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Scale, Scope, and Spillovers: Evidence from Franchised Chains

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ABSTRACT

How scale and scope affect firm performance, and what this says about what the boundaries of the firm should be, are central questions in economics - industry studies research in particular. Difficulties often arise, however, in empirically assessing these effects. Because franchised chains are fundamentally single-product or single-concept entities that are developed separately even when they belong to multi-chain firms, we use data on franchised chains to clearly distinguish scale from scope effects. After controlling for chain unobserved heterogeneity via fixed effects, we find strong evidence of positive scale effects within a chain, suggesting positive spillovers or network advantages from being large. For parent company scope, i.e. product variety measured by the number of other chains of the same parent, we find no effect on sales per outlet, and a negative effect on the number of outlets of a chain. We also find that ownership changes have no effect on sales per outlet, but reduce the numbers of outlets of the target chain in the following years. Overall, our findings suggest that increasing scale is beneficial to chains, but that multi-chain firms engage in some form of rationalization to reduce competition among their chains/products.

1. Introduction

How does a firm's scale of operations, and the scope of its activities, affect its performance and growth? Do firms benefit from mergers, takeovers and other ownership changes, and if so why? Under what circumstances do consumers benefit from such changes as well? These questions have been central concerns in industrial organization and organizational economics, and in microeconomics generally, as they relate to fundamental issues such as optimal firm boundaries, firm productivity and industry evolution. As a result, they have attracted much theoretical and empirical attention. However, partly due to measurement issues, empirical evidence concerning the importance of scale, and even more so scope, effects on firm performance remains scarce. Moreover, much of the theoretical literature continues to consider firms as basically single product entities despite recent contributions documenting how firms typically produce a variety of products and an evolving mix of products over time.[1] Thus studies of firm scope, its variation over time, and the effects of these decisions on firm outcomes are particularly lagging behind. As noted by Bernard et al. (2009), "Further research is needed into the respective roles of firms' intensive (how much of each product is produced) and extensive (how many products are produced) margins in firm growth".

We contribute to this literature by examining how scale and scope externalities affect firm performance. In particular, we focus on franchised chains and analyze the impact of scale and scope on two measures of chain operational (rather than financial) performance. As we explain further below, one of these measures, namely sales per outlet, captures franchisee benefits to a large extent while the other, namely the number of outlets, relates more to franchisor performance.

[1] See notably Bernard, Redding, and Schott (2009), Klepper and Thompson, (2009) and Nocke and Yeaple (2006) for both evidence on, and models of, multi-product firms.

One advantage of using data on franchised chains is that they are fundamentally single-product entities. As a result, scale and scope are more easily defined and measured in this context than in, say, manufacturing, where authors often must rely on broad industry classifications to identify and "count" the different products offered by a firm. This is not to say that franchised outlets sell only one product, but simply that the set of products offered is quite limited and intrinsically linked to the brand name. Consequently, the "menu" of products sold is chosen centrally by the franchisor and quite stable over time. This means that we can measure scale simply using total revenues (sales) achieved in any given franchised chain. Also, though most franchised chains are owned by a parent company that owns nothing else, some firms own more than one chain (or concept). [2] Some of the best-known examples of multi-chain companies include Choice Hotels International, which owns Comfort Inn, MainStay Suites, Econo Lodge and several other chains; Yum! Brands Inc., the largest fast-food restaurant company in the world, with brands such as KFC, Pizza Hut, Taco Bell, and others; and finally Service Brands International, owner of Molly Maid and Mr. Handyman. Because data on sales and number of outlets are still published at the chain level in various data sources, we can clearly distinguish chain scale from parent company scope.

Using data on the largest U.S. franchised chains and the companies that own them, we ascertain how the performance of individual chains, at the outlet/franchisee level and at the chain/franchisor level (measured by sales per outlet and the number of outlets in the chain respectively), is affected by the chain's total sales (scale) and the number of other chains owned by the same parent company (scope), both measured at t-1.[3] Moreover, since parent companies

[2] We use the words "product" or "concept" interchangeably to mean the menu of product options offered at each outlet in a chain.

[3] Our version of scope among these chains differs from that analyzed in Basker et al. (2008). In that paper, the authors argue that general-merchandise chains add to the scope of their stores by adding product lines when they grow in terms of outlets. Here the chains are more specialized, as noted above, and do not diversify the offerings at

often modify their scope by acquiring or selling existing chains, we also examine how ownership changes, as opposed to organic parent company growth, affect chain performance.

We find that sales per outlet (or unit or store – we use these interchangeably) and the number of outlets in a chain are both positively related to chain sales from the last year in our fixed effects regressions. This suggests positive spillovers from scale, i.e. there are network advantages from being part of a larger chain. When it comes to scope, however, we find that increases in the number of other chains owned by the same parent firm have no effect on sales per unit, and a negative effect on the number of outlets of the chain. Since the chains owned by multi-chain firms tend to be in the same rather than different industries, our interpretation is that such firms find it beneficial to curb growth in their chains to reduce competition among them. Hence, our findings indicate that firms engage in some form of rationalization, a result that echoes findings from the gasoline retail industry where outlets have been found to be located further apart when a larger fraction of them in a given market are owned by the same firm (Netz and Taylor, 2002). Note that such opposite "within-industry" effects for scale and scope would be impossible to identify if, in order to measure scope, we had to rely on firm involvement in different industries.

Our analyses of what occurs when chain ownership changes further support these findings and conclusions. Specifically, we find that ownership changes have no effect on sales per unit either in the short run or long run, but they have a negative effect on the chain's number of units in the long run.

The paper is organized as follows. In the next section, we briefly review related literature and derive implications. We then describe our data and present descriptive statistics, followed by

individual stores much at all. Instead, the firm grows in scope by diversifying into other business ideas, i.e. other chains.

the empirical model specification. We present our results in Section 4, followed by concluding remarks in Section 5.

2. How Scale and Scope Can Affect Chain Performance?

Large franchised chains are comprised of many outlets, all of which sell a “single” menu of products under the franchisor’s brand name. The branded nature of the product in turn implies differentiation across chains, and thus downward-sloping demand curves locally. In addition, production at the local, or outlet, level presumably entails both fixed and variable costs, and opening a new outlet involves some sunk cost. Under these conditions, the scale of the chain (or its total sales) and the scope of its parent company (or how many different products/chains the company owns) may affect the operational performance of a chain through either cost or demand. Moreover, since the chains owned by the parents tend to be in the same sector, increases in scale or scope may allow firms to exercise more market power locally, or deter entry of other chains, and thus again affect chain performance via these effects as well.

In this section, we describe how scale and scope are expected to affect our two measures of chain performance, namely - sales per outlet and total outlets of a chain. We view sales per outlet as capturing basically store/outlet-level productivity, and thus as a likely source of benefits to a franchisee (i.e. the local operator). The second measure of performance, total outlets, represents performance benefits that are more likely to be captured by the franchisor (or parent company). As we discuss further in the methodology section below, our goal empirically is to bring evidence on the presence and overall magnitude of the scale and scope effects rather than identify the exact channel through which they operate. We discuss the channels separately, however, to better highlight the potential sources of the spillover effects.

2.1 Scale Effects

2.1.1. Cost-based Arguments

Scale may affect the performance of the chain because it reduces production costs locally. This could occur, for example, if the chain can better negotiate terms with suppliers as it becomes larger. If the chain can better negotiate with suppliers of materials, in particular, one would expect variable costs, and thus marginal costs, to go down. Assuming profit-maximizing behavior at the outlet level, the lower marginal costs should lead to lower prices (whether chosen by the outlet or the chain) and higher quantities sold in each outlet. Since individual outlets face downward sloping demand curves, we know from principles that they should operate in the elastic portion of the demand curve. Decreasing price then should lead to higher total revenues at the outlet level. Moreover, since variable, and thus total, costs of operation are reduced, the chain should also find it profitable to operate more outlets in the market.[4]

If, in contrast, the increased scale of the chain allowed it to reduce outlet-level fixed costs, we would expect no short-term effect on outlet-level price or quantity. In the long run, however, average costs are lower so price again should go down, revenues should go up, and the profitability of existing outlets again should lead the chain to expand its number of outlets. In other words, whether scale reduces outlet-level variable or fixed costs, in the long run, the effects would be the same: higher sales per outlet and a greater number of outlets as well.

Finally, if scale only reduced the cost of opening outlets, rather than ongoing operational costs, outlet-level sales should be unaffected by scale, but the number of outlets should go up with chain scale.

[4] One can think either in terms of new markets where it was not profitable to open an outlet that now become profitable, or simply that there is "room" for more outlets in existing markets.

2.1.2. Demand-side Effects

In the context of franchised chains and associated brands, it has been common to assume in the empirical literature that larger numbers of outlets in a chain implies more consumer exposure to the brand and its products. In that sense, the outlets represent a form of advertising that contributes to expand demand for the chain's product.

