

## Time will tell: interaction effects of franchising percentages and age on franchisor mortality rates

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**Abstract** Drawing from franchising and organizational ecology literatures, we hypothesize that franchising provides benefits to franchisors by addressing issues of adverse selection, moral hazard, holdup, obsolescence, and senescence. We assert that, over time, these benefits increase such that the more a franchise chain utilizes franchisees rather than company-owned outlets, the greater the franchising benefits accrue to the franchisor. We test our propositions by studying the mortality rates of 393 franchise organizations in the U.S. automotive products and services sector over the 21-year time period 1985–2005, using proportional hazard analysis. We find that older franchise chains with higher percentages of franchised units have lower mortality rates than older franchise chains with lower percentages of franchised units. We also find that younger franchise chains with higher percentages of franchised units have higher mortality rates than younger franchise chains with lower percentages of franchised units.

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## Franchising

Franchises employ about 18 million people in the U.S., account for over 40 % of sales in the retailing sector, and have an economic impact of over two trillion dollars to the U.S. GDP (Dant et al. 2011). Within the broader category of hybrid organizations, franchise organizations consist of one firm (the franchisor) which licenses to another firm or firms (the franchisee) the right to use the franchisor's proprietary trademarks, operating systems, product/service specifications, and other tangible or intangible resources in exchange for various fees. The franchise agreement typically outlines geographic boundaries and/or exclusivity, agreement timelines, standards for operations, penalties for lack of compliance, and other contractual issues.

The motivations behind franchising activities have been the focus of much theoretical and empirical work. Both parties seek to benefit from the relationship: the franchisee bypasses product and/or market development time and expense and benefits from economies of scale not independently feasible; and the franchisor grows at a faster rate, assigns risk to external parties, and benefits from franchisees' local knowledge and on-site management (Rubin 1978; Martin 1988; Norton 1988; Windsperger 2002). Because franchisees are the residual claimants of the profits their units generate, they have significant motivation for successful operations, thereby greatly reducing the need by the franchisor to monitor franchisees (Dahlstrom and Nygaard 1994). Franchising has thus been viewed as a means of addressing the *agency dilemma* that arises when conflict exists between principal's and agent's goals leading to significant monitoring costs for the principal (e.g., Rubin 1978; Brickley and Dark 1987; Michael 1996; Shane 1996; Grünhagen and Mittelstaedt 2005).

Academic research on franchising dates back at least to the 1960s (Oxenfeldt and Kelly 1968–69) and has spanned multiple disciplines. However, studies in franchising, in general, have not frequently been longitudinal in nature (Combs and Ketchen 2003). This might be attributed in part to the fact that much of the literature on the franchise sector's long-term impact on the U.S. economy incorporated data from the now-defunct U.S. Department of Commerce publication "Franchising in the Economy" which ceased to exist in 1992 (Grünhagen and Mittelstaedt 2000). Nevertheless, some researchers have begun utilizing a type of empirical analysis with a long-term orientation to examine the growth and survival rates of franchise systems. This type of analysis is built on the foundational concepts of *organizational ecology* (Hannan and Freeman 1977, 1989), but research that examines franchising using this perspective remains rare (Pilling et al. 1995; Shane 2001; Kosova and Lafontaine 2010; Grünhagen et al. 2011 represent some of the very few examples). Additional longitudinal studies such as these are needed to gain additional important insights into the efficacy of franchising (Combs and Ketchen 2003; Kosova and Lafontaine 2010).

We seek to add to this growing body of longitudinal franchising research using the empirical tools and some of the underlying theories of organizational ecology, in addition to theories utilized in the franchising literature, to identify patterns in

franchising activities. Specifically, we are interested in the degree to which the level of franchising within chains affects the franchise chains' mortality rates over time. We develop hypotheses regarding these effects and test our suppositions using 21 years of data from the automotive products and services sector.

