IT Businesses and Franchising: A Research Proposal

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Abstract

Franchising has been popular as a growth strategy for small businesses; it is even more so in today's global and information-based economy. In early 2001, Entrepreneur *magazine—well known for its Franchise 500 listing—added a Tech Businesses category to its Franchise Zone with three subcategories: Internet Businesses, Tech Training, and Miscellaneous Tech Businesses. This study applies Herbert Simon's model for business firm growth as a theory-grounded solution to help managers understand the growth dynamics of IT-based franchising businesses. We present a research proposal with a pilot study of the growth of 27 IT-based franchise businesses, and explain how to relate the parameters of Simon's model to strategic variables that can give managers a valuable strategic tool to understand the context of their industrial competition in IT-based franchising.*

1. Introduction

The information age has laid out a "new competitive landscape" [2, 3, 20, 21], with innovations in computer-based technologies for information processing and telecommunications that have incrementally transformed the way we live and do business. Franchising is popular as a growth strategy for both small and large businesses; it is even more so in today's global and information-based economy. Franchising is defined as

> A business opportunity by which the owner (producer or distributor) of a service or a trademarked product grants exclusive rights to an individual for the local distribution and/or sale of the service or product, and in return receives a payment or royalty and conformance to quality standards. [17]

In his best seller, *Business @ the Speed of Thought*, Bill Gates [15] wrote: "Information Technology and business are becoming inextricably interwoven. I don't think anybody can talk meaningfully about one without talking about the other." Today, not only are franchise businesses using information technology (IT) internally to develop good relationships between the franchisor and the franchisees [6], but also many franchise businesses are now dedicated to various aspects of IT:

> With the ubiquity of computers, it comes as no surprise that an entire segment of franchises are serving both business and consumer computer users. In 2001, [*Entrepreneur* magazine] recognized the growth of these companies by giving them their own category, divided into Internet Businesses, Tech Training and Miscellaneous Tech Businesses. With that increasing demand, companies like The Fourth R and Computertots/Computer

> Explorers are teaching everyone from children to businesspeople how to get the most out of computers. For people who are already computer and Web savvy, companies like GlobeNetix provide Internet services, while franchises such as Computer Doctor handle maintenance. [10]

At the time of this writing, 27 companies are listed, of which many have international franchises. In this rapidly changing economy where information is a primary competitive resource, the cycle of winning and losing and asset redistribution intensifies as the speed of information exchange increases. As a result, the size and performance of business firms increasingly resembles a one-sided skew distribution. A few IT-based franchises, such as WSI Internet, dominate the market while a large number of smaller companies struggle to survive (see Table 1). It is more necessary than ever to find explanatory theories to describe, model, and predict the emerging market structures of the business environment in the digital economy, both at the aggregate level of industries, and for individual firm competition [8].

To assist managers of IT-based franchise businesses, concrete quantitative theories are also helpful for better understanding the dynamics of firm growth and business competition in the IT franchising industry. Herbert Simon, the 1978 Nobel laureate in economics, developed such a model [16, 23, 25]. Designed for modeling the growth of business firms in industries with skew distributions, Simon's model provides a valuable tool for quantitatively modeling the growth of IT-based franchises.

This study contributes to information systems strategy by applying Simon's model for business firm growth as a theory-grounded solution to help managers understand the growth dynamics of IT-based franchising businesses. In this paper, we present a research proposal with a pilot study of the growth of IT-based franchise businesses, and explain how we can relate the parameters of Simon's model to strategic variables that can give managers a valuable strategic tool to understand the context of their industrial competition in IT-based franchising. The study is organized as follows. First, we present Simon's model for firm growth and describe its key parameters. Then, based on Herbert Simon's approach for theory formation [24], we present a research proposal to empirically test the applicability and usefulness of Simon's model on IT-based franchises. We demonstrate the application of Simon's model with a pilot study analyzing the data available at the Entrepreneur.com web site on the 27 information technology businesses.