If chain scale indeed increases market demand, all else the same, profit-maximizing outlet managers should respond with higher prices and higher quantities. If price were not a decision variable at the outlet level, increased demand would still lead to increased quantities. In either case, the result would be greater sales per outlet, at least in the short run. In the long run, however, increased demand should lead franchisors to expand the number of outlets, which might ultimately bring outlet-level demand back to its original level (or even less).[5] Whether outlets enjoy larger sales levels in the end, or the franchisor responds mostly via increased number of outlets, might depend on who the beneficiary of outlet profits are. In the case of franchised chains, assuming the franchisor cannot modify the terms of their contracts with existing franchisees, they could have incentives to mostly increase the number of stores. This strategy would have the advantage of further increasing "advertising" and thus future sales.

2.1.3 Entry Deterrence

In their seminal papers, Schmalensee (1987) and Eaton and Lipsey (1979) described how, in spatially differentiated markets, firms may benefit from opening more than the monopoly profit maximizing number of outlets as a way to prevent competitors from locating nearby and

[5] See, for example, Kalnins (2004) and Blair and Lafontaine (2005) for discussions of this issue, which is often referred to as encroachment in franchising.

driving down prices.[6] Thus entry deterrence constitutes another potential channel through which scale may increase firm performance. It is unclear whether outlet-level demand should go up or down relative to the no entry deterrence case. This is because reduced competitive entry may shift demand up locally, but the increased number of same-chain outlets necessary to achieve this outcome would have the opposite effect. Whether local demand and sales per outlet would be higher or lower as a result, then, depends on the relative magnitude of these two effects. Reduced competitive pressure, however, should entice the firm to price higher and expand further, and thus make it profitable to further increase the number of outlets.

2.2 Scope Effects

2.2.1. Cost-based Effects

Owning several brands or chains could make it possible for a parent company to obtain better terms from the suppliers that sell inputs to the various chains, or to share the cost of different activities in the production process (e.g. marketing, distribution, customer database, billing or booking systems) across different chains/products. Important cost savings - especially when it comes to franchised chains that require training, monitoring, and other support of franchisees from the parent company - should in addition arise from efficiencies in management and related headquarters activities. Hence the impact of scope from a cost perspective should be similar to the one for scale above. Specifically, if variable or fixed costs of operations at the outlet level can be reduced by increasing the scope of the parent company, sales per outlet and number of outlets in the chains should both go up. If only the cost of opening outlets were reduced, then only the number of outlets would go up with scope.

[6] Of course, for this entry deterrence mechanism to work, there must be some sunk cost of entry, otherwise the equilibrium unravels and entry deterrence cannot be achieved. See Judd (1985) on this issue. Note that Hadfield (1991) argues that franchising can be used to make preemption credible.

2.2.2. Demand-side Effects

While the argument as to how scale might affect demand is straightforward, it is more difficult to see why scope, or the ownership of several chains/product concepts by a parent, would lead to increased demand for a different, single chain's product. After all, most consumers do not know or care who owns the different chains in a parent company's portfolio.

There are some specific sets of circumstances, however, when one might expect to see positive demand spillover effects arising from scope. The first is typical of say hotel companies. Many hospitality firms own several chains of differing quality levels, and offer loyalty programs that cut across their chains.[7] In that case, increased scope is much more likely to affect demand for the products of the chains in the parent company's portfolio. Alternatively, in some contexts, parent companies find it worthwhile to co-locate branded offerings and offer "bundles" to consumers. While such co-location likely yields some cost advantages, whose effects were described above, these practices also may yield increased demand for the chains' products. A typical example from the trade literature arises in the context of the fast-food industry, where family members often have different preferences when it comes to dining out. A location that offers products from several different brands to this group of customers then has an advantage over the single-brand outlet.[8] Finally, if the parent company owns multiple chains, the chains may benefit from each other's reputations if the parent company does large-scale advertising of its multiple products to the same pool of customers.

Whether due to loyalty programs, advantages arising from offering more choices to customers, or potential reputation spillovers, the presence of positive demand effects from scope

[7] For an example of how such loyalty programs work, see Deighton and Shoemaker, Hilton HHonors Worldwide: Loyalty Wars, HBS case #501010.

[8] Studies of agglomeration economies in the hotel industry similarly emphasize positive spillovers in terms of heightened demand and hotel-level performance arising among co-located hotels that belong to different hotel segments (e.g. Canina et al., 2005; Chung and Kalnins, 2004).

again should operate just as in the case of scale, namely they should lead to increased sales per outlet (at least in the short run) and increased numbers of outlets in the parent company's chains.

2.2.3. Entry Deterrence

While the argument as to why expanding a chain aggressively to deter entry are straightforward, there is perhaps even more scope for entry deterrence for multi-brand firms, especially those that operate chains in the same industry. A firm that controls several chains in the same business sector for example could increase the presence of all its brands locally, providing customers with presumably desirable variety – or, equivalently, more outlets within short distances from geographically dispersed customers - while maintaining its monopoly power. If multi-chain firms are especially likely to benefit from entry deterrence, we would expect scope to have a positive impact on each chain's number of outlets as reduced competition further contributes to the profitability of opening outlets locally. Note that the desire to further deter entry would also reinforce this effect. It is again unclear how scope would affect outlet-level productivity or sales, however, since the firm necessarily sacrifices revenues per outlet of a given chain when it increases the scope of its activities and thus the number of outlets of its other chains locally.

2.2.4. Market Power Effects

When it comes to scope, the differentiated products literature suggests that another effect might be at work. Specifically, a firm that sells two competing products has an incentive to set their prices at higher levels than those that separate firms, each selling one of the products, would choose. For example, maximizing

$$\Pi = p_1 * q_1 + p_2 * q_2 - c_1(q_1) - c_2(q_2)$$

where $q_1 = a - b_1p_1 + b_2p_2$ and $q_2 = \alpha - \beta_2p_2 + \beta_1p_1$, would yield prices that are higher than the prices that maximize $\Pi_1 = p_1*q_1 - c_1(q_1)$ and $\Pi_2 = p_2*q_2 - c_2(q_2)$ under the same demand conditions. But with higher optimal prices for the products, of course, also come lower optimal quantities. Fundamentally, the joint owner now internalizes the lost sales of its other product that result from pricing either product aggressively, so it maximizes profits by being less aggressive, and selling less of both products, at higher prices.[9]

The joint profit-maximizing problem described above yields implications not only for prices, which, as described below, we do not observe in our data, but also for sales per outlet and number of outlets per chain, which we do observe. For one thing, as suggested by Gandhi et al. (2008), and the literature on gasoline retailing (e.g. Netz and Taylor, 2002), chains should choose to locate stores further away, which in turn would translate to fewer, as opposed to more, outlets as parent company scope increases. The reduction in local competition would mean that existing outlets might benefit from higher demand, allowing them to sell more, or at least as much, at the higher prices induced by the merger effect. At the same time, however, a movement up along the same demand curve for an outlet exercising market power would reduce revenues given that demand is elastic at the profit maximizing point. In net, it is unclear what effect increased scope should have on sales per outlet, but the theory implies a negative effect for the number of outlets in the chain.[10]

[9] Thomadsen (2005) finds evidence consistent with this effect. Specifically, using data on all fast-food outlets of McDonald's and Burger King in Santa Clara county in California, he shows in his counterfactual experiments that mergers among nearby outlets, which occur as franchisees purchase existing company owned or other franchisee owned outlets, can have a large positive effect on prices at the merging, and other outlets in the same chain.

[10] There is a related literature on the effects of mergers on product variety. However, although location decisions affect the extent of differentiation and in that sense product variety in our setting, there is also a direct relationship here between location decisions and quantities sold. In Richard (1993), Berry and Waldfogel (2001), Watson (2008), or Draganska, Mazzeo and Seim (2009), product variety decisions can be separated from quantity decisions. Most of these studies then focus on the effects of mergers on the acquiring firm's product mix (i.e. number of products offered) not on changes in the quantities supplied/offered by the acquired chain, or single product entities, as we do.

3. Data and Methodology

3.1 Data and measurement

The data in this paper are mostly from a listing entitled the *Top 200 Franchise Systems*, published annually by the *Franchise Times* magazine, since 1999. This annual ranking of the largest U.S. franchised chains – as measured by their worldwide sales in the previous year – gives data for up to 300 largest chains depending on the year of publication (in the main listing, along with an "Up and Comer" section). Specifically, given that each listing gives data for the previous year, we have data for the largest 225 franchised chains in 1998 and 2000, largest 200 in 1999, largest 250 chains in 2001 and 2002, and largest 300 chains each year from 2003 to 2007. The information provided for each chain each year includes not only the chain's worldwide sales, but also its total number of outlets, and the name of its parent company. The latter allows us to identify ownership changes as well as obtain a measure of the parent's other operations besides the chain in question. We approximate the latter using the number of other chains in our listings that are owned by the same parent company.[11]

Our unbalanced panel data set contains information concerning 502 different chains over a maximum period of 10 years, for a total of 2648 observations. However, since we use lagged explanatory variables in all our analyses, and some chains have missing sales or total units in some years, our final sample effectively starts in 1999 and contains 1970 or 1972 observations depending on the dependent variable, across 374 chains, i.e. about 5.3 observations per chain on average. We classify the chains among 20 sectors, described in the appendix.[12]

[11] Parent companies also may own smaller chains not included in the top 200+ chains. However, our measure captures the number of major chains that they own.
[12] Our results remain the same if we use alternative industry classifications – see Section 4.2.