## Organizational ecology

Organizational ecology derives its approach to analyzing populations of organizations from ecological and evolutionary change models. The primary goal of this theoretical perspective is to “understand the forces that shape the structures of organizations over long time spans” (Hannan and Freeman 1989, pg. xi). Scholars from the domains of organizational theory and management (Hannan 1997; Swaminathan 2001; Dobrev and Kim 2006; Marquis and Lounsbury 2007), strategy (Ruef 1997; Stern and Henderson 2004; Sorenson et al. 2006; Dobrev 2007; Li 2008), international business (Zhou and Li 2008), and sociology (Hannan and Freeman 1977, 1984, 1989; Brittain and Freeman 1980; Carroll 1985; Hannan and Carroll 1992; Carroll and Swaminathan 2000; Polos et al. 2000) have used the approach. Industries including automobiles (Dobrev and Kim 2006; Dobrev 2007), banks (Li 2008), brewers (Carroll and Hannan 1989a; Carroll and Swaminathan 2000), microprocessors (Wade 1995), newspapers (Delacroix and Carroll 1983; Carroll and Hannan 1989b), sports leagues (Dobbs et al. 2005, 2011; Dobbs 1999), wineries (Swaminathan 2001), and youth service agencies (Wholey and Huonker 1993) have been examined empirically using the perspective. In franchise-specific literature, Kosova and Lafontaine (2010) investigated franchise age, size, growth, and survival; Shane (2001) examined the effects of incentive contracting on the survival rates of franchise systems; while Pilling et al. (1995) used population ecology to study cross-industry competition between franchises, company-owned units, and independent operators.

Organizational ecologists speak of organizational forms, which can be thought of as organizations with “particular clusters of features” (Polos et al. 2000). They are typically characterized by similar resource requirements (e.g., inputs, employees, customers, technology), and may be thought of as possessing qualities along the lines of strategic groups. The research follows a strategy of 1) identifying an organizational population comprised of organizations with similar forms, 2) gathering information on all organizations in the population, 3) recording information about entries and exits, and 4) estimating organizational, population, and environmental effects on entry and exit (Carroll and Hannan 2000; Hannan 2005).

From the earliest days of organizational ecology research, organization age has been an area of great interest to scholars. Early studies of organizational survival found age to be positively correlated with organizational survival (Freeman et al. 1983; Barnett and Carroll 1987; Baum and Mezias 1992; Bruderl et al. 1992). It was hypothesized that organizations experience a “liability of newness” due to a lack of legitimacy and lack of sustainable resources (Stinchcombe 2000; Hannan and Freeman 1984). But in subsequent years, more and more research either contradicted these findings or found exceptions to them. A liability of “adolescence” was hypothesized wherein organizations are at greatest risk not when they are founded, but when their initial stock of resources is depleted; after that time their risk of failure returns to

the pattern of the liability of newness and decreases monotonically over time (Bruderl and Schissler 1990). A liability of “obsolescence” was hypothesized wherein organizations are at greater risk of failure at older ages due to a growing mismatch of organizational resources and environmental conditions—what was once a good fit is no longer (Hannan 1998). And a liability of “senescence” was hypothesized wherein organizations are also at greater risk at older ages, but due to accumulated rules, routines, and structures that eventually reduce the organizations’ efficiency and effectiveness (Barron et al. 1994; Ranger-Moore 1997).

Of the ecological examinations of franchises mentioned earlier, few used robust modeling techniques to test the effects of organizational age on mortality rates. Using Weibull and Cox proportional hazard models, Kosova and Lafontaine (2010) found evidence for a liability of newness in franchises over a 20 year period in the U.S. Shane (2001) also found evidence for a liability of newness using Cox regression modeling. However, due to the modeling choices made (i.e., the use of a log function, which is very common in the ecological literature, without testing for quadratic or interaction effects), unobserved liability of aging would not have been possible to detect in their results. Therefore, while there is limited support for a liability of newness in franchising, that support is very limited and the possibilities for liabilities of aging have not been thoroughly investigated for nonmonotonic relationships or interaction effects with other variables. Given that both liabilities of newness and aging have been found in the ecological literature, investigating how age may impact mortality rates of franchise organizations may provide additional insight into what type of relationship may actually exist between franchise age and mortality rates and the possibility of intervening variables that may have additional impacts.

