories for the terms of the franchise contracts, we concentrate on royalty rates almost exclusively. This is because under the assumptions of most of the theoretical models, franchisees are kept at their reservation utility level.[4] As royalty rates affect behavior at the margin, and fixed fees do not, franchisors choose royalty rates first in these models. The franchise fee is then determined as the present value of all downstream revenues in excess of those necessary for the franchisee to attain his opportunity level of utility, given the royalty rate and the length of the contract. Consequently, everything else constant, factors that are expected to have a positive effect on the royalty rate are expected to have a negative one on the franchise fee, and *vice versa.*

Theoretical models developed in a dynamic and in a static setting both provide useful predictions regarding how firms adjust their contract terms as they mature. The more dynamic models of franchise contracting include Gallini and Lutz' (1992) model of signaling, and McAfee and Schwartz' (1994) model of franchisor opportunism. A few other models, notably Rubin (1978) and Mathewson and Winter (1985), contrast the expected behavior of established versus new franchisors. Assuming that "becoming established" occurs with years of experience, we can determine whether the data supports these models as well. Finally, for models framed in a static setting, one can make assumptions as to how the underlying forces should change over time, as a franchisor becomes better established, which then provides implications for royalty rate changes. Though the focus of these models is not on the dynamics, if they truly capture the essence of franchising, their dynamic implications are quite testable. We now turn to a discussion of each of the models and their implications,

[4] Mathewson and Winter (1985) are an exception. In their moral-hazard *cum* asymmetric information model, franchisees earn rents ex-ante because they are liquidity constrained. See also Kaufmann and Lafontaine (1994) and Michael and Moore (1995) for evidence of downstream rents in franchising.

Table 1

Implied Theoretical Effects of Franchising Experience and Number of Outlets on Royalty Rates

Model	Additional Assumptions	Franchising Experience	Number of Outlets
1. Signaling (Gallini & Lutz (1992))	None	−	−
2. Franchisor Opportunism (McAfee & Schwartz (1994))	None	0	0
3. Market saturation effects under two-sided moral hazard (Rubin (1978))	None	+	+
4. Franchisor reputation effects under one-sided moral hazard (Mathewson & Winter (1985))	None	−	−
5. Risk Sharing	None		−
6. One-Sided Moral Hazard (Stiglitz (1975), Caves and Murphy (1976))	a) The franchisees' role becomes less important or less difficult to assess as the franchisor gains experience	+	+
	b) The franchisees' role becomes more important or more difficult to assess as the franchisor gains experience	−	−
7. Two-Sided Moral Hazard (e.g. Rubin (1978), Lal (1990))	a) The franchisees' role becomes less important or less difficult to assess as the franchisor gains experience	+	+
	b) The franchisee's role becomes more important or more difficult to assess as the franchisor gains experience	−	−
	c) Cobb-Douglas production and exponential disutility (Bhattacharyya and Lafontaine, (1995))		0

Note: This table indicates that years of franchising experience or the number of outlets should have either positive (+), negative (-), or no effect (0) on the royalty rates according to the various theories.

starting with those models that have direct dynamic implications.

In their signaling model, Gallini and Lutz (1992) suggest that royalty rates are used by franchisors as a way to signal their quality. In this model, if the true quality of the franchising firm is known, the optimal contract is one with a fixed fee and no royalty rate because royalty rates lead to double marginalization, which is costly to the franchisor.[5] However, with an information asymmetry where only the franchisor knows his quality, high-value franchisors will want to signal their type. One way they can do that is by offering a contract that makes their revenues depend on the revenues of franchisees. In the separating equilibrium, higher-value firms will use high royalty rates, while lower-value franchisors will opt for low or, at the limit, no royalties. Gallini and Lutz (1992) note that over time, the quality of the franchisors becomes known to potential franchisees so that the positive royalty rate is no longer needed. Thus as years of franchising experience increase, the royalty rate should decline according to this theory.[6]

McAfee and Schwartz (1994), on the other hand, examine franchisors' incentives to behave opportunistically towards existing franchisees in a context where franchisees compete against each other. After entering into a franchising arrangement with a franchisee, the franchisor will have an incentive to offer a new franchisee terms that involve a lower royalty rate and a higher franchise fee. This is because royalties operate on the franchisee's margin, so that the new franchisee can then undercut the existing franchisee, giving the new franchisee a competitive advantage over the first franchisee. The franchisor benefits from this because he can capture the new franchisee's profits via a higher fixed fee. However, given that franchisees will expect this type of franchisor opportunism, they will enter into a franchise agreement only if the franchisor can commit to not behave in this opportunistic way. One form this commitment might take would be relatively stable contract terms over time. Hence the prediction from this model is that royalty rates might tend to be fairly constant as firms gain franchising experience.[7]

Under Rubin's (1978) characterization of double-sided moral hazard, franchisors

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[5] Double marginalization refers to the high prices that result when downstream firms with market power buy a product from an upstream monopolist and then impose a second margin on the product's wholesale price to maximize their own profits.

[6] See Bagwell and Riordan (1991) for a similar argument in the context of pricing and quality signaling.

[7] See also O'Brien and Shaffer (1992) for a similar argument in the general context of vertical relationships.

are motivated to uphold the value of their tradename and provide services to franchisees in part by their desire to sell future franchises. As the size of the chain increases, leading to market saturation and a reduction in the potential for future franchise sales, the disciplining power of future franchise sales decreases. Rising royalty rates over time would compensate for this loss in franchisor incentives. Note that this effect, which requires some degree of market saturation, may only occur in very large chains.

Mathewson and Winter's (1985) model assumes that new franchisors will be limited by their lack of reputation as to the amount of franchise fee they can charge upfront. As a result, in their model, and holding everything else constant, new chains will charge low franchise fees, and high royalty rates. As they become better established, they will be able to increase their franchise fee, and will want to reduce their royalty rate.

Finally, a pure risk-sharing model gives no prediction about the effect of franchisor experience on royalty rates.[8] However, assuming that outcomes across outlets are positively correlated, and assuming a mean-variance utility function for both the franchisee and the franchisor, the royalty rate would decrease with the number of outlets in the franchised chain, shifting more of the variation in unit revenues towards the franchisee to compensate for the increase in total risk born by the franchisor.[9] Thus this model's "dynamic" prediction relates to chain size rather than years of experience.

The standard one-sided and two-sided moral hazard models are the main models framed in a more static setting. In the former, production requires that risk averse franchisees put forth some level of effort, for example they must manage daily operations closely or do local advertising. This effort is assumed unobservable to the risk neutral franchisor. In that case, royalty rates arise as a compromise between providing insurance and incentives for franchisees (see e.g. Stiglitz (1975), Caves and Murphy (1976) Mathewson and Winter (1985)). In a double-sided moral hazard model, both franchisees and franchisors need to provide some level of unobservable effort to produce the output (see Rubin (1978), Blair and Kaserman (1982), Mathewson and Winter (1985), Lal (1990) and Bhattacharyya and Lafontaine (1995)). For

[8] See Stiglitz (1974) and Rees (1985) for formal models. Lafontaine and Bhattacharyya (1995) summarize the empirical evidence on the effect of risk on franchising, and argue against the risk-sharing hypothesis as an explanation of franchise contracting.

[9] This result assumes the use of an affine contract, as affine contracts are typically used in franchising.

example, the franchisee still manages the unit, but now the franchisor must put some effort into advertising the whole chain, in monitoring existing franchisees and finding new ones, and in providing training and managerial support to franchisees. In that case, royalties arise as a way to provide incentives to both franchisors and franchisees.

In both one-sided and two-sided moral hazard models, changes in the relative importance of the franchisee's input, or in the difficulty in assessing its provision, will affect the optimal royalty rate. Not surprisingly, if the relative importance of the franchisee's input increases as the firm becomes better established, the optimal royalty rate will decrease, whereas decreases in the importance of the franchisee's input will have the opposite effect. Hence both increases and decreases in royalty rates may arise as firms become better established in these models, depending on which input becomes relatively more important over time. However, Bhattacharyya and Lafontaine (1995) show that under double-sided moral hazard, assuming a constant Cobb-Douglas production technology, and exponential disutility of effort functions, the royalty rate would be unaffected by the number of outlets in the chain.[10]

3. The Data

As noted in the introduction, the data we have access to is quite unique: For the first time, we have information on the contract terms, namely royalty rates, advertising fees and franchise fees, for about 1000 individual franchisors each year for 13 years, from 1980 to 1992 inclusively. Most of the data used here come from the *Entrepreneur* magazine's "Annual Franchise 500" surveys.[11] These surveys also include information relative to the year in which the firm began its operation, the year in which it became involved in franchising, the number of units (company-owned and franchised), the type of business it is involved in, and the amount of capital required to open an outlet.

The royalty rate and franchise fee demanded by a franchisor are generally the

[10] Risk-sharing, single-sided moral hazard and double-sided moral hazard models also suggest that contract terms should vary across all franchisee-franchisor pairs. In reality, contract terms are the same for all franchisees joining a franchisor at a point in time. Assuming that they reflect an average of optimal contract terms for the set of franchisees joining then, the theories predict that contract terms would change with changes in the set of franchisees joining the chain. While this gives no suggestion as to the direction of the change, it implies that contract terms should be adjusted rather frequently. This prediction can also be tested with the data in this paper.

[11] The first survey really was done in 1980, reporting data for 1979. Unfortunately, in this case, the advertising fee was not reported.

same for all franchisees joining a chain at a point in time.[12] In addition, royalty rates are usually constant over all sales levels.[13] As a result, one can meaningfully refer to, and examine empirically, the royalty rate and franchise fee offered to franchisees by a franchisor at each point in time.[14] Note that in this case the yearly data reflect the franchise contract terms offered that year to new franchisees, not changes in the terms of existing franchisees' contracts.[15]

Though the number of franchisors surveyed by the *Entrepreneur* magazine remains relatively constant over time, one does not find the same franchisors responding consistently to the survey across the various survey years. Table 2 describes our sample of franchisors, and shows for example that only 103 franchised chains are found throughout our 13 years of data. The unbalanced nature of our sample is due in large part to entry: on average, in any given year, about 15% of the franchisors covered in the survey have just started franchising (i.e. they report that they started franchising the year of the survey itself, or the previous year). Second, our unbalanced sample is in part the result of exit. According to the Department of Commerce (1988), between 120 and 180 franchisors stopped franchising or stopped their operations altogether each year over the period from 1980 to 1986.[16] One of the better

[12] See Lafontaine (1992a) on this. Note that in the *Entrepreneur* surveys, which are our main source of data, some franchisors give a range or answer "varies" in describing their fees. Cases where fees were said to "vary" were eliminated from the data since it is impossible to assign fees to these firms. However, averages were used for those that indicated a range under the assumption that the average fee represents the average outlet in the chain. Our empirical results below were unchanged when we limited ourselves to samples including only firms that did not report any range in their fees.