Table 1 shows descriptive statistics for our final sample for all the variables we use in our empirical analyses (we explain variable measurement in more detail in the methodology section). It also shows that the chains in this sample are very large, with annual worldwide sales of more than 1.46 billion dollars on average over the period of our data, and an average of 1655 outlets per chain. The average sales per outlet are above 1.5 million dollars per year, but the numbers vary importantly within/across the chains from just $20,000 (for some cleaning services franchises) to $29 million (for some hotel chains). We also find much variance in the number of outlets per chain - some chains are very small with just 29 outlets (for a sit-down restaurant chain), while some are as large as 33,818 outlets (McDonald's). These chain differences also suggest that controlling for unobserved chain heterogeneity will be important in our empirical setting.

Because these numbers are averages calculated over almost a decade, in Figure 1 we show the sales per outlet, number of outlets per chain, and the number of parent's other chains on average every year from 1999 to 2007. This figure suggests that despite the differences among the chains, the annual averages of sales per outlet and number of outlets are quite comparable across years in our data. Thus there is no large-scale structural break that might bias our analyses. The average number of other chains of the same parent varies to a greater extent over time, however. Because of changes in the listing's coverage, described above, one may worry that some of this may be due to measurement error for this variable. We address this by comparing our measure, based on the sum of all the chains in our data, to a more conservative measure of parent's other activities - captured by the number of Top 200 chains throughout. However, as Figure 1 shows, the evolution of the two measures is quite similar. Thus the variance in parents' other operations over time must be due to other reasons, including changes in ownership, rather than changes in data coverage.

We explore the issue of ownership changes specifically in Figure 2, where we show the number of chains that experienced a parent change each year, along with their mean sales per outlet and total outlets. Comparing Figures 2 and 1 suggests that chains that experienced an ownership change have more outlets and lower sales per outlet, on average, especially later on in our data. In other words, the figures indicate some correlation between ownership/parent changes and chain size (in total outlets) or productivity (per outlet sales).

In Figures 3 and 4, we show the kernel-density estimates of the distribution of the (log of) sales per outlet and number of outlets, respectively, for the top 200 chains in 1999 and then again in 2007. These figures first establish that there much variation in these variables across chains and over time. Specifically, while annual averages for both per outlet sales and chain's total outlets are relatively stable over time, per Figure 1, we see in Figure 3 that the distribution of the (log of) sales per outlet is shifting to the right over time, and the skewness of the distribution goes down from 0.39 (in 1999) to 0.00 (2007). In other words, sales per outlet are increasing over time among several chains. This increase is to be expected, of course, since our sales data are in nominal dollars, but the move towards a more symmetric distribution and convergence of mean and median per outlet sales is intriguing. In contrast, the distribution of the number of outlets is quite similar in 1999 and 2007, though the small increase in skewness suggests a larger difference between the mean and median size of the chains in the last year of our data.

In Table 2, we focus on the phenomenon of multi-chain ownership by parent companies by showing the number of chains owned by the parents in the first year of our data, in 1998, and then again in 2007. This table shows that most chains belong to parents that own no other chain, and that the distribution of chain ownership among parents has not changed much over the period of our data. Since the sample contains more chains in later years, 87 chains in our data in 1998 were owned by a parent that owned some other top chain, compared to 101 chains in 2007.

Still, in terms of percentages, these are quite similar - 39 vs. 34% of the chains, respectively. Note that from the descriptive statistics for the “Parent Change Yr Dummy Variable” in Table 1, ownership changes occurred in 3.7% of the observations in our data, for a total of 74 chains in our sample.[13] Thus large franchise chains do not change hands very frequently. Finally, though this is not shown in the table, we find that most multi-chain firms own chains in the same sector. Using the list of franchise sectors described in the Appendix, we find that those parent companies in our data that own more than one chain operate on average in 1.3 different sectors. Put differently, focusing on parents with exactly two chains, for example, we find that both chains are in the same sector in 78% of the cases.

While the above are just aggregate statistics, they point towards interesting dynamics among and within the chains. To explore whether these patterns are driven at least in part by spillovers from scale or scope, and, when it comes to scope, whether ownership changes matter separately from organic changes in the scope of a parent company’s other activities, we turn to an exploration of these data patterns via regression analyses below.

3.2 Empirical Methodology

Our main goal is to explore whether there are spillovers (i.e. positive/negative returns) from scale within a chain, and/or spillovers from scope among the chains of the same parent, and to assess the magnitudes of these effects if they are present. In that sense, we are interested in overall or net spillover effects that can affect chain performance through the various channels described in Section 2, rather than in identifying the specific channel through which they occur.

[13] There are two chains for which we could not reliably determine the year of ownership change and thus identify the year when the parent change dummy variable should equal one. Thus, we have some missing values in our parent change dummy variable.

In addition, we want to determine whether changes in parent ownership affect spillovers effects arising from scope. To explore all these questions we estimate chain performance as follows:

$$Y_{it} = f(Scale_{it-1}, Scope_{it-1,} \boldsymbol{X_{it}}, Parent\ Change_{it}, Parent\ Change_{it}{*}\ Scope_{it-1})exp(\varepsilon_{it}) \qquad (1)$$

where i and t index chain and year respectively. In this equation, Y_{it} stands for one of our two measures of chain performance, namely: per outlet (or unit or store) sales, which we view as a measure of local productivity, and total outlets, which we view as a measure of total chain performance. Given pre-determined franchise contract terms, for franchised outlets, local productivity, or per outlet sales, increases will mostly accrue to franchisees. Benefits from increases in the chain's number of outlets, on the other hand, are more likely to accrue to franchisors.

As mentioned previously, we measure *Scale* in equation (1) using the total sales of the chain. *Scope* represents the impact of other chains/products that belong to the same parent, which we measure using the number of other chains of the same parent. Since neither type of spillovers need be realized immediately, we measure both scale and scope at time *t-1*. Thus we assume that if the sales of the chain increased in the previous year for some reason, this is more likely to impact the local productivity or total number of outlets in the chain the next rather than the same year. Using lags and including both explanatory variables as predetermined at time *t* when we measure chain performance also helps us avoid potential reverse causality issues that may arise in this type of analysis.

To control for various types of demand shocks that may affect performance, or the timing of a potential ownership change, $\boldsymbol{X_{it}}$ includes a vector of year dummy variables and a vector of cross-effects between industry dummy variables and a time trend. Including these controls further helps to avoid potential endogeneity issues that might arise if chain performance and our variables of interest were driven by common shocks.[14] Year dummy variables in particular control for various unobserved macro-level shocks, including inflation, changes in aggregate demand due to business cycles (e.g. recession or "dot.com" bubble), as well as potential political or regulatory changes in particular years. In addition, the industry-specific time trends control for potential differences in the growth rates of the industries in which the chains operate. As described in the data section, we classify the chains among 20 industry categories (see appendix). Differences in growth rates across industries during our sample period could arise for a number of reasons, including changes in competition, regulation, technological trends or changes in people's preferences for particular products. The fact that these industry time trends are always jointly significant in all our specifications confirms the importance of controlling for them in our analyses.

To examine the impact of ownership changes on chain performance, and their potential impact on spillovers from scope, in equation (1) we include a *Parent Change* dummy variable, and its cross effect with our measure of scope.[15] Moreover, to distinguish between the short-run and long-run impact of the change in parent, we use one of two versions of the *Parent Change* dummy variable. First, we explore the short-run effect using a dummy variable set equal to 1 in the year that the chain's ownership changes, and 0 otherwise. We refer to this variable as the "Parent Change Yr Dummy variable". However, since ownership changes usually take time to be realized and affect operational performance, we expect parent changes to potentially have an observable effect on the chain's performance over a longer time period. To analyze the long run impact, we define a dummy variable set equal to 1 from the year of parent change onwards, and

[14] Moreover, when using per outlet sales as our dependent variable, the impact of shocks affecting total chain sales as well as the number of outlets is already eliminated to a large extent by taking the ratio.

[15] Very few chains experience multiple ownership changes during our sample period. Thus we consider only the impact of the first parent change observed in our data. In Section 4.3 we verify that chains with multiple ownership changes are not driving our results. Also, since parent changes affect only the size of parents, we consider only cross-effects of our Parent Change dummy with scope.

0 in all years before. We refer to this variable as the “From Parent Change Yr Dummy Variable”. In other words, this dummy variable compares the chain’s performance after the ownership change to its performance in the years before the ownership change.

Since these variables comprise a mix of continuous, discrete and binary variables, to allow for a non-linear relationships among them, we estimate the above equation in semi-log form. Specifically, we include both performance and scale measures in logarithmic form, and estimate the impact of scale on performance in the form of an elasticity.[16] Whether the scale coefficient is smaller (larger) than one thus allows us to assess whether there are decreasing (increasing) returns to scale. We include the many dummy variables mentioned above, and scope, i.e. the number of other chains, linearly in the regressions, however. Since scope is a discrete variable with a very limited range of values, and most of the chains belong to parents with no other chain (see Table 2), its impact is best assessed in the form of a semi-elasticity, i.e. the percentage increase in performance due to 1 unit/chain increase in scope rather than elasticity (i.e. the impact of a 1% increase).