2. Simon's model for the growth of business firms

2.1. Skew distributions and information productivity models

The phenomenon of skew distributions is not a new one. The fundamental idea is a situation where a few significant items or members of a set are responsible for a significant majority of the productivity, while the majority of items or members are responsible for only a relatively small portion. For example, the majority of income or wealth accrues to a small number of people (the original Pareto principle); the majority of business revenues comes from a small number of customers; the majority of Web browser hits on a user's computer comes from a small number of websites [26]; and the majority of assets in an industry belong to a small number of firms [16]. In all these examples, the converse is also true; that is, the majority of firms in an industry are responsible only for a relatively small percentage of the assets.

Out of a number of different models that try to mathematically represent skew distributions [see 5], the most promising we have found has been that developed by Herbert Simon, the 1978 Nobel laureate in economics, in his extended investigation to model the growth of business firms using skew distributions [16, 23, 25]. Using a dynamic growth model, Simon represents the growth of individual firms within an industry. Although Simon's model is over thirty years old, we have been unable to locate any work other than ours [4, 5] that has built upon or even applied his techniques to the problem of modeling the size of firms. The closest we were able to locate has been applications to database performance evaluation [12, 13, 14] and the evaluation of website caching performance [26].

Although it has been so little applied in the past, Simon's model provides a timely solution to the present need for a quantitative theory to analyze strategic growth of IT-based franchise businesses in the information age. In the following sections, we describe Simon's model in detail and explain why it is well suited for our study.

2.2. Description of Simon's model

Simon's model is a stochastic model that traces the growth of individual firms within an industry. On one hand, because it models individual firms, it allows us to examine the path of an individual firm's growth vis-à-vis its competitors. On the other hand, because it is stochastic, it does not precisely explain why one firm should outperform another. However, later we will propose an extension to Simon's model that attempts to associate particular properties to individual firms in the stochastic process, which we relate to specific strategic variables. Here, we summarize Simon's model as described in his 1964 paper with Yuji Ijiri [16].

Simon's model describes a situation where there are a number of firms in an industry. In each time period, the industry as a whole experiences a unit of growth. This unit growth comes either from the entry of a new firm into the industry (and into the pool of firms being modeled), or from the unit growth of a single firm in the industry. α designates the ***rate of new entry*** into the industry, expressed as a number from 0 to 1, indicating the probability that the unit growth of the industry in a given time period goes to a new entrant.

If in a particular time period the industry grows by the enlargement of an existing firm rather than by the addition of a new one, the probability of any existing firm experiencing this growth is a weighted average of $1–\alpha$. The weight of each individual firm depends on how recently it experienced growth. The assumption here is that a firm that has experienced recent growth is more likely to grow again in the present than is another firm that experienced growth a relatively long time ago. The strength of this industry recency effect, or ***growth potential***, is measured by a number γ between 0 and 1. In an industry with $\gamma = 0$, neither current size nor past growth give any advantage in current growth. In an industry with $\gamma = 1$, current growth is entirely dependent on current size, with no regard to recency of growth [26]; that is, the larger the firm at present, the greater its chances to grow in the immediate future. Simon estimates that most γ values would be between 0.9 and 1, for which recency of growth has a greater effect on current growth than does the current size of a firm.

Mathematically, Simon's model expresses the probability P that a particular firm i will grow by one unit in the $(k + 1)$st interval as

$$P[y_i(k+1)=1]=\frac{1}{W_k}\sum_{\tau=1}^{k} y_i(\tau)\gamma^{k-\tau}$$

where k is the current time period;
$y_i(\tau)$ is 1 if firm i grew by a unit in time τ, and 0 if not;
γ is the industry growth potential; and
Wk is the sum of growth potentials of all firms, described in Ijiri and Simon [16].

Simon's model incorporates the entry of new firms into an industry with the α parameter. However, there is no explicit acknowledgement of the rate of exit from the industry. This is not an oversight in the model, but a simplification. In fact, α more correctly represents the *net* rate of entry, with the assumption that there are more entrants than exiters in the period of observation. Of course, this assumption makes the tracking of individual firm growth less meaningful. In a future refinement of the model, we could explicitly incorporate a rate of exit parameter, and modify the model to include a mechanism for firms to exit the industry, perhaps after a period of no growth.