## Hypotheses

Given the varying effects of age on organizational mortality rates found in the organizational ecology literature and the limited findings regarding age effects on franchise system mortality, we believe further investigation of franchise age and mortality is warranted. We propose that how franchise systems, as an organizational form, benefit or face challenges as they age may be a function of how franchising addresses issues of adverse selection, moral hazard, holdup, and liabilities of obsolescence and senescence. And because franchise chains vary in the proportion of franchisees vs. company-owned outlets, we also propose that franchise chains with higher proportions of franchisees will reap more of whatever benefits exist for franchising in general.

The selection of franchisees is typically based on financial requirements, such as upfront franchise entry fees and specific equity levels, and operational considerations, such as experience, personality, knowledge, etc. (Rubin 1978; Kaufmann and Lafontaine 1994). Such prequalification standards are used to safeguard against adverse selection of franchisees who would be less likely to succeed in the long term (Dnes 1992; Bergen et al. 1992). Over time, franchisors are likely to learn more about the qualifications needed for success with their particular system and make improvements to their selection procedures (e.g., McDonald’s as cited in Kaufmann and Lafontaine 1994). It stands to reason, then, that as a franchise system ages and its

selection procedures improve, it will benefit from those improvements the more it utilizes franchising as opposed to company-owned outlets.

Moral hazard in the context of franchising is ordinarily discussed with regard to the agency dilemma (Lafontaine 1992; Combs and Ketchen 1999; Castrogiovanni et al. 2006; Perryman and Combs 2012). Because the goals of a principal and agent may be in conflict, monitoring is needed by the principal to verify the agent is behaving in appropriate ways. Moral hazard arises when the agent promises to behave one way, but fails to do so reaping additional rewards (e.g., money, time, energy, etc.). Franchising is viewed as a means of enforcing principal/agent agreements through extensive contracting. However, monitoring of contract compliance by the principal (franchisor) can be costly. Eisenhardt (1989) proposed that these monitoring costs would decrease over time as a principal's knowledge of the agent's activities increased. Therefore, we expect the cost of monitoring to avoid agent moral hazard will decrease over time for those franchise chains with higher proportions of franchised units leading to lower mortality rates.

According to Barney and Ouchi (1986, p. 440), holdup occurs when one firm involved in a transaction with another makes investments that would not be more valuable in any other situation. This effectively creates switching costs for such firms desiring to leave or break contracts, agreements, or other kinds of transactional relationships. In franchising, franchisees may be required to invest in certain proprietary equipment unusable in other applications. The franchisee has a strong disincentive then, to break or end the relationship with the franchisor, even if there are other more profitable ventures to pursue. Over time, levels of capital, time, knowledge, and other resource investments in the franchise system will accumulate, thus making the franchisee more and more likely to stay within the system. In a sense, franchisors have more holdup power over franchisees the longer they are together. We therefore expect that holdup effects will increasingly benefit franchising chains over time the more those chains utilize franchising vs. company-owned units.

Finally, local franchisees not only pour their time and efforts into their units, but also contribute local expertise and market knowledge over time that would otherwise be difficult for the franchisor to acquire (Windsperger 2002; Windsperger and Dant 2006). Over the lifetime of a franchise system, this may counter the effects of obsolescence (poor resource fit with shifting environment) and senescence (inefficiencies due to inertia, rules, procedures, etc.). Franchisees which innovate and adapt to environmental shifts may share such information with the franchisor and successful adaptations can be adopted throughout the franchise network. These adaptations may serve to create a better fit with environmental conditions for the franchise chain overall, thus limiting any effects of a liability of obsolescence. Franchisees may also exert pressure on franchisors to alter contractual terms (Kaufmann and Lafontaine 1994) over time. This may force franchisors to reexamine and alter procedures, terms, and rules that ordinarily would be resistant to change due to inertia and path dependence. Thus, the inefficiencies of franchisors due to growing and outdated rules and procedures (liability of senescence) may be held in check for franchise chains as they age. We assert then, that as franchise systems with higher percentages of franchisees age, they will be better positioned to address the threats of obsolescence and senescence.