We further assume that $\varepsilon_{it} = \mu_i + u_{it}$ is a composite error term, where μ_i represents chain-level unobserved heterogeneity correlated with our regressors. We therefore estimate all specifications using chain-level fixed effects.[17] Controlling for chain fixed effects is very important in our context, as it helps to address potential endogeneity issues due to self-selection. More/less efficient chains may have better/worse sales performance or more/less outlets.

[16] Though the chain’s number of outlets is a count variable, we treat it as continuous in our analyses for several reasons. First, we do not have any observation where this variable is 0 as would be typical for count models. Second, as Figure 4 shows, the distribution of the (log of) this variable is fairly close to a normal distribution. Third, as shown in Table 1, the dispersion of values is quite large, ranging from 29 to more than 33818 units (with a mean of 1655 outlets). Not surprisingly then, when we estimated Poisson fixed effects models, which would be more suitable for a count dependent variable, the Poisson distribution was rejected in our data.

[17] When we estimated random effect specifications, the estimated coefficients were notably different. The assumption of correlated unobserved heterogeneity was also confirmed by Hausman tests, which rejected the random effects models.

Ownership changes also may be correlated with performance if new parents target more or less efficient chains. Moreover, chain fixed effects help to control for any other unobserved (to us) characteristics at the chain, industry or market level that do not change over our sample period. This might include, for example, characteristics such as being owned all along by a parent company that is better or worse at providing corporate support, having more/less mobile customers,[18] operating in a more profitable sector or a better/worse location, or specifics of a chain's ownership structure.[19] All these unobserved characteristics affect not only the chain's performance, but also the likely presence of scale/scope spillovers.

Finally, since the variation in chain performance may differ across chains, and observations also might be serially correlated over time within chains, we adjust standard errors for heteroscedascity and chain-level clusters in all estimations, as recommended by Stock and Watson (2008).[20]

Our empirical specification can be expressed *in levels* as follows:

$$Y_{it} = A_i * (Scale_{it-1})^{\beta} \exp\{\alpha Scope_{it-1} + \gamma Parent\ Change_{it} + \theta Parent\ Change_{it} * Scope_{it-1} + \boldsymbol{\Omega' X}_{it-1} + u_{it}\} \quad (2)$$

where: $A_{i=}e^{\mu i}$ represents the component of chain performance associated with chain unobserved efficiency, and any spillovers from scope, parent changes, aggregate/industry and other shocks serve as performance shifters for any given scale effect. Hence, keeping all the 'shift' effects constant between *t* and *t-1*, chain performance at time *t* would simply be driven by chain

[18] Brickley (1999) notes that externalities among outlets are expected to be more important in industries/products with more mobile/non-repeat customers (i.e. customers with lower switching costs) such as fast food than in industries with less mobile customers, e.g. health-care.
[19] Lafontaine and Shaw (2005) show that mature chains – as in our data - keep relatively stable mixes of company-owned and franchised outlets. We also find that the percentage of franchised outlets is quite stable for the chains in our data.
[20] Stock and Watson (2008) discuss the consistency and efficiency of different estimators for standard errors in panel data fixed effects regressions. They recommend using clustered robust standard errors as the appropriate correction for serial time correlation if the panel is longer than 3 periods and when no restrictions can be placed on the serial correlation structure of the errors (e.g., that the errors follow a low-order moving average process). These conditions characterize our data.

unobserved efficiency and scale effects, i.e. $Y_{it} = A_i * (Scale_{it-1})^{\beta}$. So, if we consider, for example, the impact of chain scale on sales per outlet, and find β=0.1, the implication is that if the chain's worldwide sales were let's say 20% higher in the previous year, this year the chain can expect that the outlet-level sales would be higher by about 2% on average solely due to the increased reputation or other demand/cost-side spillovers from scale, as discussed in Section 2.

4. Results and Interpretation

4.1 Baseline Specification

Our main results are summarized in Tables 3 and 4, where Table 3 focuses on sales per outlet, while results in Table 4 are for the chains' number of outlets. To better assess whether our estimates of scale/scope spillovers are sensitive to parent ownership changes, in both tables we first present results that do no incorporate any parent change dummy variables. In this case, we simply measure the chains scale and its parent's scope based on who owns the chain at any given point in time, ignoring any differences that might result in terms of scope due to parent companies' organic growth versus changes in scope of the parent company that occur due to ownership changes. We then show results when we introduce the year of parent change dummy variables, and its interaction with our measure of parent company scope. We interpret the results from this specification as identifying the short-term effects of ownership change. Finally, in column 3 of both tables, we include instead the parent change dummy variable that is set equal to one for the year of, and all years after, the chain becomes owned by a different parent. We interpret the results from this specification as showing the long-run effects of ownership changes.

Results across all columns in Tables 3 and 4 show strong evidence of positive scale effects for the chains in our data. The estimated elasticities suggest that sales per outlet increase on average by 0.15% (cca. $2310 given a mean of $1.54M), and the total number of outlets increases by 0.37% (cca. 6 outlets) this year if the chain's total sales went up by 1% the previous year. As mentioned in Section 2, these positive spillover effects could arise due to positive demand effects or cost reductions. However, we expect that in the context of franchising, much of the scale effect is due to the increased visibility or reputation of the common brand, which then further enhances the demand for the product. However, given that the estimated elasticities are below one, our results also imply that returns to scale are decreasing. Hence, in the long run, our results imply that everything else constant, chains converge in size to chain-specific sizes.[21]

As for scope, the results are again very consistent across our specifications. However, in this case, we find no scope effect whatsoever for sales per outlet (or local productivity), and we find negative, rather than positive, scope effects for total units in the chain. The latter, moreover, remains the same whether or not we control for parent changes. Specifically, we find that increasing the number of chains of the parent company last year by one reduces the number of outlets of the focal chain by about 1%, or 16 outlets on average, this year. Thus when the parent company is increasingly involved in other activities, as captured by the number of its other chains in the previous period, it downsizes the focal chain this period. We view this result as most consistent with the parent company's likely desire to rationalize its operations, and thus reduce competition among the chains it owns. An alternative explanation might be that the parent company devotes its limited resources to particular activities, and when it focuses more of these on its *other* chains, it does not have the resources to also grow the focal chain. This explanation, however, should yield a lack of growth for the focal chain, not a reduction in the existing number of outlets. Instead, our results support the implications of the recent models on dynamics of multi-product firms that imply that there are limits to firm scope (e.g. Bernard et al., 2009; Nocke and Yeaple, 2006; or Mitchell, 2000).

[21] See Kosová and Lafontaine (2009) for more discussion on size-convergence among franchised chains.

Finally, in Table 3 we see that there are neither short- nor long-term effects of ownership changes on sales per outlet, nor any significant differences in how scope interacts with sales per outlet as a result of parent changes. When it comes to the total number of outlets in the chain, we find a significant negative effect of parent changes that is stronger in the long than the short run. We find no change in the strength of the scope spillover effects, however, associated with a parent change. Specifically, the coefficients of the interaction terms between scope and the short and long-term parent change dummy variables are insignificant. In other words, change of parent company itself results in a smaller number of outlets on average by up to 7%, or about 118 (at the mean of 1655) outlets, for chains during the period from the year a parent change occurred onwards (which lasts about three years on average in our data), but it does not affect how the breadth of activities of the parent relate to chain size. Put differently, focusing attention to our control group (i.e. years/chains without parent changes), our results imply that chains have about 118 outlets more in those years when they do not experience a parent change.

In sum, we have shown strong evidence of scale and scope spillovers both within and across chains. However, while the within-chain scale effects are positive, as expected from theory, the cross-chain spillover effects are negative, contrary to what one would predict from theoretical arguments focusing on cross-chain cost reduction or demand-enhancing effects. Since sales per outlet are unaffected by parent scope in our data, while the number of outlets goes down, we can only conclude that chain total sales go down, overall, with increases in parent company scope, whether this increase in scope arises organically or via ownership changes. In other words, belonging to a more diversified parent is detrimental for both the number of outlets and total sales in a chain.

We have also shown evidence that ownership changes further reduce the number of outlets in the target chains directly, per the coefficient on the parent change dummy variables.

At the same time, the lack of impact of these dummies on sales per outlet, especially in the long run, also excludes the possibility that the negative impact of parent changes on total outlets is the result of a new parent company implementing a policy of getting rid of low performing stores. If this were the case, we should see that sales per outlet or local store productivity would increase in the years following the ownership change as the pruning (i.e. the reduction in outlets that we observe) occurs. In other words, we should see a positive impact of the "From Parent Change Yr Dummy" on sales per outlet since only efficient stores would be allowed to continue their operations. Alternatively, one might assume that chains reduce the number of outlets not because they are getting rid of low-sales outlets, but rather of those that operate at high cost. In this case, we would not expect to observe an increase in sales per outlet as a result of pruning. But as we discuss further in Section 4.3, the fees that franchisees (outlets) pay to their parent company are based on outlet sales, not profits. As a result, the parent company is unlikely to get rid of stores whose sales are high but profits are low because franchisees run them inefficiently. Similarly, for company owned stores, the chain is much more likely to replace the manager and put in place someone that can keep costs at the desired level, than to close down an outlet that generates a sufficient level of sales. We conclude that while chains reduce the number of outlets as they get involved in more activities, or as take over other chains, per our data, there is no evidence suggesting that pruning is the motivation behind these reductions.