A related limitation is the fact that although Simon's model represents firm growth, it says nothing abut firm decline. Again, this simplification notwithstanding, the model is still able to present a fairly accurate representation of the dynamics of firm growth. However, a future modification could include a mechanism for firms to decline in size, perhaps by having each individual firm expend assets as a function of time. This could be connected with the exiting mechanism, such that a firm exits the industry when it declines in size to zero.

2.3. Simon's model and IT franchising businesses

The two principle parameters of Simon's model are α, the rate of new entry of items; and γ, the industry growth potential. In the context of IT franchising businesses, α represents the probability that a new firm will enter the industry. In their simulated tests of the model, Ijiri and Simon [16] calculated α two different ways: In some simulations, they used a fixed number such as 0.2. Such a number could be obtained by looking at the average number of new entrants over a period, and then dividing this number by the average number of firms in the industry. To approximate a dynamic entry situation more closely, Ijiri and Simon alternatively calculated α as the number of firms currently in the industry, $n(k)$, divided by the total number of asset units, k, at that time.

In Simon's model, γ represents the industry growth potential of existing firms, such that a customer who has recently purchased a firm's product or service is more likely to purchase from the same firm at the present time than from a firm not so recently visited. For IT-based franchising businesses in the information age, γ seems to represent the strength of network effects in an industry [1]. In the presence of network effects, a firm's products are more valuable to customers when there is a large customer base. Therefore, the more recently customers have acquired the product, the more likely new and repeat customers are to acquire products from the same firm. This network effect is reflected in Simon's model when a firm that has recently grown is more likely to grow again in the immediate future than firms of the same size that have not grown so recently. One of the most notable effects of the information age has been to increase the incidence and strength of network effects [20]. As a result, we would expect that the γ effect would be more marked in the information age.

2.4. Individual growth potential (γ_i): An extension to Simon's model

In a sense, Simon's model as originally presented is non-strategic. It is a stochastic model that tries to model the general pattern of the growth of firms within an industry. Although it does track the growth of individual firms, with some outperforming others, the determination of which particular firm would outperform another is entirely determined by chance. In their application of Simon's model to website caching policies, Watson et al [26: Appendix C] demonstrate the growth pattern of a small number of document hits to determine the probability that a particular document will be the next one to be requested. With such a detailed trace of each individual item, each item could be assigned its own growth potential. From this approach, we propose an individual growth potential, γ_i, a parametric form of the industry growth potential, γ, where each firm i has its own individual γ_i. Although the concepts of α, γ, and γ_i are still somewhat abstract, we will clarify them as we relate them to the growth of IT franchising businesses.

3. Research proposal: Empirical testing of the model

The next step in our study of how Simon's model can represent the growth of IT franchising businesses involves testing the model with actual data. In this section, we propose a research study that conducts such an examination, and we explain how the findings of the study can be used to determine the values of α, γ and γ_i. We begin here by describing Herbert Simon's unconventional approach to theorizing, which approach he used to develop his model for business firm growth. It is important to lay out his philosophical approach to better understand how his model can be applied to the problem at hand. Then we describe the methodology of the research study and present the results of our pilot study. This pilot study is a model of how more comprehensive data can be used to determine the parameters of Simon's model, and how we can relate these to the growth of IT business franchises.

3.1. Simon's theory-discovery approach to model development

Herbert Simon's research stream that modeled the growth of business firms using skew distributions followed a somewhat unusual approach to theorizing. The standard approach in the social sciences—primarily Sir Ronald Fisher's legacy of null hypothesis statistical testing—is this: (1) Develop a theory and generate hypotheses. (2) Using experimental or quasi-experimental control, test the hypotheses to see if they hold for observed empirical data. (3) If the data is consistent with the theory, the theory is supported. Otherwise, it is refined to better fit the data.

Although this paradigm is more or less accepted as gospel, it is not without its critics [see 9 for a review of the debate]. While Herbert Simon does not take issue with Fisher's approach, he does argue that it is inadequate for exploring phenomena that are not well understood [24]. In such a situation, it is necessary to adopt another approach that begins by observing the data, and searches for models that can adequately explain the data.