[13] In Lafontaine (1992b), 93 of the 117 respondents said that their royalty rate was constant over all sales levels. Another 20 said it was piece-wise linear, with 18 of them using a sliding scale and 2, an increasing scale. The remaining respondents said "other".

[14] In addition to using royalty rates and franchise fees, business-format franchisors also sometimes require franchisees to buy certain inputs directly from them. If these are sold at a markup, they provide an additional mechanism for franchisors to extract revenues from their franchisees. One distinguising feature of business-format franchising, however, is that in most cases, production occurs at the outlet level. This makes it possible for franchisees to substitute away, at least to some extent, from inputs that franchisors might sell above marginal cost, limiting the scope of input markups as a source of revenues for franchisors. Royalties on sales will not induce this type of input choice distortion. Furthermore, in business-format franchising, the franchise itself – or equivalently the tradename – is considered a product, so that any other input sold to franchisees is considered tied. Both the input choice distortion effects and the Antitrust treatment of tying limit the use of input markups by business format franchisors. See Hunt and Nevin (1975), Klein and Saft (1985) and Lafontaine (1993) for more on this issue.

[15] Franchise contracts last an average of about 15 years (U.S. Dept. of Commerce (1988)) during which renegotiation of contract terms is very rare.

[16] According to the same source, the number of franchisors increased over the same period from

known franchisor directories, *The Franchise Annual*, reports an even greater exit rate. Third, the lack of continuity in the sample results in part from the characteristics of the survey itself: For many franchisors, responding to this survey is a way to increase their visibility vis-à-vis potential franchise buyers. When the firm is not interested in attracting new franchisees, the value of responding to the survey that year is reduced, and some may choose not to respond. In that sense, the sample in any given year is biased towards new franchisors, and those more established franchisors that are expanding. Finally, our sample is unbalanced partly because of the way in which we built the database: given that many of the franchisors surveyed are relatively small firms, matching franchisors across survey years proved a tedious and difficult process. We used a fairly conservative approach in this respect, treating as separate those firms for which there was not enough evidence to conclude with very high probability that they were the same. All of these reasons for the lack of balance in our sample introduce some possibility of sample selection bias. However, much of the variation in the sample may also reflect random non-responses. We come back to this issue later, in our methodology section.

Other sources of data on individual franchisors, such as *The Franchise Annual* by Info Press Inc., Bond's *Source Book of Franchised Opportunities* and the Dept. of Commerce's *Franchise Opportunities Handbook* were used in building the database mostly as a way to settle inconsistencies in the *Entrepreneur* surveys. In addition, the latter two sources provide useful additional information on each franchised chain, including the number of States in which the chain operates, which gives a measure of the geographical dispersion of the whole chain, and the amount of initial training provided by each franchisor to its franchisees, in number of days. However, in adding these new variables, there is considerable loss in sample size because the samples covered by these sources did not match the samples covered in the Entrepreneur surveys. Thus the added variables are not emphasized below.

Table 3 gives the mean, standard deviation, and range of the main variables of interest, along with the number of observations over which these were calculated. Note that the relevant notions of royalty rates and franchise fees in this paper represent all the variable and fixed payments from the franchisee to the franchisor. As a result, the "royalty rate" used herein is the percentage of sales paid to the franchisor, including any advertising fee given as a percentage of sales. The "franchise fee" is the fixed up-front fee paid to the franchisor when opening a new outlet. However, when the

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1584 to 2177.

Table 2

Characteristics of the Entrepreneur Sample

Observed	Number of Firms	Number of Obs.	Started Franchising in (mean)	Started Business in (mean)	Number of Firms (Consecutive Observations)
1 time	1281	1281	1982.4	1976.1	1281
2 times	826	1652	1981.8	1975.3	767
3 times	508	1524	1980.4	1974.8	438
4 times	432	1728	1978.9	1971.4	351
5 times	226	1130	1979.0	1973.0	169
6 times	201	1206	1976.6	1969.5	152
7 times	142	994	1977.3	1970.5	105
8 times	97	776	1973.8	1965.6	63
9 times	68	612	1975.3	1966.4	41
10 times	68	680	1970.5	1963.3	36
11 times	54	594	1974.4	1969.3	34
12 times	57	684	1970.6	1963.8	27
13 times	103	1339	1966.4	1960.0	103
Total	4063	14200	1979.8	1973.3	3567

advertising fee or royalty payments are given as a fixed amount per time period, they are discounted and added to the fixed franchise fee.[17] Finally, nominal values are expressed in thousands of dollars and, when needed, are transformed to 1992 U.S. dollars using the CPI.[18] Royalty rates and other proportions are in percentages. More detailed variable definitions are found in the Appendix.

Before moving on to the econometric evidence below, it is worth examining the

[17] In reality, fixed up-front fees and ongoing fixed payments are different in that the obligation to pay the latter disappears if the outlet goes out of business during the period of the contract. Since ongoing fixed payments are really uncommon, 673 out of 12,259 observations, and failure rates are also low according to the U.S. Dept. of Commerce (1988) (the number of discontinued outlets in 1986 was 7934, while the total number of business format franchises was 246664, for a discontinuation rate of about 3.2% per year), we decided to disregard this difference. The discount rate used was 3%, under the assumption that the ongoing fixed fees are stated in real dollars. Given the very small number of cases where ongoing fixed payments occur, results are not sensitive to this procedure.

[18] Some of the franchisors in the sample are Canadian. Their franchise fees were transformed to $U.S.

Table 3

Descriptive Statistics for the Main Variables of Interest

Variable	N	Mean	S.E.	Min.	Max.
Royalty Rate (in %)	12787	6.2	3.6	0.0	30.0
Royalty less Advertising (in %)	13168	4.7	3.0	0.0	30.0
Advertising Fee (in %)	13428	1.4	1.8	0.0	30.0
Franchise Fee ($K)	13597	22.1	35.8	0.0	1118.8
Franchise Fee (1992 $K)	13597	27.7	46.2	0.0	1431.8
Franchise Fee less Fixed ($K)	13597	17.7	16.4	0.0	487.5
Franchise Fee less Fixed (1992 $K)	13597	22.2	20.8	0.0	694.4
Capital Required (1992 $K)	13812	167.7	685.0	0.0	38022
Number of Outlets	14159	203.8	712.2	1.0	12643.0
% Company-owned Outlets	14159	23.0	29.2	0.0	100.0
Canadian Franchisor	14164	0.11	0.31	0.0	1.0
Franchising Experience	14200	16.2	10.4	1.0	85.0
Financing Provided (dummy)	14088	0.25	0.43	0.0	1.0
Number of States with Outlets(1)	7235	14.8	14.9	0.0	50.0
Initial Training (in days)	7060	15.4	15.2	0.0	290.0

(1): This variable equals 0 for the few Canadian franchisors in our data with no units in the U.S.

raw data directly. Table 4 describes, for each variable of interest, the number of times that the variable went up, down or stayed the same across any consecutive pair of observations. It shows that most firms did not change their royalty rates or nominal fixed fees from one year to the next. For royalty rates, 76% (or 6417 of 8398 in row 1) did not change their royalty rates. For fixed fees, 62% (5600 of 9037) did not change their nominal fixed fees despite underlying price inflation in the economy. Of those who did change their royalty rates, the changes were split almost equally between cases where the royalty rate went up, and cases where it went down. However, while the data show that changes do not occur frequently, those that do occur tend to be quite sizeable, with an average change in royalty rates of about 2.5 percentage points up or down, representing almost 50% of the starting value (see row 1). Figure 1 displays the whole distribution of percent changes in royalty rates.

The next two rows in the table show that the royalty rate exclusive of advertising fees, and advertising fees themselves, are both more persistent than what we use below as our notion of royalty rates. Moreover, these additional rows show that there is much persistence in the royalty rate however it is defined.

Figure 1
Distribution of Annual Percentage Change in
Royalty Rates (incl. Advertising Fees)