Combined with the strong within-chain scale effects found in our data, our results suggest that the reduction in chain size will have further detrimental effects on the focal chain in the future. Consumers are therefore expected to be worse off as parent company scope increases. The parent company, on the other hand, presumably benefits from reduced competition among its brands, and the resulting higher prices and lower quantities (which, combined, per our results, lead to an overall insignificant impact on per outlet sales levels). The potentially lower quantities sold per outlet, and the lower number of outlets, in turn both reduce costs.[22] In that sense, the effects found here are consistent with parent company profit maximization per Section 2.2.3.

4.2 Robustness

We have verified the robustness of the effects described above in a number of ways. First, we experimented with different industry classifications, using either franchising sectors defined by the U.S. Department of Commerce in some of its old publications on the subject, or using a classification from the Bond Guide on Franchising, or using 6-digit NAICS. Unfortunately, the latter is rather unsatisfactory as a classification system for franchised chains, leading to some sectors with very many observations, and many others with just one or two, where we could not separately identify the sectoral trends from the chain fixed effects. We obtained very similar results using the Bond or Department of Commerce classifications, but chose to rely on the classification described in the appendix.

We show two other sets of robustness results in Tables 5 and 6, where Table 5 again focuses on sales per outlet, whereas Table 6 shows corresponding regressions for the total number of outlets in the chain. Our first set of analyses addresses the issue of the length of time-series data available for individual chains. Since some of the chains "enter" the Top 200 listing late in our sample period, and others do poorly and exit the same listings after some period of time, we have a very unbalanced panel. In the first two columns of Tables 5 and 6, which correspond to columns 2 and 3 of Tables 3 and 4, we restrict our sample to just those chains with 3 or more consecutive years of data. As Stock and Watson (2008) discuss, for panels with just two years of data, the conventional heteroscedasticity-robust estimator of standard errors -

[22] See Kalnins (2003) for evidence that when they are located near one another, outlets of the same chain price more aggressively than outlets of competing chains, though the latter still react to each other's prices. Similarly, as noted previously, Thomadsen (2002) finds that prices in competing outlets go up, as predicted by a simple monopoly to merger model, when franchisees take over nearby outlets.

unadjusted for clusters - is most efficient. Hence, for those chains with less than 3 observations each in our data, we could be overestimating standard errors in Tables 3 and 4, leading us to mistakenly conclude that effects are insignificant. However, the results we obtain when we focus on chains with three or more years of data in Tables 5 and 6 are very similar, in magnitude as well as significance levels, to our baseline results. We conclude that our results are unaffected by the fact that we have very short time periods for some of the chains in our data.

In the next set of columns in Tables 5 and 6, we turn to an issue mentioned earlier, about our main measure of parent company scope (based on all chains reported in the directories), which may suffer from measurement error due to changes in the number of chains included in the listings over time. Given this, we replicated our regressions using a more conservative measure of scope – based only on the other Top 200 chains of the same parent. Not surprisingly, given what we saw in Figure 1, and the fact that the two measures are very highly correlated (correlation coeff. = 0.98), we again obtain results that are very consistent with our baseline results (see columns 3 and 4, Tables 5 and 6).

In the next section, we address several issues to show first that our results are not driven by some alternative explanations and, second, to examine more closely potential mechanisms behind the scale and scope effects we observe.

4.3. Exploring Alternative Explanations.

In Table 7, we consider whether by any chance our scope measure might be omitting demand or reputation spillover effects, and whether this explains why we find no effect on outlet-level productivity combined with a negative impact of scope on total outlets. If benefits from scope arise from lower overhead costs at the headquarters, or better supply networks, we would expect they would be best captured by our current measure, namely the number of chains over which the company is able to spread these costs, than by the sales of such chains, which we expect might relate more to demand or reputation effects than to cost savings. However, this alternative measure does not have any effect on either sales per outlet or number of outlets, directly or through interactions with our parent change dummy variables. Moreover, the inclusion of this variable and its interaction terms does not change the impact of scale and scope we found previously.[23] We again find no evidence of scope effect for the chain's sales per outlet, but negative scope effects for the number of outlets. And since cost savings would imply a positive effect of scope, as would reputation effects, we conclude that the scope spillovers in our data again are due to the parent companys' desire to rationalize their network of outlets and reduce competition among their branded offerings rather than the result of cost efficiencies or increased demand.

In Table 8, we exclude the few chains that experienced multiple parent changes during the period of our data. The subsample of chains that experienced just one parent change is interesting because the diversification literature suggests that managers may diversify into other activities for "managerial motives," namely to reduce their employment risk – e.g. by showing to shareholders that they are doing "something"- or to increase their personal compensation. Such scope changes would be expected to hurt the parent company in the long run since the target chains neither add value to the company nor increase its profitability, but rather are meant to help managers fulfill their personal objectives. Alternatively, managers may underestimate the managerial or organizational cost of, and overestimate the benefits from, diversification and not realize that these costs may outweigh the benefits. Shaver and Mezias (2009) provide some evidence along these lines. In either of these scenarios we would expect the chain to be resold to

[23] Since the sales of parent's other chains is a continuous variable, as is our scale measure, we include it in logs to measure its impact on performance in the form of an elasticity. Also, to avoid problems with taking the log of zero, we add 1 to the Sales of Parent's Other Chains before taking the log.

another parent soon after the first parent change occurs in our sample. Thus excluding the chains that changed parent multiple times within our data period allows us to explore whether our negative scope results may be driven by such "bad" diversification decisions. Table 8, however, shows that our results remain the same when we exclude these few chains. We conclude that managerial motives and inefficient diversification activities are not driving the negative effect of scope on number of outlets we find in our data.

In Table 9, we explore how the extent of franchising in the target chains may affect the scale and scope effects. Since royalty rates and advertising fees in franchise contracts typically are based on franchisee's sales, franchisors may care more about sales than profits in franchised outlets.[24] They may therefore have a tendency to locate outlets closer to each other than corporate chains would, leading to the type of "encroachment" effect mentioned in Section 2.1.2. The incentives of new parent companies to reduce the size of target chains thus may be especially strong for chains that are more heavily franchised.

Since the extent of franchising does not vary much over time within chains (and thus it is fundamentally captured in the chain fixed effects), we examine this issue by exploring results for the subsample of chains in our data that franchise at least 80% of their outlets.[25] Our results again confirm all our previous findings, and further indicate, as expected, that the negative scope effect on number of outlets is indeed stronger in this subsample. This, in turn, again suggests that parents of franchised chains are especially interested in limiting both intra- and inter-brand competition among the brands they manage.[26]

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[24] Note that the idea that franchisors could maximize outlet sales rather than profits requires that there be no reputation consequences from doing so, or that the franchisor not view the loss of reputation as costly.

[25] We use an 80% threshold because: 1) the data source already requires that a chain be at least 20% franchised to be included in the listing and 2) data on franchising suggest that this threshold identifies chains that are heavily invested in franchising (e.g. Blair and Lafontaine, 2005, p. 91 note that more than 70 percent of mature franchisors franchise 80% or more of their outlets).

[26] See HBS case by Khanna and Ganot, on Choice Hotels International Inc., for a nice example of these issues.

5. Conclusion

In this paper, we have quantified the scale and scope externalities (or spillovers) that arise "within" franchised chains as well as across those that are owned by the same parent company. Controlling for chain unobserved heterogeneity via fixed effects, we showed strong evidence of positive scale effects within chains. As for parent company scope, measured by the number of other chains owned by the parent in the previous year, we found no effect on chain-level sales per outlet, but a negative effect on the number of outlets. Moreover, chains that experience ownership changes suffer from a reduction in number of outlets in the year in which the change occurs and the following years as well. Combined with the lack of effect on sales per outlet, and the negative scope effect we document, we conclude that chain total sales go down in the long run when they become part of more diversified parent companies.

Overall, our results reject the idea that increasing scope within a single parent company yields important efficiency gains - traditionally emphasized in the diversification literature – or major reputation/loyalty or entry deterrence benefits. We are left with the more standard market power argument as the main reason why parent companies seem to benefit from owning more than one product concept. In other words, chain sales, and consumers who must presumably pay higher prices and travel further to purchase the chain's product, are hurt by increased scope, whether it is achieved organically, or via ownership changes. The parent company, on the other hand, might well benefit if the cost reductions attendant to lower quantities sold (at higher prices, given reduced competitive pressure) per outlet, and fewer numbers of outlets in the chains, outweigh the sales revenue reduction observed at the chain level. We do not have data on prices or parent company profits to ascertain the effects on these variables empirically. But the fact that we find that chains may be exercising market power is surprising on its own. We did not expect such a finding in the type of industries where franchising occurs, given that the ease of entry and relatively low switching costs between different products compared to e.g. branded products in manufacturing (cars, computers, etc.) that characterize these industries would seem to seriously hamper the exercise of market power. Yet the evidence we present is most consistent with parent companies taking steps to curb competition when they own more than one chain. Our results thus suggest that the branding that is central to franchising in fact does differentiate product offerings in important ways.[27]

Despite the very different setting of our analyses, our conclusions are quite consistent with Scherer's (2006) summary in his survey of evidence on mergers, which suggests that the rise in mergers and acquisition activity in the U.S. does not appear to have had any positive effect on US productivity. Instead, as our paper suggests, even in industries where entry and exit is fairly low cost, firms benefit from, and thus engage in, reducing competition when they can profit, or expect that they could profit, from doing so.