The benefits of franchising are not static in nature, but rather they are dynamic and change over time. In particular, benefits to franchisors increase as they age due to counteracting effects that franchising has regarding the principal–agent relationship and the liability of aging. Over long periods of time, we would expect this to increase franchise chain survival rates and decrease mortality rates. Also, the more a franchise chain takes advantage of franchising through a higher percentage of franchisees vs. company-owned outlets, the more these benefits are likely to have positive effects. Given, then, that as franchise systems age, franchising benefits are amplified that address issues of adverse selection, moral hazard, holdup, obsolescence, and senescence, we hypothesize that:

Hypothesis 1: Older franchise systems with a higher percentage of franchised units will have lower mortality rates than older franchise systems with lower rates of franchised units.

In a similar vein, if the benefits of franchising are increased as a franchise chain ages, in earlier years those benefits will not have the same level of positive impact. As noted above, the costs of developing and monitoring franchise contracts is significant. Also, a lack of legitimacy (Hannan and Freeman 1989) may exist for newer franchise chains. Given, then, that at younger ages franchise systems have yet to fully exploit franchising benefits addressing issues of adverse selection, moral hazard, holdup; and may also incur a liability of newness, we hypothesize that:

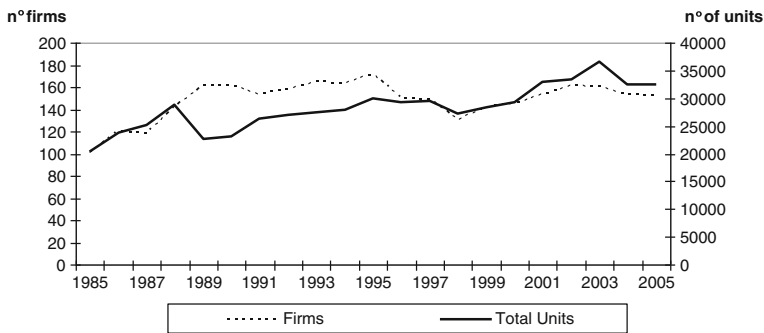
Hypothesis 2: Younger franchise systems with a higher percentage of franchised units will have higher mortality rates than younger franchise systems with lower rates of franchised units.

## Methods

### Data source and characteristics

The data used in this study span a time period from 1985 to 2005 and include a total of 393 firms, all of which provided automotive products and/or services. This research uses archival data drawn from the *Franchise Annual*, an annually published, commercially available collection of data on franchise systems in the U.S. consistent with other franchise-related research (e.g., Brickley et al. 2006; Kaufmann and Dant 2001; Lafontaine and Shaw 1998). Further, the *Franchise Annual* provides a listing of firms organized by industry, a feature not readily available in similar guidebooks.

On average, franchisors began franchising operations 1984 with 58.8 % of firms in the sample beginning prior to the 1985 publication date, the initial year of the data set. Over the time horizon of the study it was common for firms to appear, then drop out of the set again. The range of firms analyzed each year spans 101 to 172 with an average of 148 firms per year. After first appearing in the data set firms remained in the set for an average of 7.9 years and only 19 firms existed in the data set for the entire study period. The oldest firm (Goodyear Tires) was established in 1898 while the youngest firms (two) were established in 2000. Since we are analyzing franchise systems we note that firms in the set maintained on average 165 total units, 78 % of



**Fig. 1** Evolution of the number of franchisors total units over time

which were operated by franchisees. Figure 1 displays the development of the total number of franchisors and franchised units in our sample over time. Firms in our sample provided 16 unique services (see Table 1), such as the *oil, lube, filter* category, which was represented most frequently at 16.5 %.