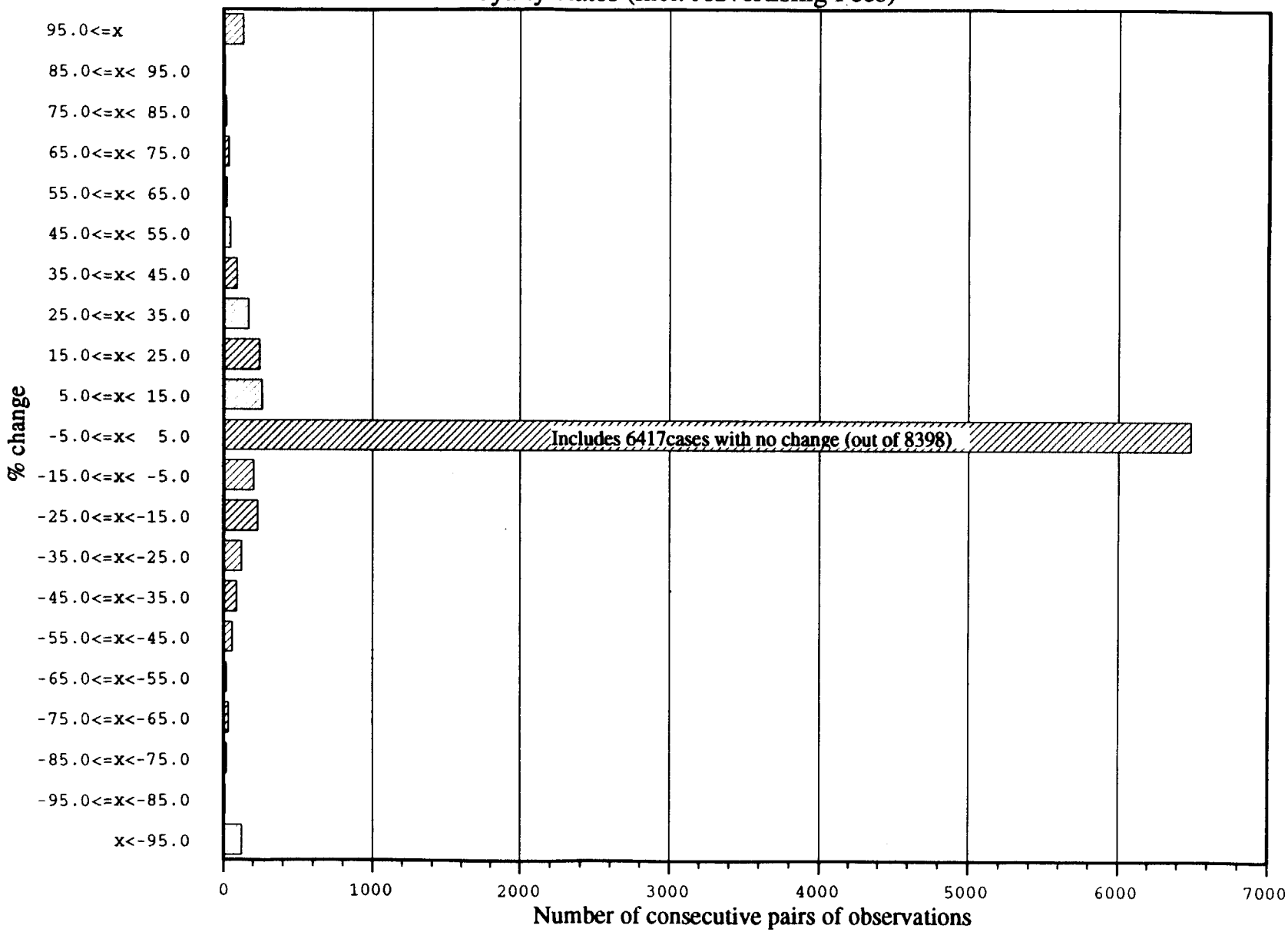


Table 4: Summary of Changes from Year to Year

Changes in	Up			Down			No Change	Total		
	N	mean change	mean % change	N	mean change	mean % change	N	N	mean change	mean % change
Royalty	1059	2.38	45.93	922	-2.59	-48.34	6417	8398	0.02	0.49
Royalty−Adv.	672	2.44	62.78	600	-2.68	-62.11	7471	8743	0.00	0.56
Advertising	736	1.75	126.30	633	-1.97	-128.10	7525	8894	0.00	1.33
F Fee (nom.)	2403	9.57	38.79	1213	-12.83	-48.32	5421	9037	0.82	3.83
F.Fee-Fix(nom.)	2306	5.99	37.03	1131	-7.21	-46.20	5600	9037	0.63	3.67
F Fee(real)	2078	12.87	40.62	6505	-4.33	-13.23	454	9037	-0.16	-0.18
F.Fee-Fix (real)	2013	7.82	38.17	6524	-2.64	-12.25	500	9037	-0.16	-0.34

Table 4 also shows that, due most likely to underlying inflation, nominal franchise fees were adjusted upward between two consecutive years by 26% of franchisors, whereas only 13% adjusted them downward. Figure 2 shows the whole distribution of percent changes in franchise fees, and illustrates this asymmetry. However, the mean increase when this fee goes up far exceeds the mean inflation rate. This suggests that when these fees are adjusted upward, they are making up for several years of inflation, or they are raising fees for additional reasons. As for "real" (CPI adjusted) franchise fees, they change frequently, but this is due mostly to our correction for inflation. As shown in Figure 3, 80.8% (or 6786 cases out of 8398) of franchise fees were changed rather little, by 15% or less (up or down).

Overall, Table 4 and the figures above show not only that franchise contract terms change infrequently, but also that when they do change, the direction of this change is not systematically positive or negative. This is important evidence in light of the number of theoretical models discussed above that predict that changes in royalty rates and franchise fees should be systematically in one direction or another.

4. Empirical Methodology and Results

The data patterns above suggest that royalty rates are adjusted little over time, and that franchise fees often do not keep up with inflation because they are modified infrequently.[19] In what follows, we examine more systematically how contract terms

[19] These data patterns suggest that hazard rate models of spell duration might have been a

Figure 2
Distribution of Annual Percentage Change in
Nominal Franchise Fees (incl. Fixed Payments)

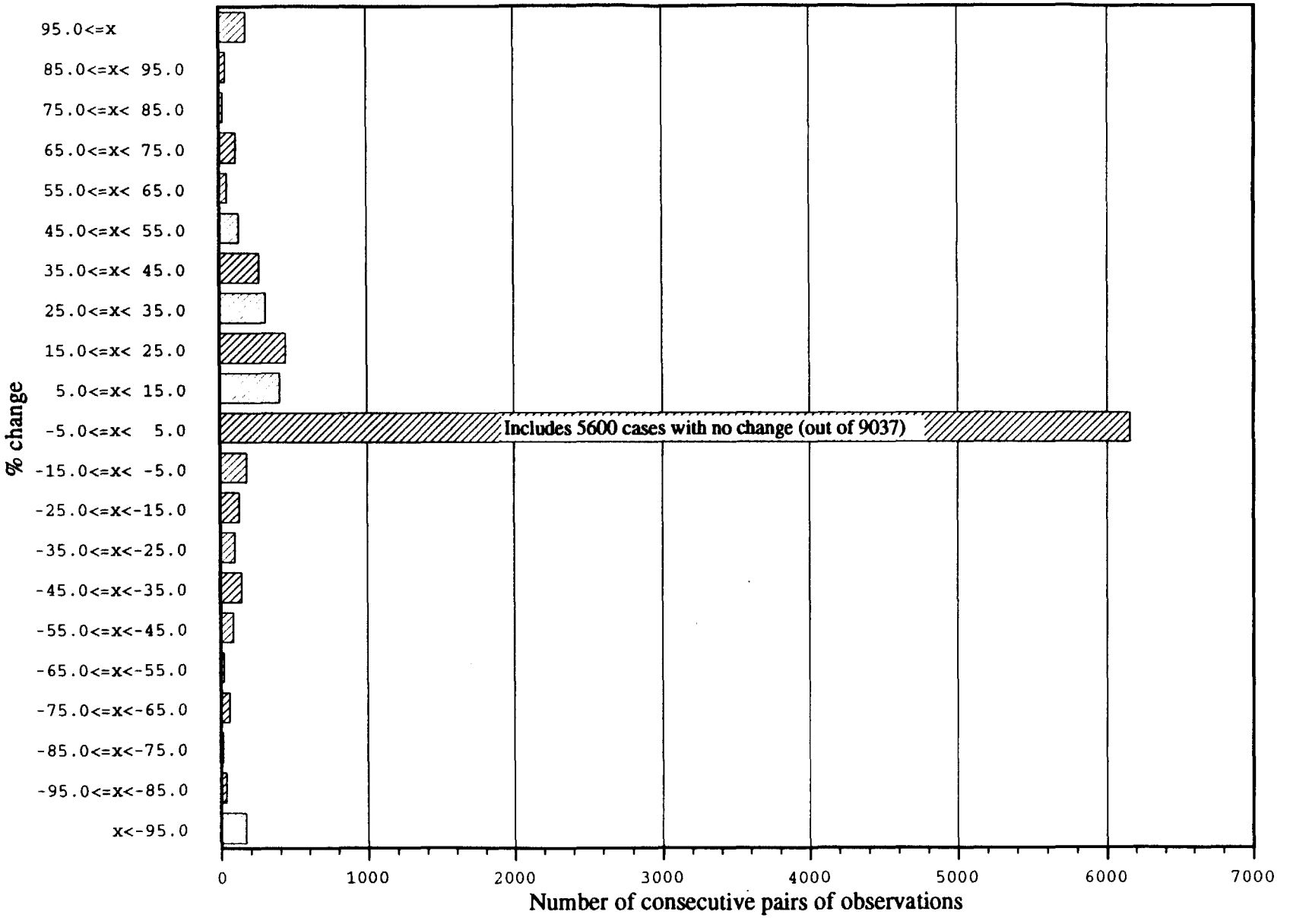
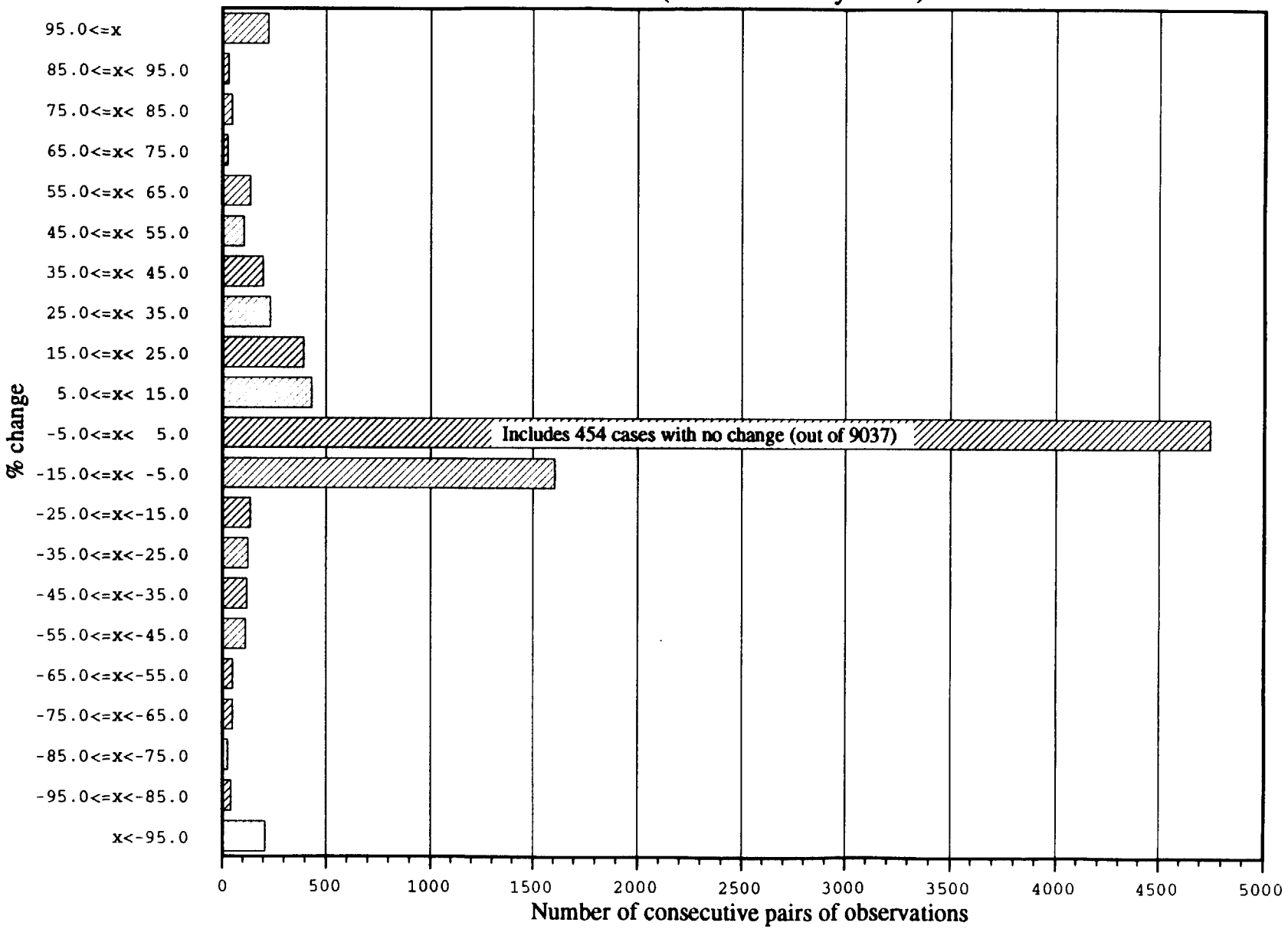