Ironically, Simon's [24] approach to developing quantitative models is remarkably similar to the philosophy behind grounded theory, a very qualitative—even interpretive—research methodology which arose at about the same time that Simon presented his approach [see 18 for an overview and review of grounded theory]. "Grounded theory's distinctive features, as initially presented, are its commitment to research and 'discovery' through direct contact with the social world studied coupled with a rejection of *a priori* theorizing" [18: 34]. Rather than assuming that there is a theory "out there" that can be seen manifest in the empirical observations, grounded theory views theory as a systematic way to explain what is empirically observed. Thus, it is critical to not approach a study with theoretical presuppositions. A grounded researcher must let the data explain itself, and allow a theory arise that explains what the researcher observes. The grounded theory approach, though still growing in acceptance, has been used for investigations in the information systems domain [for example, 19, 22].

Thus, although Herbert Simon's approach is unfamiliar to most researchers, its underlying philosophy is not unique. It involves five steps whose basic thrust is to observe empirical data and to select a model that most efficiently explains the phenomenon reflected in the data. The main difference between this approach and traditional hypothesis testing is that there is no attempt to prove that a model is "correct". Rather, the researcher must argue and demonstrate that the selected model appropriately and satisfactorily resolves the research question at hand. Simon's five steps are:

1. Start with the analysis of empirical data, not theories.
2. Make simple generalizations that approximately summarize striking features of the empirical data.
3. Manipulate the influential variables to seek for limiting conditions that will improve the approximation.
4. Construct simple mechanisms to explain the simple generalizations.
5. Propose explanatory theories that go beyond the simple generalizations and make experiments.

Table 1. Growth pattern of 27 IT-based franchising firms [10]

Company	Founded	Franchising Since	Number of franchises in year						
			1996	1997	1998	1999	2000	2001	2002
WSI	1995	1996			113	113	232	491	695
New Horizons Computer Learning	1982	1992		186	212	219	251	283	
Quick Internet	1995	1996		30	56	126	259	200	
Academy of Learning	1987	1987	137	137	153	158	166		
Computertots/Computer Explorers	1983	1988		152	140	140	131	105	
Wireless Zone	1988	1989		61	78	91	122	132	
CompuChild	1994	2001						93	90
Computer Troubleshooters	1997	1997		4	14	36	71	90	
Computer Moms Int'l. Corp	1994	1998			30	57	59	62	65
Z Land.com	1995	1996			2	25	48		
Expetec	1992	1996			11	14	31	44	45
@Wireless	1994	2000				4	19	36	
NetSpace	1996	2000					10	33	
Geeks On Call America	1999	2001						6	33
Full Circle Image Inc.	1991	1997			12	20	23	32	31
Zaio.com	1998	2002					9	23	
Wireless Toyz	1995	2001				4	4	13	20
Rescuecom	1997	1998			4	4	7	11	17
Computer Builders Warehouse	1991	1999			1	2	7	9	13
Friendly Mobile Computer Services	1992	2000			1	1	3	4	13
Computer U Learning Centers	1993	1997		3	5	5	12		
Show Me PCs	1999	1999				1	3	9	9
LifeStyle Technologies	2000	2001					1	5	9
GlobeNetix	1997	2000						4	
Gate Post Computer Services	2000	2001						2	3
Support On-Site Computer Services	1997	1998			1	2	2	3	
GlobeVantage	2000	2001						1	

3.2. Analysis of empirical data

The researcher begins with observation and analysis of the empirical data, rather than bringing in theories that beforehand try to explain what will be seen. This approach to theory building is applicable in situations where there is no existing theory that explains the phenomenon. While there is a place for bringing in the closest existing theory to the situation and trying to fit it, there is also a place for starting out with a clean slate and allowing the data tell the story. Simon uses this approach in developing his skew distribution model for business firm growth [16, 23, 25]. The goal here is not to test the validity of any existing theory, but rather to discover applicable theory that can adequately explain the empirical data that is observed [24].