#### Dependent, theoretical, and control variables

The dependent variable in this study follows the exit concept of other articles in which organizational survival was examined (e.g., Dobbs 1999; Dobrev 2007; Shane 2001; Kosova and Lafontaine 2010). We measure this variable as a dummy-variable that takes value “1” for non-survivors and “0” for survivors. A non-survivor firm is a firm that ceases to appear in the *Franchise Annual*. Time of exit from the population was recorded

**Table 1** Percent of firms by specialized services offered

| Services                | Percent |
|-------------------------|---------|
| Oil, lube filter        | 16.50   |
| Appearance accessories  | 14.80   |
| Paint/body work         | 14.50   |
| Brakes                  | 14.50   |
| Parts product           | 14.20   |
| Mobile/distance service | 13.70   |
| Transmission repair     | 13.00   |
| Washing detailing       | 9.40    |
| Muffler repair          | 8.90    |
| Suspension              | 8.10    |
| Glass/windshield        | 7.90    |
| Tires                   | 7.90    |
| Heating cooling         | 7.10    |
| Engine/power drive      | 6.60    |
| Bed liners              | 6.60    |
| Phones/alarms           | 6.10    |

*N*=393



as the year prior to the last year that the franchisor was listed in the *Franchise Annual* because of the assumed time lag between exit and the publication of the directory.

The theoretical variables we test in our models include firm age, the percentage of franchised units, and a multiplicative interaction term between the two. Firm age is measured by subtracting the year of study from the year the organization began operations. The percentage of franchised units is derived from dividing the number of franchised units by the total number of units in the chain. A franchise chain with a value of .75, then, would be comprised of 25 % company-owned units and 75 % franchisee-owned units. The interaction term is a traditional product term generated by multiplying the age of the firm by the percentage of franchised units. This type of operationalization of the interaction term provides the most straightforward interaction and interpretation of moderating effects (Jaccard et al. 1990).

A broad range of control variables was included that were thought to have an impact on the franchise chains in the automotive product/service sector. Consistent with Shane (2001), the size of franchise chains was captured using the total number of units in the chain; and due to extreme skewness, we used the log transformation of total units (again, consistent with Shane 2001). As environmental factors, we considered a number of variables thought to impact survival rates of the automotive products and services industry in particular. Since many of the firms derive sales from vehicles in need of repair or maintenance, we include the number of manufacturer vehicle recalls as a proxy for the general level of need for automotive services.

We also included broader control variables related to the economy: inflation, unemployment, and GDP. High inflation or unemployment rates may limit the ability of customers to pay for automotive products or services, thus limiting sales for some franchise outlets. On the other hand, high inflation or unemployment rates may influence people's decisions to keep older model vehicles in more need of repair thus boosting sales for some franchise outlets. The same type of logic can be applied to the growth of the economy as measured by the annual change in GDP and also the annual inflation rate. In addition, however, even though resource scarcity arguments have largely been contradicted by empirical research on franchising activities (Combs and Ketchen 2003); there may yet be benefits to franchisors in tight credit markets over time and credit availability generally tracks very closely with GDP growth rates (Kalani and LeBas 2012). Table 2 presents the means, standard deviations, and a correlation matrix of all the variables.

## Methodology

Previous investigations of mortality rates of franchise chains have used a variety of empirical modeling techniques. Initial investigations made use of ANOVA (e.g., Falbe and Welsh 1998) and logistic regression (e.g., Lafontaine and Shaw 1998). Subsequent investigations began making use of modeling techniques used in the organizational ecology literature such as Cox regression analysis (e.g., Shane and Foo 1999; Shane 2001). More recently Kosova and Lafontaine (2010) utilized proportional hazard modeling with a Weibull distribution to account for the possibility of negative duration dependence (i.e., a liability of aging). They found the Weibull model to have more robust estimates than that achieved using a Cox regression model. Consistent with Kosova and Lafontaine (2010), we test our hypotheses with