[27] See also Sutton (1995) on endogenous barriers to entry.

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TABLE 1: DESCRIPTIVE STATISTICS, REGRESSION SAMPLES (TABLES 3-4, COL. 1)

	Levels					Log				
	obs.	mean	sd	min	max	obs.	mean	sd	min	max
Sales per Outlet*	1970	1.54	2.33	0.021	28.9	1970	-0.12	1.02	-3.88	3.36
Total Outlets (Worldwide)	1972	1655.3	3633.6	29	33818	1972	6.42	1.26	3.37	10.4
Scale: Chain's Total Sales(t-1)	1972	1464.9	4103.5	38	56800	1972	6.24	1.30	3.64	10.9
Scope: # of Parent's Other Chains(t-1)	1972	1.37	2.48	0	12					
Alternative Scope Measures										
Scope: Sales of Parent's Other Chains(t-1)	1972	2342.7	5138.7	0	30800	1972	2.89	3.92	0	10.3
Scope: # of Parent's Other Top 200 Chains(t-1)	1972	1.22	2.24	0	11					
Parent Change Dummy Variables										
Short Run Effect:										
Parent Change Yr Dummy Var.	1961	0.037	0.19	0	1					
Long Run Effect:										
From Parent Change Yr Dummy Var.	1961	0.11	0.32	0	1					

Notes: * All sales variables are in M of dollars; Scope = 0 if there are no other chains that could generate spillovers, i.e. chain does not have a parent that owns other chains. We add 1 to Sales of Parent's Other Chains before taking logs.

TABLE 2: DISTRIBUTION OF NO. OF CHAINS PER PARENT IN 1998 AND 2007.

	Year: 1998		**Year: 2007**	
Number of chains per parent	# of chains owned by such parent	%	# of chains owned by such parent	%
1	138	61.33	199	66.33
2	22	9.78	26	8.67
3	24	10.67	18	6.00
4	12	5.33	8	2.67
5	5	2.22	15	5.00
6	6	2.67	18	6.00
7	7	3.11	7	2.33
9			9	3.00
11	11	4.89		
Total # of Chains	225		300	
Total # of Parents	164		228	

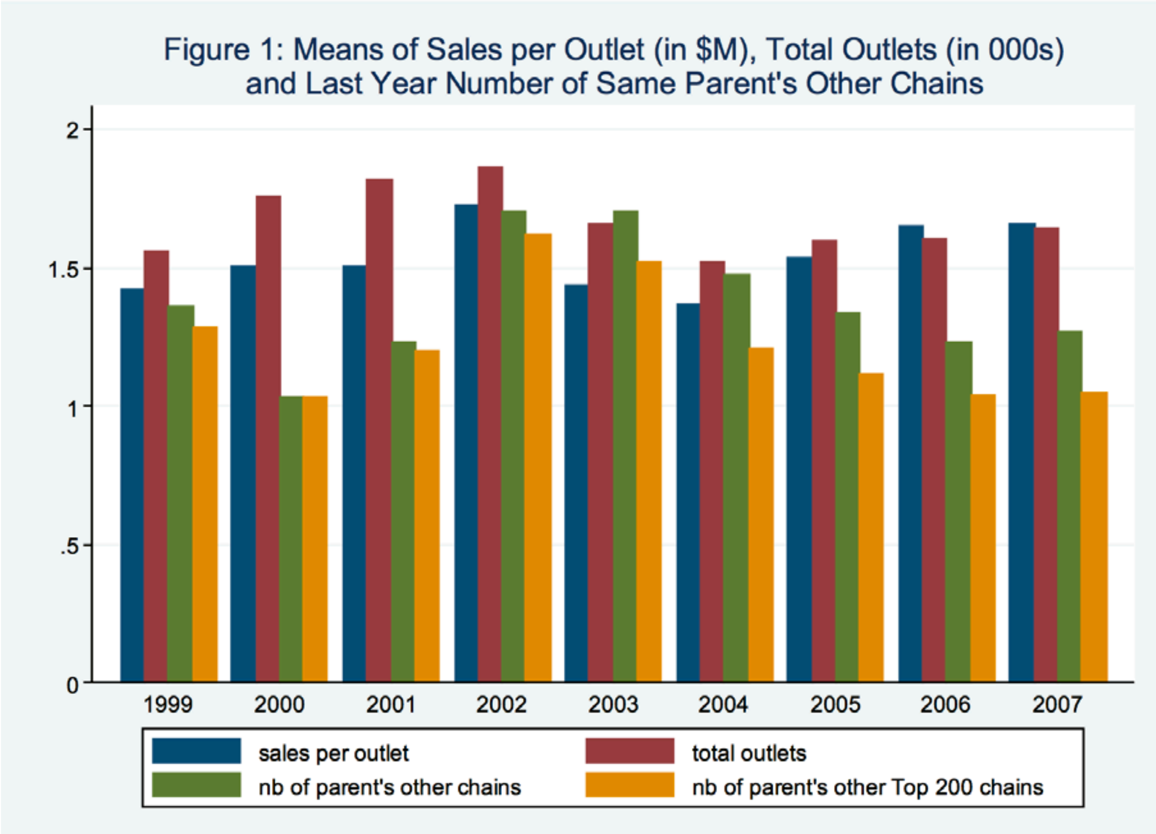


Figure 1: Means of Sales per Outlet (in $M), Total Outlets (in 000s)
and Last Year Number of Same Parent's Other Chains
2
1.5
1
.5
0
1999
2000
2001
2002
2003
2004
2005
2006
2007
sales per outlet
total outlets
nb of parent's other chains
nb of parent's other Top 200 chains