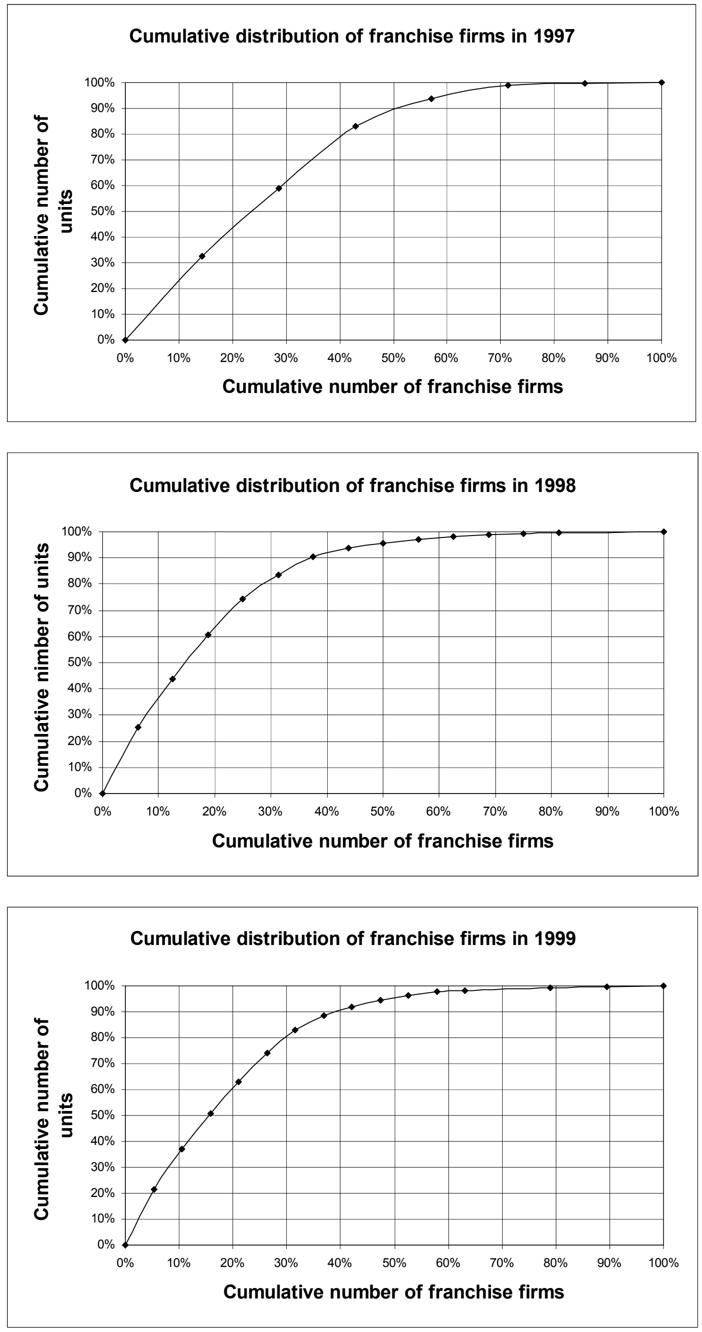
In early 2001, *Entrepreneur* magazine—well known for its Franchise 500 listing—added a Tech Businesses category to its Franchise Zone with three subcategories: Internet Businesses, Tech Training, and Miscellaneous Tech Businesses. At the time of the writing, 27 companies are on the list with many of them having international franchises. In our pilot study, we study the data available at the Entrepreneur.com web site on the 27 information technology businesses [11]. Table 1 presents the available results from Entrepreneur.com.

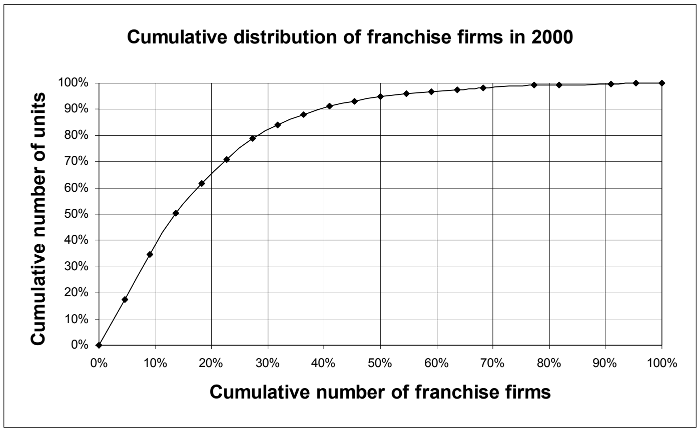
3.3. Summarizing striking features of the empirical data