**Table 2** Descriptive statistics and correlations

| Variable              | Mean   | s.d.   | Min    | Max    | 1    | 2    | 3    | 4    | 5    | 6    | 7    |
|-----------------------|--------|--------|--------|--------|------|------|------|------|------|------|------|
| 1. Exit               | .07    | .26    | .00    | 1.00   | 1.00 |      |      |      |      |      |      |
| 2. Firm age           | 19.91  | 15.74  | 1.00   | 125.00 | -.04 | 1.00 |      |      |      |      |      |
| 3. Percent franchised | .78    | .29    | .00    | 1.00   | -.02 | .07  | 1.00 |      |      |      |      |
| 4. Log total units    | 3.76   | 1.71   | .00    | 8.86   | -.08 | .42  | .32  | 1.00 |      |      |      |
| 5. Recalls            | 323.43 | 140.18 | 173.00 | 601.00 | -.12 | .12  | .00  | .03  | 1.00 |      |      |
| 6. Unemployment rate  | .06    | .01    | .04    | .07    | .01  | -.07 | .02  | -.03 | -.52 | 1.00 |      |
| 7. GDP change         | 2.99   | 1.32   | -.20   | 4.80   | -.01 | .03  | -.02 | .01  | .06  | -.44 | 1.00 |
| 8. Inflation rate     | .03    | .01    | .02    | .05    | .05  | -.09 | .01  | -.01 | -.33 | .06  | -.26 |

Coefficients greater in magnitude than .04 are significant at the .05 level

the Weibull model.<sup>1</sup> The hazard function of a firm  $\lambda_j(t)$  is expressed as:  $\lambda_j(t) = \exp(X_j\beta)$ , where  $X_j$  is a vector of measured explanatory variables for the  $j$ th firm (time-varying constant covariates),  $\beta$  is the vector of unknown regression parameters to be estimated (as coefficients or hazard ratios). We performed our analysis using the *streg* function in STATA (version 10.0) software package.

Given this method of analysis, the treatment of various aspects of time is of particular interest to investigators. We split the data into year-long episodes by franchise chain so that covariates could be updated on an annual basis; this yielded 3,004 firm-year observations. In STATA, the *stset* function was used to appropriately organize the data for analysis. Even though firms were not observed prior to 1985, they were still at risk of failure. This left-truncation of the data was handled by STATA using the *origin* function to set the time the firm was first at risk for failure as its founding year. The *enter* function was used to set the year the firm was first under observation. Firms which were still listed in the *Franchise Annual* directory at the end of the observation period were treated as right-censored in the various models generated from the *streg* function.

## Results

Results of the proportional hazard rate analysis are reported in Table 3. To ease interpretation, we have included a three dimensional surface plot (see Fig. 2) of the hazard estimates for franchise chain age and percentage of franchised units derived from the model in presented Table 3. The interaction term is significant, and even though the first-order terms are only marginally significant, the significance level of the interaction term is what is critical to testing our hypotheses (Jaccard et al. 1990).