Figure 3
Distribution of Annual Percentage Change in
Real Franchise Fees (incl. Fixed Payments)



are modified as the chain becomes more mature and larger. More specifically, this section develops the methodology to be used, and the issues involved, in testing whether royalty rates rise or fall with increased franchising experience. We concentrate on royalty rates again because under most theories, the effect of franchising experience on franchise fees is simply the reverse of the effect noted in Table 1 for the royalty rates.

4.1. OLS estimation

The hypotheses in Table 1, which relate royalty rates to franchising experience, can be characterized empirically as follows:

$$R_{it} = \beta X_{it} + \epsilon_{it}, \tag{4.1}$$

where R_{it} is the royalty rate and X_{it} is the number of years (at time t) since firm i began franchising. Other control variables included in the estimation of equation (4.1), including non-linear terms in X_{it}, are omitted here for notational simplicity. The sign of β should be as described in Table 1 under the various theories. Assuming for the moment that the error term in (4.1) is independent of X, this equation can be estimated by OLS. Results from doing so, which are directly comparable to the cross-sectional evidence currently in the literature, are shown in Tables 5 and 6 for royalty rates and franchise fees respectively.[20]

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good way to proceed further. However, as will be seen below, we opted against this approach because we wanted to use not only the information about whether contract terms went up, down or stayed the same, but also the information on the size of the change from one period to the next.

[20] Note that the royalty rate model may also be estimated in Tobit form, as there are a number of cases where firms choose a 0 royalty rate. However, the results are little different from the least squares results. Reestimating the models of columns 1 and 2 of Table 5, the Tobit coefficient estimates are:

	1	2
Years Franchising	0.025**	0.010**
	(.008)	(.009)
(Years Franchising)^2	-.0009**	-.0008**
	(.0002)	(.0002)
Number of Outlets (100's)		0.076**
		(.016)
(Number of Outlets (100's))^2		-.0008**
		(.0003)

which is quite similar to results in Table 5. The reason for this is that the data does not form a sizable mass point at zero. The distribution of the royalty rate is concentrated at royalty rates

Table 5: OLS Results for the Royalty Rate (with Adv. Fee)

Independent Variables	1	2	3	4	5
Years Franchising	.022**	.0061	.0090	-.0011	-.012
	(.008)	(.0082)	(.0129)	(.0085)	(.012)
(Years Franchising)^2	-.0008**	-.0007**	-.0009**	-.0005**	-.0005*
	(.0002)	(.0002)	(.0003)	(.0002)	(.0003)
Number of Outlets		.084**	.216**	.097**	.211**
		(.015)	(.028)	(.016)	(.028)
(Number of Outlets)^2		-.0009**	-.0026**	-.0012**	-.0026**
		(.0003)	(.0005)	(.0003)	(.0005)
Financing Provided			.416**		.301**
			(.108)		(.110)
Number of States			-.015**		-.005
			(.005)		(.005)
Canadian Franchisor			.754**		.881**
			(.258)		(.251)
Canadian * States			-.137**		-.106**
			(.037)		(.036)
Training Provided			.004		.0082*
			(.003)		(.0035)
Capital Required			.0003		.0002
			(.0005)		(.0005)
Constant	6.55**	6.56**	6.25**	6.88**	6.30**
	(.12)	(.12)	(.18)	(.16)	(.21)
Sector Dummies	no	no	no	yes	yes
N	12285	12285	5660	12285	5660
R^2	.007	.014	.027	.073	.105
SSR	148416	147907	66353	139085	61010

Notes: $^+$: α=.10; *: α=.05; **: α=.01 for 2-tail t-tests. Standard errors in parentheses. All regressions include year dummy variables.

In the first two columns of these tables, we present the estimates of regressions of the dependent variables on franchising experience, where both a linear and a quadratic term are used.[21] In the second column, we introduce linear and quadratic effects for

between five and ten percentage points. More specifically, out of a total of 12,285 observations, 1034 are at zero, 1903 between zero and five, 7660 are between 5 and 10, 1373 between 10 and 15, 233 between 15 and 20, and 82 are above 20 but below 30.

[21] Alternative dependent variables, such as the royalty rate without the advertising fee and the fixed fee without the ongoing fixed payments, were also considered. But not surprisingly given

Table 6: OLS Results for the Log of Nominal Franchise Fee (Including Ongoing Fixed Payments)

Independent Variables	1	2	3	4	5
Years Franchising	.0055**	.0035*	-.0035	.0004	-.0026
	(.0017)	(.0018)	(.0027)	(.0019)	(.0029)
(Years Franchising)^2	-.00019**	-.00017**	-.0001	-.0001	-.0001
	(.00005)	(.00005)	(.0001)	(.0001)	(.0001)
Number of Outlets		.0161**	.0027	.0182**	.0032
		(.0037)	(.0050)	(.0033)	(.0046)
(Number of Outlets)^2		-.0003**	-.0003**	-.0003**	-.0002*
		(.0001)	(.0001)	(.0001)	(.0001)
Financing Provided			.115**		.114**
			(.023)		(.023)
Number of States			.0051**		.0044**
			(.0009)		(.0009)
Canadian Franchisor			-.101*		-.092*
			(.045)		(.042)
Canadian * States			.035**		.0222**
			(.004)		(.0039)
Training Provided			.0091**		.0078**
			(.0009)		(.0009)
Capital Required					
Constant	2.97**	2.97**	2.77**	2.91**	2.77**
	(.024)	(.024)	(.052)	(.031)	(.042)
Sector Dummies	no	no	no	yes	yes
N	12709	12709	5875	12709	5875
R^2	.050	.054	.109	.116	.170
SSR	7925	7899	2706	7372	2519

Notes: $^+$: α=.10; *: α=.05; **: α=.01 for 2-tail t-tests. Standard errors in parentheses. All regressions include year dummy variables.

the size of the franchised chain, measured by the number of outlets. Both royalty rates and franchise fees show similar patterns in the data: they both tend to increase (at a decreasing rate) as the number of years of franchising experience goes up and as the number of units in the chain increases. Interestingly, the effect of the size of the chain

the data reported in Table 4, the results remained essentially unchanged relative to those reported.

on both fees is more systematically significant, and more important economically than the effect of franchisor years of experience. The differences between estimates from columns 1 and 2 suggest that both variables do capture at least in part the same underlying phenomenon of a franchise becoming better established, as expected. However, as can be seen from their significance levels, each variable independently contributes to the explanatory power of the model.

In column 3, we introduce additional RHS variables suggested by the theories described in Section 2. (See the Appendix for variable definitions.) Results show among other things that the geographical dispersion of outlets in the chain (measured by the number of different States in which the chain has established outlets) has a negative effect on the royalty rate, while the amount of initial training (in days) provided by the franchisor to the franchisee has a positive effect on the same. If, as we conjecture, these variables capture the amount of effort needed from both parties to the contract, or the difficulty in assessing this effort, under double-sided moral hazard, then these results are consistent with theory.[22]

Finally, in columns 4 and 5, we added sectoral dummy variables to the previous two regression equations as a way to capture systematic differences in technology and in margins that might affect the choice of royalty rates and franchise fees for firms in these different industries.[23] The results from these regressions suggest that there are sectoral differences in the setting of the royalty rates and fees: in all cases, the sector dummies are significant additions to the regressions.[24]

All regressions reported in Tables 5 and 6 contain year dummies for the reporting

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[22] Several other independent variables were introduced but we chose not to report those results in the tables largely because of their lack of effect combined with the reduction in sample sizes that they generated. The variable "business-experience" for years of experience prior to beginning franchising, the squared footage of the average outlet, and the minimum number of employees in the average outlet were found to have no effect on royalty rates or fees in either OLS or fixed effects regressions. In OLS regressions, the variable "experience-required" of the franchisee prior to franchising has a significant positive effect on the nominal franchise fee, contract length has a small negative effect on royalty rates, and the proportion of company-owned units has a small positive effect on both franchise fees and royalty rates. None of these effects remain in the fixed-effects regressions. Contract length is the only variable with a significant (negative) effect in the fixed effects regressions, and only for the franchise fee regression. The coefficients on other variables were unaffected however by the inclusion or exclusion of this variable in that regression.

[23] The U.S. Department of Commerce defines twenty-six business format franchising sectors. See the data appendix for more details on these.

[24] The F-statistics for the null hypothesis of no sectoral effects are: F(25,12243) = 31.06, F(25,5611) = 19.66, F(25,12683)=36.3, F(25,5849)=17.4 for the last two columns of Tables 5 and 6 respectively, thus rejecting the null hypothesis.

year for each observation. Though the coefficients on these dummy variables are not reported, they do follow a very positive time trend in both the royalty rate regression (where the coefficient on a time trend is .077 (.008)) and in the fee regression (.046 (.002)). However, the large number of degrees of freedom available permits the less-restricted estimation with year dummies, which are also significant as a group.[25] Finally, the results reported in Tables 5 and 6 all contain White's (1980) correction for heteroscedasticity of the variances of the coefficient estimates.[26]

In conclusion, the results in Tables 5 and 6 are quite consistent with the cross-sectional results currently in the literature, such as those of Brickley and Dark (1987), Norton (1988), Sen (1991) and Lafontaine (1992) which all support some form of moral hazard model. Most important for our purposes, the results above, as those currently in the literature, suggest that the amount of franchising experience and the size of the chain are significant and important determinants of franchise contract terms. However, these results may merely be artifacts of an omitted variable bias. Some of the results obtained with the introduction of sector dummies in the regressions, such as the resulting lack of effect of franchising experience in the franchise fee regression when sectoral effects are included, suggest that the sector effects may be picking up some omitted variable effects. We now turn to an examination of results obtained under fixed-effects estimation (dropping sectoral dummies, which do not vary within firms over time and thus cannot be estimated with firm fixed effects), where we can ask specifically whether the OLS results above reflect mostly between-firm effects or whether they relate to within-firm dynamics.