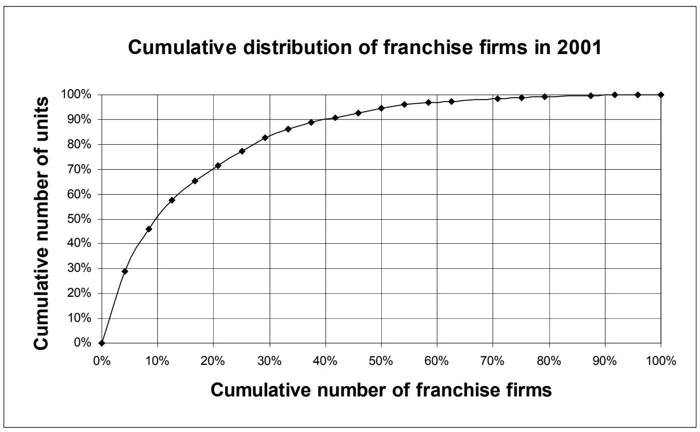
Based on eyeballing the data, estimate simple generalizations that approximately capture and explain the major trends evident in the observed data. This stage of generalization relies on graphical methods of descriptive data analysis. Because the purpose at this stage is exploratory, it is necessary to use many different graphical presentation techniques. This will give several different views of the data. Sometimes rotation techniques will be necessary for multidimensional data [see 9]. This stage requires creativity and imagination to discern patterns in the data that might not be immediately obvious. Mathematical transformations of the data, such as logarithms, reciprocals and square roots, might be necessary to see general patterns.

A valuable perspective of the empirical data is obtained by plotting the percentage cumulative number of firms on the horizontal axis, and the percentage cumulative assets on the vertical axis. We call this format a Pareto-form presentation, as it demonstrates the Pareto 80-20 principle where approximately 80% of business assets are in the top 20% of firms. Figure 1 plots the cumulative distribution of the 27 IT-based franchising firms from 1997 to 2001, demonstrating a Pareto-type skew distribution.

Figure 1. Cumulative distribution of IT-based franchising firms for 1997-2001 by year







3.4. Identifying the influential variables

To better understand the limits of the generalization, tweak the pertinent variables to push the generalization to its limits, thus understanding the boundaries of its applicability. One major risk of using a multiplicity of exploratory graphical presentation techniques is that inevitably, multiple patterns will emerge, many of which will be purely coincidental. Thus, the patterns that have been preliminarily identified will need to be "tested" for reliability. At this stage, this simply involves tweaking the variables that the patterns depend on to see what form the data takes on when the variables occur at extreme values. Very often, these extremes will yield results that widely diverge from the patterns identified early on; such occurrences would indicate that such patterns are probably coincidental. However, it is always possible, when dealing with empirical data, that some extreme values are outliers that occur for reasons that cannot be explained even by an excellent model. Thus the researcher has to exercise caution and discernment in excluding and including possible explanatory patterns in this boundary-finding stage.

3.4.1. Determine α and γ. The next step in modeling the growth of IT-based franchising businesses is to use the plotted data to determine the values of α and γ that apply in the industry. We have not yet worked this step out in detail, but it will involve a backward derivation of these two parameters, obtained by fitting the data to the model and thus deriving α and γ. This is similar to the process suggested by Watson et al [26] in estimating α and γ when modeling the incidence of Web document hits to determine an optimal caching policy.