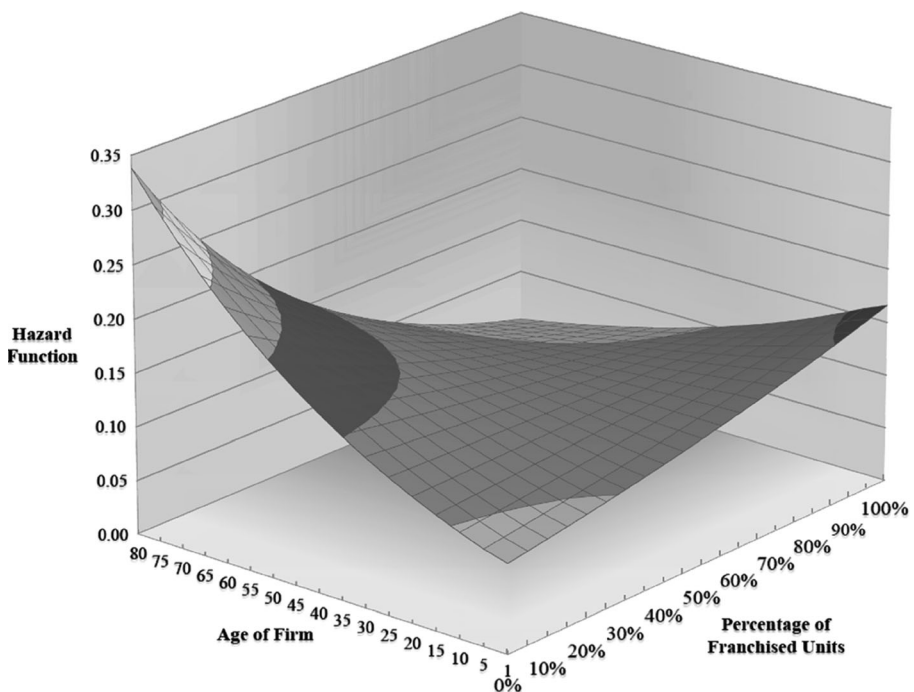
<sup>1</sup> We also estimated models using Cox regression. All coefficients had the same signs in both models, and both models were significant at  $p > .0000$ . However, significance levels were higher for all variables in the Weibull model, and the significance level was higher for the Weibull model as a whole as indicated by the likelihood ratio.

**Table 3** Weibull proportional hazard model

| Independent variables                         | Coef.   | Std. error | Z     | P <  z |
|-----------------------------------------------|---------|------------|-------|--------|
| Age of firm                                   | .02     | .01        | 1.80  | .07    |
| Percent franchised units                      | .73     | .36        | 2.06  | .04    |
| Age of firm $\times$ percent franchised units | -.03    | .01        | -2.60 | .01    |
| Log total units                               | -.15    | .05        | -3.16 | .00    |
| Recalls                                       | -.01    | .00        | -6.84 | .00    |
| Unemployment rate                             | -62.10  | 11.98      | -5.19 | .00    |
| GDP change                                    | -.22    | .07        | -3.25 | .00    |
| Inflation rate                                | -25.75  | 8.63       | -2.98 | .00    |
| Constant                                      | 4.34    | 1.31       | 3.32  | .00    |
| Log likelihood                                | -176.32 |            |       |        |
| LR chi2                                       | 89.09   |            |       |        |
| Probabilty > chi2                             | .00     |            |       |        |

3,004 observations, 372 firms, and 217 failures

As seen in Fig. 2, older firms with higher percentages of franchised units have lower mortality rates than older firms with lower percentages of franchised units. This supports hypothesis 1. As regards hypothesis 2, younger firms with higher percentages of franchised units have higher mortality rates than younger firms with lower percentages of franchised units, thus supporting this hypothesis as well.

**Fig. 2** Interaction effect of percentage of franchised units with firm age on franchise mortality rates

All control variables had significance levels at better than the  $p < .01$  level and all had negative coefficients indicating lower mortality rates. Larger franchise chains were less likely to fail than smaller franchise chains. To further investigate potential effects of size and age, we also tested an interaction term between the two variables, but no significance of the interaction term was found at the  $p < .10$  level. More automotive recalls decreased mortality rates as we thought they might. The general environmental economic control variables had mixed effects. While the more “negative” factors of higher unemployment and inflation rates negatively impacted mortality rates (enhanced survival), it was positive GDP growth rather than negative that had the same effect.

## Discussion

The results of our investigation provide support for the idea that franchising benefits increase over time and more so for franchising chains with higher percentages of franchised units vs. company-owned units. Using the estimates provided in the model and graphed in Fig. 2, a 60 year old franchising chain with 80 % of its units franchised has a higher likelihood of survival (mortality hazard function of .09) than a franchising chain of the same age but with 20 % of its units franchised (mortality hazard function of .19). Our model estimates the likelihood of failure for the latter is twice that of the former. The highest likelihood of failure predicted by our model is that of an old franchise chain with very few franchised units, while the lowest likelihood of failure is that of an old franchise chain with a very high percentage of franchised units. Therefore, we assert there is evidence that an older franchise chain with fewer franchised outlets is at a significantly higher risk of failure.