4.2. Fixed Effects Models and Estimation

Suppose now that the unobservable error term above, ϵ_{it}, is better described as:

$$\epsilon_{it} = u_i + e_{it} \tag{4.2}$$

where u_i is a firm-specific component that represents the quality of the firm (such as its technology, its market value, the quality of its management, etc.), and e_{it} is a measurement error or other type of stochastic shock. In this case, the treatment of

[25] The F-statistic for the addition of eleven year dummies to the regressions in the first column of Tables 5 and 6 respectively when a time trend was also included were F(11,12273) = 1.5 for the royalty rate regression and F(11,11689) = 4.25 for the franchise fee regression.

[26] The White tests for heteroscedasticity, in which the residuals are regressed on the cross-products of the right-hand-side variables, showed that heteroscedasticity was a problem in these regressions.

the individual effect u_i depends on the assumptions we make about the relationships between u, e, and X.

Assume for example that u_i captures differences in franchisor quality, and that firms that remain in business and see their experience increase are more likely to be high quality (high u_i) firms. This would imply a positive correlation between u and X, while u and e could still be orthogonal to each other.[27] This bias can be eliminated by estimating a fixed-effects model in which all variables are taken as differences from their time-series means. The dependent variable is $\tilde{R}_{it} = R_{it} - \sum_{t=1}^{T} R_{it}/T$, and applying the same transformation to X_{it} to get $\tilde{X}_{it}$, the model is:

$$\tilde{R}_{it} = \beta \tilde{X}_{it} + \tilde{e}_{it} \tag{4.3}$$

where u_i is eliminated since it does not vary over time, thus producing a consistent estimate of β.[28]

Table 7 presents fixed effects results comparable to the OLS results shown in Tables 5 and 6.[29] These results are quite different from the OLS results. The OLS results implied that royalty rates and fees rise rapidly as firms become better established. "Within" firms, however, we see that the number of outlets now has no systematic effect on royalty rates or fees, though it had strong positive effects on both in the OLS regressions. Franchising experience also has virtually no effect on

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[27] One could also assume that u, e, and X are all mutually orthogonal. In that case, the model could be estimated as a random effects model in which there is firm-specific heteroscedasticity. However, we find the assumption of no correlation between X and u to be unappealing in these data, and for that reason we chose the fixed effects approach. We performed Hausman tests of fixed versus random effects that confirmed this choice. See footnote 29 below.

[28] Less restrictive models would imply new sources of bias. Replace (4.2) with the following less constrained characterization of the unobservable ϵ_{it}:

$$\epsilon_{it} = \phi_{it} + u_i + e_{it} \tag{4.4}$$

where ϕ_{it} is the component of the firm-specific effect that varies over time. For example, if firm quality increases over time, perhaps due to learning-by-doing or to improved marketing or business conditions, it will be impossible to distinguish between changes over time in the true quality of the firm and the true effect of franchising experience on franchisor's choices of royalty rates. Without exogeneous measures of changing firm quality, or of ϕ_{it}, β will pick up both relationships. Our data do not allow us to disentangle these effects.

[29] The F-test supporting the introduction of firm-specific fixed effects relative to ordinary least squares are: $F(3688, 8580) = 14.6$ and $F(3739, 8953) = 13.1$ for royalty rates and franchise fee respectively (columns 1 and 3 of Table 7). The Hausman tests supporting the use of fixed effects rather than random effects are $\chi^2_{16} = 29.1$ and $\chi^2_{16} = 41.3$ for royalty rates and nominal franchise fees.

Table 7: Fixed Effects Results

	Royalty Rate (with adv. fee)		Nominal F. Fee (incl. ongoing fixed)	
Independent Variables	1	2	3	4
Years Franchising	-.081	-.172*	-.0038	.044**
	(.061)	(.072)	(.0135)	(.016)
(Years Franchising)^2	.002**	.0015**	-.0001	-.0002*
	(.0003)	(.0006)	(.0001)	(.0001)
Number of Outlets	.018	.051	.0012	.0003
	(.020)	(.033)	(.0044)	(.0070)
(Number of Outlets)^2	-.0003	-.0008	-0.0001	-.0001
	(.0003)	(.0006)	(.0001)	(.0001)
Financing Provided		-.077		.0116
		(.076)		(.0162)
Number of States		.007		-.0006
		(.006)		(.0013)
Canadian * States		-.014		.0019
		(.030)		(.0065)
Training Provided		.0074		.0015
		(.0045)		(.0010)
Capital Required		.0002		.00009*
		(.0002)		(.00004)
N	12285	5660	12709	5875
R^2	.020	.029	.111	.107
SSR	20060	8192	1183	416
ρ	.115**	.148**	.145**	.131**
	(.009)	(.013)	(.009)	(.013)

Notes: $^+$: α=.10; *: α=.05; **: α=.01 for 2-tail t-tests. Standard errors in parentheses. All regressions include year dummy variables.

contract terms: in the royalty rate regression, the coefficient on squared franchising experience is statistically significant, but not economically important; in column 4, the significance of the coefficients on franchising experience is an artefact of the dramatically reduced sample that results when additional variables are included in the regression. Note that this is a general pattern in these data: the differences in coefficients across columns for a given dependent variable arise due to sample effects rather than as a result of the inclusion of new independent variables.

The coefficients on the control variables – that is on variables other than years of experience and number of outlets – also tend to go to zero (or are estimated

very imprecisely) in the fixed effects regression. However, in light of the hypotheses pertaining to these variables, the fixed effects may be over-controlling. The hypotheses regarding the control variables are often cross-sectional hypotheses: they explain, for example, that some firms are more likely to have high royalty rates because monitoring is more costly for those firms (those that have very geographically dispersed units, for example). If fixed effects are introduced into the empirical tests for cross-sectional hypotheses, they will absorb all the cross-sectional variation in the data and the hypotheses are not testable. In this situation, for those variables, the OLS results presented above are the relevant results.

4.3. Interpretation of the Fixed Effects Results

What accounts for the dramatic differences between the fixed-effect and OLS results? The coefficient estimates on franchising experience in the OLS models are biased upwards. The cause of the bias is itself interesting. Since we know from the fixed-effect results that royalty rates do not rise with experience within firms, we can only conclude that higher quality firms tend to charge higher royalty rates. Thus, in cross-sectional models, the estimated β will be positive even when royalty rates are fixed over time within firms (or even when they decline over time). Previous cross-sectional work has suffered from very pronounced omitted variable bias.

The fixed effects results are quite consistent with the distributional information presented in Table 4. In Table 4 we showed two things. First, royalty rates and franchise fees are adjusted very infrequently from one year to the next. Second, when they are adjusted, there is no apparent pattern of adjustment upward or downward; royalty rates and franchise fees are increased about as often as they are decreased. Thus, it is not surprising that we find no consistent pattern of increasing or decreasing royalty rates with experience when we run fixed effects regressions – firms rarely change the terms of their contract, and when they do, the direction of change varies. Note that this persistence arises despite the fact that the measures we use for both fees are more volatile than the potential alternative shown in Table 4. In that sense, our findings of persistence are very general.

What do our fixed effects results tell us about the validity of the various theoretical models that have been proposed in the literature, as summarized in Table 1? On the basis of these results, we conclude that there is no systematic change in royalty rates as firms become better established. This supports the model proposed by McAfee and Schwartz, where franchisors use relatively constant franchise contract

terms to alleviate the possibility and perception of their own opportunism. Or, it suggests that double-sided moral hazard models might well capture the essence of franchising, but that the production function and monitoring technologies do not change much over time.

Finally, in our fixed-effect as in our OLS results, we find no systematic relationship between franchise fees and royalty rates. Recall that the standard theoretical approach assumes that franchisors set royalty rates first, and franchise fees second based on residual downstream profits. This suggests that coefficients in the franchise fee regressions should be of opposite signs from those in the royalty rate regressions. In reality, the coefficients are often of the same signs. Furthermore, the two contract terms are not directly correlated, nor is it the case that royalty rates are an important determinant of franchise fees.[30] This refutes the recursive model, in which the royalty rate is set and the franchise fee extracts the residual, and the simultaneous equations model in which they are set jointly. Lafontaine (1992) obtained similar results, and concluded that franchise fees are set mostly to recover the cost to the franchisor of establishing a new unit.[31] Though these results are not reported here, we also did not find any significant effect of the proportion of company-owned units on royalty rates, despite the fact that in some models, the two variables can play similar roles.[32]

The fixed-effects regressions results presented in Table 7, and on which the above conclusions are based, are corrected for within-firm serial correlation over time because significant serial correlation is present in the data.[33] The issue of serial correlation is discussed in more detail below, along with an alternative approach to modelling contract term dynamics in franchising. Before turning to this issue, however, we examine some sampling issues and the robustness of the above results.

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[30] When the royalty rate is added to the franchise fee regression in column 2 of Table 6, its coefficient is insignificantly different from zero (at -.0023(.0027)).

[31] See also Dnes (1992) on this issue.

[32] For example, both ownership of some units and royalties on sales of franchised units give incentives to franchisor or can be used by the franchisor to signal its type. See Gallini and Lutz (1992) for the latter argument, and Lafontaine (1992, 1993) and Scott (1995) for a more general statement that company-ownership can be a substitute for royalties.

[33] Though the serial correlation coefficient, ρ, could in principle be specific to each firm, we impose the constraint that it is equal across all firms. Note that there is no serial correlation correction in the ordinary least squares regressions of Tables 5 and 6. If such a correction were introduced the estimated ρ would approach the value of one and thus would approximate fixed effects estimation.

4.4. Sampling Issues and Robustness of the Econometric Results

Two issues arise concerning the stability and consistency of the coefficient estimates that we have presented thus far. First, do the estimated coefficients vary for important subgroups of the population, and second, is there evidence of any sample selection bias arising from the attrition in the data set described in Table 2? These issues are addressed in turn.