α simply represents the rate of entry of new firms into the industry. There are two approaches to determining α. The simple approach is, at the end of the entire observation period, to divide the total number of firms by the total number of units of growth. For example, if the industry has a total asset value of \$2 billion, and \$1 million represents a unit asset (a sample minimum efficient scale; see Ijiri and Simon [16]), then we have 2,000 units of growth. If the industry has two hundred firms, then α is $200 \div 2000 = 0.1$. The other approach to calculating α would be to try to estimate a dynamic functional form that represents the rate of entry at any given point in time. For this calculation, we would need to take into account the theoretical determinants of barriers to entry, and α would be the inverse of barriers to entry.

Like the second approach to computing α, the computation of γ would also be nontrivial. It would involve observing the state of the industry at each point in time, dynamically calculating the value of γ at each point, then perhaps obtaining an average value that is representative of all the time periods. While the concept of α (rate of entry into the industry) is relatively simple, γ is a complex, rich parameter that can capture an aspect of the attractiveness or profitability of different franchise industries.

3.4.2. Determine γ_i. For computing the individual growth potential, we will follow a backward derivation procedure, similar to that which we described for calculating γ above. The primary difference here is that rather than aggregating the results and calculating an industry-wide γ, we will compute an individual γ_i for each firm. We are not certain at this point what will be the relationship between γ and γ_i. It might be as simple as the mean of all the individual γ_i values, or γ might be the complex result of a weighted array of γ_i values.

While α represents the inverse of barriers to entry, and γ represents some measure of industry attractiveness such as network effects, γ_i seems to represent an index of individual competitive advantage in comparison with the other franchise firms in the same industry. Such an index would be valuable when related to various well-accepted strategic variables. For example, Clarkin, Hasbrouck, and Rosa [7] found that the total number of franchise units and the number of years of franchising experience are both significant predictors of franchise business performance.

3.5. Constructing simple mechanisms

When a few patterns are identified that seem to be fairly consistently represented in the data, the researcher will then look for simple mathematical models that seem generally consistent with the data. Of course, there will be a wide amount of actual divergence from the actual data, so the researcher must be flexible in not trying too hard to find a "perfect" match at this stage. Getting the general shape of the pattern of data will be sufficient. One reason why it is important to not find a perfect fit just yet is that there are likely some parameters affecting the observed data that a simple model cannot include. It would take future refinements to fine-tune the model to include other relevant parameters—this is a necessary next step. At this stage, though, the researcher is simply looking for a base model that generally "works", one solid enough for extensions and modifications.

Figure 2 plots the graphs from Figure 1 on one chart, highlighting the year-to-year changes in the shape of the Pareto curve. In general, the roundness of the curve has increased with time. The roundness of the Pareto curve indicates the existence of a skew distribution; that is, a situation where a fewer number of firms is responsible for more of the franchise units. This indicates greater industrial concentration and stronger performance from a smaller number of firms.