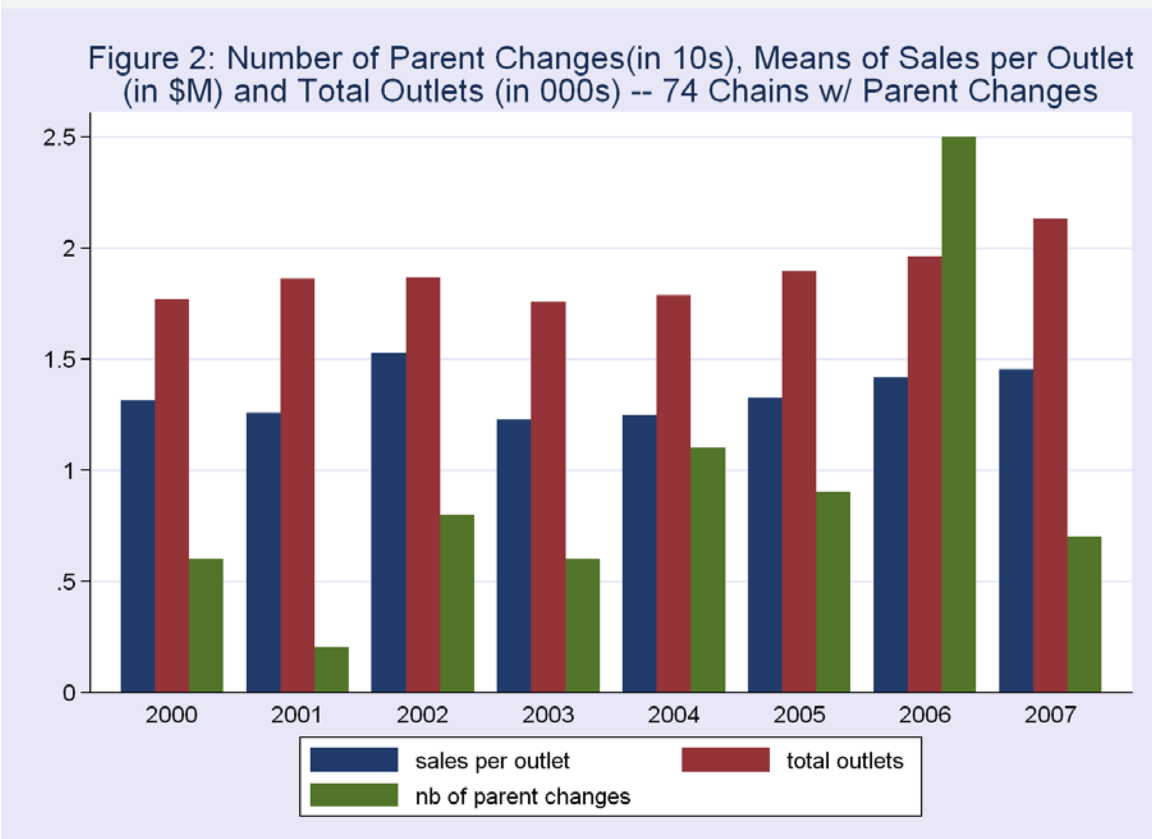
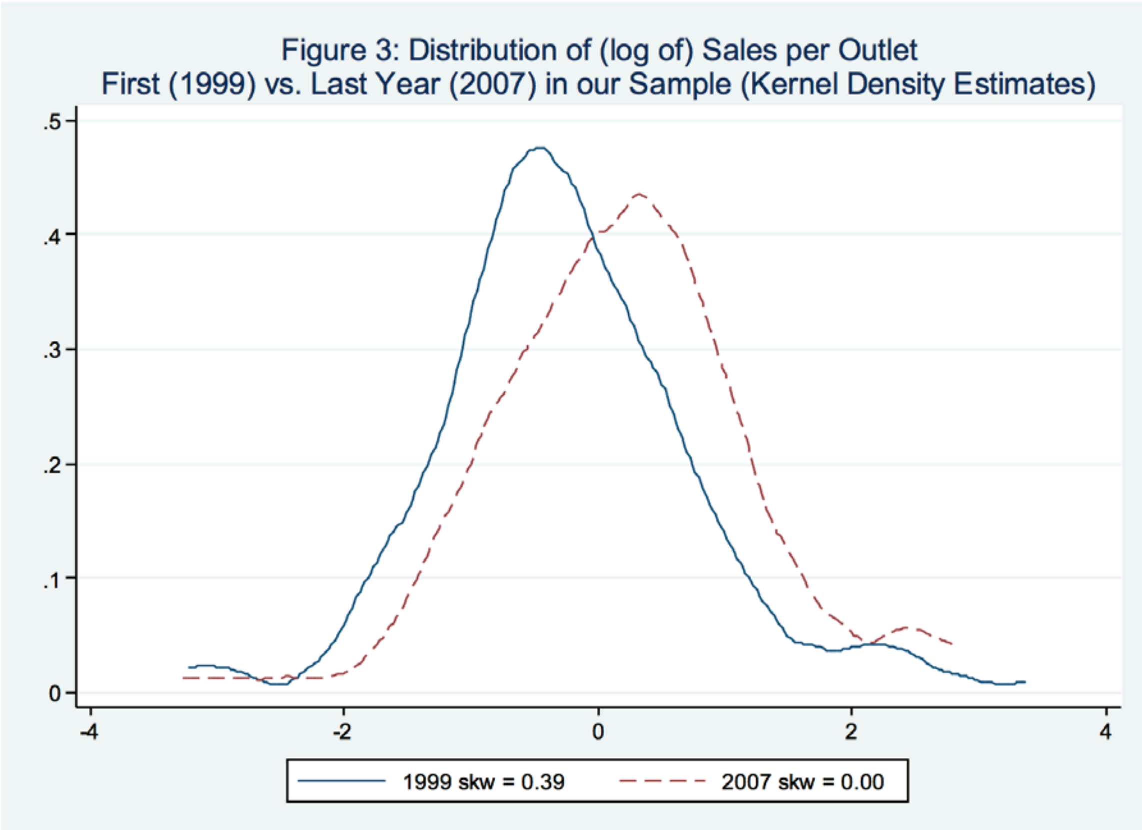
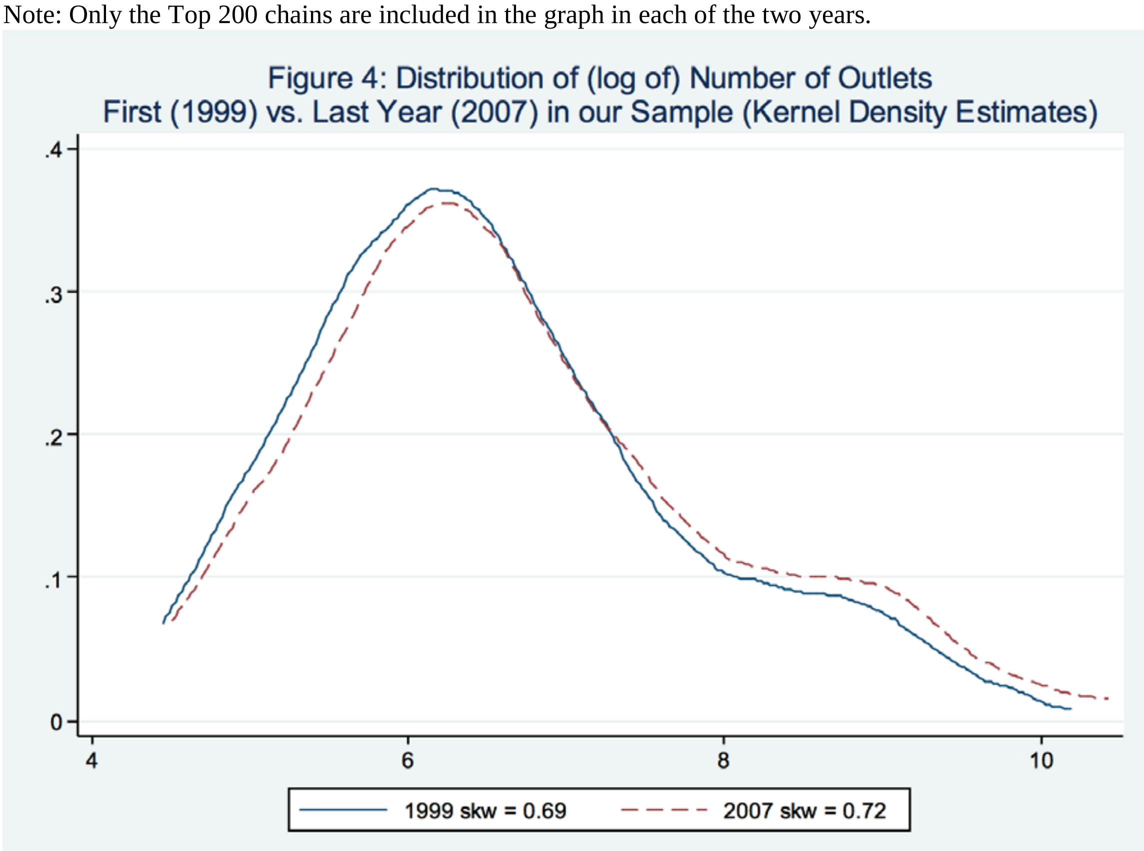


Figure 2: Number of Parent Changes(in 10s), Means of Sales per Outlet
(in $M) and Total Outlets (in 000s) -- 74 Chains w/ Parent Changes
2.5
2
1.5
1
.5
0
2000
2001
2002
2003
2004
2005
2006
2007
sales per outlet
total outlets
nb of parent changes



Note: Only the Top 200 chains are included in the graph in each of the two years.



Note: Only the Top 200 chains are included in the graph in each of the years.

TABLE 3: SALES PER OUTLET (LOGS). FIXED-EFFECTS ESTIMATION, 1999-2007

	(1)	(2)	(3)
Scale: Chain's Total Sales(t-1)	0.145***	0.144***	0.147***
	(0.035)	(0.035)	(0.036)
Scope: # of Parent's Other Chains(t-1)	0.008	0.008	0.007
	(0.009)	(0.009)	(0.009)
Parent Change Yr Dummy Var.		0.009	
		(0.028)	
Parent Change Yr Dummy Var. * Scope		-0.006	
		(0.005)	
From Parent Change Yr Dummy Var.			0.006
			(0.032)
From Parent Change Yr Dummy Var.*Scope			0.004
			(0.006)
Year dummy variables	Yes	Yes	Yes
Industry dummy variables * time trend	Yes	Yes	Yes
Observations	1970	1959	1959
Number of Chains	374	374	374
Adjusted R-squared	0.217	0.222	0.222

Notes: All variables in logs with the exception of dummy variables and # of Parent's Other Chains(t-1). We include the number of parent's other chains linearly, since most parent companies own just one chain (see text for more details). Significant at: *** 1%, ** 5%, * 10%. Standard errors corrected for heteroscedasticity and chain-level clusters in parentheses.

TABLE 4: TOTAL OUTLETS(LOGS). FIXED-EFFECTS ESTIMATION, 1999-2007

	(1)	(2)	(3)
Scale: Chain's Total Sales(t-1)	0.378***	0.377***	0.372***
	(0.040)	(0.041)	(0.041)
Scope: # of Parent's Other Chains(t-1)	-0.010**	-0.011**	-0.012**
	(0.005)	(0.005)	(0.005)
Parent Change Yr Dummy Var.		-0.057**	
		(0.027)	
Parent Change Yr Dummy Var. * Scope		0.002	
		(0.004)	
From Parent Change Yr Dummy Var.			-0.070**
			(0.031)
From Parent Change Yr Dummy Var.*Scope			0.002
			(0.006)
Year dummy variables	Yes	Yes	Yes
Industry dummy variables * time trend	Yes	Yes	Yes
Observations	1972	1961	1961
Number of Chains	374	374	374
Adjusted R-squared	0.430	0.436	0.439

Notes: All variables in logs with the exception of dummy variables and # of Parent's Other Chains(t-1). We include the number of parent's other chains linearly, since most parent companies own just one chain ((see text for more details). Significant at: *** 1%, ** 5%, * 10%. Standard errors corrected for heteroscedasticity and chain-level clusters in parentheses.