4.4.1. Coefficient Stability

In considering coefficient stability, two subgroups of the population are especially interesting: those franchisors that will shortly stop franchising, and those franchisors that have a history of successful franchising. We have added information to our data set as to whether a firm has gone out of business or stopped franchising within our sample period. This information was obtained by searching the most extensive franchisor directories for all years in which the firm did not appear in our sample after an initial appearance. If the firm was found in a franchisor directory for that year, it is still franchising and we conclude that it is not in our sample because it did not fill out the questionnaire. If the firm is not in these franchisor directories for any year after which it dissappears from our sample, it is considered to have stopped franchising or have gone out of business starting in the year in which we no longer can find it.[34]

This information allows us to investigate whether the fees or rates of those franchised chains that will shortly go out of business or stop franchising follow different dynamic paths than those of the more stable franchisors. This might occur, for example, if firms that are about to go out of business make adjustments in order to start attracting more franchisees. In column 2 of Tables 8 and 9 we display the regression results when the sample is restricted to those firms that will go out of business or leave franchising within the next three years. We see that the royalty rates and fees of these firms do follow a different dynamic path than those of more

[34] The problem of firms merging or being bought by others is not as big an issue in these data as it is in many other firm-level data. The reason is that the unit of observation here, namely the franchised chain, rarely dissappears as a result of a merger. What the buyer gets when he or she buys a franchised chain in part is the right to the tradename and to the franchise contracts. As a result, most such purchases result in the franchise chain continuing to operate under its own name and its own set of contracts, and remaining a separate potential observation in our data despite having merged with, or being bought out by, another firm.

Table 8: Fixed Effects Subsample Results for Royalty Rates (Including Adv. Fee)

Independent Variables	1 Entire Sample	2 Out-of- Business	3 Balanced Subsample	4 Selection Corrected
Years Franchising	-.081	.312*	-.155	.138^{+}
	(.061)	(.144)	(.113)	(.080)
(Years Franchising)^2	.002**	.0055**	.0014**	.002**
	(.0003)	(.0011)	(.0006)	(.0003)
Number of Outlets	.018	-.283	-.006	.018
	(.020)	(.172)	(.031)	(.019)
(Number of Outlets)^2	-.0003	.021	.0001	-.0003
	(.0003)	(.020)	(.0005)	(.0003)
λ			.	-.327
				(.265)
N	12285	2876	2451	12229
R^2	.020	.045	.142	.020
SSR	20060	3647	4275	19481
ρ	.115**	.156**	.439**	.118**
	(.009)	(.018)	(.019)	(.009)

Notes: $^{+}$: α=.10; *: α=.05; **: α=.01 for 2-tail t-tests. Standard errors in parentheses. All regressions include year dummy variables. ρ is the autoregression coefficient. In the selection correction column, λ is the coefficient of the inverse Mills ratio.

stable firms (the regressions for the entire original sample are in column 1 of both tables).

In the out-of-business subsample, royalty rates rise and franchise fees decline as the firms gain experience. They do not, however, rise or decline as firms increase the number of outlets, possibly because these firms are experiencing very little growth in outlets.[35] This is an interesting pattern that theoretical models of franchising do not illuminate.

A second interesting subsample is the group of successful franchised chains that eventually have 10 or more years of experience. This sample is also of methodological interest in that it is useful to know the extent to which using a balanced panel data

[35] The Chow tests for the significance of a different constant and coefficients for all the regressors are equal to 17.04 and 35.16 for the royalty rate and franchise fee regressions respectively, both greater than the critical values of $F_{16,12205} = 1.65$ for royalty rates and $F_{16,12625} = 1.65$ for franchise fees. Hence we reject the hypothesis that the coefficient vectors are the same for the firms that go out of business and those that do not. Note that the coefficients of the year dummy variables are also significantly different between the two subsamples.

Table 9: Fixed Effects Subsample Results for the Log of the Nominal Franchisee Fee (Incl. Ongoing Fixed Payments)

Independent Variables	1 Entire Sample	2 Out-of- Business	3 Balanced Subsample	4 Selection Corrected
Years Franchising	-.0038	-.112**	.042	-.033^{+}
	(.0135)	(.042)	(.027)	(.019)
(Years Franchising)^2	-.0001	.0000	-.0003*	.0001
	(.0001)	(.0003)	(.00016)	(.0001)
Number of Outlets	.0012	-.070	-.0033	.0016
	(.0044)	(.044)	(.0077)	(.0044)
(Number of Outlets)^2	-.0001	-.0001	-.0001	.0001
	(.0001)	(.0054)	(.0078)	(.0001)
λ				-.127*
				(.062)
N	12709	2936	2451	12648
R^2	.111	.031	.314	.113
SSR	1183	270	253	1162
ρ	.145**	.083**	.487**	.190**
	(.009)	(.018)	(.018)	(.009)

Notes: $^{+}$: α=.10; *: α=.05; **: α=.01 for 2-tail t-tests. Standard errors in parentheses. All regressions include year dummy variables. ρ is the autoregression coefficient. In the selection correction column, λ is the coefficient of the inverse Mills ratio.

set – that is one in which the number of periods over which firms are observed is the same for all firms in the data – might have affected the conclusions above. This leads us to investigate whether limiting the data set to franchising chains for which we have ten or more years of data alters the conclusions that we have drawn above. Note that such firms might well have just started franchising when we first observe them, so that both newly established and more mature franchised systems are still observed in this subsample. Results from estimating our model on this subsample of franchised chains are shown in column 3 of Tables 8 and 9. These results do not differ much from the full sample results in column 1, except that they suggest that successful franchised chains (those that will eventually reach 10 or more years of experience) are slightly more likely to raise their franchise fees and lower their royalty rate as they gain experience.[36]

[36] Chow tests confirm a difference between the coefficients for the balanced sample and the entire sample for the royalty rate and the franchise fee regressions. For the fixed effects regressions,

The subsample results of Tables 8 and 9 are interesting because, in addition to addressing sample selection issues, they demonstrate some behavioral differences for firms that are about to go out of business. Unlike the average firm in the sample, the firms in this subsample choose to lower their fixed fees and raise their royalty rates as they gain franchising experience. This would seem to suggest that as their firm begins failing, owners or managers begin to lower the fixed fees to encourage entry by franchisees into their franchising business and thus postpone or obviate failure.[37]

4.4.2. Sample Selection Bias

Another issue regarding coefficient stability is whether there is some sample selection bias due to the fairly high attrition of firms from the sample. In these data, we know that 4063 franchisors appear in our sample for at least one year. However, only 1017 are found in the 1992 survey. Thus more than 3000 firms exit the sample in some way. Of these, about half goes out of business or stops franchising, so their departure is a normal part of the evolution of the population of franchising firms. The other 1500 or so franchisors simply do not respond to the survey, for whatever reason. Of course, as emphasized below, the fixed effects regression results that model within-firm variation in royalty rates and franchise fees eliminate much of the sample selection bias that would result from cross-sectional comparisons. Still, it is possible that some form of selection bias remains. We address this issue using the standard Heckman (1979) selection methodology.

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the F-tests are 22.2 and 23.2 respectively for the royalty rate and franchise fees, so that the hypothesis of constant coefficients across the balanced subsample versus all others is rejected. These F-test values include differences in coefficients on year dummies; the F tests permitting only differences in the experience effects reject equality of coefficients only in the franchise fee regressions.

37 We also examined several other subsamples. First, we examined the subsample composed of those franchisors that start franchising after 1980. We look at this subsample because our industry information suggests that our data set contains basically the entire population of firms that started franchising after 1980. When the data is limited to this subsample, we obtain the same results as for the entire sample: there is no apparent change in royalty rates or franchise fees as firms gain experience or increase the number of outlets. Similarly, we find no change in royalty rates over time for very large chains (defined either as those with more than 250 outlets or those with more than 2000 outlets). This result is interesting in light of Rubin's argument that franchisors with a large number of units will need to charge higher royalty rates so as to maintain their incentives to uphold the value of the franchise. Finally, we estimated models for subsamples of firms based on industry groups, namely automotive products and services, business aids and services, construction, restaurant and fast-food, and others. Again the results for each of the subsamples were insignificantly different from those of the entire data set.

Though the Heckman method of controlling for sample selection bias is well-known, it bears repeating for use in the fixed effects context. Assume a two equation system:

$$R_{it} = \beta X_{it} + u_i + e_{it} \tag{4.5}$$

and

$$\begin{aligned} Y_{it} &= 1 \quad \text{if } \Gamma' Z_{it} > -\eta_{it} \\ &= 0 \quad \text{otherwise} \end{aligned} \tag{4.6}$$

where R_{it} is the royalty rate (though it could also be the franchise fee), X_{it} stands for franchising experience (again omitting other variables for notational simplicity), $E(e_{it}, \eta_{it}) = \sigma_{12}$ and $Var(\eta_{it}) = \sigma_{22}$, and Y_{it} is the selection rule. The royalty rate is only observed when the franchisor remains in the sample, or when

$$\begin{aligned} E(R_{it}|X_{it}, Y_{it} = 1) &= \beta X_{it} + u_i + E(e_{it}|\eta_{it} \geq -\Gamma' Z_{it}) \\ &= \beta X_{it} + u_i + \frac{\sigma_{12}}{(\sigma_{22})^{1/2}} \lambda_{it}, \end{aligned} \tag{4.7}$$

where $\lambda_{it} = \frac{\phi(w_{it})}{(1-\Phi(w_{it}))}$ for $w_{it} = \frac{\Gamma' Z_{it}}{(\sigma_{22})^{1/2}}$, so λ_{it} is the inverse of the Mills ratio.

The important point of (4.7) is that sample selection bias in fixed effects models will arise only if there are strong time-series changes within firms in the probability of remaining in sample (or λ_{it}). The estimation of (4.7) requires Z_{it} variables that can identify the propensity to remain in the sample. The Z_{it}'s we use to identify the change in the propensity to remain in the sample are variables that reflect the desirability of being in the *Entrepreneur* survey. The first variable is an indicator (SEEK) of whether the franchise chain is seeking new franchisees – firms that are recruiting new franchisees are expected to want to participate in the survey. The second variable is the firm's ranking (RANK) in the *Entrepreneur* survey – if a firm is given a low rank in its subsector in a given year's survey, it is less likely to participate.[38]

[38] More specifically, we use three dummy variables, each set equal to one if the firm is seeking franchisees in the U.S., in Canada, or in other countries, respectively, and set equal to zero otherwise. We also use the order in which the firm appears in the survey. The magazine ranks firms using a particular formula, and in each subsector, reports data first for the highest ranking firm, and then the second, etc. In each subsector, there are also a number of firms that do not provide all the necessary information for the magazine to rank them. These appear in the survey after all the ranked firm, giving them less "standing". The order within this group of firm follows basically their size in number of outlets.