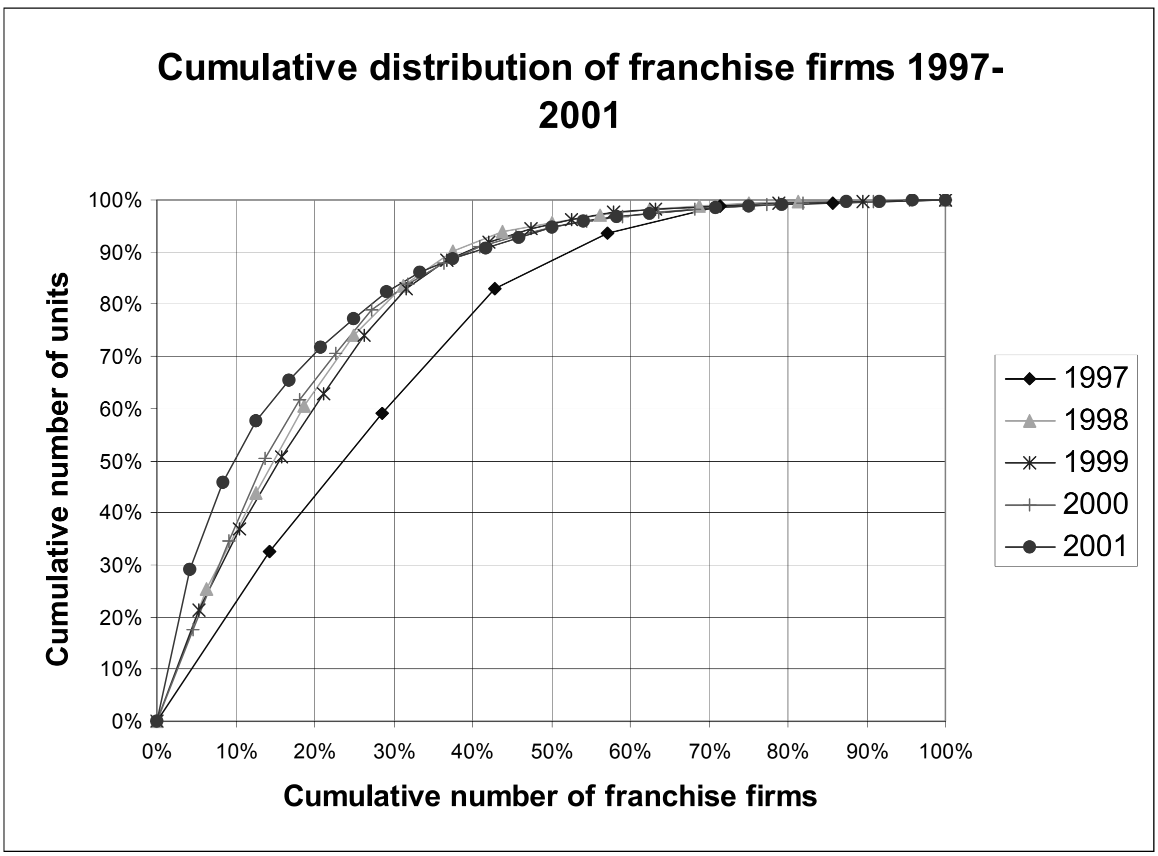


Figure 2. Changes in cumulative distribution of IT-based franchising firms, composite for 1997-2001

3.6. Proposing explanatory theories

When a working model is identified that fits the data reasonably well (sometimes more than one might be identified), the researcher will need to offer some theory to explain why the data would have the properties manifest in the model. Deriving this theoretical explanation is an imaginative process that involves going back and forth between the theory—including existing theory on the phenomenon—and the empirical data. Thus, an explanation should arise that reconciles observed phenomena with the mathematical properties of the model. When such a theory has been identified, it will provide a base for making predictions. These predictions can be used to conduct experiments that test the theory by applying it to other empirical data under controlled conditions matching those from which the grounded theory arose.

At this preliminary stage of our investigation, it is difficult to propose explanations for the trends we observe in the IT-based franchising industry. In our proposed study, we will examine a larger number of companies that more exhaustively represent the industry. Moreover, we will conduct case studies of the most successful businesses to better understand the reasons for the skew distribution we observe in the industry.

4. Conclusion

In this study, we have described a procedure for modeling the strategic growth of IT-based franchise businesses. The intensity of the information age is making business competition fiercer. Today, not only are franchise businesses using information technology (IT) internally to develop good relationships between the franchisor and the franchisees, but also many franchise businesses are now dedicated to various aspects of IT. As a tool for modeling the growth of IT-based franchise businesses, we have presented Herbert Simon's model for firm growth [16, 23, 25] and have related the two key parameters of Simon's model, α and γ, to important strategic theories pertinent to franchises [7]. We have also introduced the idea of individual growth potential, γ_i, as a measure of firm competitiveness within an industry. We have presented a research proposal to empirically test the applicability and usefulness of Simon's model on IT-based franchise business using a pilot study of 27 actual firms.

An increasing amount of research has been written on how different aspects of the competitive landscape are changing [see 3]. Framed under the titles of "the information age" and "the new economy", much literature recognizes that many of the fundamental theories and perspectives in strategy research must be reassessed, as the environment upon which they were based undergoes momentous changes. This research study provides a valuable contribution in trying to quantitatively model the growth of franchise businesses in this new age.

As both IT and franchising continue to transform the competitive landscape, it is vital for managers to be able to understand the changing nature of competition. Such understanding opens up doors for innovative directions of managing that can lead to competitive advantage and superior performance.

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