TABLE 5: ROBUSTNESS CHECKS – SALES PER OUTLET (LOGS). FIXED-EFFECTS ESTIMATION, 1999-2007

	3 or more consecutive obs.		*Top 200 other chains*	
	(1)	(2)	(3)	(4)
Scale: Chain's Total Sales(t-1)	0.143***	0.146***	0.141***	0.145***
	(0.036)	(0.036)	(0.036)	(0.036)
Scope: # of Parent's Other Chains(t-1)	0.008	0.007	0.014	0.014
	(0.009)	(0.009)	(0.009)	(0.009)
Parent Change Yr Dummy Var.	0.009		0.010	
	(0.028)		(0.027)	
Parent Change Yr Dummy Var. * Scope	-0.006		-0.007	
	(0.005)		(0.006)	
From Parent Change Yr Dummy Var.		0.007		0.005
		(0.033)		(0.032)
From Parent Change Yr Dummy Var.*Scope		0.004		0.007
		(0.006)		(0.008)
Year dummy variables	Yes	Yes	Yes	Yes
Industry dummy variables * time trend	Yes	Yes	Yes	Yes
Observations	1909	1909	1959	1959
Number of Chains	326	326	374	374
Adjusted R-squared	0.221	0.222	0.224	0.224

Notes: All variables in logs with the exception of dummy variables and # of Parent's Other Chains(t-1). We include the number of parent's other chains linearly, since most parent companies own just one chain (see text for more details). Significant at: *** 1%, ** 5%, * 10%. Standard errors corrected for heteroscedasticity and chain-level clusters in parentheses.

TABLE 6: ROBUSTNESS CHECKS - CHAIN'S TOTAL OUTLETS(LOGS). FIXED-EFFECTS ESTIMATION, 1999-2007

	3 or more consecutive obs.		*Top 200 other chains*	
	(1)	(2)	(3)	(4)
Scale: Chain's Total Sales(t-1)	0.374***	0.370***	0.378***	0.373***
	(0.041)	(0.041)	(0.041)	(0.041)
Scope: # of Parent's Other Chains(t-1)	-0.011**	-0.012**	-0.011*	-0.013*
	(0.005)	(0.005)	(0.006)	(0.006)
Parent Change Yr Dummy Var.	-0.057**		-0.055**	
	(0.027)		(0.026)	
Parent Change Yr Dummy Var. * Scope	0.002		0.001	
	(0.004)		(0.005)	
From Parent Change Yr Dummy Var.		-0.067**		-0.067**
		(0.031)		(0.031)
From Parent Change Yr Dummy Var.*Scope		0.002		0.001
		(0.006)		(0.007)
Year dummy variables	Yes	Yes	Yes	Yes
Industry dummy variables * time trend	Yes	Yes	Yes	Yes
Observations	1910	1910	1961	1961
Number of Chains	326	326	374	374
Adjusted R-squared	0.434	0.437	0.435	0.439

Notes: All variables in logs with the exception of dummy variables and # of Parent's Other Chains(t-1). We include the number of parent's other chains linearly, since most parent companies own just one chain (see text for more details). Significant at: *** 1%, ** 5%, * 10%. Standard errors corrected for heteroscedasticity and chain-level clusters in parentheses.

TABLE 7: ARE WE OMITTING DEMAND/REPUTATION SPILLOVERS? FIXED-EFFECTS ESTIMATION, 1999-2007

Dependent Variable(in logs):	*Sales Per Outlet*		*Total Outlets*	
	(1)	(2)	(3)	(4)
Scale: Chain's Total Sales(t-1)	0.143***	0.146***	0.378***	0.373***
	(0.035)	(0.035)	(0.040)	(0.040)
Scope: # of Parent's Other Chains(t-1)	0.010	0.011	-0.014**	-0.016***
	(0.013)	(0.013)	(0.006)	(0.006)
Alt. Scope: Sales of Parent's Other Chains(t-1)	-0.003	-0.005	0.004	0.006
	(0.007)	(0.008)	(0.005)	(0.005)
Parent Change Yr Dummy Var.	-0.0003		-0.036	
	(0.028)		(0.027)	
Parent Change Yr Dummy Var. * Scope	-0.012		0.016	
	(0.013)		(0.012)	
Parent Change Yr Dummy Var. *Alt. Scope	0.006		-0.014	
	(0.012)		(0.012)	
From Parent Change Yr Dummy Var.		-0.011		-0.049
		(0.034)		(0.033)
From Parent Change Yr Dummy Var. * Scope		-0.007		0.015
		(0.009)		(0.010)
From Parent Change Yr Dummy Var. * Alt. Scope		0.011		-0.013
		(0.009)		(0.010)
Year dummy variables	Yes	Yes	Yes	Yes
Industry dummy variables * time trend	Yes	Yes	Yes	Yes
Observations	1959	1959	1961	1961
Number of Chains	374	374	374	374
Adjusted R-squared	0.222	0.223	0.437	0.441

Notes: All variables in logs with the exception of dummy variables and # of Parent's Other Chains(t-1). We include the number of parent's other chains linearly, since most parent companies own just one chain (see text for more details). Significant at: *** 1%, ** 5%, * 10%. Standard errors corrected for heteroscedasticity and chain-level clusters in parentheses.

TABLE 8: EXCLUDING CHAINS WITH MULTIPLE OWNERSHIP CHANGES. FIXED EFFECT ESTIMATION, 1999-2007

Dependent Variable (in logs):	*Sales Per Outlet*		*Total Outlets*	
	(1)	(2)	(3)	(4)
Scale: Chain's Total Sales(t-1)	0.143***	0.146***	0.379***	0.374***
	(0.036)	(0.036)	(0.041)	(0.041)
Scope: # of Parent's Other Chains(t-1)	0.008	0.007	-0.011**	-0.012**
	(0.009)	(0.009)	(0.005)	(0.005)
Parent Change Yr Dummy Var.	0.005		-0.060**	
	(0.030)		(0.030)	
Parent Change Yr Dummy Var. * Scope	-0.005		0.003	
	(0.005)		(0.004)	
From Parent Change Yr Dummy Var.		0.008		-0.073**
		(0.035)		(0.034)
From Parent Change Yr Dummy Var.*Scope		0.004		0.002
		(0.006)		(0.006)
Year dummy variables	Yes	Yes	Yes	Yes
Industry dummy variables * time trend	Yes	Yes	Yes	Yes
Observations	1930	1930	1932	1932
Number of Chains	369	369	369	369
Adjusted R-squared	0.223	0.224	0.437	0.441

Notes: All variables in logs with the exception of dummy variables and # of Parent's Other Chains(t-1). We include the number of parent’s other chains linearly, since most parent companies own just one chain (see text for more details). Significant at: *** 1%, ** 5%, * 10%. Standard errors corrected for heteroscedasticity and chain-level clusters in parentheses.

TABLE 9: CHAINS THAT FRANCHISE MORE THAN 80% OF OUTLETS. FIXED EFFECT ESTIMATION, 1999-2007

Dependent Variable (in logs):	*Sales Per Outlet*		*Total Outlets*	
	(1)	(2)	(3)	(4)
Scale: Chain's Total Sales(t-1)	0.163*** (0.046)	0.170*** (0.045)	0.340*** (0.048)	0.330*** (0.046)
Scope: # of Parent's Other Chains(t-1)	0.010 (0.012)	0.010 (0.012)	-0.015** (0.006)	-0.018*** (0.006)
Parent Change Yr Dummy Var.	0.013 (0.041)		-0.056** (0.025)	
Parent Change Yr Dummy Var. * Scope	-0.006 (0.006)		0.003 (0.004)	
From Parent Change Yr Dummy Var.		0.022 (0.049)		-0.113*** (0.039)
From Parent Change Yr Dummy Var.*Scope		0.005 (0.007)		0.002 (0.006)
Year dummy variables	Yes	Yes	Yes	Yes
Industry dummy variables * time trend	Yes	Yes	Yes	Yes
Observations	1286	1286	1287	1287
Number of Chains	249	249	249	249
Adjusted R-squared	0.236	0.238	0.420	0.436

Notes: All variables in logs with the exception of dummy variables and # of Parent's Other Chains(t-1). We include the number of parent's other chains linearly, since most parent companies own just one chain (see text for more details). Significant at: *** 1%, ** 5%, * 10%. Standard errors corrected for heteroscedasticity and chain-level clusters in parentheses.

APPENDIX

Sector	Number of Obs.	%	Number of Chains	%
Automotive Products & Services	113	5.7	21	5.6
Business Services	80	4.1	17	4.5
Business Supplies	24	1.2	4	1.1
Contractors	37	1.9	10	2.7
Cosmetic Products & Services	47	2.4	7	1.9
Eating Places - Full Service	262	13.3	46	12.3
Eating Places - Limited Services	515	26.1	93	24.9
Education	19	1.0	4	1.1
Health & Fitness Products & Svcs	50	2.5	12	3.2
Hotels & Motels	362	18.4	51	13.6
Maintenance	78	4.0	17	4.5
Personal Services	61	3.1	15	4.0
Real Estate	33	1.7	8	2.1
Recreation and Travel	31	1.6	7	1.9
Rental	52	2.6	11	2.9
Retail - Building Materials	19	1.0	3	0.8
Retail - Food	35	1.8	9	2.4
Retail - Home Furnishings	13	0.7	7	1.9
Retail - Other	123	6.2	29	7.8
Retail - Used Products	18	0.9	3	0.8