The results from estimating equation (4.7) are shown in the fourth columns of Tables 8 and 9, where the probability of remaining in sample is taken as a function of the SEEK and RANK variables. The results demonstrate that the fixed-effects regression results that model within-firm variation in royalty rates (or franchise fees) eliminate much of the sample selection bias that would result from cross-sectional comparisons. This is evident from equation (4.7): when that equation is estimated with fixed effects all sample selection bias that is constant over time within firms is eliminated. Thus, the sample selection bias estimated in column 4 of Tables 8 and 9 arises only from within-firm variation in selection. Results suggest that in fact there is no selection problem remaining in the fixed-effects regressions for the royalty rate. For the franchise fee equation, the coefficient on the inverse Mills ratio suggests that firms that remain in sample tend to be those that lower their franchise fees. This is consistent with the "recruiting" needs of such firms. However, the selection correction does not alter the main conclusion which is that the contract terms do not vary systematically within firms as they gain franchising experience. In that sense, we conclude that our results above are fairly robust.

4.5. Lagged Dependent Variable Estimation

The theoretical literature on contract terms that was summarized in Section 2 suggests a number of reasons why firms might alter their contract terms over time, but doesn't explicitly model the process of changing the terms of the contract. Adjustment costs may hinder the process of changing contract terms for new contracts. For example, many state legislatures require that franchisors file new disclosure documents upon making "material changes" in the conditions of sales of their franchise (see Kaufmann (1992)). Also, frequent changes in royalty rates over time lead to higher administrative costs: at any point in time, the franchisor has to keep track of the contracts of each of its franchisees, a task that is made more difficult the more different contracts there are. Such increases in administrative costs might prevent franchisors from modifying their royalty rates too frequently.[39]

If adjustment costs are significant, observed royalty rates may change little with experience even though preferred royalty rates, R^*, are changing. In other words, if adjustment costs are significant, the theoretical models in Table 1 that imply changes in desired royalty rates may be valid models of franchising despite evidence of rigidity

[39] See Lafontaine (1992b) for evidence that administrative costs are a hindrance to contractual changes.

in R. We need to consider a model with adjustment costs in order to disentangle the separate effects on observed R of adjustment costs and of changes in desired R^*.

Assume that the costs of adjusting the current royalty rate R to the desired R^* can be written as

$$C_{it} = a(R_{it} - R^*_{it})^2 + b(R_{it} - R_{i,t-1})^2. \tag{4.8}$$

Costs C reflect both the costs to the franchisor of having the actual rate R diverge from the desired rate R^* (the first term in (4.8)), and the costs of changing the rate (the second term in (4.8)). The optimal royalty rate is the one that minimizes costs C. Solving for the minimum of C gives

$$R_{it} - R_{i,t-1} = (1 - \delta)(R^*_{it} - R_{i,t-1}) + \mu_{it} \tag{4.9}$$

where $(1 - \delta) = a/(a + b)$ and μ_{it} is an optimization error. Assume that the desired R^* is represented by equation (4.1) above, the substitute (4.1) and (4.2) into (4.9), and rearrange to get

$$R_{it} = (1 - \delta)\beta X_{it} + \delta R_{i,t-1} + (1 - \delta)u_i + \eta_{it}. \tag{4.10}$$

Thus, (4.10) contains a lagged dependent variable whose coefficient is the rate of adjustment of the actual to the desired royalty rate. The relationship between this model and the fixed-effects version is simply that (4.10) reduces to the fixed effects model when the royalty rate is adjusted immediately (that is, when $\delta = 0$).

The estimation of equation (4.10) requires the estimation of a fixed-effects model with a lagged dependent variable. Before turning to the empirical results of estimating (4.10), note several properties of this equation. First, the coefficients on X variable in (4.10) is equal to the response of the desired royalty rate to X, β, times the speed of adjustment, $(1 - \delta)$. Since the speed of response is always less than 1 if there are adjustment costs, the models presented above that ignore these costs underestimate the true impact of X on the desired royalty rate.

Second, there is an interesting theoretical distinction between fixed effects estimation and estimation with a lagged dependent variable, often called the distinction between "unobserved heterogeneity" and "state dependence." The fixed effect u_i in (4.10) represents unobserved heterogeneity: firms choose their contract terms when they begin franchising and these contract terms are then fixed over time. Adjustment costs cause state dependence: the firm's current state, or value of its royalty rate, strongly affects its future state because it is costly to change R even if the desired R^*

changes over time due to changes in X. Patterns of either heterogeneity and state dependence imply that royalty rates are very persistent over time, but the theoretical source of the persistence varies considerably between the two. We discuss these distinctions below.

Table 10: Lagged Dependent Variable Results for the Royalty Rate (with Adv. Fee)

	OLS	Fixed Effects	First Differencing (1)	
Independent Variables	1	2	3	4
Lagged Royalty Rate	.871**	.257**	.522**	.602**
	(.005)	(.012)	(.068)	(.109)
Years Franchising	.004	-.042**		
	(.005)	(.013)		
(Years Franchising)^2	-.0001	.002**	.0015	-.0009
	(.0001)	(.0004)	(.0014)	(.0022)
Number of Outlets	.013	.027	.011	.013
	(.008)	(.022)	(.058)	(.086)
(Number of Outlets)^2	-.0001	-.0004	.0001	.0004
	(.0001)	(.0004)	(.0008)	(.0013)
Financing Provided				.023
				(.113)
Number of States				-.028*
				(.012)
Canadian * States				-.036
				(.176)
Training Provided				.011
				(.007)
Capital Required				.0000
				(.0003)
N	8010	8010	5408	2462
R^2	.772	.081	.056	.035
SSR	21914	10190	19783	8164

Notes: $^+$: α=.10; *: α=.05; **: α=.01 for 2-tail t-tests. Standard errors in parentheses. All regressions include year dummy variables.

(1): In these regressions, the lagged royalty rate is instrumented by lag 2 of the royalty rate. Also, the coefficient for the year franchising variable is not identified in these regressions because it rises by one every year.

The regression results with a lagged dependent variable are shown in Tables 10

Table 11: Lagged Dependent Variable Results for the Log of the Nominal Franchise Fee Including Fixed Ongoing Payments

	OLS	Fixed Effects	First Differencing (1)	
Independent Variables	1	2	3	4
Lagged Franchise Fee	.865**	.353**	.563**	.543**
	(.005)	(.012)	(.062)	(.080)
Years Franchising	.0003	-.0034		
	(.0011)	(.0183)		
(Years Franchising)^2	-.0000	.0000	.0004	.0007
	(.0000)	(.0001)	(.0003)	(.0005)
Number of Outlets	.0027	.0050	.0123	.019
	(.0017)	(.0047)	(.0115)	(.020)
(Number of Outlets)^2	-.0001	.0001	-.0001	-.0002
	(.0001)	(.0001)	(.0002)	(.0003)
Financing Provided				-.051$^+$
				(.027)
Number of States				-.0011
				(.0028)
Canadian * States				.078$^+$
				(.042)
Training Provided				.0017
				(.0016)
Capital Required				-.0000
				(.0001)
N	8413	8413	5774	2633
R^2	.766	.210	.044	.056
SSR	1228.0	596.5	1182.4	490.2

Notes: $^+$: α=.10; *: α=.05; **: α=.01 for 2-tail t-tests. Standard errors in parentheses. All regressions include year dummy variables.

(1): In these regressions, the lagged franchise fee is instrumented by lag 2 of the franchise fee. Also, the coefficient for the year franchising variable is not identified in these regressions because it rises by one every year.

and 11 for the royalty rate and the franchise fee respectively. For comparison purposes, in both tables, column 1 shows OLS results when a lagged dependent variable is included among the regressors. Given the erroneous omission of the fixed effects, the coefficient on the lagged dependent variable is very sizeable in these because the

lagged dependent variable is a very good proxy for omitted fixed effects. This is because the lagged variable is a very good proxy for an omitted fixed effect. The correct equation to be estimated is the fixed effects model with a lagged dependent variable (equation (4.10)), the results of which are shown in the second column in both tables. However, the second column fixed effects are inconsistently estimated because the constructed error term is correlated with the lagged dependent variable. This will always produce a downward bias in the coefficient on the lagged dependent variable. Consistent coefficient estimates can be produced by first differencing the regression to eliminate the fixed effect, and then instrumenting the difference in the lagged dependent variable with a longer lag, as in columns 3 and 4 of the tables.[40]

The results in these columns imply that, *within firms, the lagged dependent variable has a significant effect.* This means that adjustment to the optimal royalty rate is indeed slow. The larger the coefficient on the lagged dependent variable, the greater the adjustment costs and the slower the adjustment of royalty rates and franchise fees within firms over time. The coefficients of .52 and .56 on the lagged dependent variable, which become .60 and .54 when we include other potential explanatory variables, suggest that δ in (4.10) is high, or that adjustment costs are indeed high. Looking at the coefficients on the other regressors, we see few significant effects.

These results suggest that the contract terms are characterized by both heterogeneity and adjustment costs (or state dependence). We find that within the fixed effects model, an F-test supports the addition of the lagged dependent variable. And we also find that firm-specific fixed effects are a significant addition to the lagged dependent variable model.[41]

However, another possibility is that the significance of the lagged dependent variable is really reflecting serial correlation in the residuals (as we found that serial

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[40] The downward bias in the coefficient on the lagged dependent variable arises because there is a correlation between the difference of the lagged dependent variable from its mean and the difference of the residual from its mean, and this correlation creates a large negative bias when T is small (Hsiao, pages 74-75). The only way to eliminate this correlation is to first difference the model to eliminate the fixed effect and then instrument the first difference of the lagged dependent variable with a lag of two or more periods (which is not correlated with the current lag in the residual).