Our results also provide support for the proposition that the benefits of franchising are not fully realized for younger franchising systems and such firms still face significant liabilities of newness. According to the estimates of our model, a 10 year old franchising chain with 80 % of its units franchised has a higher likelihood of failure (mortality hazard function of .13) than a franchising chain of the same age but with 20 % of its units franchised (mortality hazard function of .10). The differences in mortality hazard rates between younger firms with different percentages of franchised units is far smaller than with older franchise chains. Therefore we assert there is evidence that franchising takes time to develop into system able to fully generate benefits to a franchisor over time, and younger franchisors will be at slightly, but significantly, greater risk of failure in their earlier years.

These findings produce some managerial implications. Particularly, our research provides to franchisors some guidelines about optimizing company-owned versus franchised units. Our findings suggest that as the firm increases its experience as a franchise chain, the franchisor should keep a higher percentage of franchised units. This study provides the franchisors with an indication of the level of franchised units they should have based on their years in business. This is consistent with a view of environment-firm “fit” as a precondition for survival. Also, of importance to franchising, Grünhagen and Dorsch (2003) find that the franchisor–franchisee relationship quality deteriorates over time. Our study suggests that franchisors learn how to

manage relationships with increasing experience in franchising, so that they may be able to ameliorate the deterioration of the relationship.

While the benefits of franchising regarding the problems of adverse selection and moral hazard have been addressed by previous researchers, how franchisors can use holdup to their own benefit over the long-term is a new contribution of this research. Also, that franchising may counteract obsolescence and senescence is another original contribution to the literature that we make here. Our findings also contribute to the organizational ecology literature with new evidence on hybrid forms which has historically been under-investigated by organizational ecologists.

However, several limitations of our study should be noted. First, the data source used, *Franchise Annual*, is composed of secondary data from franchisors whose appearance in the directory is voluntary. As is the case with many archival data sources, gaps, inconsistencies, and errors occur and cannot always be filtered or corrected. Nevertheless, given the dearth of better sources of franchising activities, we proceeded with this source. Second, the data do not contain automotive dealerships and independent firms that also compete in the market with franchise units. This implies we cannot capture competition effects from those kinds of firms. Third, our data only cover the franchise automotive industry. Generalization to different industries will require further investigation and confirmation.

The limitations just mentioned and our study results both introduce avenues for further investigation. Confirmation or contradictory evidence of our primary finding that older franchisors with higher percentages of franchisees have lower mortality rates could be sought in industries other than the automotive products and services sector. Also, organizational survival is only one type of dependent variable that can be used to understand effects of franchising. If the effects we hypothesize are robust, they should appear in other measures of firm performance such as income, profits, or even the acceptance rate for new franchisees. It may also be interesting to investigate different types of exit; for example, distinguishing between organizational failure and the decision to stop franchising.

Summarizing, in this paper we have investigated ecological phenomena in hybrid organizations (franchises) operating over a 21-year period. Other scholars have studied franchising with either explicit or implicit ecological frameworks (Pilling et al. 1995; Shane 1996; Shane and Foo 1999; Perrigot et al. 2004; Kosova and Lafontaine 2010; Grünhagen et al. 2011) but no previous studies to our knowledge have applied survival analysis to study mortality rates of franchised businesses in one industry over 20+ years. We found that organizational age interacts with the percentage of firm units that are franchised such that mortality rates are lowered for older firms with higher percentages of franchised units. We ascribe this observed relationship to the benefits of franchising regarding the issues of adverse selection, moral hazard, holdup, obsolescence, and senescence. Our findings have relevance for scholars of franchising and organizational ecology who are interested in age effects, as well as practicing franchise chain operators who are interested in the optimal mix of franchisees vs. company-owned outlets. We hope and believe this research provides valuable additional insight to both groups.

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