[41] The values of the F-tests for the addition of the lagged dependent variables to the fixed-effects models are $F(1,8002) = 695.2$ and $F(1,8417) = 211.1$ for the royalty rates and franchise fees respectively. The values of the F-tests for the addition of the fixed effects to the lagged dependent variables models are $F(2391,5601) = 2.93$ and $F(2455,5959) = 2.57$ for the royalty rates and franchise fees respectively, for p values all well below .0001.

correlation was present in our fixed-effects regressions before a lagged dependent variable was introduced). We can test whether the data is characterized by serial correlation or state dependence (i.e., a lagged dependent variable). The model of serial correlation is:

$$R_{i,t} = \beta X_{i,t} + u_{i,t} \tag{4.11}$$

where

$$u_{i,t} = \rho u_{i,t-1} + e_{i,t}. \tag{4.12}$$

We can rewrite this as

$$R_{i,t} = \rho R_{i,t-1} + \beta X_{i,t} - \rho\beta X_{i,t-1} + e_{i,t} \tag{4.13}$$

or

$$R_{i,t} = aR_{i,t-1} + bX_{i,t} - cX_{i,t-1} + e_{i,t}. \tag{4.14}$$

Thus if $a \cdot b + c = 0$, the lagged effect of R is due to serial correlation, not to state dependence or adjustment costs. As is evident from equation (4.14), the test between serial correlation and state dependence depends entirely on having explanatory variables that have a significant impact on R. The intuition underlying these equations is as follows. The notion of state dependence is that when a change in X occurs, it has a prolonged effect on R: it changes the optimal R^* in the short run, and then alters future R's because the current state of R affects future states due to state dependence (or because adjustment costs result in slow changes in R). In contrast, if changes in R appear to be random, or cannot be explained by X, then R will have a structure of serially correlated errors. If the econometrician does not have good data on explanatory variables, state dependence must be rejected in favor of serial correlation.

In the royalty rate and franchise fee regressions, we find weak evidence of state dependence. This test is conducted using the first-differenced model with the instrumented lagged dependent variable. In the royalty rate and the fee regressions, the restriction that $a \cdot b + c = 0$ is rejected only at the 10 percent level for several explanatory variables.[42] Thus, we find weak evidence of state dependence, evidence that might be stronger if we had more powerful explanatory variables.

In sum, given the very weak effects of the regressors on royalty rates and franchise fees, we cannot readily distinguish state dependence from heterogeneity. In other

[42] Regressions underlying these results are available from the authors upon request.

words, we cannot distinguish whether contract terms are relatively fixed over time because firms set their optimal terms at the outset and do not change them, or because the costs of changing these terms is so great that they are reluctant to do so even when the desired royalty rate (or franchise fee) changes.

5. Conclusion

The primary goal of this research is to provide the first systematic evidence on how franchisors adjust the key monetary terms of their contracts, namely their royalty rates and franchise fees, as they gain franchising experience. A number of theoretical models imply that royalty rates should decline with years of franchising experience (as in signaling models and reputation effects à la Mathewson and Winter (1985)), while other models suggest that they should rise as a franchised chain becomes better established (as in the market saturation effect à la Rubin (1978) or double-sided moral hazard under the assumption that the role of the franchisor becomes more important as the franchise becomes better established). Still others suggest that the terms of the contract should be relatively stable because they arise from fundamentally stable production parameters (double-sided moral hazard, as in Bhattacharyya and Lafontaine, 1995) or because adjustment costs are high (McAfee and Schwartz, 1994).

We find evidence of very strong persistence in contract terms over time, and when these terms do change, little evidence of systematic movement up or down in contract terms. Using a panel data set of 2782 franchising firms followed from two to thirteen years, we model changes in the two key monetary terms of franchise contracts, namely royalty rates and franchise fees. We find that in both the royalty rate and franchise fee regressions the introduction of firm-specific fixed effects explains a large proportion of the variance. Fixed effects by themselves account for .851 and .801 respectively of the variance in royalty rates and franchise fees. This suggests that the contract terms vary importantly across firms but are relatively rigid within firms over time. When we model royalty rates within firms, in fixed-effects regressions, we find that there is no systematic increase or decrease in royalty rates or fees as firms gain experience. Furthermore, the introduction of a lagged dependent variable to model the slow adjustment of contract terms in these fixed effects regressions gives significant results, though it is partially indicative of serially correlated errors. This econometric evidence of strong persistence in the contract terms is bolstered by a look at the raw data, which indicates that less than 25% percent of firms change either their royalty rate or their advertising fee from one year to the next, and only 38% percent of them change their nominal franchise fees (or fixed ongoing payments) between any

two consecutive years. This is important new evidence, in that no previous empirical work has used panel data to model contract terms, and empirical work based on cross-sectional data has produced erroneous conclusions due to the omission of important firm-specific effects.

The observed persistence of contract terms found here is important in that it is inconsistent with those models from Table 1 that imply that contract terms should change in a systematic way as firms become better established. However, absent better explanatory variables in our data, we cannot tell whether contract terms are fixed over time because firms choose their optimal contract terms at the outset, and these do not change systematically over time, or whether the optimal contract terms are changing but adjustment costs are preventing franchisors from modifying their observed contract terms.

On the other hand, most of the agency-theoretic models of franchising imply that contract terms should be tailored to the individual circumstances of the franchisee or the unit. That this does not occur is clear from the observation that franchisors offer a single contract to all franchisees at a point in time. However, in that case it has been suggested that the terms of the contract actually offered by the franchisor would reflect the "average" circumstances of the franchisees and units being franchised at a particular point in time. Under this scenario, the contract terms should change as the mix of franchisees and units being franchised changes. Our results do not support this alternative implication the models either.

From both an empirical and theoretical perspective, we need to better understand how firms set their contract terms, what may lead them to want to change them, and what factors might prevent them from doing so. More specifically, our work suggests that researchers need to focus on two important characteristics of franchise contract terms: a) that once franchisors set these terms, they change them very little over time, and b) that there is considerable variation in contract terms across franchising firms that is not well explained by typical characteristics of the firms. We believe that theoretical models that would systematically address the issues that arise when franchisors deal with multiple franchisees, and over long periods of time, might prove especially useful in this regard.

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Appendix: Data Sources and Variable Definitions
Table A1: Variable Definition and Sources

Variable:	Definition	Source
Royalty Rate	Total percentage of sales paid by franchisee to franchisor, including advertising fees. Observations where this percentage was above 30% were excluded from our data set on the assumption that such rates must represent a proportion of profits rather than sales	E
Advertising Fee	Usually a percentage of sales paid by franchisees to franchisors, a component of what we call the royalty rate	E
Franchise Fee - nominal	Fixed upfront payment made by the franchisee to the franchisor at the beginning of the franchise relationship	E
Franchise Fee - real	As above, but deflated using the CPI from the Economic Report of the President	E
Fixed Payments	Ongoing fixed payments sometimes required by the franchisor, which are a component of what we use as our measure of franchise fee.	E
Franchising Experience	Number of years since the franchisor started franchising.	E
Number of Outlets	Number of units in the chain	E
Financing Provided	A dummy variable set equal to one if the franchisor provides some amount of financing to the franchisee	E
Initial Training Provided	Number of days of initial training provided to the franchisee by the franchisor	S and F
Number of States with Outlets	Number of States in which the franchisor has established outlets.	S and F
Canadian Franchisor	Set equal to one if the franchisor's headquarters address is in Canada. This variable was interacted with the Number of States variable because the number of States in which a franchisor operates outlets is not an appropriate measure of geographical dispersion for Canadian firms.	E
% Company-Owned	Proportion of units in the chain that are company-owned and operated	E
Capital Required	Amount of capital franchisors say is needed to open a unit of their franchise	E

Note: E refers to the *Entrepreneur* surveys, various years, S refers to the *Sourcebook of Franchise Opportunities*, and F, to the *Franchise Opportunities Handbook*.. Data found in the latter two sources were obtained from the *Franchise Opportunities Handbook* for the years 1980 to 1987, and 1990, and in the *Source Book of Franchised Opportunities* for 1988, 1989, 1991 and 1992. Unfortunately, although the latter sources cover fairly large samples of franchisors, they do not match the samples covered by the *Entrepreneur* surveys.These sources typically provided data for about half the franchisors included in the *Entrepreneur* survey of the corresponding year.

The *Source Book of Franchised Opportunities*, in some editions, also gave information on the average number of employees per outlet, on the length of the franchise contract, on whether or not the franchisee is required to buy some of its inputs from the franchisor, on whether or not passive ownership is allowed by the franchisor, and on the squared footage of the average outlet. We used these data in some of our work to establish the role that these variables might play in the setting of contract terms. We found very little empirical support for including them in our analyses, and as they were not available for all firms or across years, their use reduced our sample size too much. As a result, we do not discuss these in the body of the paper.

Table A2: Sector Definitions

Dept. of Commerce Sector	Sector Number
Automotive Products and Services[1]	1
Business Aids and Services:	
Accounting, Credit, Collection Agencies and Gen. Business Systems	2
Employment Services	3
Printing and Copying Services	4
Tax Preparation Services	5
Real Estate	6
Miscellaneous Business Services[2]	7
Construction, Home Improvement, Maintenance and Cleaning Services[3]	8
Convenience Stores	9
Educational Products and Services[4]	10
Restaurants:	
Chicken	11
Hamburgers, Franks, Roast Beef, etc	12
Pizza	13
Mexican	14
Seafood	15
Pancakes, Waffles	16
Steak, Full Menu	17
Sandwich andOther	18
Hotels, Motels and Campgrounds	19
Laundry and Drycleaning Services	20
Recreation, Entertainment and Travel[5]	21
Rental Services (Auto-Truck)[6]	22
Rental Services (Equipment)[7]	23
Retailing (Non-Food)[8]	24
Retailing (Food Other than Convenience Stores)[9]	25
Miscellaneous[10]	26

[1] Includes Tire, Battery and Accessory Stores; Auto and Truck Wash Services, and Brake and Muffler Repair and Services and some establishments with significant sales of non-automotive products such as Household Appliances, Garden Supplies, etc.
[2] Includes Computer Services, Business Consultants and Brokers, Security, Dentists, Insurance, and Others.
[3] Includes Furniture Repairs, Water Conditioning, Lawn Care, Sewer Cleaning and Carpet Cleaning.
[4] Includes Day-Care Centers and Health and Diet Services
[5] Includes Travel Agencies, Miniature Golf Courses, and Dance Studios.
[6] Includes Leasing.
[7] Includes Formal Wear
[8] Includes General Merchandise, Drugs and Cosmetics, Gift Shops, Shoes and Apparel, Hardware, Paints and Floor Covering, Furniture, Draperies and Bedding, Consumer Electronics, and Vending.
[9] Includes Retail Specialty Food Shops, Donut Shops, Ice Cream Stores, Coffee Services, Candy Stores, Bakeries and Supermarkets.
[10] Includes Beauty Salons, Fitness Centers, Wholesale Services and Others.